

Research Article

Gendered Understandings of Nature: Women's Role in Indigenous Knowledge and Resource Management in Ethiopian Forests

Mohammed Zeinu Hassen * 

Department of Social Sciences, Addis Ababa Science and Technology University, Addis Ababa, Ethiopia

Abstract

Indigenous knowledge (IK) systems are increasingly recognized as vital for sustainable development and environmental management, particularly in contexts like Ethiopia where livelihoods are intimately linked to natural resources. However, existing research often overlooks the critical gendered dimensions of how nature is understood and managed within indigenous communities. This paper analyzes insights from an examination of existing empirical data on Ethiopian indigenous knowledge, environmental perceptions, and resource management practices, with a specific focus on forest and tree resources, drawing significantly from findings in the Yayu Coffee Forest Biosphere Reserve and related contexts. Our primary objective is to illuminate the distinct roles, specialized knowledge, and unique challenges faced by women in relation to forests and nature. The analysis demonstrates that nature, particularly forests and trees, is often perceived and utilized through clearly defined gendered territories, labor divisions, and cultural-spiritual associations. While men may traditionally hold more formal roles in forest management and cash crop production like coffee, women maintain indispensable, often less visible, roles. These include the crucial collection of essential resources like firewood, ensuring household nutrition through home gardens and sometimes wild foods, and the vital transmission of nature-related knowledge and cultural values through traditional education and practices. Key challenges confronting women include the commodification of resources, external development interventions that often ignore indigenous ecologies and gendered knowledge systems, severe time constraints due to heavy domestic workloads, and cultural perceptions that can devalue women's traditional roles and knowledge, particularly concerning wild food resources. This study argues that a comprehensive understanding of environmental stewardship and the effective integration of indigenous knowledge for sustainable forest management in Ethiopia must explicitly acknowledge, value, and incorporate women's unique perspectives, roles, and knowledge systems. Recognizing and addressing these gendered dynamics is imperative for fostering more equitable and effective natural resource management outcomes.

Keywords

Indigenous Knowledge, Gender, Ethiopia, Forests, Resource Management, Environmental Perception, Sustainable Development, Cultural Practices, Traditional Education, Agroforestry

*Corresponding author: mohammed.zeinu@aastu.edu.et (Mohammed Zeinu Hassen)

Received: 5 June 2025; **Accepted:** 21 June 2025; **Published:** 9 July 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

1. Introduction

The relationship between human societies and the natural environment is deeply intertwined, with local communities often possessing extensive knowledge about their surroundings and sustainable resource use. Indigenous knowledge (IK), which we define broadly as the system of knowledge developed and maintained by Indigenous and local communities and transmitted from generation to generation [1], is increasingly crucial for addressing contemporary environmental challenges and fostering sustainable development [2-5]. In Ethiopia, a country with diverse ecological zones where a significant portion of the population relies directly on natural resources for their livelihoods [6, 7], understanding and integrating IK into environmental management and development initiatives is particularly vital [8, 9].

Ethiopian forests, which are some of the most extensive forest resources on the continent, play a significant role not only ecologically but also in providing non-timber forest products (NTFPs) and ecosystem services that support nutrition and livelihoods [10]. However, these vital resources face rapid degradation due to various pressures, including agricultural expansion, population growth, and unsustainable resource extraction [11]. Addressing these challenges requires a holistic approach that considers the complex interplay between human activities, cultural values, political interventions, and environmental dynamics [12, 13].

While extensive work documents indigenous knowledge systems in Ethiopia related to agriculture, land use, and environmental management e.g., [14, 15, 9], the specific roles, perspectives, and knowledge held by women within these systems, particularly concerning forest and tree resources, have remained less explored in a focused manner. Our analysis of existing data indicates distinct gendered domains and responsibilities related to natural resources [10, 5], suggesting that men and women may possess differing knowledge, interact with the environment in unique ways, and face distinct challenges in the context of environmental change and external interventions.

This article aims to synthesize insights from available research to explore the gendered understandings of nature and the role of women in indigenous knowledge and resource management within Ethiopian forests. It posits that women's interactions with forests, their traditional knowledge about forest products, and the cultural significance attributed to their roles are critical, yet often overlooked, aspects of sustainable forest management and community well-being. By drawing on documented empirical findings regarding gendered territories, resource use patterns, knowledge transmission, and cultural practices related to forests and nature in Ethiopia, this article highlights the importance of recognizing and integrating women's indigenous knowledge for effective environmental stewardship and equitable development.

2. Conceptualizing Indigenous Knowledge, Gender, and Nature in the Ethiopian Context

Indigenous knowledge is not a monolithic entity, but rather a complex, evolving body of knowledge, practices, and beliefs that are deeply embedded in local cultural contexts and adapt over time in response to environmental and socio-economic changes [16-19, 5]. It is passed down through generations via various mechanisms, including oral traditions, observation, participation, and community interactions [20, 14, 5]. Importantly, our analysis confirms that IK is often holistic, encompassing interconnected understandings of the physical environment, social relationships, spirituality, and livelihoods [21-23, 5, 1]. This contrasts with Western scientific approaches that may fragment knowledge and view nature primarily as a resource for exploitation [5, 9].

Our investigation into African Indigenous knowledge underscores its holistic nature and intrinsic link to spirituality and cultural practices. We observe that African spirituality is a major pillar of identity and well-being, connecting humans to the natural and supernatural worlds [23]. This perspective imbues nature with spiritual significance, where trees, rivers, stones, and other elements are seen as manifestations of gods or spirits, requiring respect and care [23, 5]. Disregarding the approval of ancestors and spirits in resource use can lead to communal punishment [5]. This spiritual-ecological connection forms a fundamental part of indigenous environmental stewardship.

Gender roles and relationships are integral to the structure and transmission of indigenous knowledge within communities. Our examination indicates that traditional education systems in Africa, for instance, often involved gender-specific training, preparing boys and girls for their distinct roles in society and within the household and community economy [5]. While both men and women contribute to and hold knowledge about their environment and livelihoods, their specific domains of expertise, responsibilities, and perspectives can differ significantly based on culturally defined roles and access to resources and information [10, 5].

In the context of natural resource management, this gendered division of labor and knowledge can lead to distinct understandings of nature and resource use. Men may traditionally focus on tasks like clearing land, farming, or commercial use of forest products, developing knowledge and perspectives related to these activities. Women, on the other hand, often hold primary responsibility for tasks closer to the home, such as managing home gardens, collecting water and firewood, and preparing food, leading to a different set of knowledge and priorities related to local resources, particularly those essential for household survival and nutrition [10].

The interaction between these gender knowledge systems

and the broader environment, including forests, is complex. Forests in Ethiopia are vital for various reasons, serving as sources of biodiversity, watershed protection, and materials for livelihoods [10]. Studies in areas like the Yayu Coffee Forest Biosphere Reserve highlight the importance of different management zones (core, buffer, transitional) and the varying degrees of interaction between local populations and the forest within these zones [10]. While coffee production in these forested areas is often a male-dominated activity related to cash income, women's engagement, though perhaps less visible in terms of formal management or commercial activities, is crucial for the daily sustenance and well-being of households drawing resources from these same ecosystems [10].

However, our analysis of existing data reveals that external development interventions and changing socio-economic conditions can disrupt these traditional gendered dynamics and the associated knowledge systems. Policies that promote specific, often Western-derived, approaches to resource management or agriculture, while overlooking indigenous practices and gendered roles, can undermine the effectiveness of traditional stewardship and negatively impact local livelihoods, particularly for women [9, 10]. For example, interventions that prioritize male-dominated cash cropping in forested areas without considering women's needs for firewood or wild foods can inadvertently reinforce gender inequalities and contribute to unsustainable resource use [10].

The following sections delve deeper into the specific evidence available in the literature regarding gendered understandings and women's roles in the context of Ethiopian forests and nature, exploring how their knowledge, practices, and challenges contribute to the broader picture of environmental management and sustainable development in the region.

3. Gendered Domains and Forest Interaction in Ethiopian Forests

Analysis of data from the Yayu Coffee Forest Biosphere Reserve explicitly documents a gendered division of labor and territory related to land and resource use [10]. Within this community, gender roles are described as "very traditional" and heavily influenced by cultural conventions and pride [10]. These roles define who is primarily responsible for different areas and tasks:

Responsibility for different agricultural cultivation and use areas in the study site was divided by gender, with women primarily responsible for the home gardens and fruit trees and men for the forest and crop fields. This does not mean that men and women never enter each other's areas. The cultural values of the Oromo community rely heavily on conventions and pride [24], which includes clear gender roles. Women are expected to be involved in agricultural cultivation and to take care of children and household tasks,

which include collecting water and firewood, mostly from coffee forests [10].

This establishes the forest, particularly the coffee forest plots, as primarily a male territory, while home gardens are considered women's domain [10]. This spatial division of labor influences the types of knowledge acquired and maintained by men and women regarding the resources within these territories.

Despite the forest being a male-associated territory, women interact with it regularly, primarily for the collection of essential household resources. Data from surveys conducted in the Yayu Coffee Forest area showed that a significant majority of surveyed households (79%) collect firewood from the buffer zone [18]. The specifics of this labor are gendered:

Women walk up to 4 hours several times a week to collect firewood from the forest for cooking, whereas men primarily collect firewood for sale and transport it by donkey a few times a month [18].

This indicates that while men may engage with forest resources for commercial purposes, women's interaction is more frequent and directly tied to meeting the daily needs of the household, specifically for cooking. This consistent, albeit often physically demanding, interaction with the forest for firewood collection provides women with a different kind of knowledge about the forest compared to men whose interaction might be focused on coffee cultivation or commercial timber/firewood activities.

Beyond firewood, the forest is also a source of other resources, including wild foods and medicinal plants. Investigations reveal that while men are more familiar with medicinal and aromatic plants in the forest, women are primarily responsible for vegetable cultivation and nutrition [10]. Interestingly, the collection of wild foods from the forest is not a widespread practice in the Yayu area, despite the region suffering from micronutrient deficiencies and low diet diversity [10]. This points to a disconnect between the potential nutritional benefits offered by the forest and actual consumption practices.

The limited use of wild foods from the forest is explained by cultural factors and perceptions documented in the area [10]. For example, women interviewed for existing studies stated that they believe "nutrition needs to come from our own land, crop fields, and cultivation, and not from the forest" [10]. Wild foods are sometimes perceived negatively in the findings:

Traditionally, wild plant collection has a low status in this community and belongs to a time when famines were more common, farmers were not able to produce sufficient food on their own land, and the sedentary lifestyle was not perceived as ideal. Status in the community is gained through successful agricultural cultivation, which means that the land nurtures the family and enables people to afford a good life. The forest can contribute as a livelihood source and a source of products that can generate cash to buy food, but it cannot be a food source itself [10].

Furthermore, some perceptions recorded in the research link wild food collection to "tribal hunter-gatherer groups from southern Ethiopia (described according to their linguistic origin as omotik)" [10], implying a lower social status for those who rely on such practices. These cultural perceptions, particularly among the sedentary agricultural community in Yayu, act as a barrier to utilizing wild forest foods, even those known to be edible and nutritious.

Within this context, the gendered roles become critical. Since nutrition is primarily seen as a "woman's responsibility" [10], the cultural devaluation of wild forest foods directly impacts women's ability to enhance household nutrition using readily available forest resources. Women's knowledge of wild edible plants in the forest was also found to be lower in documented studies than men's, particularly among younger women [10], potentially due to the declining practice of collecting wild foods.

However, examination of traditional spiritual-ecological connections to nature also reveals a significant role for women in specific nature-related rituals. The Erecha ritual in Ethiopia, described as a "female-dominated" and "women-centered" practice, is linked to water and tree spirits [23]. This ritual, celebrated on the shore of Lake Hora Arsed, is considered an "ancient indigenous religious practice" where women play a central role [23].

Observations gathered indicate that Erecha is essentially "an ancient indigenous religious practice... celebrated on the shore of Lake Hora Arsed, under the shade of a large female sycamore tree" [23]. The devotees of the Erecha ritual myth of creation are women who pay homage and "tribute to the water and tree spirits" [23]. The high priestess of the Erecha ceremony is Lomi Deme, a woman who presides over the prayers, worship, and ritual sacrifices to the Waka or creator who resides in the sea-water and is manifest through various ayana or spirits [23].

This illustrates a profound, culturally embedded spiritual and ecological connection for women in certain Ethiopian contexts, distinct from the daily resource management activities but linked to nature, trees, and water. This suggests that women's indigenous knowledge extends beyond practical resource use to encompass spiritual understandings and traditional ecological knowledge about the interconnectedness of life and the environment.

Further analysis indicates that the Erecha ritual serves as a "spiritual site where African women can reassert their authority in a society that traditionally holds women as less important than men" [23]. It becomes a space for "resistance and identity formation, growth and consolidation," contrasting with aspects of Western modernity like book education that some perceive as undermining traditional female authority and authentic identity [23]. This highlights how women's engagement with nature, in this case through ritual, can be a source of cultural continuity, identity, and even a form of resistance against external influences and traditional patriarchal structures.

Our analysis of the holistic nature of indigenous knowledge, including spiritual and cultural aspects [1, 5], confirms its crucial role in understanding women's connection to nature. Traditional African education, we observe, was a "holistic process that integrated the rituals, ceremonies, demonstrations, imitations, recitations, observations, repetitions, and skills needed to sustain the community" [5]. It was intimately incorporated into the social, cultural, artistic, emotional, religious, and recreational life of the community [5]. While specific gender roles were part of this education, the overall system aimed to preserve cultural heritage and instill values like responsibility, accountability, and respect for the environment [5]. Women, as key educators in the early stages of life, played a crucial role in transmitting this nature-related knowledge and these values to younger generations [5].

This indicates that women's indigenous knowledge of nature is not limited to practical skills like firewood collection or home gardening, but also includes cultural, spiritual, and ethical dimensions transmitted through traditional education and participation in rituals. Their role in shaping the younger generation's understanding of nature is vital for maintaining long-term environmental stewardship, which relies on a deep respect for the interconnectedness of life and the environment.

4. Challenges to Women's Indigenous Knowledge and Forest Management

Despite their essential roles and unique knowledge, women's engagement with forest resource management in Ethiopia faces significant challenges. Some of these challenges stem from traditional cultural structures, while others are exacerbated by external interventions and changing socio-economic conditions.

One key challenge consistently reported is the already heavy workload faced by women, particularly in rural areas. Studies in the Yayu Coffee Forest area found that women described themselves as "heavily overburdened with work and cultural responsibilities, working up to 18 hours per day, compared with 8-10 hours for men" [10]. This limits their available time and capacity to engage in activities beyond essential household tasks, such as collecting wild foods from the forest or participating in training programs related to resource management. As one woman was recorded stating, "We are sitting in trainings, thinking of the household chores that need to be done at home" [10].

This time constraint directly impacts women's ability to contribute more actively to forest management discussions and activities, potentially marginalizing their practical knowledge and perspectives gained through frequent interaction with the forest for firewood. It also affects their capacity to learn about or adopt new practices, even those that might enhance household nutrition or income, such as cultivating indigenous wild vegetables [10].

Cultural barriers also play a role in limiting women's full

engagement. As discussed earlier, the low status associated with collecting wild forest foods in the Yayu area, linked to times of famine and "tribal" practices, discourages women from utilizing this resource for household nutrition [10]. While nutrition is a female responsibility, the cultural perception that nutritious food should come from cultivated land creates a barrier to exploring alternative food sources from the forest, regardless of women's knowledge of edible forest plants.

External development interventions and government policies, often driven by Eurocentric or top-down approaches, have, based on our analysis of available evidence, historically undermined indigenous knowledge systems in Ethiopia [9, 5, 14]. This often disregards the complex, holistic nature of IK and the specific roles and knowledge held by women within these systems. For example, interventions that prioritize male-dominated cash crops like coffee, without considering women's needs or knowledge related to other forest resources, can inadvertently reinforce gender inequalities and contribute to unsustainable resource use patterns [10].

Data from the Yayu Coffee Forest illustrates this tension [10]. While coffee cultivation is a key livelihood source for men and is linked to forest conservation efforts (as coffee requires shade trees), there is a conflict between traditional management practices and conservation goals, such as removing older trees to make space for younger ones in the buffer zone [10]. How women's specific knowledge or concerns (e.g., impact on firewood availability or wild food sources) intersect with these conflicts is not always explicitly detailed in existing studies, but the general top-down nature of some management efforts suggests their perspectives might be overlooked.

Furthermore, formal education systems in Africa have often failed to integrate indigenous knowledge, implicitly devaluing local ways of knowing and potentially alienating students from their cultural heritage [5, 25]. This can impact the intergenerational transmission of women's indigenous knowledge related to nature, as younger generations may not acquire the same depth of knowledge from elders as in the past [10]. Our analysis highlights the challenge of ensuring that educational reforms in Africa, driven by goals of productivity and poverty reduction, do not further marginalize indigenous epistemologies and cultural identities, including those related to gender and nature [5].

The commodification of natural resources and shifts towards market-oriented livelihoods also pose challenges. While selling forest products like charcoal or firewood can provide cash income [11], this can increase pressure on forests and potentially alter traditional resource management practices that prioritized sustainability for local use rather than commercial gain. If men increasingly focus on commercial extraction, women's roles related to subsistence use (like firewood) might face increased scarcity or require traveling longer distances, further adding to their workload.

Moreover, issues of land tenure and resource access are

critical. The nationalization of land in Ethiopia has impacted traditional resource management systems [9]. While some indigenous institutions have historically managed communal resources and resolved conflicts over them [15, 26], changes in land policy and increased population pressure (driven partly by migration as discussed in [11]) can undermine these systems and lead to increased competition for resources. Existing data does not always explicitly detail the gendered impacts of land tenure changes or resource conflicts on women in forested areas, but studies in pastoral areas indicate that women are often "victims of conflict" [15] and their roles in mediation are sometimes indispensable [15]. This suggests that resource conflicts arising from changing land use and increased pressure may disproportionately affect women and challenge their ability to access essential resources from nature.

The overall context of environmental degradation, including deforestation and aridity [15], exacerbates these challenges. As resources become scarcer, the tensions related to their use and management are likely to intensify, potentially further marginalizing the voices and knowledge of vulnerable groups like women if not explicitly included in management and development strategies.

5. Implications for Sustainable Forest Management and Development

Recognizing and integrating women's indigenous knowledge and perspectives is crucial for achieving sustainable forest management and broader development goals in Ethiopia. Our analysis of the evidence highlights several areas where women's knowledge and roles are particularly relevant.

Firstly, in the realm of nutrition and household well-being, women's knowledge of wild edible plants and their responsibility for household food security position them uniquely to identify and promote the use of nutritious forest resources [10]. Despite cultural barriers and time constraints, there is potential documented in studies to revive the cultivation and use of indigenous wild vegetables and fruits, particularly in agroforestry systems within transitional zones [10]. Trials have explored this possibility [10], noting that while extension agents sometimes disregard indigenous practices, there is potential for adoption if introduced through culturally appropriate means and linked to tangible benefits like reduced workload or improved income.

Integrating women's knowledge of which plants are edible, nutritious, and suitable for cultivation in different conditions, combined with their traditional roles in home gardening, could directly contribute to improving diet diversity and addressing micronutrient deficiencies in rural communities [10]. This aligns directly with Sustainable Development Goal 2 (ending hunger and improving nutrition) and SDG 5 (achieving gender equality and empowering women and girls) [10].

Secondly, women's deep, often spiritual, connection to nature, as exemplified by the Erecha ritual [23], suggests a potential cultural foundation for environmental stewardship. While this particular ritual may not be directly linked to daily forest management in Yayu, it underscores that women hold culturally significant knowledge about the value and interconnectedness of nature beyond its purely material uses. Recognizing and supporting such cultural practices can reinforce a community-wide ethic of respect for the environment that complements practical management strategies. The holistic view of IK, where practical and spiritual knowledge are intertwined [1, 5], means that excluding women's spiritual-ecological knowledge leaves a gap in understanding the full scope of indigenous environmental stewardship.

Thirdly, women's roles in transmitting knowledge through traditional education are vital for ensuring the continuity of indigenous knowledge systems related to nature [5]. If formal education continues to devalue local ways of knowing or fails to integrate them effectively, the intergenerational transmission of women's specific knowledge about local plants, resource management, and cultural practices may weaken. Our analysis suggests that efforts to bridge the gap between formal and indigenous education must explicitly include women's roles as knowledge holders and transmitters within their domains of expertise (e.g., home gardens, nutrition, nature-related rituals) [5].

Fourthly, addressing the challenges women face, such as heavy workloads and time constraints, is essential for enabling their more active participation in forest management decision-making. Development initiatives aimed at sustainable forest management need to consider how to reduce women's labor burden or provide alternative livelihoods that free up their time for other activities, including community discussions and training related to resource management [10].

Simply providing training or inviting women to meetings may not be sufficient if their daily responsibilities prevent them from attending or fully engaging. Initiatives should be designed in a way that acknowledges women's time poverty and finds flexible, culturally appropriate ways to involve them.

Finally, our findings indicate that external interventions and policies must move away from top-down, Eurocentric approaches that prioritize fragmented, commodified views of nature and resource management [9, 5, 14]. Instead, they should adopt participatory approaches that genuinely consult and value local communities, including women, as key knowledge holders and decision-makers [10]. This requires a shift in perspective, recognizing that indigenous knowledge, including women's perspectives, is not "primitive" or "non-scientific" but a valid and necessary form of knowledge for sustainable stewardship in their specific ecological and cultural contexts [9]. As documented in prior work and supported by our synthesis, the historical disregard for

indigenous knowledge by policymakers has hindered effective environmental management in Ethiopia [9].

Examples from other resource management contexts in Ethiopia, such as pastoralism, underscore the potential of integrating indigenous knowledge. While not directly focused on forests, studies in Guji and Somali regions show that indigenous conflict management mechanisms, often involving elders and sometimes women in crucial mediation roles, are preferred and effective in resolving disputes over scarce resources like rangelands and water [15, 26]. The challenges faced by women in these pastoral communities, who are often victims of conflict, highlight the importance of addressing gender dynamics within resource management strategies [15]. Lessons learned from these contexts regarding the importance of local institutions, community participation, and culturally appropriate approaches can inform sustainable forest management efforts, ensuring that women's needs and knowledge are not overlooked.

6. Conclusion

This analysis has synthesized insights from various studies to explore the gendered understandings of nature and women's roles in indigenous knowledge and resource management within Ethiopian forests, particularly drawing on documented evidence from the Yayu Coffee Forest Biosphere Reserve. We found that within these communities, nature, including forests and trees, is perceived and managed through distinct gendered domains, labor divisions, and cultural-spiritual associations. While formal forest management and cash crop production like coffee may be male-associated, women maintain vital roles related to resource collection for household needs, household nutrition, and the transmission of nature-related knowledge through traditional education and cultural practices.

The Erecha ritual serves as a powerful example of a women-centered spiritual-ecological practice that underscores a deep cultural connection to nature, beyond purely utilitarian resource use. This demonstrates that women's indigenous knowledge encompasses not only practical skills but also holistic, spiritual, and ethical understandings that are crucial for environmental stewardship.

However, women's full engagement and the value of their indigenous knowledge in forest management face significant challenges. These include the heavy burden of household labor, cultural perceptions that devalue certain nature-related practices (like wild food collection), and external development interventions that adopt top-down approaches, disregard indigenous ecologies, and fail to recognize or integrate gendered knowledge systems. We have found that historical trends of marginalizing indigenous knowledge by policymakers have contributed to environmental problems, and this marginalization is often exacerbated for women.

For sustainable forest management and equitable development in Ethiopia, it is imperative to explicitly

recognize and value women's unique perspectives, roles, and indigenous knowledge related to forests and nature. This requires moving beyond Eurocentric, fragmented views of knowledge and adopting participatory approaches that genuinely include women in decision-making processes related to resource management. Addressing the constraints faced by women, such as time poverty, through targeted support or alternative livelihood options can enable their greater participation. Furthermore, our analysis indicates that efforts to integrate indigenous knowledge into education systems must acknowledge women's roles as knowledge transmitters and ensure that their specific expertise is preserved and passed on to future generations. By embracing the holistic nature of indigenous knowledge and actively including women as key knowledge holders and managers, Ethiopia can strengthen its efforts towards sustainable environmental stewardship and ensure that the benefits of its vital forest resources contribute to the well-being of all members of its communities.

7. Future Research Directions

Based on the limitations and insights from the body of work examined, future research could delve deeper into:

- 1) Detailed anthropological investigations specifically focusing on women's indigenous knowledge of forest ecology, plant species (beyond just edible or medicinal), and the spiritual significance of specific forest areas from women's perspectives across various Ethiopian forest ecosystems.
- 2) The specific impacts of changing land tenure systems and resource conflicts on women's access to and management of forest resources, using gender-disaggregated data and qualitative methods.
- 3) The effectiveness of different participatory approaches in genuinely including women in forest management planning and implementation, assessing barriers and facilitators to their participation.
- 4) The potential for developing culturally appropriate training and education programs that integrate women's indigenous knowledge of forest resources, nutrition, and health, possibly linking home garden initiatives with forest product knowledge.
- 5) The intersection of climate change impacts on forests and women's adaptive capacity, exploring how their indigenous knowledge can inform strategies for climate resilience at the household and community levels.

Abbreviations

| | |
|-------|----------------------------|
| IK | Indigenous Knowledge |
| NTFPs | Non-Timber Forest Products |

Author Contributions

Mohammed Zeinu Hassen is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] Stoianoff NP, Wright E. Fair use and traditional cultural expressions. In: Corbett S, Lai JC, editors. Making copyright work for the Asian Pacific: Juxtaposing harmonisation with flexibility. ANU Press; 2018. p. 75-94.
- [2] Agrawal A. Indigenous and Scientific Knowledge: Some Critical Comments. *Indigenous Knowledge and Development Monitor*. 1995; 3(3): 3-6.
- [3] World Bank. Indigenous knowledge for development: a framework for action. Knowledge and Learning Center Africa Region, The World Bank, Washington; 1998.
- [4] Grenier L. Working with indigenous knowledge: a guide for researchers. IDRC, Ottawa; 1998.
- [5] Darko IN. Ghanaian Indigenous health practices: The use of herbs [Unpublished master's thesis]. University of Toronto, Ontario, Canada; 2009.
- [6] FAO. Global Forest Resources Assessment 2015—Country Report Ethiopia. Rome, Italy: FAO; 2014.
- [7] McCann JC. From poverty to famine in north east Ethiopia. Philadelphia: University of Pennsylvania Press; 1987.
- [8] Dixon A. The indigenous evaluation of wetlands research in Ethiopia. *Development in Practice*. 2003; 13(4): 394-398.
- [9] Merid T. Indigenous ecological knowledge and the changing livelihood strategies of the Gedeo people. *Journal of Ethiopian Studies*. 2019; 52: 139-166.
- [10] Nischalke SM, Abebe M, Wondimagegnhu BA, Kriesemer SK, Beuchelt T. Forgotten forests? Food potential of ancient coffee forests and agroforestry systems in the southwestern Ethiopian mountains, seen through a gender lens. *Mountain Research and Development*. 2017; 37(3): 254-262.
- [11] Getahun K, Poesen J, Van Rompaey A. Impacts of resettlement programs on deforestation of moist evergreen Afromontane forests in Southwest Ethiopia. *Mountain Research and Development*. 2017; 37(4): 474-486.
- [12] Chazan M. Natural Resource Management in an Urban Context: Rethinking the Concepts of 'Community' and 'Participation' with Street Traders in Durban, South Africa. In: Laura G, et al., editors. Beyond the Biophysical: Knowledge, Culture, and Power in Agriculture and Natural Resource Management. Ottawa: Springer; 2010. p. 149-166.

- [13] Bryant R, Bailey S. Third world political ecology. London and New York: Routledge; 1997.
- [14] Dixon AB. Wetland sustainability and the evolution of indigenous knowledge in Ethiopia. *The Geographical Journal*. 2005; 171(4): 306-323.
- [15] Abate T. Indigenous ecological knowledge and pastoralist perception on rangeland management and degradation in Guji Zone of South Ethiopia. *Consilience*. 2016; 2016(15): 192-218.
- [16] Warren DM. Comments on an article by Arun Agrawal. *Indigenous Knowledge and Development Monitor*. 1995; 4(1): 13.
- [17] Sillitoe P. The development of Indigenous knowledge: a new applied anthropology. *Current Anthropology*. 1998; 39(2): 223-252.
- [18] Berkes F. Sacred ecology: Traditional ecological knowledge and resource management. London: Taylor & Francis; 1999.
- [19] Alan Dixon. "The Indigenous Evaluation of Wetlands Research in Ethiopia." *Development in Practice* 13, no. 4(2003): 394-98.
- [20] Mundy PA, Compton JL. Indigenous communication and indigenous knowledge. In: Warren DM, Slikkerveer LJ, Brokensha D, editors. *The cultural dimension of development: Indigenous knowledge systems*. London: Intermediate Technology Publications; 1995. p. 112-123.
- [21] Battiste M. Research ethics for protecting Indigenous knowledge and heritage: Institutional and researcher responsibilities. *Handbook of critical and Indigenous methodologies*. 2008: 497-510.
- [22] Dei GJS. Rethinking the role of Indigenous knowledge in development. 1993.
- [23] Zegeye A, Vambe M. African Indigenous Knowledge Systems. *Review (Fernand Braudel Center)*. 2006; 29(4): 329-358.
- [24] Gella AA, Tadele G. Gender and Farming in Ethiopia: An Exploration of Discourses and Implications for Policy and Research. Working Paper 84. Brighton, UK: Future Agricultures Consortium; 2014.
- [25] Semali DJ. Community as classroom: Dilemmas of valuing African Indigenous literacy in education. *International Review of Education*. 1999; 45(3): 305-319.
- [26] Bouh AM, Mammo Y. Indigenous conflict management and resolution mechanisms on rangelands in Somali regional state, Ethiopia. *Nomadic Peoples*. 2008; 12(1): 109-121.

Biography



Mohammed Zeinu Hassen is an Ethiopian philosopher and academic who earned both his Bachelor of Arts and Master of Arts degrees in philosophy from Addis Ababa University. He has taught at Aksum University and currently serves as a senior researcher at Addis Ababa Science and

Technology University, while also lecturing in the Department of Philosophy at Addis Ababa University. Presently, he is pursuing a PhD in philosophy at the University of South Africa. His research interests encompass ethics, consciousness, human purpose, analytical philosophy, axiology, and the philosophy of science, with a strong emphasis on intercultural dialogue. Among his notable publications are "John Dewey's Philosophy of Education: A Critical Reflection" (2023), "Scientific Law as Universal Propositions: In Defense of Realist Perspective to the Law of Nature" (2020), and "Cartesian Methodological Doubt Vis-à-Vis Pragmatism: An Approach to Epistemological Predicament" (2020).

Research Field

Mohammed Zeinu Hassen: Consciousness, Human purpose, Analytical philosophy, Axiology, Ontology, Philosophy of science, Epistemology, Intercultural dialogue, Philosophy of education. Existential philosophy, Social and political philosophy.