Youth knowledge, engagement, and challenges in forest management and governance in Africa: a literature review

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HIGHLIGHTS

- Traditional forest knowledge among African youth is steadily declining.
- Youth face significant barriers to participation in sustainable forest management, including insecure tenure, limited training opportunities, and inadequate inclusion in decision-making.
- Rural youth depend on forests but lack secure and sustainable livelihood opportunities in rural areas.
- Opportunities for urban youth to engage in sustainable forestry and tree-based value chains remain understudied, yet are critical for the future of forests.
- Youth empowerment in forestry requires targeted education, supportive policy reform, and meaningful engagement mechanisms.

SUMMARY

Africa's forests are vital for biodiversity, livelihoods, and climate stability, yet they face increasing threats from anthropogenic activities and climate change. As the continent's youth population grows, their role in sustainable forest management becomes more critical. A literature review of empirical studies published between 2000 and 2024 found that urbanisation and modernisation are eroding traditional forest knowledge, though many rural youths remain dependent on the forests. Barriers such as insecure land tenure, limited training, exclusion from decision-making, and lack of support hinder youth engagement. Despite these challenges, young people show strong interest in sustainable forest use and conservation, though urban youth perspectives are underrepresented. To enhance youth involvement, the review recommends inclusive policies, better education on forest management, and integrating indigenous and scientific knowledge. Empowering African youth as conservationists and sustainable forest managers is crucial for addressing environmental challenges; future research should prioritize women and male youth from rural as well as urban areas, as both these groups remain underrepresented in the existing literature.

Keywords: African youth, forest governance, forest management, NTFPs, sustainability

INTRODUCTION

The African continent contains approximately 16% of the world's forest area, which is vital for both ecosystem functioning and human wellbeing. These forests encompass a wide range of ecosystems, including tropical rainforests, savannahs, shrublands, and mangroves, as well as trees outside forests (FAO 2020). Home to at least 9 000 tree species (BGCI 2021), Africa's forests play a critical role in sustaining biodiversity, supporting livelihoods, enhancing resilience, and regulating the climate. As Africa's population is projected to increase from 1.55 billion in 2025 to 2.47 billion by 2050 (United Nations 2024), the importance of forests in delivering essential ecosystem services is expected to grow further. Yet deforestation and forest degradation in Africa – primarily driven by agricultural expansion and unsustainable land-use practices, and potentially intensified by climate-related factors (Trisos *et al*. 2022 p. 1290, Wimberly *et al*. 2024) – risk exacerbating existing land-use pressures and heightening forest vulnerability. Because these environmental threats are largely anthropogenic, effective responses depend on collective action and sustained societal commitment (Trisos *et al*. 2022, Sections 9.3–9.4).

African youth are a driving force in forest conservation and sustainable development across the continent. As the world's youngest continent, Africa has over 400 million

young people aged 15–29, which is 3.5 times the youth population of Europe (United Nations 2025). While there is no single global definition of youth, the United Nations uses ages 15–24 for statistical purposes, the OECD often applies 15–29, and the African Union, through the African Youth Charter, defines youth as 15–34 (African Union 2006, United Nations 1981, OECD 2021). Regardless of the exact definition, Africa's youth population share is strikingly larger than in most other regions. By 2050, the continent is expected to account for 25% of the global population, up from 18% in 2024. This large youth cohort is increasingly educated, ambitious, and vocal in demanding change (Ickowitz Foundation 2022, 2024), positioning them as key actors in driving a transformative environmental agenda (von Hellermann 2010, Gitonga *et al*. 2023, Ickowitz Foundation 2024).

The role of forests in achieving sustainable development is reflected across multiple Sustainable Development Goals (SDGs), including protecting biodiversity and forest cover (SDG 15), enhancing climate resilience and carbon mitigation (SDG 13), supporting the water cycle (SDG 6), contributing to poverty alleviation and improved nutrition (SDGs 1 and 2), and creating decent, sustainable employment in the forestry sector (SDG 8).

Understanding the perspectives, activities, and aspirations of African youth regarding forests is therefore essential for effective forest governance. As they transition into adulthood, their experiences will shape future environmental actions (Lerner 2018), highlighting the importance of exploring contemporary youth–forest relationships (Brown *et al*. 2021, Gitonga *et al*. 2023). Meaningful youth engagement in forest-related discourse is vital – not only because they are tasked with confronting environmental challenges, but also due to their potential to drive innovative solutions. Increasingly, young people are recognised as agents of change in natural resource management (Zulu *et al*. 2023), with organisations such as the United Nations and African Union emphasising their pivotal role in sustainable development (African Union 2006, UN 2018). Nevertheless, youth–forest dynamics remain underexplored and poorly understood.

Africa's youth navigate a complex landscape of opportunities and challenges, where the aspiration to shape their future and contribute to the continent's development remains central. In some aspects, this group has made meaningful progress. In recent decades, improvements in health and education have expanded their prospects. Life expectancy rose from 53 years in 2000 to 64 years in 2023 (WHO 2024), while literacy rates increased from 61% to 75% during the same period. However, despite these gains, African youth still face greater difficulties than their peers elsewhere. Poverty remains widespread, with approximately 440 million people – around 40% of the continent's total population – living in extreme poverty in 2023 (Ingutia 2023, United Nations 2024). Many young people struggle to secure stable livelihoods, often relying on informal employment and experiencing chronic unemployment or prolonged socioeconomic stagnation – commonly referred to as "waithood" (Brown *et al*. 2021, Calvès *et al*. 2007, Carreras *et al*. 2020, Sumberg *et al*. 2021).

While education has increased awareness of global issues such as climate change (Ickowitz Foundation 2022, 2024, Simpson *et al*. 2021), it does not always guarantee employment, especially as rapid population growth and sluggish economic performance strain job markets (Boti Phiri 2022). Rural youth in particular face barriers to entering productive agriculture, including limited land and capital access (Brown *et al*. 2021, Magagula and Tsvakirai 2020). As a result, many perceive farming and forestry as labour-intensive and unattractive, prompting migration to urban areas (Sumberg *et al*. 2017). Others pursue diversified livelihoods, combining farming with off-farm income-generating activities (LaRue *et al*. 2021). Beyond economic hardship, African youth are affected by conflict and forced migration. Sub-Saharan Africa hosts over 20 million refugees (UNHCR 2025), and many young people are at risk of being recruited into armed groups due to education gaps, resource scarcity, and social exclusion (Ismail and Olonisakin 2021).

Systemic barriers also curtail youth political agency and marginalise their participation in decision-making processes. Despite Africa's demographic youthfulness, political leadership is still dominated by older generations, often fueling disillusionment and disengagement among young people (Ickowitz *et al*. 2022, 2024). Nonetheless, many youths are actively forging alternative pathways to influence, creating a sustainable future through climate action and eco-entrepreneurship, leveraging their skills to shape more resilient communities (Ickowitz Foundation 2024, Simmons 2022).

Although research has examined the economic and social struggles of African youth, their role in forest governance – and its implications for sustainable development – remains insufficiently explored. A deeper understanding of how young people engage with forest resources is essential for shaping policies that support youth livelihoods while promoting forest ecosystem sustainability (Brown 2021). This includes advancing forest landscape restoration, enabling youth entrepreneurship within a forest-based green economy, preserving traditional ecological knowledge, formulating equitable policies, applying agroforestry and implementing climate-smart forest practices at the local level.

This review investigates African youths' experiences, knowledge, and aspirations related to forests and broader environmental challenges. It examines their awareness of forest resources, participation in forest-based economies, and perspectives on forest governance at local, national, and continental levels. The objective is to enhance understanding of how African youth can be more effectively integrated into forest management, agroforestry and sustainable development efforts – both to improve their socio-economic prospects and to support environmental resilience.

The body of literature examining African youth–forest connections through a sustainability lens remains limited. While historical studies of forest-related practices (including youth involvement) exist, the aspirations and visions of young people – who will shape future forest governance – are seldom explored. A natural and constructive first step in addressing

this gap is to assess the current state of knowledge and identify research needs to inform future policy, strategy, and academic inquiry. This review therefore aims to synthesise existing peer-reviewed knowledge on the relationship between African youth and forests, including agroforestry. It does not include an analysis of the formal forest education organization, content and development (Onatunji *et al*. 2019, 2021). This analysis uses a dynamic and forward-looking lens, with a focus on forest knowledge, youth engagement, and future aspirations for sustainable forest use.

METHODOLOGY

Framework

This review adopts a temporal perspective on African youth–forest relations, recognising youth as a group whose forest-related knowledge, practices and aspirations are shaped by past experiences, present socio-economic conditions and future expectations. This perspective is particularly relevant in Africa, where a rapidly growing youth population is increasingly expected to play a central role in sustainable development and forest governance (African Union 2006, United Nations 2018, Ickowitz Foundation 2024).

The analytical orientation is informed by research emphasising that learning, agency and change emerge over time through the interaction of experience, knowledge and institutional context (Argyris and Schön 1978, Easterby-Smith and Lyles 2011, Emirbayer and Mische 1998). It also aligns with sustainability transition perspectives, which highlight how long-term change in resource governance depends on the gradual reconfiguration of practices, roles and power relations across generations (Geels 2002, Fischer *et al*. 2015).

This perspective provides the rationale for organising the review around four themes: (1) youth experiences and knowledge of forests, (2) current youth engagement in forest use and forest-based livelihoods, (3) youth perspectives and aspirations regarding future forest governance, and (4) recommendations proposed in the literature to strengthen youth inclusion. Together, these themes link existing empirical evidence to the broader situation of African youth and help assess how current patterns of engagement may shape future roles for young people in sustainable forest management.

Selection and analysis

The review process was informed by the PRISMA 2020 guidelines, which provide a structured framework for the transparent identification, screening, and reporting of studies in systematic reviews (Page *et al*. 2021). The review focused on empirical publications in English published between 2000 and 2024 and primarily accessed through scientific databases. Searches were conducted using Web of Knowledge, Scopus, and Google Scholar, employing the search terms outlined in Table 1.

Although few studies explicitly examined the nexus between African youth and forests, the review included empirical research addressing youth knowledge, practices, views and aspirations towards forests, whether as a primary or secondary focus. Definitions of 'youth' varied across studies and were not always explicitly stated; such variation was accepted provided that the research addressed relevant aspects of the youth–forest relationship. The search strategy combined concepts related to forests, African countries, and youth using Boolean operators, with truncation applied where appropriate (e.g., "agroforest*") to capture variations in terminology (Table 1). The initial identification phase yielded

TABLE 1 *Search terms and selection criteria used for the literature review (2000–2024). Overview of key search terms across fields and concepts (forest, youth, Africa) and their rationale for inclusion during the identification and screening phases*

Phase	Field	Concept / Scope	Search Words & Criteria	Records (n)
Step 1: Identification	Title	Forest (Ecological Scope)	"Forest" or "tree" or "wood" or "timber" or "bioenergy" or "Non-timber forest products" or "NTFP" or "agroforest*"	383,856
Step 2: Identification	Abstract	Africa (Geographic Scope)	"Africa" or names of all African countries (linked with "or")	4,988
Step 3: Identification	All Fields	Youth (Demographic Scope)	"Youth" or "young people" or "youngsters" or "young adults" or "generation" or "age-groups" or "student*"	279
Step 4: Identification	All Fields	Linkages (Socioeconomic Scope)	"View*" or "attitude*" or "perception*" or "vision" or "aspiration*" or "engagement" or "occupation" or "livelihoods" or "career" or "knowledge"	95
Step 5: Screening	Title	Refinement	Removal based on title relevance	35
Step 6: Screening	Abstract	Refinement	Removal based on abstract relevance	31
Step 7: Complementation	N/A	Addition	Added publication not from peer-reviewed publication	32

95 references, which were first screened by title to exclude studies clearly outside the scope, reducing the dataset to 35 studies. Abstract screening further narrowed the selection to 31 peer-reviewed studies. One additional non-peer-reviewed study on youth – science linkages (Gitonga *et al*. 2023) was included, resulting in a final corpus of 32 references. For each study, information on publication year, country, source, research approach, and key findings was extracted using a standardised framework. The selected studies generally incorporated a youth perspective, often in comparison with older adults. The studies were then synthesised thematically according to the four analytical categories outlined in the above framework, enabling the identification of patterns, gaps, and variations in youth knowledge, engagement, and barriers related to forest-based activities across different contexts.

LITERATURE REVIEW RESULTS

General overview

The reviewed literature spans the period from 2000 to 2024, reflecting growing, albeit still modest, scholarly attention to youth engagement with forest use and perceptions of forests (Appendix 1). Only two studies were published before 2010, followed by ten between 2010 and 2019. Since 2020, 20 studies have been recorded, suggesting increased interest in youth-related forest use and governance. However, it remains unclear whether this rise reflects a broader expansion in forest-related research across Africa or a specific increase in youth-focused studies. The publications appear in diverse interdisciplinary journals, underscoring the multifaceted nature of the topic. Key journals represented include Forest Policy and Economics (4), Heliyon (2), Journal of Ethnobiology and Ethnomedicine (2), and Southern Forests: A Journal of Forest Science (2), alongside 22 studies published in other outlets.

The studies span 20 countries, with Ethiopia, Cameroon, and Ghana most frequently represented (Figure 1). A few cover multiple countries (Lemke and Claeys 2020, Luiselli *et al*. 2019). North Africa is represented by only one study.

While the topics vary, most focus on forest management and governance, primarily in rural contexts (Appendix 1).

The dominant theme across literature is community forestry and livelihoods, which is addressed in sixteen studies (Gichuki *et al*. 2000, Yami *et al*. 2013, Yusuf *et al*. 2013, Ebifa-Othieno *et al*. 2017, Giuliani *et al*. 2017, Osei *et al*. 2019, Abebe *et al*. 2020, Ahononga *et al*. 2020, Chukwuone *et al*. 2020, Nigussie *et al*. 2021, Kudzinawo *et al*. 2022, Lucungu *et al*. 2022, Piabuo *et al*. 2022, Zikargae *et al*. 2022, Bayala *et al*. 2024, Opelele Omeno *et al*. 2024). Eleven studies specifically focus on youth or consider both youth and women as marginalised groups (Yusuf *et al*. 2013, Giuliani *et al*. 2017, Macneil *et al*. 2017, Luiselli *et al*. 2019, Lemke and Claeys 2020, Uduji and Okolo-Obasi 2020, Galabuzi *et al*. 2021, Nketia *et al*. 2022, Gitonga *et al*. 2023, Jama *et al*. 2023, Bamwesigye *et al*. 2024). Nine studies explore indigenous knowledge (Tanyanyiwa and Chikwanha, 2011, Ebifa-Othieno *et al*. 2017, Chukwuone *et al*. 2020, Ameneshewa *et al*. 2023) or other traditional knowledge related to tree species, medicinal plants, and practices (Dovie *et al*. 2008, Bobo *et al*. 2015, Luiselli *et al*. 2019, Galabuzi *et al*. 2021, Yanou *et al*. 2024). While sixteen articles examine forests in relation to rural livelihoods and community forest management, youth are often a secondary rather than the primary focus. Six studies discuss agency and power dynamics within communities (Yami *et al*. 2013, Bobo *et al*. 2015, Garekae *et al*. 2017, Lucungu *et al*. 2022, Zikargae *et al*. 2022, Kimengsi *et al*. 2024). Several studies, such as Ebifa-Othieno *et al*. (2017) and Zikargae *et al*. (2022), address multiple themes. The role of urban youth in African forest contexts is rarely examined. Although a few studies consider urban perspectives – for example, Ebifa-Othieno *et al*. (2017) on perceptions of non-timber forest products (NTFPs), Gitonga *et al*. (2023) on youth activism, and Luiselli *et al*. (2019) on bushmeat consumption, most research focuses on and was conducted in rural settings.

A variety of qualitative and quantitative approaches were employed. For instance, Ameneshewa *et al*. (2023) use ethnographic tools such as interviews and focus groups to study indigenous knowledge in southern Ethiopia. Osei *et al*. (2019) appied surveys and statistical analysis to examine

FIGURE 1 *Countries covered by the review (number of studies within brackets): Benin (1), Botswana (1), Burkina Faso (1), Cameroon (4), Democratic Republic of Congo (2), Ethiopia (5), Ghana (4), Guinea (1), Kenya (3), Mali (1), Morocco (1), Niger (1), Nigeria (4), Tanzania (1), Somalia (1), South Africa (1), Togo (1), Uganda (3), Zambia (1), Zimbabwe (1). (Luiselli et al. 2019 and Lemke and Claeys 2020 studied multiple countries)*

smallholder motivations for reforestation. Several studies, including Bayala *et al*. (2024), adopt mixed methods. Gitonga *et al*. (2023) provide a detailed case study based on a youth workshop in Kenya. Overall, fourteen studies employ qualitative methods, twelve use quantitative approaches, and six combine both.

Youth forest knowledge and learning

Key findings on youth forest knowledge are summarised in Table 2. The reviewed literature highlights a decline in the transmission of traditional forest knowledge to youth, raising concerns for sustainable forest management. Ebifa-Othieno *et al*. (2017) find that rural youth in Uganda participate in forestry activities but know less about tamarind (*Tamarindus indica*) uses than elders. Similarly, Abebe *et al*. (2020) report a weakening of knowledge transmission in Ethiopia, with elders noting that "the youth do not listen to elders anymore." Tanyanyiwa and Chikwanha (2011) observe that youth place less value on sacred forests, while Bobo *et al*. (2015) note diminished awareness of species-specific taboos, both among Cameroonian youth. This erosion of traditional knowledge is linked in some studies to modernisation and limited intergenerational mentoring (Abebe *et al*. 2020, Ebifa-Othieno *et al*. 2017). Ameneshewa *et al*. (2023) emphasise that because indigenous knowledge is embedded in local history and social traditions, declining ecological knowledge could undermine sustainable forest use and management.

Generational shifts in forest values may also result from differing time horizons. Abebe *et al*. (2020) report that younger households in Ethiopia often prioritise short-term needs over long-term knowledge retention, a concern more prevalent among older generations. Likewise, Tanyanyiwa and Chikwanha (2011), Chukwuone *et al*. (2020), and Ameneshewa *et al*. (2023) find that older generations perceive themselves as the primary custodians of indigenous knowledge. As Ameneshewa *et al*. (2023, p. 2) state in their Ethiopian study: "Forest resources in the Shato core area have been safeguarded, managed, and utilised sustainably for many generations because of this indigenous knowledge system. The study shows that today's youth do not recognize these strategies."

However, the decline in traditional forest knowledge is not uniform across all contexts or locations. Rural youth continue to retain certain practices and insights. For instance, Galabuzi *et al*. (2021) report that agricultural youth in Uganda possess knowledge of strip cropping and on-farm tree cultivation. Similarly, Uduji and Okolo-Obasi (2020) find that Nigerian youth maintain both knowledge of and interest in traditional non-timber forest product (NTFP) practices. Chukwuone *et al*. (2020) document youth familiarity with techniques such as controlled harvesting, although their understanding of other forms of indigenous knowledge is more limited. Likewise, Dovie *et al*. (2008) observe that rural youth in South Africa are knowledgeable about species used for fuelwood and construction but have less awareness of medicinal plants.

However, the overall trend points to a gradual reduction in traditional and indigenous knowledge among youth, partly influenced by the expansion of formal education, which Chukwuone *et al*. (2020) note often diminishes interest in traditional practices. Limited schooling can also have adverse ecological consequences. For example, in Ethiopia, lack of education, landlessness and unemployment drive land clearing for cultivation, contributing to ongoing deforestation (Abebe *et al*. 2020).

Various capacity-building initiatives have been introduced to address rural knowledge gaps in conservation and sustainable forest management. Zikargae *et al*. (2022) describe forest and land management programmes in Ethiopia, while Gichuki (2000) reports on youth groups in Kenya engaged in wetland conservation. However, participation in conservation and restoration efforts remains uneven. Both Lucungu *et al*. (2022) and Abebe *et al*. (2020) find limited interest among youth in acquiring conservation skills. Economic challenges and urbanisation further constrain youth involvement in forest-based enterprises and the preservation of traditional and indigenous knowledge, particularly among those who divide their time between urban and rural settings (Lucungu *et al*. 2022). Despite these challenges, innovative conservation education targeting youth is emerging. Gitonga *et al*. (2023) document a Kenyan workshop on youth-led NTFP commercialisation, reforestation, and ecotourism.

Patterns of youth participation

Although research highlights a growing disconnect between youth and forests, many young people continue to depend heavily on forest resources. Table 2 highlights patterns of youth participation in forest use and management. Studies in Benin (Ahononga *et al*. 2020) and Uganda (Ebifa-Othieno *et al*. 2017) specifically show that rural youth prioritise provisioning services, such as timber and non-timber forest products (NTFPs). In Botswana, forest dependency is highest among young households with limited educational attainment (Garekae *et al*. 2017). Youth with few livelihood alternatives often turn to farming and forest-based income sources, drawing on their physical capabilities and practical skills (Abebe *et al*. 2020, Chukwuone *et al*. 2020, Garekae *et al*. 2017, Opelele Omeno *et al*. 2024).

Macneil *et al*. (2017, p. 444) observe in Cameroon that young people engaged in a variety of forest activities throughout the year, such as collection of NTFPs and firewood, hunting and fishing. Galabuzi *et al*. (2021) found that limited land access remains a major barrier to intensive forest management and agroforestry for young rural men and women in Uganda:

> *"Agroforestry by women and youths presents a chance to reverse deforestation effects including landslides, water stress, and food insecurity around Mount Elgon. However, the women and youth involved were generally poor, land insecure, and illiterate, limiting their potential and interest in agroforestry tree technologies"* (Galabuzi *et al*. 2021, p. 3306).

Land scarcity also reduces youth interest in forest restoration, particularly when farming options are restricted. In

TABLE 2 *Youth forest knowledge, patterns of participation, aspirations & concerns, and key recommendations for enhancing youth engagement (2000–2024)*

Reference	Youth forest knowledge and learning	Patterns of youth participation	Aspirations on forests expressed by youth	Key recommendations for enhancing youth engagement in forest governance
Abebe *et al*. 2020	Youth have limited access to formal education because of remoteness and cost	Youth landlessness drives deforestation; youth excluded from decision-making	Youth desire for land access, jobs, and rural livelihoods	Apply adaptive co-management; recognize community diversity and youth roles
Ahononga *et al*. 2020	Youth know less about cultural and regulating ecosystem services than elders	Not explicitly assessed	Not explicitly assessed	Improve information on cultural, regulating, and supporting ecosystem services
Ameneshewa *et al*. 2023	Weak transmission of indigenous forest knowledge; declining intergenerational learning	Youth are marginal in customary and state forest governance	Forests increasingly viewed by youth as economic assets	Document indigenous knowledge; integrate indigenous and scientific systems; revitalize customary institutions
Bamwesigye *et al*. 2024	Strong awareness of climate–forest links; learning mainly perception-based	High willingness to engage in agroforestry; low influence in formal governance	Forests valued by youth for climate adaptation, livelihoods, and resilience	Integrate indigenous knowledge; strengthen agroforestry education; support youth-led initiatives
Bayala *et al*. 2024	Youth possess local ecological knowledge but have limited understanding of community resource management area rules	Youth numerically represented but with low influence and accountability	Youth support conservation if benefits and transparency are ensured	Build youth capacity; ensure transparent representation; strengthen bottom-up governance
Bobo *et al*. 2015	Declining knowledge of wildlife taboos among youth	Youth disengaging from traditional conservation norms	Not explicitly assessed	Reconcile conservation goals with changing youth values
Chukwuone *et al*. 2020	Youth actively practice indigenous forest management techniques	Youth participate mainly through labour, not through decision-making	Youth view forests as livelihood and income resources	Support youth access to credit; clarify rights; target young household heads
Dovie *et al*. 2008	Youth possess high practical knowledge of fuelwood and construction species	Youth participate through daily forest use	Not explicitly assessed	Include youth knowledge in management; design age-sensitive co-management
Ebifa-Othieno *et al*. 2017	Youth know fewer medicinal and cultural uses of *Tamarindus indica*	Youth are active in harvesting but are excluded from ownership and decision-making	Rural youth seek income; urban youth disengaged	Improve value addition; provide nutrition and conservation education
Galabuzi *et al*. 2021	Practical knowledge focused on fast-growing income trees	Youth participate mainly as labourers and have limited land-use rights	Trees valued by youth as economic assets	Strengthen forestry extension; improve land access and inputs for youth
Garekae *et al*. 2017	Experiential knowledge centred on extraction and trade	Youth show high involvement driven by poverty and unemployment	Forests seen by youth as livelihood safety nets	Provide skills training; promote alternative livelihoods; include youth in planning

TABLE 2 *Continued*

Reference	Youth forest knowledge and learning	Patterns of youth participation	Aspirations on forests expressed by youth	Key recommendations for enhancing youth engagement in forest governance
Gichuki 2000	Conservation knowledge gained through hands-on projects	Youth participate via youth-led conservation groups	Young people wish to combine income generation with conservation	Support youth groups with training and finance
Gitonga *et al*. 2023	Strong awareness of ecosystem services and green enterprises	Youth are active in youth-led groups but have limited statutory power	Youth try to combine conservation with business opportunities	Include youth in participatory forest management; improve market access
Giuliani *et al*. 2017	Limited formal education; forest knowledge implicit through wild resource use	Youth excluded from associations and land access	Young people desire financial independence and stable rural livelihoods	Improve vocational training; enhance access to land and rural services
Jama *et al*. 2023	Moderate climate change knowledge; awareness drives forestation intent	Youth participate mainly through advocacy rather than formal governance	Forests valued for climate regulation and future benefits	Strengthen climate education; align forest policy with youth values
Kimengsi *et al*. 2024	Youth disengaging from traditional forest knowledge	Youth largely absent from forest institutions	Preference for non-forest urban livelihoods	Create youth-friendly forest institutions; provide engagement incentives
Kudzinawo *et al*. 2022	Skills in NTFP cultivation implied but not assessed	Youth participation not analysed separately	NTFP production as viable livelihood	Promote NTFP value chains for youth livelihoods
Lemke and Claeys 2020	Local knowledge implied through youth engagement	Youth excluded from communal land governance	Interest in land access and secure tenure	Build youth capacity for inclusive land governance
Lucungu *et al*. 2022	Youth have limited knowledge of traditional management	Outmigration reduces youth engagement	Mixed or negative views on co-management	Involve youth in developing forest management models
Luiselli *et al*. 2019	Limited bushmeat knowledge among youth	Youth mostly excluded from bushmeat trade	Preference for modern diets	Develop culturally relevant youth conservation messaging
Macneil *et al*. 2017	Youth knowledgeable about NTFPs and agroforestry	High engagement in forest-based livelihoods	Seek income diversification and food security	Support diversified, youth-centred forest livelihoods
Nigussie *et al*. 2021	Limited knowledge of biomass and bioenergy markets	Low participation among smallholders	Interest in income from biomass supply	Incentivize youth participation; support training and finance
Nketia *et al*. 2022	Basic knowledge from afforestation programs	Youth participation is constrained by political and logistical challenges	Desire stable jobs in restoration programs	Improve monitoring, depoliticize recruitment
Opelele Omeno *et al*. 2024	Knowledge gained through daily forest product use	Youth show high labour participation but have a limited governance role	Dependence on forests for income	Increase youth capacity in sustainable management
Osei *et al*. 2019	Familiarity with tree planting and agroforestry	Youth farmers show interest in tree planting	Interest in income-oriented tree planting	Incentivize youth reforestation programs
Piabuo *et al*. 2022	General appreciation of forest values; limited governance knowledge	Youth feel excluded from decision-making. Low revenues.	Desire education, jobs, and conservation	Adapt governance structures; co-create opportunities

TABLE 2 *Continued*

Reference	Youth forest knowledge and learning	Patterns of youth participation	Aspirations on forests expressed by youth	Key recommendations for enhancing youth engagement in forest governance
Tanyanyiwa and Chikwanha 2011	Limited indigenous knowledge among youth	Excluded from traditional forest governance	Disengagement from customary practices	Integrate indigenous knowledge into education and mentoring
Uduji and Okolo-Obasi 2020	Growing knowledge of NTFPs among rural youth	High involvement in NTFP collection; minimal institutional support. The role of corporate social responsibility projects	Desire better income and market access	Target corporate social responsibility to youth NTFPs
Yami *et al*. 2013	Practical knowledge from exclosure management	Youth participation is limited by social norms and restricted land access	Expect tangible benefits from conservation	Strengthen benefit-sharing and youth involvement
Yanou *et al*. 2024	Hybrid local and external knowledge systems	Participation in farming and landscape management	Desire resilient, productive landscapes	Integrate indigenous knowledge with youth training
Yusuf *et al*. 2014	Technical beekeeping knowledge through training	Participation enabled by low land requirements	Income generation and livelihood improvement	Improve training, species choice, and market linkages
Zikargae *et al*. 2022	Skills gained through non-formal environmental education	Youth participation is selective but improves when inclusion mechanisms are strengthened	Combine environmental restoration and livelihoods	Expand inclusive, experiential youth training

Ethiopia, fuelwood shortages and increasing youth landlessness have hindered forest conservation expansion through exclosures (Yami *et al*. 2013).

In parallel, other studies document that forest based ventures, including sustainable timber and NTFPs, are increasingly seen as viable income sources for rural youth (Uduji and Okolo-Obasi 2020). Ebifa-Othieno *et al*. (2017) and Gitonga *et al*. (2023) highlight NTFP income streams such as medicinal plants and food products that could boost youth participation in sustainable management. Two studies emphasise the income potential of NTFPs: Yusuf *et al*. (2013) on beekeeping and Kudzinawo *et al*. (2022) on moringa (*Moringa oleifera*). Beekeeping, in particular, is accessible to youth due to low capital and land requirements, though challenges such as fire hazards, bee abandonment and honey theft persist (Yusuf *et al*. 2013).

Research indicates that rural youth engage in forest-related activities by weighing the potential benefits and required effort against alternative livelihood options, influenced by broader socio-economic trends and patterns of urban migration. Lucungu *et al*. (2022) attribute the low participation of young people in community forestry activities in the Democratic Republic of the Congo to rural-to-urban migration – a trend similarly observed by Piabuo *et al*. (2022), Garekae *et al*. (2017), Giuliani *et al*. (2017) and Kimengsi *et al*. (2024). In Cameroon, many young people also migrate in an effort to escape traditional roles, further weakening their ties to forest-based practices (Kimengsi *et al*. 2024). As urban income opportunities increase and the future of farming becomes increasingly uncertain and constrained, reliance on forest livelihoods continues to diminish. However, migration does not always lead to a complete severance of rural ties, the process can be gradual, with many young people balancing urban employment or education with time spent in their home villages. Nevertheless, economic priorities often take precedence over cultural attachments to local forests, as evidenced in Uganda (Ebifa-Othieno *et al*. 2017) and Cameroon (Bobo *et al*. 2015). This evolving relationship reflects a complex interplay of migration, economic pressures and cultural change.

At the same time, evidence suggests that young people possess significant potential to revitalise forest conservation and management efforts (Gichuki 2000, Gitonga *et al*. 2023). However, sustained engagement weakens when programmes are characterised by poor governance or mismanagement (Nketia *et al*. 2022). While youth-led, community-based forestry initiatives can enhance participation and local ownership (Gitonga *et al*. 2023), this momentum may be undermined by increasing migration to urban centres (Abebe *et al*. 2020, Piabuo *et al*. 2022).

Under adverse and unstable conditions, structural and economic barriers can push rural youth towards unsustainable or illicit livelihood strategies (Uduji and Okolo-Obasi 2020).

These shifts are often driven by poverty, exclusion from the benefits of resource extraction, and the failure of corporate social responsibility initiatives to meaningfully reach or empower young people. The authors claim that private sector involvement through corporate social responsibility could play a role in youth empowerment, particularly by supporting those engaged in the collection and trade of non-timber forest products (NTFPs). Although research on the relationship between urban African youth and forests remains limited, existing evidence suggests that youth in urban areas have little interest in NTFPs (Ebifa-Othieno *et al*. 2017); however, the workshop findings reported by Gitonga *et al*. (2023) indicate that some segments of urban youth may be interested in forest bioeconomy careers when these align sustainability with job creation and income generation.

Aspirations on forests expressed by youth

Youth perspectives on the future use of forests vary across the studies reviewed. Table 2 identifies key youth aspirations covering viewpoints on access to land, inclusion in decision-making and interest in conservation practices. In rural areas, many young people express interest in improved forest management but report feeling excluded from decision-making processes and marginalised. They call for a more equitable share of forest-derived benefits (Abebe *et al*. 2020, Nigussie *et al*. 2021). In Ethiopia, Abebe *et al*. (2020) find that this sense of exclusion can even lead to intergenerational conflict. Community-based forest management initiatives struggle to engage young people, hindered by governance challenges or a lack of alignment with youth priorities (Lucungu *et al*. 2022). However, youth perspectives are not uniform. For example, Giuliani *et al*. (2017) report that young Moroccans are open to living in rural areas, provided sustainable livelihoods are available alongside essential services such as education and healthcare. There is also growing interest among youth in afforestation and agroforestry although the opportunities can be limited. In Ethiopia, for example, younger and female-headed households face significant constraints in developing forest-related activities (Nigussie *et al*. 2018). Meanwhile, in Nigeria and Kenya, youth are becoming increasingly receptive to modern forestry practices (Chukwuone *et al*. 2020, Gitonga *et al*. 2023).

Education emerges as a central mechanism for addressing forest decline. By expanding livelihood options beyond direct forest extraction, education can reduce youth dependence on forest resources that might otherwise contribute to deforestation (Garekae *et al*. 2017, Opelele Omeno *et al*. 2024). At the same time, the transmission of traditional ecological knowledge fosters innovation by combining traditional practices with modern approaches, as demonstrated in Uganda, Ethiopia, and Kenya (Ameneshewa *et al*. 2023, Gitonga *et al*. 2023). Practical, project-based learning – including training in green entrepreneurship and environmental initiatives – equips youth with the skills needed to establish viable forestry enterprises that deliver long-term environmental and economic benefits (Gitonga *et al*. 2023, Zikargae *et al*. 2022). Integrating indigenous knowledge into formal education systems can further strengthen natural resource management while deepening young people's connection to sustainable forest use (Ameneshewa *et al*. 2023).

At the youth workshop, Kenyan youth expressed strong interest in training on governance, project management, resource mobilisation and green business. As one participant stated:

> *"Recognizing that our forests are the key to our future, I am inspired to provide environmental education in schools. I am passionate about ensuring that young people are aware of the importance of nature conservation and actively participate in it"* (Gitonga *et al*. 2023, p. 17).

The youth also sought collaboration with community forest associations to strengthen their role in forest stewardship. However, despite this enthusiasm, participants felt that greater inclusion in decision-making at all levels is essential for full participation in sustainable forest initiatives (Gitonga *et al*. 2023).

Recommendations formulated in the studies

The reviewed studies suggest various interventions to promote sustainable forest use among the youth. Table 2 presents suggestions related to forest education, land rights, policy inclusion and non-timber forest product development. A central theme in this list relates to the inclusivity of young people in forest management decisions. Abebe *et al*. (2020) stress that clear objectives and inclusive approaches are vital, ensuring marginalised groups – including youth – are actively involved in project planning. This echoes Garekae *et al*. (2017), who highlight youth as key stakeholders and agents of change in sustainable forest management. Galabuzi *et al*. (2021) argue that empowering youth and strengthening extension networks are essential for enhancing youth participation and leadership in forest management. However, for such initiatives to be effective, equitable participation in communal resource governance must be ensured. Similarly, Lemke and Claeys (2020) highlight that addressing governance challenges is critical to enabling all stakeholders – particularly young people – to play meaningful roles in the management of communal resources.

Youth engagement in the development of non-timber forest products (NTFPs) holds considerable environmental and economic potential. However, socio-economic and structural barriers continue to constrain meaningful participation (Abebe *et al*. 2020, Galabuzi *et al*. 2021), compounded by limited institutional and technical support for NTFP processing and value addition (Uduji and Okolo-Obasi 2019). Several studies therefore emphasise the need for policy frameworks that more effectively integrate youth into the forest sector (Gichuki *et al*. 2000), particularly through strengthened community forest associations (Gitonga *et al*. 2023).

Education emerges as a central mechanism for addressing these constraints. By expanding livelihood options beyond direct forest extraction, education can reduce youth dependence on forest resources that might otherwise contribute

to deforestation (Garekae *et al*. 2017, Opelele Omeno *et al*. 2024). At the same time, the transmission of traditional ecological knowledge fosters innovation by combining indigenous practices with modern approaches, as demonstrated in Uganda, Ethiopia, and Kenya (Ameneshewa *et al*. 2023, Gitonga *et al*. 2023). Strengthening knowledge-sharing platforms, improving market access, and providing training in agroforestry and sustainable forest management further promote green entrepreneurship, helping young people overcome land and financial constraints while increasing engagement in sustainable forestry (Galabuzi *et al*. 2021, Gitonga *et al*. 2023). Practical, project-based learning – including training in green entrepreneurship and environmental initiatives – equips youth with the skills needed to establish viable forestry enterprises that deliver long-term environmental and economic benefits (Gitonga *et al*. 2023, Zikargae *et al*. 2022). Integrating indigenous knowledge into formal education systems can further strengthen natural resource management while deepening young people's connection to sustainable forest use (Ameneshewa *et al*. 2023). Nonetheless, Macneil *et al*. (2017) emphasise the need for further research on youth-centred forest governance to better understand their role in decision-making. Forest management strategies must also incorporate climate change perspectives that reflect youth voices, ensuring the next generation is actively engaged in shaping resilient policies (Jama *et al*. 2023).

Ultimately, investment in education, skills development and secure land tenure, supported by intentional engagement and mentoring, can empower youth as active leaders in rural sustainable development. Such efforts not only benefit young people but also contribute to both local and global environmental progress (Chukwuone *et al*. 2020, Giuliani *et al*. 2017, Uduji and Okolo-Obasi 2020, Zikargae *et al*. 2022).

DISCUSSION

This review identified differing, and partly opposing, developments in the relationship between African youth and forests. There is a steady decline in interest in traditional rural livelihoods and a reduced curiosity to learn from older generations' forest knowledge among African youth due to modernisation and urbanisation. Despite this main trend, the rural youth population remains significant, exhibiting interest and curiosity for forest-based sustainable livelihoods that also provide means of income, although their engagement is constrained by structural challenges such as insecure land tenure, limited financial capital and exclusion from decision-making processes. Furthermore, the review revealed growing concern within youth groups for forest conservation, recognising forests as an integral contributor to a sustainable trajectory for the continent's development.

These trends can be explained by a combination of socio-economic transformations and institutional structures. The erosion of traditional and indigenous knowledge is linked to rural–urban migration caused by population increase, low agricultural productivity, reduced time in nature, the search for better opportunities in cities, and the rise of formal education systems that do not integrate traditional ecological learning. Youth engagement is hampered by systemic barriers, including inadequate access to land and finance, inadequate representation in both traditional and formal governance structures, and a lack of targeted forest extension services. In urban contexts, disconnection from forest landscapes, combined with limited opportunities for forest-related career paths, may explain the weak engagement of urban youth in forest occupations. However, youth also demonstrate a growing interest in environmental issues, climate change, sustainable forests and the forest-based green economy, particularly where youth-led initiatives exist alongside access to supportive networks, training and resources.

The findings of this review resonate with earlier work by Brown (2021), which highlighted the marginal role youth play in forest governance across the Global South. Similarly, Sumberg *et al*. (2021) and Carreras *et al*. (2020) observed that African youth's aspirations for environmental or entrepreneurial engagement are often hampered by structural constraints. This review synthesises these insights by integrating more recent perspectives on youth agency from Gitonga *et al*. (2023), who documented youth interest in forest-based innovation, and aligns with the broader socio-ecological transition framework proposed by Geels (2002) and theory of agency by Emirbayer and Mische (1998), viewing youth as future agents of sustainability change.

Based on these findings, the following five key implications emerge for policy, industry, and youth groups:

1. Forest-related policies and decisions at all levels should explicitly recognize youth as stakeholders and actively integrate their voices into forest governance. This can be achieved by formalizing youth representation in local forest management planning and benefit-sharing agreements, as well as establishing meaningful youth participation in national and international fora.
2. Educational reforms should bridge formal training with indigenous knowledge, fostering both ecological literacy and vocational pathways into the forest bioeconomy. In practice, this entails developing site-specific curricula that combine scientific forestry training with intergenerational mentoring programs, where local elders and youth co-document traditional management practices.
3. Secure and equitable land rights for both women and youth are critical to foster long-term engagement and entrepreneurship in agroforestry and sustainable timber production. Rather than seeking top-down continental reform, local authorities can operationalize this by clarifying youth land-use rights within village bylaws and recognizing youth-led restoration groups as legal entities eligible for land concessions.
4. Both rural and urban youth should be engaged through innovation hubs that link forest sustainability to modern technologies. Such hubs can serve as incubators for "green" startups, providing technical training in information technology for forest monitoring or urban marketing tools.

5. Enterprises in the forest-based bioeconomy can develop sustainable markets for NTFPs as avenues for youth employment. This can be supported by establishing local value-addition facilities and incubation programs that offer skill-building in processing and fair-trade certification, tailored to the specific forest products of the region.

This review is limited by the relatively small number of youth-focused empirical studies across Africa, where some studies treated youth as a secondary demographic within broader forest governance analyses. In addition, unclear methodological descriptions constrained the depth of comparative insights. Both temporal and geographic coverage were uneven, limiting the generalisability of the results. It is likely that more insights could be gained about forest knowledge, experiences and aspirations among both young African women and urban youth. This review primarily focused on peer-reviewed literature and did not systematically include grey literature such as reports from NGOs, international organisations or research centres. While such sources provide valuable and often practice-oriented insights, their exclusion may limit coverage of ongoing initiatives and policy-relevant experiences related to youth and forest governance in Africa. The findings are constrained by the available literature, which lacks empirical data from conflict-affected regions where security challenges likely impede research, meaning the findings may not reflect the specific realities of youth in those volatile contexts.

Given Africa's rapid growth in youth and the pressing sustainability challenges it faces, more youth-focused forest research is needed. Future studies should investigate urban youth attitudes, consumption patterns, and activism related to forests and green value chains, as well as the gendered dynamics of youth–forest interactions. Research should also explore youth aspirations and innovation in forest landscapes, including youth-led restoration, NTFP commercialisation, and community forestry entrepreneurship. Employing longitudinal, action-research, and participatory approaches can deepen understanding of how youth perspectives and engagement evolve over time while positioning young people as co-creators of sustainable forest futures. Although this review focuses on Africa to ensure geographical and socio-political specificity, future comparative studies across the Global South could illuminate broader lessons for youth-inclusive forest governance while remaining sensitive to local contexts.

CONCLUSIONS

This review set out to assess African youth's forest-related knowledge, participation and aspirations. It has demonstrated that youth are both vulnerable and vital actors in the future of Africa's forests. The disconnect between youth and the natural environment, including forests, if unaddressed, may undermine progress toward sustainable development goals. However, the studies also show that youth represent an untapped force for conservation, innovation and resilience. The current body of literature is insufficient, and this review offers only an initial overview of the field. Continued and deeper research into the dynamic relationship between African youth and forests is essential for building sustainable and inclusive forest governance systems on the continent that benefit both the natural environment and the youth population.

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APPENDIX 1 *Reviewed studies (2000–2024): year, country, focus*

Reference	Country	Title	Source	Study approach, methods, and respondents
Abebe *et al*. 2020	Ethiopia	Examining social equity in community-based conservation programs: A case study of controlled hunting programs in Bale Mountains, Ethiopia	World Development	Grounded qualitative study of local equity perceptions in community-based hunting, involving respondents stratified by age, gender, and role.
Ahononga *et al*. 2020	Benin	Socioeconomic factors determining ecosystem services local perceptions in two ecological zones in Benin (West Africa)	International Journal of Biological and Chemical Sciences	Quantitative survey of 689 respondents across two regions, analysing perceptions of ecosystem services stratified by age and socio-economic factors.
Ameneshewa *et al*. 2023	Ethiopia	Indigenous knowledge and forest management practices among Shekachoo people in the Sheka Biosphere Reserve A case of Shato core area, South-west Ethiopia	Cogent Social Sciences	Qualitative study using interviews and observations to document indigenous management practices among elders, women, youth, and experts.
Bamwesigye *et al*. 2024	Uganda	Climate Change and Potential of Agroforestry in Uganda: Youth Perceptions and Willingness to Participate in Adaptation and Transition Efforts	Forests	Survey of 1,138 Ugandan youth using descriptive statistics and OLS regression to explore climate perceptions and willingness to adopt agroforestry.
Bayala *et al*. 2024	Ghana	Towards more inclusive community landscape governance: Drivers and assessment indicators in northern Ghana	Forest Policy and Economics	Qualitative assessment using key informant interviews, focus groups, and observations to identify inclusivity drivers and indicators in community resource governance.
Bobo *et al*. 2015	Cameroon	Wildlife use and the role of taboos in the conservation of wildlife around the Nkwende Hills Forest Reserve; South-west Cameroon	Journal of Ethnobiology and Ethnomedicine	Questionnaire survey of 126 households across seven villages documenting local uses, taboos, and cultural relationships with wildlife.
Chukwuone *et al*. 2020	Nigeria	Socioeconomic factors affecting households' use of indigenous forest management practices in managing non-wood forest products: evidence from forest communities in Nigeria derived savannah	Heliyon	Survey of 200 households in 10 forest communities identifying socioeconomic factors influencing indigenous management of non-wood forest products.
Dovie *et al*. 2008	South Africa	Knowledge of plant resource use based on location, gender and generation	Applied Geography	Survey of local knowledge regarding 267 woody plant species, examining differences in use based on gender and age.
Ebifa-Othieno *et al*. 2017	Uganda	Knowledge, attitudes and practices in tamarind (*Tamarindus indica L*) use and conservation in Eastern Uganda	Journal of Ethnobiology and Ethnomedicine	Cross-sectional survey of local indigenous knowledge, attitudes, and practices regarding the use and conservation of *Tamarindus indica*.
Galabuzi *et al*. 2021	Uganda	Women and youths participation in agroforestry: What counts and what doesn't around Mount Elgon, Uganda?	Journal of Mountain Science	Mixed-methods assessment using surveys, focus groups, and interviews to analyse socio-economic characteristics and agroforestry adoption among women and youth.
Garekae *et al*. 2017	Botswana	Socio-economic factors influencing household forest dependency in Chobe enclave, Botswana	Ecological Processes	Household surveys and logistic regression analysis identifying socio-economic determinants of forest dependency.

Reference	Country	Title	Source	Study approach, methods, and respondents
Gichuki 2000	Kenya	Community participation in the protection of Kenya's wetlands	Ostrich	Descriptive study of community-led wetland conservation initiatives, focusing on income generation, youth employment, and environmental protection.
Gitonga *et al*. 2023	Kenya	Kenyan Youth Perspectives on ForestsReport from a youth-scientist dialogue on sustainable forestry	SLU Global	Workshop proceedings documenting youth perspectives (ages 18–25) on forest governance, sustainable management, and green economy engagement.
Giuliani *et al*. 2017	Morocco	Realities, Perceptions, Challenges and Aspirations of Rural Youth in Dryland Agriculture in the Midelt Province, Morocco	Sustainability	Participatory qualitative and quantitative study examining rural youth perspectives, aspirations, and gendered realities in dryland agriculture.
Jama *et al*. 2023	Somalia	Understanding young people's perception toward forestation as a strategy to mitigate climate change in a post-conflict developing country	Environment, Development and Sustainability	Survey of university students using structural equation modelling to examine perceptions and behavioural intentions toward forestation.
Kimengsi *et al*. 2024	Cameroon	Institutional change pathways and implications for forest resource use in the Bakossi landscape of Cameroon	Journal for Nature Conservation	Analysis of forest-dependent households using surveys, focus groups, interviews, and instrumental variable analysis to study non-timber forest product use.
Kudzinawo *et al*. 2022	Ghana	Empirical examination of financial and economic viability of Moringa oleifera production in the Bono East Region, Ghana	Forests, Trees and Livelihoods	Financial and economic viability assessment using farmer surveys, processing firm data, and project appraisal methods.
Lemke and Claeys 2020	Kenya, Tanzania, Mali, Guinea	Absent Voices: Women and Youth in Communal Land Governance. Reflections on Methods and Process from Exploratory Research in West and East Africa	Land	Exploratory research involving participatory workshops and field visits with social movements, academics, and legal actors regarding communal governance.
Lucungu *et al*. 2022	DRC	Local perception and attitude toward community forest concessions in the Democratic Republic of Congo	Forest Policy and Economics	Survey-based assessment of forest users using multinomial probit regression to analyse perceptions and attitudes toward community concessions.
Luiselli *et al*. 2019	Burkina Faso, Niger, Nigeria, Togo	Understanding the influence of non-wealth factors in determining bushmeat consumption: Results from four West African countries	Acta Oecologica	Survey of 2,453 urban and rural residents examining the influence of age, gender, and location on bushmeat consumption patterns.
Macneil *et al*. 2017	Cameroon	Investigations of the livelihood strategies of young men and women in forested landscapes of eastern Cameroon	International Forestry Review	Focus groups and surveys in six villages examining how youth (ages 19–30) utilize forest resources and agroforestry for subsistence.
Nigussie *et al*. 2021	Ethiopia	Small-Scale Woodlot Growers' Interest in Participating in Bioenergy Market in Rural Ethiopia	Environmental Management	Inductive qualitative research examining smallholder implementation of soil and water conservation, highlighting the inclusion of youth and women.

Reference	Country	Title	Source	Study approach, methods, and respondents
Nketia *et al*. 2022	Ghana	Going Green Rhetoric or Reality: An Assessment of the Prospects and Challenges of Ghana's Youth in Afforestation Programme	Society & Natural Resources	Assessment using surveys and institutional data to evaluate the potential and challenges of a national youth afforestation program.
Opelele Omeno *et al*. 2024	DRC	Household Dependence on Forest Resources in the Luki Biosphere Reserve, Democratic Republic of Congo	Environmental Management	Surveys and focus groups assessing household forest dependence and the influence of age, wealth, and education on resource reliance.
Osei *et al*. 2019	Ghana	Socio-economic determinants of smallholder plantation sizes in Ghana and options to encourage reforestation	Southern Forests	Survey and regression analysis of smallholder-led reforestation, examining how socio-economic factors influence plantation size and tree planting.
Piabuo *et al*. 2022	Cameroon	Community forest enterprises (CFEs) as Social Enterprises: Empirical evidence from Cameroon	Forest Policy and Economics	Document review, interviews, and focus groups assessing 38 community forest enterprises to determine their function as social enterprises.
Tanyanyiwa and Chikwanha 2011	Zimbabwe	The role of indigenous knowledge systems in the management of forest resources in Mugabe area, Masvingo, Zimbabwe	Journal of Sustainable Development in Africa	Qualitative study examining indigenous knowledge in forest conservation, documenting traditional practices and youth disengagement.
Uduji and Okolo-Obasi 2020	Nigeria	Youth empowerment in non-timber forest products (NTFPs) of sub-Saharan Africa: the role of corporate social responsibility in Niger Delta, Nigeria	Journal of Enterprising Communities	Participatory interviews and logit analysis evaluating the impact of corporate social responsibility on rural youth engaged in NTFP activities.
Yami *et al*. 2013	Ethiopia	The effectiveness of village bylaws in sustainable management of community-managed exclosures in Northern Ethiopia	Sustainability Science	Qualitative evaluation of community bylaws using local users, including youth, as the unit of analysis.
Yanou *et al*. 2024	Zambia	The Hybridisation, Resilience, and Loss of Local Knowledge and Natural Resource Management in Zambia	Human Ecology	Walking interviews and photovoice exploring Tonga local knowledge for landscape management, featuring youth and women as key knowledge holders.
Yusuf *et al*. 2014	Nigeria	Creating Youth Employment through Modern Beekeeping: Cae Study of Selected Youth Trained in Moro Local Government Area Kwara State, Nigeria	South African Journal of Agricultural Extension	Structured interviews with 116 participants evaluating the adoption and productivity outcomes of youth beekeeping training.
Zikargae *et al*. 2022	Ethiopia	Empowering rural society through non-formal environmental education: An empirical study of environment and forest development community projects in Ethiopia	Heliyon	Qualitative study using thematic analysis to assess skills and knowledge acquisition among out-of-school youth in environmental projects.