Innovations

Home Gardening in Ethiopia: Trends, Characteristics and Challenges– A Review

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Abstract: *Home gardens refer to the cultivation of small plots of land surrounding households, intended to diversify production and contribute to social, economic, and environmental sustainability. The objective of this review is to examine the trends in home gardening practices in Ethiopia, assess their key characteristics, and identify the major challenges associated with their management. Relevant documents were selected following the PRISMA flow diagram, resulting in the inclusion of 42 articles out of 60. To assess temporal changes in home garden characteristics, trends from studies published between 2015–2019 were compared with those from 2020–2024. Spearman correlation was used to examine the relationship between garden size and floristic composition, with significance determined at the 95% confidence level ($p < 0.05$).When the first half of the decade is compared with the second, community engagement, floristic composition, and species diversity increased, while average home garden size decreased. Although most home garden plants are of native origin, the dominance of exotic species is becoming increasingly evident in some study sites. Ensete ventricosum was the most frequently recorded species in home gardens of Ethiopia. Food, income and medicine are found to be the major recorded use categories but with appearing trends of dominance of ornamental plants in urban areas. A moderate negative correlation ($r = –0.480$) was observed between floristic composition and home garden size at the study sites, although this correlation was statistically insignificant ($p = 0.160$). Lack of access to water, land, improved seeds, and the occurrence of diseases and pests were among the identified challenges. An increase in species richness and diversity despite declining home garden size, and the apparent dominance of exotic plant species in some urban and rural settings, underscores the need for further investigation.*

Key Words*: Challenges, Ethiopia, floristic composition, home gardens, Trend*

Introduction

Home gardens are commonly defined as the cultivation of a small portion of land around the household or within walking distance from home, encompassing diverse species of plants, sometimes alongside livestock rearing to provide additional nutrition and income(Amenu, 2017; Kewessa, 2020). Home gardens promote the diversification of products and ensure social, economic, and ecological sustainability(Biruk & Tesfaye, 2019).

Home gardens support sustainable development, but many aspects of African home gardens remain poorly understood and need more study(Gbedomon et al., 2017). In Ethiopia, the lack of recognition among conservationists, planners, and policymakers (Amenu, 2017) has hindered their full integration into policy based intervention strategies(Bantihun, 2019; Yaregal & Sime, 2024).Additionally, home gardens are constrained by limited scientific and systematic documentation(Tulu & Zenawi, 2016;Amenu, 2017). As a result, their full potential remains underutilized (Jilo et al., 2021).Moreover, in recent years, there has been a decline in both yields and household income from home gardens (Fanjana & Atiso, 2020).

The objective of this review is to examine trends in home gardening practices in Ethiopia, with a focus on the key characteristics of home gardens and the major challenges associated with gardening. The findings aim to provide an evidence base for future research and to assist policymakers in integrating home gardening into sustainable development and livelihood enhancement initiatives.

Review methodology

The search for relevant documents was conducted using search keywords, including home gardening in Ethiopia, combined with related terms such as community engagement, floristic composition, species diversity, plant origin, frequent plant species, home garden size, main use categories of home garden plants, and challenges related to home gardening. These terms were also used as criteria for screening relevant studies.

During the identification phase, a systematic search was conducted for peer-reviewed and indexed publications on home gardening in Ethiopia, covering the period from 2015 to 2024, using the academic databases CORE and Google Scholar. The identification, screening, and inclusion of studies were conducted in accordance with the PRISMA flow diagram (Fig. 1). To assess temporal changes in home garden characteristics, key trends from studies published between 2015 and 2019 were compared with those published between 2020 and 2024. Spearman's rank correlation was applied to examine the relationship between garden size and floristic composition across the study sites, with statistical significance evaluated at the 95% confidence level ($p < 0.05$).

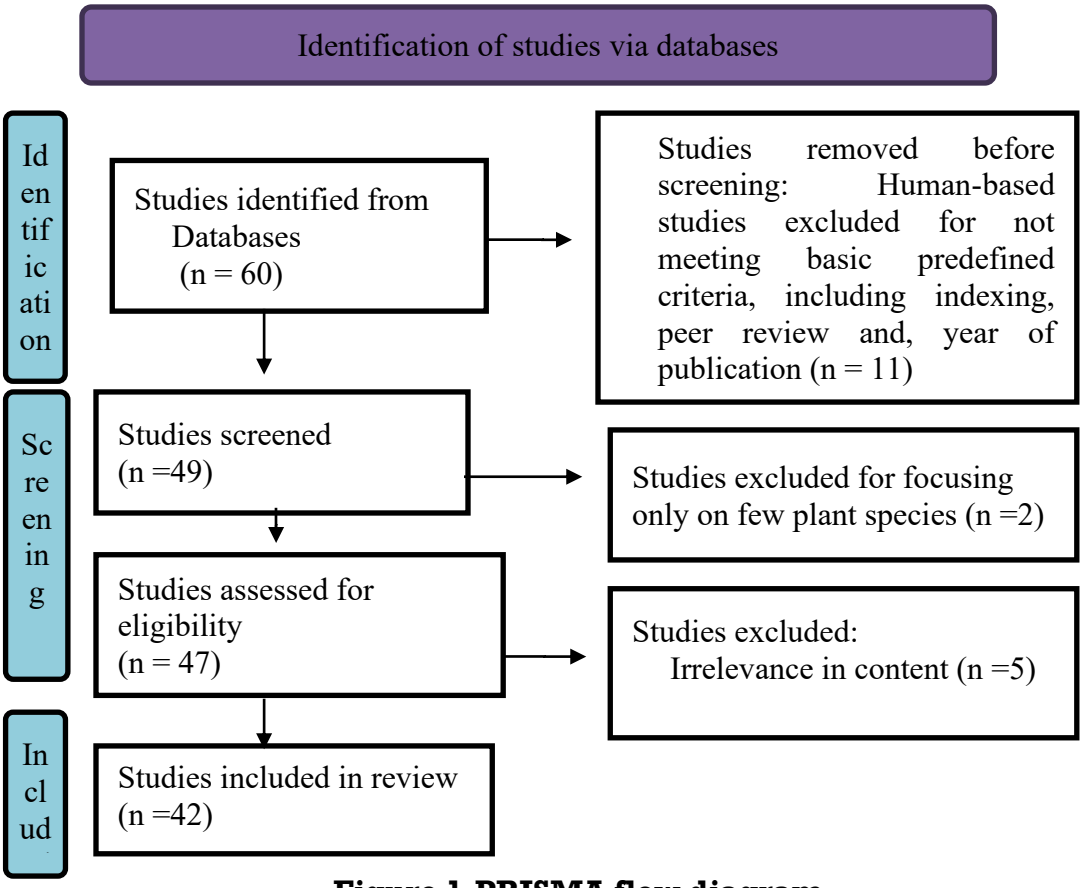


Figure 1.PRISMA flow diagram

Results and Discussions

Community engagement in home gardening in Ethiopia

The review indicates widespread community participation in home gardening across the assessed study sites in Ethiopia, with participation rates ranging from 70.9% in the Sebeta-Awas District (Mekonen et al., 2015) to 100% in Hawassa City (Reta, 2016) (Appendix Table 1). These rates are higher than those reported in Nepal, 72% (Chávez-mejía et al., 2019), and the United States, 75% (Norwood, 2022), but comparable to those in South Africa, 91% (Du Toit et al., 2022), and 80% in the Lao People's Democratic Republic (Shrestha et al., 2025).

Home gardening is a globally recognized traditional farming practice. It is embraced by both developed and developing countries. This reflects its value beyond food production, as it also sustains livelihoods and daily life. In Ethiopia, consistently high engagement highlights the deep-rooted, subsistence-oriented, and culturally embedded nature of local communities' relationship with home gardening (Legesse et al. 2016;Regassa 2016; Kebebew 2018; Bantihun 2019).

A comparative analysis of ten years of data (2015–2024) reveals that the average community engagement in home gardening increased from 86.13% (2015–2019) to

87.5% (2020–2024). This rise likely reflects the population growth-driven needs of communities, concerns over food insecurity, the need to utilize traditional medicinal practices, and the requirement for adaptation to rapid climate change.

Size of home gardens in Ethiopia

According to the review, the smallest home garden size was recorded in Bahir Dar City at approximately 35 m² (Yeshiwas et al., 2024), while the largest, 5,500 m², was documented in Misha Woreda (Woldemichael et al., 2019).These sizes are comparable with South Benin, 1,053 m² (Sedami et al., 2017), and with home gardens in India, including 5,208 m² in Mizoram (Jeeceelee & Sahoo, 2015), 200 m² in Karwar, Karnataka (Bhat et al., 2014), and 648 m² in Majhouli and Birar (Patel et al., 2022a). The trend reveals a shared global perception of the importance of home gardening for food and nutrition security. It also highlights the existence of common cultural practices and indigenous knowledge systems across different regions of the world.

Analysis of home garden sizes across study sites in Ethiopia over the last decade shows a decline in mean size from 2,440 m² in 2015–2019 to 2,027.5 m² in 2020–2024. This reduction is largely attributed to increased competition for land resulting from construction and infrastructure development. Despite this decline, the recorded home garden sizes demonstrate significant potential for enhancing food security if the available land is preserved, used efficiently, and supported by appropriate policies. In addition, innovative approaches such as vertical farming and rooftop gardening could help offset the effects of shrinking garden sizes.

Floristic composition of Ethiopian home gardens

The review of floristic composition in Ethiopian home gardens (Appendix Table 1) revealed considerable variation in species richness across study sites, ranging from 19 species in Essera District (Amenu, 2017)to 258 species in Hawassa City(R. Reta, 2016).These ranges align with 188 species in Brazil (Da Silva et al., 2023), 86 plant species in Kumba Municipality, Cameroon (Roland Ndah et al., 2023), 198 species in Mizoram, India (Jeeceelee & Sahoo, 2015), and 280 species in Tabasco, México (Avilez-López et al., 2020).

These data indicate that variation in floristic composition across regions could be attributed to the geographic and socioeconomic characteristics of each society. Home gardens, however, are consistently identified as unique reservoirs of a wide range of plant species and as important means of protecting plant genetic resources(R. Kumar et al., 2024).

A decade-long comparative analysis in Ethiopia indicates that the average number of plant species per study site rose from 82.6 (2015–2019) to 96.67 (2020–2024). This increase likely reflects urbanization-driven diversification of community needs, alongside the adoption of short-cycle, high-yield crops and herbaceous ornamental species (Tulu & Zenawi, 2016). In contrast, despite a brief increase, Ethiopian home

gardens show an overall decline of 35.98% in floristic composition, dropping from 151 species per site in 2014, as reported by Asfaw (2016), to 96.67 species (2020–2024). This significant biodiversity loss signals a concerning trend in home garden ecosystems.

Plant species diversity in Ethiopian home gardens

According to the review, the Shannon diversity index of Ugandan home gardens across the study sites ranged from 1.19 in Abay Chomen District(Legesse, 2018) to 3.43 in Hawassa City (Regassa ,2016). These results are comparable with Shannon–Wiener index values reported in other regions, such as 2.32 in Cameroon (Roland Ndah et al., 2023), 3.41 in Mizoram, India (Jeeceelee & Sahoo, 2015), and 1.84 in Madura Island, Indonesia (Setiani et al., 2022). This suggests that home gardens can maintain species diversity levels comparable to those found in natural forests(J. Ramalakshmana et al., 2023)(Ameneshewa et al., 2025).

These features of home gardens show their mixed-habitat nature, supporting the preservation of many plant species in small spaces. Home gardens contain diverse plant species, meeting community needs, offering ecological benefits, preserving indigenous knowledge, and encouraging positive human–nature relationships. The review found an increase in the Shannon-Wiener diversity index of Ethiopian home gardens from 2.49 (2015-2019) to 2.98 (2020-2024), likely due to the dominance of herbaceous plants, which are easy to manage and use.

Geographic origin of home garden plants in Ethiopia

The composition of home gardens is complex, encompassing varying percentages of native, indigenous, endemic, and exotic plant species. The review showed that approximately 66.67% of the plant species recorded in Arba Minch Town were indigenous, while the remaining 33.33% were exotic (Kebebew, 2018). In Hawassa City, approximately 32.17% of the garden plants were found to be native to Ethiopia, while 62.02% were exotic plant species(Regassa, 2016).

Similarly, of the total plant species recorded in the home gardens of Chencha, Daramalo, and Yem Woredas, approximately 65.05% were native, and 34.95% were exotic (Kassa et al., 2023). . Comparatively, in Sabata-Awas District, 58% of documented plants were exotic, while 42% were indigenous (Mekonen et al., 2015).Likewise, in the Chora District, exotic and indigenous plants account for 61% and 39%, respectively (Terfassa, 2021). In contrast, indigenous plant species accounted for 66% of the home gardens in Raya Alamata District (Eyasu et al., 2020). Additionally, other regions show that native plants account for 74% in Arunachal Pradesh, India (Y. Kumar et al., 2022), 53% in Southeast Mexico (Rooduijn et al., 2018), and 49.5% in the Amazon, Brazil (Pauletto et al., 2023).

The review finds exotic species dominate in Hawassa City, Chora, and Sabata-Awas Districts. This calls for investigating the causes and prioritizing local flora

conservation, while managed home gardens can still support valuable exotic species alongside native biodiversity.

Most frequent plant species in home gardens of Ethiopia

Among the recorded plant species in the assessed home gardens in Ethiopia, Enset ventricosum was found to be the most prevalent plant species due its diverse economic and ecological use and (Yemata, 2020)and cultural value (Yaregal & Sime, 2024).Other dominant plant species recorded in these systems Brassica carinata, Coffea Arabica and Banana which serve as food, cash crop and food plants.

The prevalence of specific species in a region is determined by socio-physiographic characteristics of the region. Similar to Ethiopia Zea mays, Brassica oleracea and Solanum tuberosum were found to be prevalent in South Africa (Ngcaba & Maroyi, 2021). Differently from Ethiopian home gardens ornamental plants such as Codiaeum variegatum, Caladium bicolor, and Crossandra infundibuliformis, dominate in Hassan District, Karnataka(G. M. P. Kumar & Shiddamallayya, 2022).

Table 1. Most frequent plants in the assessed home gardens of Ethiopia

Study sites	Most frequent plants	Source
Abay Chomen District	Croton macrostachyus, Enset ventricosum, and Cuppressus lustanica	(Legesse, 2018)
Arba Minch Town	Ensete ventricosum, Carica papaya, and Persea americana	(Kebebew, 2018)
Arba Minch Zuria and Chencha Woreda	Ensete ventricosum,Brassica carinata, andMalus sylvestris	(Dingamo et al., 2016)
Boloso Bombe District	Enset ventricosum,Zea mays and Eragrostis tef	(Fanjana& Atiso, 2020)
Bule Hora District	Ensete ventricosum, Coffea arabica, and Brassica carinata	(Tefera, 2019)
Chencha, Daramalo &Yem Woreda	Ensete ventricosum,Cordia africana ,andCoffee arabica	(Kassa et al., 2023).
Chora District	Coffee arabica, Perseaamericana and Catha edulis	(Terfasa,2021)
Essera District	Enset ventricosum, Banana, and Catha edulis	(Amenu, 2017)
EzhaDistrict	Ensete ventricosum, Solanum tuberosum, and Brassica carinata,	(Yaregal & Sime, 2024)
Habro Woreda	Banana, Avocado, and Mango	(Zenebe et al., 2021)

Source: Own literature analysis, 2025

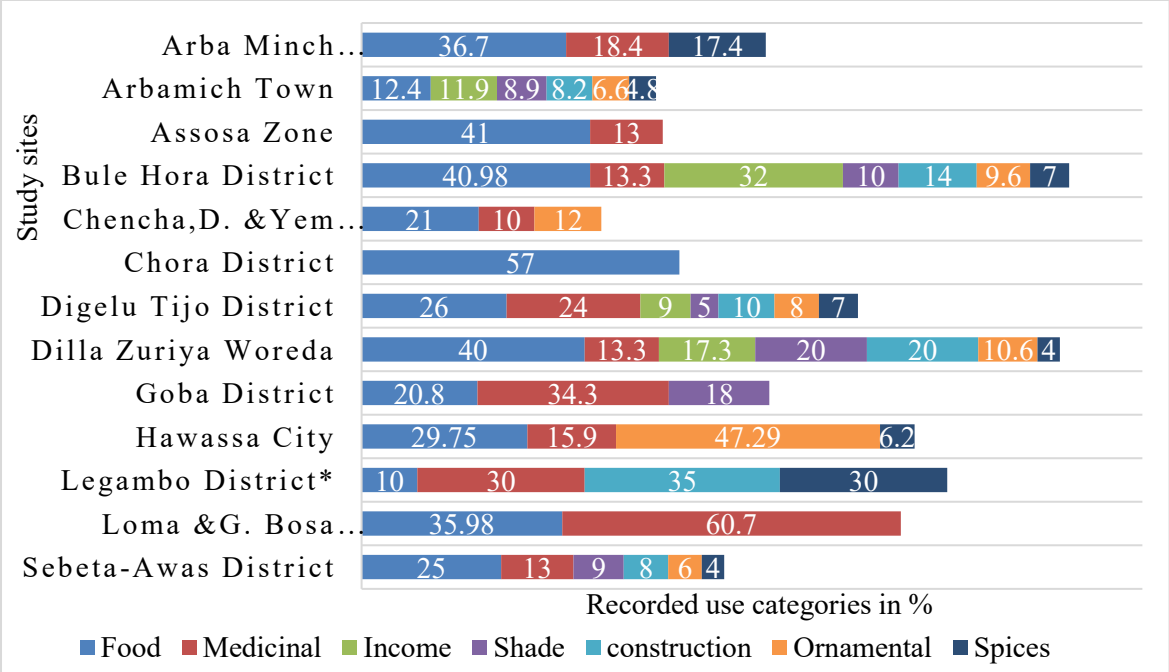
Home gardens as sources of food, income, and medicine

The review reveals that most gardeners in Ethiopia use home garden plants mainly for food, income and medicine (Fig. 2). For example in Ethiopia, home gardens contribute 34% to annual income **i**n Hawassa City (Regassa, 2016) , 35% in Mekelle City (Legesse et al., 2016), 84% in Ginir District (Abebe & Asfaw, 2025)and 37.5% in

Boloso Bombe District(Fanjana & Atiso, 2020). In Habro Woreda, they contribute about 17% to household food security and 25% to income generation (Zenebe et al., 2021).

The findings in Ethiopia are similar to the 37% contribution in Odisha, India (Ogutu et al., 2023), but much higher than the 0.81% recorded in Yogyakarta City, Indonesia (Irham et al., 2021).These data demonstrate that home gardens diversify household livelihoods, ensure access to local food, reduce poverty, and contribute to ecological stability.

The medicinal role of home garden plants in Ethiopia is substantial, as they play a vital role in providing primary healthcare to both communities and their livestock, serving as alternatives to conventional medicine. Common medicinal plant species found in most study sites were Ocimum lamiifolium, Lepidium sativum, Hagenia abyssinica, Allium sativum, Achranthes aspera, Withania somnifera, Vernonia amygdalina and Ruta chalepensis (Biruk & Tesfaye, 2019; Dekeba et al., 2019; Woldemichael et al., 2019).The result of the review is similar to findings from Lithuania, Europe (Pranskuniene et al., 2021), and the urban area of Costa Rica in America (González-Ball et al., 2022) , in which home garden plants are sources for treating various diseases.



*Plants with multiple uses were counted in each relevant category

Source: Own literature analysis (2025), compiled from sources listed in Appendix Tables 1

Correlation of size of home gardens with species richness

When the correlation between garden size and floristic composition of the study sites was examined using Pearson's correlation, the result indicated a moderate

negative relationship (r = –0.480) between the two variables, which was statistically insignificant (p = 0.160). This suggests that as home garden size increases, floristic composition tends to decrease. A possible explanation is that gardeners with smaller gardens may cultivate a diverse range of herbaceous plant species, whereas owners of larger gardens often focus on fewer, larger tree species.

This is evidenced by the finding that Bulen District has an average home garden size of 3,905 m², but only 22 species (Mohammed 2018), whereas Arba Minch Town reports 138 species within an average garden size of 727.2 m² (Kebebew, 2018). The result of this review is consistent with findings from Odeda, Nigeria (Aworinde & Erinoso, 2014), but contrasts with those from the Central Himalaya (Vibhuti et al., 2018) and Tropical India (Patel et al., 2022b). Such variation may be attributed to differences in physiographic, socioeconomic, and biological contexts across the study areas.

Moreover, the increase in the average number of plant species per study site from 82.6 (2015–2019) to 96.67 (2020–2024), despite a decline in average home garden size from 2,440 m² to 2,027.5 m² during the same period, likely suggests a predominance of herbaceous species over large trees. This trend may also align with the slight increase in community engagement levels in home gardening, which rose from 86.13% to 87.5%, likely reflecting a tendency toward more intensive use of available space during the assessed period, thereby warranting further investigation.

Challenges of home gardening practices in Ethiopia

Challenges pertaining to home gardening practice vary from place to place based on Socioeconomic and environmental conditions. Lack of access to water, land, improved seed, labor, occurrence of diseases and pests, and weeds were found to be the aspects affecting the diversity and productivity of home gardens in Sebeta-Awas and Bule Hora Districts(Mekonen et al., 2015;Tefera, 2019).

Uniquely limited access to land was identified as a key determinant of home garden harvests in Mekele City, Bure District, and (Legesse et al., 2016; Alemu et al., 2019)as well as water scarcity in Mekele City (Legesse et al., 2016), Hintalo Wejerat District(Tulu & Zenawi, 2016), Legambo District (Akale et al., 2019),and Arba Minch Town (Kebebew, 2018).Crop competition, low capital, unreliable markets, and limited skills in managing exotic species in Habro District (Zenebe et al., 2021), whereas monoculture farming, shortage of farmland, weak market linkages, and lack of human labor were challenges documented in Goba District(Zeleke et al., 2024).

Conclusion and recommendations

The review highlights increasing trends in community engagement, floristic composition, and plant species diversity between 2020 and 2024 when compared with 2015 to 2019, despite a decline in average home garden size. Notably, while garden size decreased, a negative correlation was observed between garden size and floristic composition. Additionally, Enset ventricosum was identified as the most prevalent species in Ethiopian home gardens. These gardens primarily contribute food, income, and medicinal resources; at the same time, ornamental plants are becoming more common in urban areas. Nevertheless, major constraints, such as land and water scarcity, limited access to improved seeds, and plant diseases, continue to persist. The overlooked integration of livestock with plantations, an increase in species richness and diversity despite declining home garden size, and the apparent dominance of exotic plant species in some urban and rural settings underscore the need for further investigation. Ethiopia's home gardening systems remain predominantly traditional and informal in both structure and practice, highlighting the need for community-driven and technology-based policy interventions to enhance productivity, sustainability, and resilience.

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Appendix Table 1. Community engagement level and floristic compositions, home garden size, Shannon-Winer and Simpsons diversity indices of home gardens in Ethiopia

Study Sites	Community engagement(%)	Floristic composition	H'	D	Home garden size in m^2	Sources
Abay Chomen District		93	1.19	0.615		(Legesse, 2018)
Arba Minch Town		138			727.2	(Kebebew 2018)
Arba Minch Zuria and Chencha Woredas	95	109			2500	(Dingamo et al., 2016)
Assosa Zone	81					(Paulos & Loha,2022)
Bahir Dar City					35	(Yeshiwas et al., 2024)
Boloso Bombe District	99					(Fanjana, 2020)
Bule Hora District		70				(Tefera 2019)
Bulen District	80.0	22	2.32	0.64	3905	(Mohammed 2018)
Bure District		53			4300	(Weldebirhan et al., 2023)
Chencha,Daramalo &Yem Woreda		206			3032	(Kassa et al., 2023)
Chora District		79	3.27	0.053		(Terfassa,2021)
Digelu Tijo District		72	2.97	0.78	1200	(Edo et al., 2024).
Dilla Zuriya Woreda		75	3.42	0.41	665.42	(Mengitu 2015)

Essera District		19				(Amenu 2016)
Ezha District	80	36				(Yaregal &Sime, 2024)
Goba District	90	67	2.61			(Zeleke et al., 2024)
Gozamin District		238			2575	(Yinebeb et al., 2022)
Habro District	99.0	77	1.60	0.78		(Dekeba et al., 2019)
Hawassa City	100	258	3.43		571	(Regassa, 2016)
Hintalo Wejerat District		40				(Tulu & Zenawi, 2016)
Kombolcha Town	71.9	78	2.98	0.92		(Semu, 2018)
Legambo District		20				(Akale et al., 2019)
Misha Woreda		62	2.40	0.31	5500	(Woldemichael et al., 2019)
Raya Alamata		32	2.71	0.9		(Eyasu et al., 2020)
Sebeta-Awas District	70.9	113	3.28	0.92	750	(Mekonen et al., 2015)
Ubadebretsehay District		87				(Assefa et al.,2022)
Wadera District		65	1.85			(Biruk & Tesfaye, 2019)

Source: Own literature analysis, 2025