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RECEIVED 01 October 2024

ACCEPTED 30 December 2024

PUBLISHED 24 January 2025

CITATION

Kassa AT, Keno GI, Makahamadze T and
Bekele D (2025) The socio-economic impacts
of the floriculture industries on the
smallholders in Ethiopia: the case of Sululta
District in Oromia National Regional State.
Front. Hortic. 3:1504800.
doi: 10.3389/fhort.2024.1504800

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The socio-economic impacts of the floriculture industries on the smallholders in Ethiopia: the case of Sululta District in Oromia National Regional State

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Floriculture industries produce non-edible agricultural products for the global market. Whereas, the smallholder farmers produce edible agricultural products for domestic consumption and they contribute to national food security. The purpose of this article is to uncover the impact of the floriculture industry on the socioeconomic sustainability of the smallholder farmers and associated conflicts in Sululta district, Oromia Regional State in Ethiopia. A qualitative research approach and grounded theory research design were used to carry out the study. Data was collected using document analysis, non-participant observation, and interviews conducted with twenty five research participants, 2 FGDs, and 3 key informants from the local elders. The major findings of the study indicated that floriculture industries have controlled lands in various forms that affect the smallholder farmers' access to land and water resources. The study highlights the socioeconomic non-sustainability of smallholder farmers in the study area due to social insecurity, agricultural product damage, arable land and water resource access restrictions, resulting in the smallholder farmers shift to daily laborers. The article recommends that the government should balance the foreign exchange earnings from the floriculture industries with the sustainability of the smallholder farmers. The article also recommends government in Ethiopia should promote participatory resource management environmental and social impact assessments to mitigate potential negative impacts of industries on the smallholder farmers' socioeconomic sustainability.

KEYWORDS

floriculture industry, smallholder farmers, socio-economic impacts, resource access restrictions, conflicts

1 Introduction

The floriculture industry has emerged as a significant player in the global agricultural market, driven by increasing demand for cut flowers and ornamental plants. Major exporters such as the Netherlands, Colombia, and Ecuador dominate the market, supplying roses, tulips, and other flowers to regions like Europe, North America, and Asia (Adebayo et al., 2020; Devrani et al., 2023). In Africa, Kenya stands as the largest flower exporter, contributing over \$1 billion annually to its economy and generating substantial employment opportunities, especially for women (Ambalam, 2014; Nzomoi et al., 2022). Ethiopia follows as the second-largest flower exporter in Africa, with floriculture becoming one of the fastest-growing sectors in the Ethiopian economy.

The rise of floriculture in Ethiopia has diversified the country's export portfolio, providing an essential alternative to traditional exports like coffee (Baglioni and Gibbon, 2013; Arkebe, 2015). However, the rapid growth of the floriculture industry has led to competition for land and water resources, particularly in areas inhabited by smallholder farmers. The profit-driven approach of floriculture firms often results in the restriction of access to these resources for local communities, intensifying socio-economic vulnerabilities and triggering conflicts (Borras and Franco, 2010; Mebrat et al., 2022).

Smallholder farmers, who typically cultivate edible crops and ensure national food security, face increased pressure from large-scale agribusinesses (Shepherd, 2013; Terlau et al., 2019; Wanjiru, 2021). While floriculture firms focus on non-edible agricultural products for global markets, smallholders rely on their limited land for domestic food production, using family labor (FAO, 2014; FAO, WFP and IFAD, 2012; Kirigia et al., 2016). In Ethiopia, floriculture operations, largely established as large-scale agribusinesses, grew rapidly following the 2007–2008 global food price crisis, when many countries turned to agricultural industrialization to enhance food security (Ayenew and Kopainsky, 2014; Pfrimer and Barbosa, 2017).

In 1991, Ethiopia's transition to an agricultural-led development strategy (ADLI) emphasized smallholder farmers as key to agricultural productivity and national economic growth (Abate et al., 2020; Getahun, 2020). However, the 2005 agricultural commercialization strategy introduced large-scale agribusinesses, diminishing the role of smallholders in favor of export-led industries, such as floriculture (Makki and Geisler, 2011; Regassa and Korf, 2018). Today, Ethiopia is the second-largest flower exporter in Africa, following Kenya (Mebrat et al., 2022), but the expansion of floriculture industries often results in conflicts with smallholder farmers over land and water resources (Arkebe, 2015; Hawera et al., 2021; Hagström, 2022).

Sululta, near Addis Ababa, is strategically located for industrial and residential development, offering natural beauty and an agriculture-driven economy (Koroso et al., 2021; Heyyi and Mekonnen, 2023). According to the Ethiopian Central Statistics Agency, the population, predominantly Tulama Oromo, reached 114,850 in 2021, with rising urbanization fueled by expanding enterprises (CSA, 2021). However, rapid industrialization presents challenges in balancing economic growth with environmental preservation (Gobena et al., 2020; Mohamed et al., 2020).

This study examines the socio-economic and environmental impacts of Ethiopia's burgeoning floriculture industry, particularly in Sululta District. While floriculture has diversified Ethiopia's export portfolio and positioned the country as Africa's second-largest flower exporter, its rapid growth has heightened competition for critical resources like land and water, disproportionately affecting smallholder farmers who rely on these for food production and livelihoods. The research seeks to explore these dynamics, highlight the resulting conflicts, and assess how national strategies have shifted from supporting smallholder agriculture to prioritizing large-scale agribusinesses (Peluso and Lund, 2011; D'Odorico et al., 2018).

This study examines the socio-economic and environmental impacts of Ethiopia's floriculture industry, particularly in Sululta District, through the lens of Natural Resource Management (NRM) and food sovereignty frameworks. While floriculture has enhanced Ethiopia's export portfolio and positioned it as Africa's second-largest flower exporter, its rapid growth has intensified competition for land and water, threatening the livelihoods of smallholder farmers and raising concerns about resource allocation and environmental degradation.

NRM, as outlined by Anderson et al. (2021), McDougall and Pound (2013) and Maranga et al. (2010), emphasizes responsible control, protection, and utilization of natural resources to balance ecological, social, and economic needs. Similarly, the food sovereignty framework, championed by La Via Campesina (2017), advocates for local control over resources and sustainable agricultural practices, aligning with NRM's principles of equitable resource access, biodiversity conservation, and community involvement.

Applying NRM to Ethiopia's floriculture industry highlights the need for holistic strategies to address resource demands and mitigate environmental impacts. These include shared resource management plans, sustainable water use, and efforts to reduce pollution and land degradation, ensuring both ecological health and the socio-economic sustainability of smallholder farmers (Arnés et al., 2013).

By integrating NRM and food sovereignty (Chambers and Conway, 1992; Connelly, 2007), this study underscores the importance of participatory and inclusive approaches to managing natural resources (Schneider, 1999; Wittman et al., 2010; Morrow, 2008; Doe and Smith, 2020; Zamanialaei et al., 2022). Such approaches prioritize biodiversity conservation, economic development, and social well-being, creating a pathway to reconcile the growth of the floriculture industry with sustainable agricultural systems that protect the livelihoods of smallholder farmers and support equitable development (Peluso and Lund, 2011; D'Odorico et al., 2018).

2 Material and methods

2.1 Study area

This study focuses on selected sites in Sululta, including Weserbi and Aba Gada in Sululta city's Shaggar sub-city, and

Derba Town in the Sululta district (Figure 1). Specific floriculture industries examined include Mulo and Daraba Floriculture industries, situated near rural kebeles like Lelo Chabaka and Gulale Baressa, as well as the Samore flower farm in Sululta sub-City's Aba Gada Woreda and JJ Kothahri Co. Ltd. in Weserbi Woreda (Figure 1). These locations were selected because the impacts of floriculture on the socioeconomic sustainability of smallholder farmers in Sululta remain under-researched compared to other regions.

This article uses data collected from selected study sites such as Weserbi and Aba Gada in Sululta city's Shaggar sub-city, as well as Derba Town in the Sululta district. The Mulo and Daraba Floriculture industries, located close to each other in Sululta Woreda, Derba Town, are surrounded by rural kebeles like Lelo Chabaka and Gulale Baressa. On the other hand, the Samore flower farm is located in Sululta sub-City's Aba Gada Woreda, while JJ Kothahri Co. Ltd. is in Weserbi Woreda. The floriculture industries in Sululta were selected for study because the impacts of the floriculture industry on the socioeconomic sustainability of the smallholder farmers in this area are under-researched, unlike in other locations.

2.2 Research approach and design

The qualitative approach was used to investigate the floriculture industries' impacts on the smallholder farmers' socioeconomic sustainability. This article, which is firmly rooted in the constructivist paradigm, investigated the phenomenon using open-ended questions as an exploratory technique with a case study of the smallholder farmers in Sululta district Oromia Regional State of Ethiopia.

2.3 Data collection tools

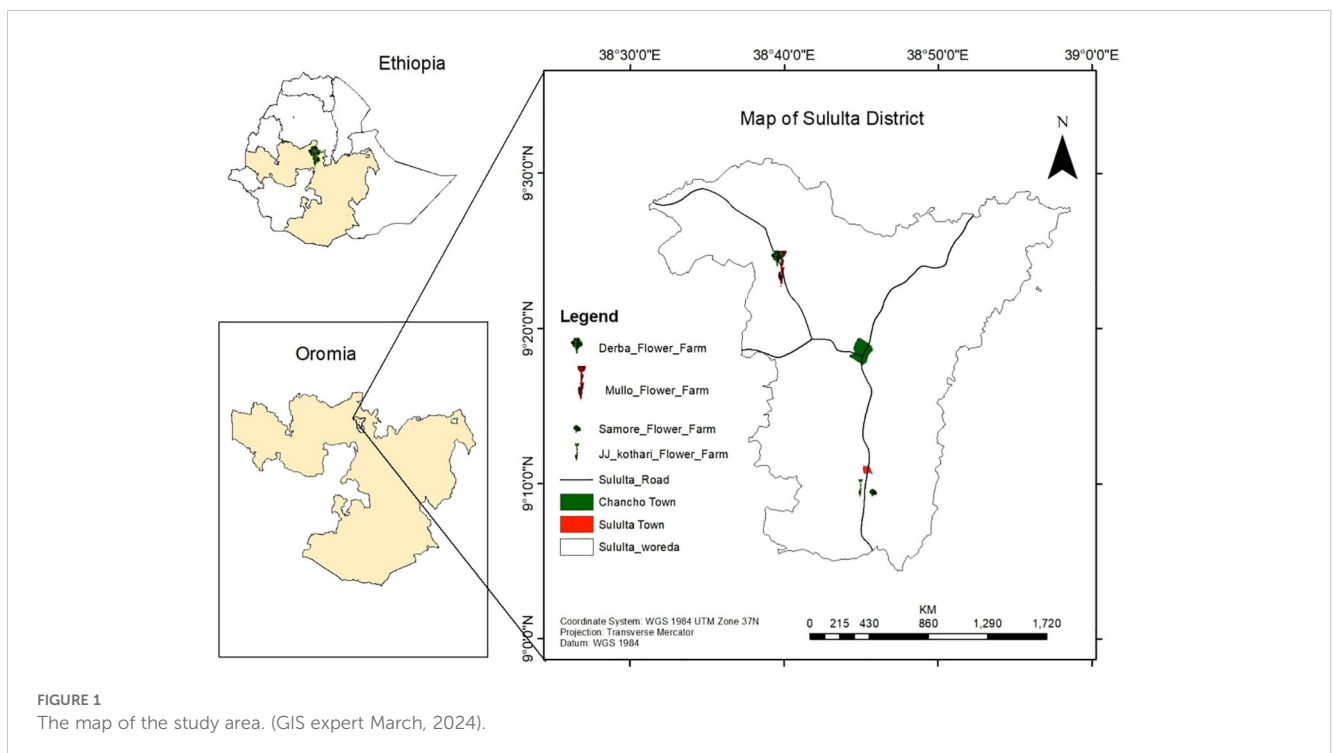
The study utilized various data collection tools, including document analysis, non-participant observation, and indepth interviews with the research participants, FGD (focus group discussions), and Key informants to understand the socioeconomic implications of floriculture industry resource access restriction of the smallholder farmers' and associated conflicts. The interviews were audio-taped with participants' consent. The data were collected between June 2022 and November 2023.

2.4 Participants and sampling

The study focused on the socioeconomic sustainability impacts of floriculture industries and targeted smallholder farmers around the floriculture industries. Interviews were conducted with a total of 28 purposefully selected individuals, including 3 key informant interviews from local elders, 9 officials, and 16 smallholder farmers who participated in the research.

In addition, semi-structured interviews were conducted with two focus groups, consisting of a total of thirteen smallholder farmers—six in one group and seven in the other for the focus group discussions (FGDs). For every FGD participant, both the homogeneity and heterogeneity of the participants were considered. The purpose of the FGDs was to augment the data collected through interviews.

In addition to interviews, non-participant observation was used as a means of gathering primary data. The investigations were semi-structured by the researchers. In addition, records like books, journal articles, and government reports were examined to



confirm the information gathered through alternative means. To enhance the quality of the data, a data triangulation and validity process was undertaken by comparing data collected at different times and locations, ensuring the reliability of the data.

2.5 Methods of data analysis

The Grounded Theory method, developed by sociologists Barney Glaser and Anselm Strauss, is a systematic qualitative approach focused on generating theory from data through a process of constant comparison and coding. It is iterative, involving continuous collection, coding, and analysis of data to identify patterns and construct a coherent narrative directly from participants' experiences (Charmaz, 2006; Strauss and Corbin, 1998). Grounded Theory is particularly valuable in studies exploring complex social issues because it allows for the emergence of insights without being restricted by predefined hypotheses (Bryant and Charmaz, 2007).

In this study, data collection was conducted in Afan Oromo, chosen because most smallholder farmer participants were native speakers of this language and did not speak English or other local languages. Using Afan Oromo facilitated a more in-depth and genuine understanding of participants' perspectives, which is crucial in qualitative research (Birks and Mills, 2015). However, the translation and transcription process posed challenges, such as the potential for loss of cultural nuances and meanings, which could affect data interpretation and the authenticity of the findings (Van Nes et al., 2010).

2.6 Ethical considerations

The informed consent, transparency, and anonymity ethical principles served as the foundation for this study. At the start of every interview, the purpose of the study, the academic institutions supporting it, and any additional questions from the participants were explained. It was made clear to the interviewees that they could withdraw from the interviews at any moment.

3 Results and discussions

3.1 Results of data analysis

The findings are presented in the table below. Through the analysis of coded data, various subcategories and categories were identified. Table 1 illustrates the thirteen subcategories and four main categories that highlight the diverse forms of land control by the floriculture industry, alongside the underlying causes of socioeconomic effects, conflicts, and the lack of socioeconomic sustainability among smallholder farmers.

Table 1 presents the findings derived from data coded in accordance with the principles of grounded theory. Through this rigorous coding process, the study uncovered several categories that encapsulate the socioeconomic impacts and conflicts. These

conflicts arise from restricted access to grazing land and water resources and the effects of floriculture industries on river water volumes. One of the stark outcomes highlighted in the table is the displacement of smallholder farmers, which forces them into marginal and stony mountainside areas, marking a significant factor in their social non-sustainability.

3.2 Land control and resource restrictions

3.2.1 Capturing and fencing the riverside land

Derba Flowers and Mullo Farm, situated adjacent to Derba Town, according to Ethiopian Horticulture Producer Exporters Association (EHPEA) (2019), these floriculture industries Spanning over 350 hectares, these farms are uniquely positioned with land fenced along the riverside in front of their compound, which crosses the asphalt road (Table 1). According to the field observation made it is estimated that a similar expanse of land is occupied on the other side of the asphalt road, extending the length of their compound (Figure 2). This arrangement suggests that the total land utilized by these farms is extensive, encompassing areas on both sides of the road.

The data collected from the FGD and interview participants indicated that the fenced area was used by smallholder farmers to access river water for various purposes. The area, previously designated by the government for youth irrigation activities, was fenced by floriculture industries in 2019. According to KII-3, the Alelu River has since begun drying during the dry season. This phenomenon is attributed to extensive groundwater extraction by the floriculture industries, which utilize multiple wells for flower cultivation. Similar patterns have been observed globally, as groundwater abstraction for commercial agriculture has been shown to disrupt river flows. For instance, Leopold and Morgante (2013) and Lanari et al. (2018) demonstrated that horticultural water use in Kenya's Upper Ewaso Ng'iro Basin significantly impacted river resources. Hengsdijk and Jansen (2006) highlighted the strain on hydrological systems in Ethiopia's Rift Valley due to agricultural water demands. Furthermore, Fantaye et al. (2023) documented the link between shallow groundwater abstraction and reduced surface water availability in Ethiopia's Lake Tana sub-basin.

3.2.2 Controlling land outside compounds

The expansion of control over lands by the floriculture industry is evident in an area located outside the premises of the Mulo and Derba Floriculture industries. This area, situated to the right of the Mulo Floriculture industry, is bordered by a hill in the distance and is covered with trees and shrubs. According to data obtained from Focus Group Discussions (FGD 1&2), interviews with research participants (RPI-5, 6), and key informant (KII-3), this area was previously used as an open communal grazing land. It has also been confirmed that the area has been fenced off and converted into a conservation area for wild animals. Key informant (KII-3) and FGD (1&2) participants have reported that pigs, monkeys, and other wild animals are now protected within this area.

TABLE 1 List of informants.

Sources of Data	Occupation	Age	Sex	Place	Year
RPI-1	Smallholder farmer	28	M	Derba Town	16 June 2023
RPI -2	Smallholder farmer	46	M	Derba Town	23 June 2023
RPI -3	Smallholder farmer	32	F	Derba Town	29 June 2023
RPI -4	Smallholder farmer	41	M	Derba Town	4 July 2023
RPI -5	Smallholder farmer	28	M	Derba Town	9 July 2023
RPI -6	Smallholder farmer	62	M	Derba Town	19 July 2023
RPI -7	Smallholder farmer	63	M	Derba Town	23 July 2023
RPI -8	Smallholder farmer	80	M	Sululta Town	9 Sept. 2023
RPI -9	Smallholder farmer	41	M	Sululta Town	14 Sept. 2023
RPI -10	Smallholder farmer	36	M	Sululta Town	23 Sept. 2023
RPI -11	Smallholder farmer	63	M	Sululta Town	28 Sept. 2023
RPI -12	Smallholder farmer	65	F	Sululta Town	7 October 2023
RPI -13	Smallholder farmer	78	M	Sululta Town	11 October 2024
RPI -14	Smallholder farmer	42	F	Sululta Town	13 October 2024
RPI -15	Smallholder farmer	47	M	Sululta Town	18 October 2024
RPI -16	Smallholder farmer	28	M	Sululta Town	18 October 2024
RPI -17	Woreda Vice-Administrator	43	M	Chancho Town	21 October 2024
RPI -18	Kebele Manager	35	M	Derba Town	25 October 2024
RPI -19	Sululta Woreda Investment Bureau	29	M	Chancho Town	26 November 2024
RPI -20	Agriculture and Rural development head	27	M	Chancho Town	30 November 2024
RPI -21	Agriculture and Rural Development officer	25	M	Chancho Town	30 November 2024
RPI -22	Shaggar City-Sululta Sub City-Mayor	41	M	Sululta Town	9 January 2023
RPI -23	Investment Bureau head	30	M	Sululta Town	14 January 2023
RPI -24	Land administration bureau head	50	M	Sululta Town	18 January 2023
RPI -25	Derba Floriculture industry	37	M	Derba Town	28 January 2023
KII-1	Small holder farmer/Local elder	72	M	Sululta Town	14 Sept. 2024
KII-2	Small holder farmer /Local elder	81	M	Sululta Town	26 October 2023
KII-3	Smallholder farmer/ Local elder	54	M	Chancho Town	2 November 2023
FGD-1	Smallholder farmer	28-42	M&F	Chancho Town	20 November 2023
FGD-2	Smallholder farmer	29-67	M&F	Chancho Town	14 December 2023

(RPI) Research Participant Interviewees; (KII) Key Informants Interviewees; (FGD) Focus Group Discussion.

3.2.3 Possessing uncultivated, huge lands in the compounds

Our investigation into the floriculture industry compounds revealed significant stretches of land that are not being utilized for construction or agricultural purposes. The Ethiopian Horticulture Producers and Exporters Association (EHPEA) reports that the Debra Flowers Industry occupies more than 350 hectares, while Mulo Flowers holds 33 hectares, as confirmed by the Sululta District Investment Bureau. Despite these substantial land holdings, EHPEA's, 2019 data indicates that only 55% of this land, approximately 210.65 hectares, is actively cultivated. This analysis

reveals that 172.35 hectares, or nearly 45% of the land, remains uncultivated, raising critical questions about the efficiency of land use and the potential for adopting more sustainable practices (Table 2).

The expansion of the floriculture industry, driven by the concept of *frontier imagination*, has significantly impacted smallholder farmers' access to arable and grazing lands (Alamineh and Eneyew, 2021; Meyfroidt et al., 2022). This concept, which frames undeveloped land as an opportunity for economic growth, has facilitated large-scale acquisitions for high-value flower cultivation (Peluso and Lund, 2011; Asebe et al., 2018; Bergius and Buseeth, 2019; Getahun, 2020). However, such expansion has had detrimental consequences for smallholder



FIGURE 2

Mulo-Darba flower farms, the left-hand side indicating fenced land adjacent to the river, the FF compound on the right hand, and the main road from Chancho to Darba.

farmers, including the loss of access to agricultural land, the disruption of grazing spaces, social and economic displacement, and environmental concerns. Additionally, it has eroded cultural and social cohesion, threatening food security and traditional agricultural systems while imposing significant risks to the environment (Asebe et al., 2018).

Although the floriculture industry has potential economic benefits, as noted by Arkebe (2015), these challenges underscore the need for equitable land access, the safeguarding of community rights, and the implementation of sustainable development practices to mitigate adverse effects on smallholder farmers (Chambers and Conway, 1992; Connelly, 2007; Tomislav, 2018; Galli et al., 2020).

However, the interview made with the deputy administration to the Sululta Woreda administration indicates that the Mulo and Derba Floriculture industries are used for dairy farming; On the other hand, the data collected from FGD and key informants indicate that the Floriculture industries are fraudulently holding the land not to be taken

away from them. The data from the research participants (RPI-2, 4), key informants (KII-3), and FGD-2 revealed that there were no more than 10 cows and a few sheep (Figure 3). These data also indicate that the Floriculture industries' activities do not supply any animal products to the local or any other markets. Besides, the products of these cows are only consumed by the workers of the Floriculture industries. The research participant (RPI-23) stated that the Samore flower farm was using uncultivated land for soya plantations, whereas there were no such kinds of activities seen in the compound.

3.2.4 Covering lands with a non-edible mono-crop

The collected data from key informant (KII-3) in the Derba and Samore flower industries highlights that utilizing vast areas of land for monoculture, specifically non-edible plants like flowers, does not contribute to increasing the food supply. This practice is particularly concerning in Ethiopia, a country grappling with severe land scarcity where smallholder farmers typically manage plots of just 0.9 hectares (George, 2015). Various studies have uncovered Ethiopia's challenges with not only food insecurity but also chronic food insecurity, emphasizing the country's ongoing struggle (Salami et al., 2010; Gezmu, 2013; Ayenew and Kopainsky, 2015). Vhugen and Gebru (2019) shed light on the impact of large-scale agricultural ventures on the productivity of smallholder farmers and their critical role in ensuring food security (Kirigia et al., 2016; Moroda et al., 2018; Barreiro-Álvarez et al., 2024). They also point out how the expansion of such large-scale agricultural projects and the creation of jobs can adversely affect the social sustainability of these farmers and their contribution to food security (Chambers and Conway, 1992; Connelly, 2007; Galli et al., 2020).

With global hunger and food insecurity on the rise since 2015, the United Nations introduced Sustainable Development Goal 2 (SDG 2) with the aim of eradicating hunger by 2030 (Gil et al., 2019; Barreiro-Álvarez et al., 2024). Observations reveal that smallholder farmers engage in mixed farming on their limited plots, reinforcing the severe land scarcity challenge highlighted by George (2015). Thus, the practice of dedicating extensive tracts of land to flower cultivation — a single type of crop that does not contribute to the food supply — is particularly problematic in the context of Ethiopia's acute need for agricultural diversification and enhancement of food security.

TABLE 2 Categories and sub-categories emerged from the data analysis.

Sub-categories	Categories
Fenced land adjacent to the river	Forms of land control
Uncultivated land in the compound	
Possessed land outside the compound	
Huge land for mono-cropping (flowers)	
Electric fences near farms and grazing lands	Socioeconomic Impacts and Conflicts
Wild animals conservation	
Releasing sewerage to the farmlands	
Grazing land access restriction	Socio-economic- non-sustainability and conflict
River water access scarcity	
Causing River drying	
Displacement	Socioeconomic Non-sustainability
Pushed to the marginal areas	
Pushed to a stony push into a mountainside	



FIGURE 3

Land controlled by Mulo-Derba flower farms in Derba Town (Field Observation December 2022).

3.3 Socioeconomic impacts and conflicts

3.3.1 Electric fences, wild animals and smallholder farms

Focus Group Discussion (FGD) participants from Group 2 suggested that encounters with certain wild animals, such as monkeys, were infrequent before the establishment of floriculture farms. They observed an apparent increase in wild animal presence, including pigs and monkeys, coinciding with the expansion of floriculture operations. However, these claims are anecdotal, and further research is needed to establish a direct causal link between floriculture activities and changes in wildlife behavior or population.

Research participants (RPI-5-7), along with FGDs (FGD-1 and FGD-2) and a key informant (KII-3) from the Mulo and Derba Floriculture industries, highlighted concerns about conservation practices implemented by the floriculture businesses. These practices reportedly allow wild animals to roam lands surrounding the floriculture compounds, causing damage to agricultural activities and resulting in economic losses for smallholder farmers. While these accounts reflect the experiences of local stakeholders, the extent and specific nature of the impact require further investigation to confirm.

A key informant (KII-3) raised concerns about the challenges faced by local farmers when attempting to protect their crops from wildlife. Farmers fear being accused of harming animals protected under the conservation policies of the floriculture industry, creating a sense of insecurity and apprehension among the community.

Additionally, the use of electric fences by floriculture industries has been reported as a potential hazard. FGD participants (FGD-1) and KII-3 noted that these fences pose risks to smallholder farmers, their children, and livestock, with accidental contact leading to injury or, in some cases, fatalities. The perceived role of these fences in restricting access to grazing land and displacing local farmers further exacerbates community tensions. However, the intent behind the use of such defensive measures remains a matter of speculation, necessitating additional evidence for definitive conclusions.

The observations made during FGDs suggest that conservation practices and defensive measures, such as the use of electric fences, have contributed to socio-economic challenges for smallholder

farmers. These include crop damage, security concerns, and fears of displacement. However, the lack of solid evidence on some issues, such as the impact on water quality and wildlife behavior, calls for further research to substantiate these claims and better inform mitigation strategies.

3.3.2 Sewerage release

The socio-economic impacts on smallholder farmers, particularly those located in proximity to the Mulo and Derba Floriculture industries, are multifaceted, extending beyond food security concerns to encompass issues related to water management and agricultural sustainability. Observations made in December 2022 highlighted the challenges posed by the geographical layout and industrial activities of floriculture compounds. Smallholder farms, situated downslope from these compounds, are adversely affected by the runoff from greenhouse rooftops during the summer months. This runoff damages grass and crop production on these farms, exacerbating the difficulties faced by smallholder farmers in achieving productive and sustainable agriculture.

The United Nations has set maintaining an environment conducive to sustainable agriculture as a crucial target for achieving Sustainable Development Goal 2 (SDG 2) by 2030 (Lavers, 2012; Gil et al., 2019). This goal underscores the importance of addressing the challenges posed by water management and environmental sustainability in agricultural practices (Morrow, 2008; Mair and Smith, 2022).

Participants in focus group discussions (FGD 1 and FGD 2) proposed that floriculture industries could mitigate some of these challenges by employing technology and manpower to harvest water efficiently for their operations, thereby also addressing water scarcity issues faced by farmers. Despite the potential of using flood runoff for irrigation as a solution for smallholder farmers during the dry season, the complexities of water scarcity, exacerbated by the floriculture industries' use of river and underground water, remain a contentious issue. Conflicts and complaints from smallholder farmers about water scarcity highlight a significant socio-economic challenge.

The vice manager of the Daraba Floriculture Industries noted the diverse interests among smallholder farmers, ranging from grass production to vegetable cultivation using irrigation. This diversity in agricultural focus underscores the difficulty in managing water

supply effectively, which is identified as a weakness among the smallholder farming community.

In summary, the socio-economic impacts on smallholder farmers, particularly those adjacent to the floriculture industries, are significantly influenced by water management issues. The runoff from floriculture compounds during critical growing seasons damages crops and grass, while the broader challenges of water scarcity and effective water use for diverse agricultural practices further complicate the situation. Addressing these challenges is essential for promoting sustainable agriculture and improving the socio-economic conditions of smallholder farmers, in alignment with the goals set by the UN for SDG 2.

3.4 Resource access restrictions, pollution, socioeconomic-non sustainability and conflicts

3.4.1 Grazing land restriction

Smallholder farmers in Sululta Sub-city primarily rely on milk production for their livelihood. However, their access to grazing land is significantly hindered by adjacent floriculture industries. Data collected from smallholder farmers in Abba Gadaa Woreda reveal a decline in income from milk sales, leading many to abandon livestock husbandry altogether. Consequently, a significant number of the youth have shifted away from farming, opting instead for daily labor or other employment opportunities.

Menzel (2019) critically examines the premise that large-scale agribusiness investments bring benefits such as job creation, capital, technology, and infrastructure. He points out that, over the past fifteen years, such investments have often resulted in land conflicts and socio-economic challenges. Menzel argues that these developments contribute to the process of depeasantization among smallholder farmers, a phenomenon where farmers are pushed away from agricultural activities not as a step toward improved living conditions but rather into a state of deteriorated livelihood. This perspective is supported by the work of Araghi (1995) and Bhogal and Singh (2014:3), who highlight the negative impacts of the large-scale agribusiness on smallholder farmers, essentially forcing them into non-farming communities due to declining agricultural viability rather than as a choice for betterment.

3.4.2 Irrigable farmland restriction

Irrigable farmland and water scarcity are the primary causes of the socioeconomic impacts in the Derba area. In the past, the area was known for its irrigated cultivation using the Aleltu River.

The interview with the research participant (RPI-1) indicated that the economic impacts of flower farming activities in the area have caused the local youths to be daily laborers and guards which is the non-sustainability of smallholder farmers. The social impact is exposed by the research participants from Sululta sub-city farmers who are living on the side of the Floriculture industries and who gave up on animal husbandry because of the floriculture industries' restriction of grazing lands (RPI-8-16). The elderly and youth in the area have lost hope of continuing farming activities in the area. As a

result, most youths are working in different investments as laborers and guards, while the elders are looking after cattle.

The key informant (KII-3) and the research participants (RPI-3, RPI-5) from the Derba area have indicated that after floriculture industries had already fenced the communal grazing land they used to collect the grass using a combiner and distribute it to the smallholder farmers and sometimes they used to sell grass to the smallholder farmers. However, according to the data collected from the key informants (KII-3) and participants of FGD-2, once the floriculture has been legalized their position over the land has banned distributing and selling grass to smallholder farmers. This condition according to the interview made with the kebele manager in the area indicated that it has created grievances and the smallholders sometimes use force to access grass for livestock.

3.4.3 Water scarcity and access restriction

Ethiopia's Water Resources Management Policy (WRMP) since 1999 emphasizes Integrated Water Resources Management (IWRM) and fair access to water resources for all users, including large-scale agricultural enterprises and smallholder farmers, through requirements for water use permits (Ethiopia's Ministry of Water, Irrigation and Energy, 1999). The smallholder farmers in GulaleBaressakebele, LeloChabeka, and Derba Town are exposed to water scarcity caused by the floriculture industries in the area. These areas are dependent on the Aleltu River for their socioeconomic services such as domestic use, cattle, and irrigation. According to the data gathered from the Gulale Baressa kebele manager most of the smallholder farmers, including those living in Derba Town, do not have pipe water. According to the data collected from the Gulale Baressakebele manager (RPI-18), over 9,000 Smallholder Farmers living in the three kebeles are dependent on the Aleltu River for irrigation, cattle, and domestic use. One participant stated the following:

Our community only used the river for domestic use and cattle; however, once we started to use the river for irrigation, the floriculture industries in the locality restricted us and fenced it for its benefits. After a long debate, a decision came from the authorities that entitled organized farmers to use it. Accordingly, we were organized and saved some amount of money to facilitate the loan from the bank. In the meantime, however, we have heard that the land was given to the floriculture industries. After that, we could not trust any official who instructed us to get organized since they lied to us at that time.

A key informant (KII-3) from the Mulo and Derba area reported that in 2019, the Mulo and Derba Floriculture industries fenced off land adjacent to the Aleltu River. According to their account, the river has since been observed to run dry during the dry season. While this observation suggests a possible correlation between the floriculture industries' activities and changes in the river's flow, no hydrological studies or direct evidence currently confirm a causal link between the fencing or water usage by the industries and the river's seasonal dryness.

Given the significance of water resources for local livelihoods and agricultural activities (Ethiopian Water Resources Management Proclamation (No. 197/2000); Doe and Smith, 2020), this issue warrants further investigation. Comprehensive studies analyzing water usage patterns, conservation practices, and the river's hydrology are needed to substantiate these claims and determine the extent to which floriculture operations may be impacting the Aleltu River.

In the FGD with the local community and interview with the key informant from the smallholder farmers living in the aforementioned kebeles, and other villages in the lower valley of the River such as *Adea Kotich* were affected because of the floriculture impacts on the water volume declined and dried.

According to the data collected from the research participants (RPI-4, RPI-6), the socioeconomic impact of water scarcity is associated with the locals being exposed to expenses to buy and fetch water from long distances. Furthermore, the loss of irrigable land has contributed to the decrease in agricultural and animal productivity, which has impacted the income of smallholder farmers from these sources.

3.4.4 Water body pollution

The environmental consequences of Ethiopia's floriculture industry indicate that it is a chemical-intensive sector. As Mengistie (2017, 2020, 2021) highlights, the floriculture industry uses chemicals, some of which the UN Health Organization has banned due to their hazardous nature. This exposes smallholder farmers to significant health risks, as well as economic burdens due to healthcare expenses. Additionally, Attah and Regasa (2013) show that floriculture activities contribute to heavy metal contamination in nearby water bodies. Gelaye (2023) further supports this, linking water quality degradation to floriculture practices. According to the FGDs, Samore Flower Farm's discharge of raw sewage into the Laga Dima River has resulted in contamination of the nearby Muger River, a tributary of the Nile (Figures 4, 5).

3.4.5 Forceful resource access and conflicts

The sentiment that the properties of the floriculture industry do not belong to the community stems from the industry's limited engagement with the smallholder farmer community. This lack of interaction has failed to foster a sense of ownership among the smallholder farmers regarding the floriculture properties. Coupled with strict restrictions on grass resources and measures to safeguard against damage and loss, this situation has created a divide. According to a research participant (RPI-18) from the area, such a gap has left the floriculture industries vulnerable to being grabbed (Borras and Franco, 2010).

In the area, the floriculture industries have been implicated in exacerbating the poverty among smallholder farmers, some of whom are employed as guards. The imposition of resource restrictions has compelled locals to access these resources forcefully. As a consequence, guards have faced salary reductions and are financially liable for any property losses or damages, further deepening their poverty. Moreover, the guards, being part of the local smallholder farmers' community, find

themselves at the center of escalating tensions. This strained dynamic has fueled conflicts within the community, as evidenced by a tragic incident reported by a research participant (RPI-2): a guard, who is a relative of the participant and a member of the smallholder farmers' community, was involved in the murder of a young man from the same community. This act has starkly highlighted the grave consequences of forced resource access and the ensuing conflict. The research participant from the area has stated that:

Floriculture industries are using a few guards to avoid expenses and most of the time the guards are forced to spend consecutive nights. The guards are also members of our community who most of the time are working on their farms during the day time. On the other side, our community does not feel that the Floriculture industries should be protected, because of the restrictions they put on our access to resources most of the members of the community are trying to cross the compound and loot resources while guards fall asleep (RPI-2).

The data collected reveal that the conflict surrounding the floriculture industries is characterized by violence, a trend that has escalated over the past few years. A notable incident occurred when locals set fire to the homes of the floriculture industry's managers in response to water scarcity. The water, which had been directly diverted to the floriculture operations via canals, became scarce, sparking significant unrest. This incident not only endangered the personal security of individuals associated with the floriculture industries within the community but also forced them to either relocate far from the area or live within the confines of the floriculture compounds for safety.

In light of these developments, Gezmu (2013) has pointed out that the floriculture industry in Ethiopia often overlooks the rights of local communities, exploits natural resources, contributes to environmental pollution, and alters water usage. Furthermore, the unfair distribution of land associated with these operations frequently leads to conflicts. This analysis underscores the complex relationship between resource management, local community rights, and the sustainability practices of the floriculture industry, highlighting the urgent need for a more harmonious approach to industry-community relations and environmental stewardship (Lawrence et al., 2001).

3.4.6 Empowerment and representation challenges of smallholder farmers

Smallholder farmers in the study area are not empowered to address the negative impacts caused by the floriculture industry due to several structural and organizational challenges. Unlike the floriculture industry, which enjoys structured representation and support as a Foreign Direct Investment (FDI), smallholders lack similar representation and advocacy mechanisms. This disparity is exacerbated by the absence of organized environmental programs or water conservation initiatives among farmers, apart from the seasonal tree-planting efforts under the national Green Legacy



FIGURE 4

Samore Flower Farms canal for releasing sewage to Laga Dima River (source: Google Earth).

initiative. Without sustained and localized efforts to conserve water and maintain the area's ecological balance, smallholders remain vulnerable to the environmental degradation caused by floriculture activities (Ingram, 2011; Gudeta, 2012; Gobena et al., 2020; Goswami, 2023).

Additionally, floriculture farms have not been observed to implement water conservation or reforestation programs to mitigate their environmental impact. This gap highlights the lack of accountability and responsibility on their part to preserve the water potential and ecological health of the region. Focus Group Discussions and interviews with key respondents (e.g., RPI 20 and 21) revealed that while smallholder farmers often raise concerns with Agriculture and Rural Development Bureaus (ARDBs), these bureaus face limitations in addressing the issues effectively. As FDIs, floriculture farms are primarily accountable to federal entities, limiting the capacity of regional bodies like ARDBs to mediate or enforce sustainable practices.

The lack of programs on both sides—smallholders and floriculture farms—can be attributed to factors such as apathy, disinterest, lack of knowledge, inadequate funding, and minimal government intervention. Addressing these issues requires fostering collaboration between smallholders, ARDBs, and the floriculture industry to develop comprehensive environmental conservation strategies, empower farmers, and ensure equitable resource management. Including these aspects in the discussion will

present a balanced view of the limitations faced by both small farmers and the floriculture industry while highlighting the institutional and structural barriers that perpetuate these challenges.

Smallholder farmers often face organizational challenges, such as limited capacity for collective action or advocacy, which hinder their ability to address issues arising from environmental degradation caused by floriculture. While Agriculture and Rural Development Bureaus (ARDBs) could play a pivotal role in addressing these gaps by facilitating farmer cooperatives, offering legal and technical support, and advocating for farmers' rights, this role appears limited in the study area. Focus Group Discussion (FGD) participants revealed that smallholder farmers have lodged complaints with ARDBs about environmental destruction and its impacts on their farms. However, interviews with Respondent Participant Interviewees (RPIs) 20 and 21 indicate that while ARDBs attempt to mediate between the conflicting interests of smallholder farmers and floriculture farms, their efforts are constrained. This is primarily due to the fact that floriculture farms, being Foreign Direct Investments (FDIs), are accountable to federal entities rather than regional administrations. Additionally, the lack of adequate government support or effective interventions further exacerbates the community's vulnerability. Exploring whether ARDBs provide sufficient support, training, or funding to empower communities to confront these challenges is critical to understanding and addressing institutional shortcomings (RPI 20).



FIGURE 5

Samore flower farms releasing sewage to Laga Dima River (Source: Researchers field visit December 2022).

3.4.7 Dispossession, displacement and Socioeconomic non-sustainability

Participants of the research and key informants identified that the primary causes of socioeconomic non-sustainability among smallholder farmers include the dispossession of farmlands, displacement of some farmers to neighboring rural areas, and the relegation of remaining farmers to marginal lands. A poignant example was provided by a woman participant, who gestured toward a stony mountainside and implied, through this silent but powerful gesture, the harsh and unyielding conditions to which they have been pushed. This act underscores the dire circumstances faced by smallholder farmers, highlighting the tangible impact of land dispossession and displacement on their ability to sustain themselves and their families.

As you can see, we are pushed to this hillside. On the top of the hill, there is a Church. We do not have a place where our cattle graze. Thus, we are forced to keep them at home. If we leave them, the floriculture industry guards attack them. In addition, they might drink polluted water and their health will be affected (RPI-12).

Moreover, the displaced smallholder farmers received inadequate compensation and were allocated smaller plots of land with lower productivity compared to their original farmlands; some were even relegated to stony hillside areas. As a consequence, these displaced farmers find themselves socially marginalized and on a downward economic trajectory.

The limitation of access to agricultural resources for smallholder farmers has a direct impact on their economy, leading to a process referred to as depeasantization, as noted by scholars such as Shiva (2010), Bhogal and Singh (2014), George (2015), and Araghi (1995). Bhogal and Singh (2014:3) accurately identified both 'pull' and 'push' factors in the transformation of a farming society into a non-farming society. 'Pull' factors entice the workforce away from farming toward more profitable non-farm activities. Conversely, 'push' factors result from distress-induced transformation, driven by challenges such as declining productivity, rising costs, diminishing returns, and unemployment, compelling the agricultural workforce to transition from farming to non-farming activities. In the studied area, some smallholder farmers are shifting toward daily labor as a non-farming activity. This shift is influenced by the proximity to large-scale agribusinesses, prompting farmers to seek opportunities in urban areas or the capital city of Ethiopia, according to Makki and Geisler (2011) and Menzel (2019). This trend highlights the significant impact of both external and internal pressures on the livelihoods of smallholder farmers, pushing them toward alternative sources of income in the face of increasing agricultural challenges.

The discussion reveals a complex tapestry of challenges faced by smallholder farmers, primarily driven by resource access restrictions, displacement, and dispossession. These challenges not only disrupt the traditional agricultural practices but also erode the socio-economic fabric of smallholder farming communities. The restriction of access to essential resources, including water and grazing land, compounded by the forceful displacement and dispossession of fertile farmland, has led

to a precarious existence for these farmers. Pushed to marginal lands with limited productivity, they struggle to sustain their livelihoods and maintain the health and well-being of their livestock.

The situation is further aggravated by inadequate compensation for displaced farmers, which fails to match the value of the land lost or to provide a viable pathway for rebuilding their lives. As a result, these communities face an uphill battle against socio-economic decline, finding themselves marginalized within the broader societal framework.

In conclusion, the narrative of the smallholder farmers underscores a critical need for policies and practices that not only recognize but also protect the rights and livelihoods of these communities. Addressing the root causes of resource access restriction, displacement, and dispossession is imperative to ensure the sustainability and resilience of smallholder farming in the face of growing challenges. Without such interventions, the cycle of marginalization and economic decline is likely to persist, eroding the foundation of rural agricultural communities and diminishing their contribution to the food security of the country.

4 Conclusion and recommendation

The study highlights the adverse effects of the floriculture industry on the socioeconomic sustainability of smallholder farmers, particularly the youth, who are increasingly becoming daily laborers due to land and water access restrictions and displacement. This shift threatens local food production and exacerbates conflicts between communities and floriculture industries. It also reveals a critical need for reevaluating government strategies that prioritize export-oriented non-edible agricultural products over the sustainability of food-producing smallholder farms. The expansion of floriculture poses significant risks to the resource accessibility essential for the farmers' socioeconomic survival. These issues are compounded by structural and organizational gaps that hinder smallholder farmers' ability to address the negative impacts of floriculture. Unlike the floriculture sector, which benefits from established representation and support as Foreign Direct Investments (FDIs), smallholder farmers lack the organizational structures and advocacy mechanisms necessary to safeguard their interests. The absence of coordinated environmental programs, such as water conservation or reforestation efforts, further exacerbates their vulnerability to environmental degradation caused by floriculture activities. Additionally, Agriculture and Rural Development Bureaus (ARDBs) face significant limitations in addressing these challenges due to the floriculture industry's federal accountability and insufficient government support.

To achieve a balance between the economic benefits of floriculture and the need for food sovereignty, ensuring that smallholder farmers are empowered and their interests protected in the face of industry expansion, the following steps are recommended:

1. Strengthening farmer organizations: ARDBs should facilitate the establishment of farmer cooperatives and provide the necessary legal and technical support to empower smallholder farmers to advocate for their rights and collectively address environmental issues.

2. Improved collaboration: There needs to be enhanced collaboration between smallholder farmers, ARDBs, and the floriculture industry to develop and implement sustainable environmental conservation strategies, such as water conservation and reforestation programs, which can benefit both parties.

3. Government support: The government should provide more comprehensive support to smallholder farmers, including funding, training, and institutional capacity-building, to enable them to effectively confront the environmental challenges they face.

4. Floriculture industry accountability: The floriculture industry must be held accountable for its environmental impacts. It should be encouraged to implement water conservation and reforestation initiatives to mitigate the negative effects of its activities.

5. Policy and advocacy: Policymakers should ensure that smallholder farmers have adequate representation in decision-making processes related to environmental governance and sustainable agricultural practices.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

AK: Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing, Data curation, Investigation. GK: Conceptualization, Formal analysis, Methodology, Supervision, Writing – original draft, Writing – review & editing. TM: Conceptualization, Formal analysis, Methodology, Supervision, Writing – original draft, Writing – review & editing. DB: Conceptualization, Formal analysis, Methodology, Supervision, Writing – original draft, Writing – review & editing.

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Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. The authors acknowledge receiving a small grant of 44,000 ETB (approximately \$820 USD at the 2022 exchange rate) received during the author's PhD program from UKRI in collaboration with ARUA.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fhort.2024.1504800/full#supplementary-material>

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Appendices

Annex I: Interview for smallholder farmers (KIIs)

*Note: Additional follow-up questions were asked, as appropriate.

Note: The semi-structured questions were used for different research participants based on each objective of the study.

1. Tell us about floriculture industries in your area?
2. What are the impacts of flower farms on smallholder farmers?
3. How floriculture industries in your locality affect the environment?
4. How floriculture industries in your locality affect social aspects of the smallholder farmers?
5. How do flower farms' affect smallholders' economies and what are the economic opportunities of the floriculture for the smallholder farmers?
6. How floriculture industries in your locality affect the participatory decision of the smallholder farmers?
7. How do you understand food sovereignty?

Annex II: FDG, Elders and Officials

1. Would you share with us the role of the smallholder farmers in the decision making process in the introduction of floriculture industries in to your/their area.
2. What are the impacts of non-participatory decision making on the smallholder farmers
3. How the environmental impacts and resource control affect smallholder farmers socioeconomic sustainability
4. How floriculture industries role for the socioeconomic life improvement of the smallholder farmers.
5. How do you understand food sovereignty?
6. How floriculture support food sovereignty of the country
Warshaan ababoo akkamitti birmadumaa nyaataa biyyattii deeggaruu danda'a.