

Review Article

Review on the Contribution of Agricultural Advisory Services in Improving Smallholder Farmers' Livelihood in Ethiopia

Disasa Ararsa* , Tesfaye Tura 

Department of Rural Development and Agricultural Extension, Wollega University, Shambu, Ethiopia

Abstract

In Ethiopia, Agricultural advisory services play a crucial role in enhancing the productivity, resilience, and livelihoods of smallholder farmers in Ethiopia. This review synthesizes recent empirical and theoretical evidence on the contributions of advisory services to agricultural development, technology adoption, and livelihood improvement. Using a systematic review and narrative synthesis approach, the study examined peer-reviewed literature and institutional reports published mainly after 2020. The findings indicate that agricultural advisory services significantly promote the adoption of improved technologies, climate-smart agricultural practices, efficient input use, market participation, and income diversification. Extension approaches such as farmer field schools, demonstration plots, and digital advisory platforms have contributed to increased crop and livestock productivity, improved food security, and strengthened household resilience. Advisory services also facilitate access to market information, financial services, and collective learning opportunities, supporting commercialization and sustainable rural development. However, their effectiveness remains constrained by inadequate funding, weak institutional coordination, limited infrastructure, high extension worker-to-farmer ratios, digital access gaps, and challenges related to gender and social inclusion. The review concludes that strengthening institutional capacity, promoting demand-driven and participatory approaches, expanding digital extension, and enhancing inclusivity are essential for maximizing the impact of advisory services and achieving sustainable agricultural transformation in Ethiopia.

Keywords

Agricultural Advisory Services, Smallholder Farmers, Technology Adoption, Livelihood Improvement, Ethiopia

1. Introduction

1.1. Background and Justification of Review

The majority of Ethiopians rely on agriculture for their livelihoods, and it plays a vital role in both the country's economic growth and food security [33]. The industry is dominated by smallholder farmers, but they continue to confront obstacles

like low productivity, restricted access to better technologies, and susceptibility to shocks due to climate change [5].

Ethiopia has one of the biggest public agricultural advising systems in Africa, with development agents stationed at the kebele level to offer training, demonstrations, and technical assistance [1]. The goal of these consulting services is to en-

*Correspondence: Disasa Ararsa (disasar2023@gmail.com)

Received: 21 February 2026; Accepted: 3 June 2026; Published: 23 June 2026



Copyright: © The Author(s), 2026. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

courage the use of better seeds, fertiliser, agronomic techniques, and climate-smart agriculture technologies [40]. Participation in extension programs raises the probability of adopting new technology and better farm management techniques, according to empirical data [1].

These issues have been made worse by climate change, which has increased livelihood insecurity among Ethiopian rural communities and adversely affected agricultural production [20]. Further empirical data shows that farmers' resilience and income stability are severely threatened by climate variability, especially smallholders with limited resources [29].

Extension and information distribution systems are examples of agricultural advisory services (AAS), which are universally acknowledged as crucial tools for raising agricultural productivity and boosting rural livelihoods. These services improve farmers' ability to make decisions, encourage the adoption of better agricultural technologies, and make knowledge more accessible. According to recent research, Ethiopian smallholder farmers' adoption of improved technologies and farm productivity are greatly increased when they have access to agricultural information and extension support [44]. Additionally, by encouraging climate-smart farming methods and adaptable tactics, consulting services help farmers become more resilient [24].

Additionally, by boosting income, encouraging diversification, and lowering rural households' susceptibility to shocks, agricultural consulting services significantly improve livelihoods [33]. In Ethiopia, better household welfare and food security have also been linked to the adoption of improved farming methods made possible by advice services [34].

Despite these contributions, a number of institutional, technical, and socioeconomic issues, such as poor infrastructure, uneven service delivery across regions, and restricted access to services, continue to limit the efficacy of agricultural advisory services in Ethiopia [44]. Furthermore, the performance of advising systems and the livelihoods of farmers are still impacted by new issues including market disruptions and socioeconomic shocks [23].

Stronger and more flexible advising structures that can improve farmers' resilience and livelihood security are necessary due to the growing complexity of issues facing Ethiopian agriculture, including as climate change, disruptions to the food system, and economic uncertainty [23]. In order to guide policy and practice, it is crucial to comprehend the role that advisory services play in addressing these issues.

Furthermore, enhancing farmers' lives necessitates integrated strategies that incorporate risk management, income diversification, and productivity enhancement- all of which are impacted by the efficiency of agricultural consulting services [33]. However, it is difficult to draw thorough conclusions for policy and intervention design when the evidence is dispersed and fractured.

Both the New Extension Implementation Program (NEIP) and the Participatory Demonstration and Training Extension Systems (PADETES) programs in Ethiopia have the potential

to improve farmers' livelihoods, but their results have been inconsistent and frequently fall short of expectations [47]. Disparities in resource allocation and extension agent training hampered the efficacy of the New Extension Implementation (NEI), which was intended to tailor extension advice according to particular agro-ecological zones and farmer needs [25]. This discrepancy resulted in unequal access to technologies and knowledge. Additionally, the study indicates that it was difficult to precisely assess the effects of New Extension Implementation (NEI) on the ground due to a lack of efficient monitoring and evaluation systems [17].

A more viable path for improving farmers' livelihoods is provided by Participatory Demonstration and Training Extension Systems (PADETES), which places an emphasis on farmer-centered learning through demonstration plots and peer-to-peer knowledge sharing [5]. Improved agricultural techniques were more widely adopted when PADETES was well implemented, especially in cases where it placed a high priority on hands-on instruction and participatory approaches [11]. However, as indicated by a number of recent studies, the sustained availability of funding and technical support has presented difficulties for the long-term viability of PADETES initiatives [42].

Lack of synergy between NEIP and PADETES, which could have maximized their respective strengths, is a key flaw that the review highlights [30]. It would have been easy to integrate PADETES' pragmatic, farmer-led approach to technology transfer with the individualized advice component of NEIP. Unfortunately, the wider impact of extension services was limited since this integration was frequently absent. The top-down implementation strategy is another persistent issue that limits the extension's efficacy by failing to take into consideration the farmers' diverse socioeconomic and geographic origins [10].

The critical need for improved monitoring and evaluation methods is also highlighted by the review. It has been difficult to fully evaluate the effects of NEIP and PADETES on farmers' livelihoods due to a lack of trustworthy data collection and analysis [45]. Without trustworthy data, it's hard to know what worked, what didn't, and what needs to be changed to improve farmer outcomes and the effectiveness of extension services. Making educated decisions for next agricultural projects is further hampered by this persistent lack of data collecting.

The review demonstrates that while both NEIP and PADETES offered chances for improvement, implementation challenges, a lack of integration, a lack of funding and inadequate monitoring and evaluation systems have limited their influence on Ethiopian farmers' livelihoods [9]. Therefore, this review is justified as it aims to synthesize existing empirical and theoretical literature on the contribution of agricultural advisory services to improving farmers' livelihoods in Ethiopia, identify key gaps and challenges, and provide evidence-based insights to enhance the effectiveness, inclusiveness, and sustainability of advisory systems.

1.2. Objectives of This Review

1.2.1. General Objectives of This Review

The general objective of this review is to review the contribution of agricultural advisory services to improving smallholder farmers' livelihoods in Ethiopia.

1.2.2. Specific Objectives of This Review

The specific objectives of this review are to

- 1) To review the contribution of agricultural advisory services on smallholder farm productivity and technology adoption in Ethiopia.
- 2) To review the challenges of agricultural advisory services on the livelihood of farmers in Ethiopia.

2. Review of Methodology

The review employed a systematic and narrative synthesis methodology to evaluate the ways in which contribution of agricultural advisory services have enhanced the livelihoods of Ethiopian farmers. The approach's objectives were to guarantee comprehensive coverage, vigorous source evaluation, validity, reliability, and the integration of fresh data. In addition to major academic databases including Google Scholar, Scopus, Web of Science, Research-Gate, and African Journals Online (AJOL), a thorough search was conducted using institutional sources such as the Ministry of Agriculture (MoA) report.

To ensure the review reflected the state of knowledge and current reforms, the search prioritized studies published after 2020 while carefully choosing earlier articles that offer important historical information on Ethiopian extension systems. The selected citation has a number of inclusion and exclusion criteria. The inclusion criteria were the publication date after 2020, the geographic focus, namely in Ethiopia, the content's relevance, and expansion plans. The exclusion criteria included research published before 2020, opinion pieces and comments with minimal empirical backing, studies unrelated to agricultural extension services, and unverifiable sources.

3. Literature Review

3.1. Theoretical Review

3.1.1. Meaning of Agricultural Advisory Services

The term "agricultural advisory services" refers to a collection of institutional arrangements and support systems that give farmers access to pertinent knowledge, data, technologies, and skills to enhance agricultural output, productivity, and livelihoods. These services are intended to help farmers make well-informed decisions on market participation, livestock management, crop production, and the management of natural

resources. Technical advice, training, demonstration, and facilitation of access to markets, loans, and agricultural inputs are common components of agricultural consulting services. By using these services, farmers can increase their farming systems' efficiency, lower production risks, and adopt better agricultural practices [15].

Agricultural advisory services play a crucial role in bridging the gap between research and practical agricultural application, ensuring that innovations reach smallholder farmers and contribute to sustainable agricultural development. In this system, advisory service providers act as intermediaries that translate scientific knowledge into practical solutions suitable for local farming conditions; they also play a key role in strengthening farmers' capacity to experiment with new technologies, adapt innovations to their local environment, and share experiences with other farmers [13]. Advisory service providers serve as middlemen in this system, converting scientific knowledge into workable solutions appropriate for regional farming circumstances. Additionally, they are crucial in enhancing farmers' ability to share their experiences with other farmers, experiment with new technology, and adapt innovations to their local context. Consequently, advisory services ensure that innovations reach smallholder farmers and support sustainable agricultural development by bridging the gap between research and practical agricultural application [13].

The traditional extension approach, which primarily concentrated on top-down technology transfer, has given way to a more participatory and demand-driven model in recent years. Modern advisory services emphasize farmer learning, knowledge sharing, and collaboration among multiple stakeholders, including farmers' organizations, private sector actors, development agencies, and research institutions. This pluralistic system acknowledges that agricultural knowledge is not only generated by researchers but also by farmers through their experiences and local practices. As a result, advisory services seek to enable farmers to actively participate in agricultural innovation and rural development initiatives [14]. The focus of contemporary advisory services is on farmer education, knowledge exchange, and cooperation between many stakeholders, such as research institutions, development agencies, private sector actors, and farmers' organizations. This pluralistic framework acknowledges that farmers, via their experiences and regional customs, also contribute to agricultural knowledge. In order to enable farmers to actively engage in agricultural innovation and rural development projects, advising services are designed to support interactive learning processes [14].

Additionally, agricultural consultancy services play a major role in strengthening farmers' ability to withstand new problems like environmental degradation, market instability, and climate change. Farmers receive guidance on climate-smart agricultural practices, integrated pest management, sustainable soil and water management, and income source diversification through training and advisory support. These services

help farmers retain steady livelihoods, improve the sustainability of agricultural production systems, and adjust to shifting environmental conditions. As a result, advising services are becoming more widely acknowledged as a crucial instrument for advancing sustainable agriculture and guaranteeing food security in developing nations [35].

Furthermore, digital technologies are being used more and more by agricultural advisory services to improve the efficiency and accessibility of information distribution. Weather forecasts, pest outbreaks, market prices, and improved farming practices are just a few examples of the timely agricultural information that is now extensively disseminated through mobile phones, digital platforms, radio programs, and online advisory systems. Farmers can interact directly with extension agents and specialists and receive tailored recommendations thanks to digital advisory tools. The reach of advising services is increased by these technology advancements, especially for smallholder farmers in isolated rural areas who frequently have limited access to traditional extension systems [6].

The role that agricultural advisory services play in bolstering farmer organisations and collective action is another significant aspect of these services. The establishment and growth of producer associations, cooperatives, and farmer groups that promote information sharing, cooperative marketing, and access to agricultural services are frequently aided by advisory services. Advisory services help farmers boost their involvement in agricultural value chains, lower transaction costs, and raise their negotiating power in marketplaces. The improvement of rural livelihoods and the advancement of inclusive agricultural development are greatly aided by such institutional support [38].

All things considered, agricultural consulting services provide an all-encompassing support system designed to enhance farmers' agricultural knowledge, creativity, and decision-making. These services serve a critical role in boosting agricultural output, encouraging sustainable resource management, and improving the socioeconomic situations of rural communities by connecting farmers with research institutes, markets, financial services, and policy frameworks. Thus, in many developing nations, improving agricultural advising services is considered a crucial tactic for attaining rural development and agricultural transformation [16].

3.1.2. Review of Current Situation of Agricultural Advisory Services in Ethiopia

In Ethiopia, agricultural advisory services continue to be a fundamental tool for improving smallholder productivity, rural development, and agricultural transformation. By offering specialized agronomic advice and decision-support tools, extension services dramatically increase farmers' knowledge, acceptance of technology, and production, according to empirical studies conducted after 2020 [4]. These services help farmers adopt better seeds, fertilizer management techniques, and sustainable farming practices by bridging knowledge gaps between agricultural communities and research organizations.

Nonetheless, the advice system still has operational and structural limitations such as uneven geographic coverage, inconsistent service quality, and a shortage of human resources [46]. In many areas, extension-to-farmer ratios are still high, which limits smallholder farmers' access to individualized help and lowers the frequency and Caliber of advisory engagements.

Extension systems frequently operate with limited logistical support and training opportunities for Development Agents (DAs), which affects service quality and innovation dissemination. Therefore, strengthening institutional coordination and resource mobilization is essential for improving advisory effectiveness. Additionally, the lack of strong monitoring and evaluation mechanisms limits evidence-based decision-making and continuous service improvement [10]. The implementation of performance-based evaluation frameworks can improve accountability and service quality in extension programs. Research shows that poor finance and disjointed institutional structures impede service delivery and lessen extension's ability to respond to farmer demands [26]. Service quality and innovation dissemination are impacted by extension systems' frequent lack of logistical support and training opportunities for Development Agents (DAs). For advisory effectiveness to increase, institutional coordination and resource mobilization must be strengthened. Furthermore, evidence-based decision-making and ongoing service improvement are hampered by the lack of strong monitoring and evaluation systems [10]. Extension programs can improve service quality and accountability by putting performance-based evaluation systems into practice.

An essential component of agricultural extension that promotes commercialization and revenue diversification is market-oriented advisory services. According to research, farmers are more likely to participate in agricultural markets and earn larger financial returns if they obtain value-chain guidance and market information [43]. Advisory services boost competitiveness and revenue generation by assisting farmers in understanding market prospects, quality standards, and price dynamics. However, the full potential of value-chain-oriented advising services is limited by gaps in market information transmission and coordination between extension institutions and private sector actors [4]. Enhancing market integration and economic results for smallholder farmers can be achieved by fortifying relationships between extension providers and market participants.

In the provision of advising services, gender and social inclusion continue to be major obstacles. Research shows that cultural norms, time restrictions, and a lack of representation in extension programs frequently make it difficult for women farmers to obtain extension services [46]. Equitable access to agricultural knowledge can be improved by inclusive extension strategies that address gender-specific limitations and encourage participatory service delivery. Empowerment and better agricultural results are two benefits of extension programs that emphasize gender-sensitive tactics. Therefore, inclusive agricultural growth requires addressing social and cultural

hurdles.

To sum up Ethiopian agricultural advisory services still support rural livelihoods and agricultural productivity, but systemic changes are needed to increase their efficacy. To maximize the advantages of advisory programs, service coverage must be increased, extension quality must be improved, and institutional coordination must be strengthened. To overcome current obstacles and promote sustainable agricultural transformation, policy and investment priorities should center on capacity building, resource mobilization, and inclusive service delivery.

(i). Digital Transformation of Agricultural Advisory Services in Ethiopia

Through the introduction of information and communication technologies (ICTs) that improve information accessibility and service efficiency, digital transformation has transformed agricultural consulting services. Research conducted after 2020 shows that digital knowledge systems, interactive advisory tools, and mobile-based advisory platforms enhance the accessibility and timeliness of agricultural information [26]. Farmers can now access market prices, weather forecasts, and agronomic advice thanks to these advancements, which helps them manage risk and make well-informed decisions. According to [10], digital extension systems also enable two-way contact between extension agents and farmers, which enhances user engagement and service responsiveness. The integration of digital tools into extension systems represents a significant advancement in agricultural service delivery.

By decreasing information asymmetries and increasing service coverage, digital advising services enhance conventional extension strategies. Research demonstrates that by addressing the various demands of farmers and technology limitations, hybrid models that combine digital tools with in-person extension produce superior results [4]. By ensuring that digital innovations complement human-centered extension services rather than replace them, hybrid approaches increase the impact and inclusivity of services. For instance, farmers can obtain agronomic data on their own while still having access to opportunities for individualized extension assistance through mobile advisory applications. This combination improves farmer participation and knowledge sharing.

Despite advancements, structural obstacles to digital transformation include poor infrastructure, insufficient digital literacy, and restricted internet access [46]. Access to digital advisory services and information is frequently limited in rural areas due to connectivity issues. Furthermore, the efficacy of ICT-based solutions is impacted by the disparities in digital proficiency between extension agents and farmers [43]. Investments in digital infrastructure, capacity-building initiatives, and the creation of locally relevant content are necessary to remove these obstacles. Digital extension capacities can be further improved by fortifying alliances between the public and commercial sectors and development organizations.

Agricultural modernization is aided by digital transformation, which increases information sharing and service effectiveness. But extension systems' structural problems cannot be solved by technology alone. In order to ensure that digital technologies complement traditional advising services, successful digital adoption must be complemented by institutional reforms and human capacity development. A well-rounded strategy that combines human-centered extension with technology innovation will optimize the advantages of advisory systems and promote agricultural growth.

(ii). Institutional Reforms of Agricultural Advisory Services in Ethiopia

Improving the effectiveness and responsiveness of agricultural advising services requires institutional reform. Ethiopia's traditional extension structures frequently have hierarchical decision-making procedures and poor stakeholder coordination, which hinder the flexibility of services and the uptake of innovations [10]. Pluralistic extension models that incorporate government agencies, academic institutions, private advisors, and farmer organizations in service delivery are supported by recent research [26]. Pluralistic methods increase the variety of services offered, facilitate better information exchange, and boost farmer involvement in extension initiatives. Research shows that by addressing a variety of farmer requirements and encouraging the diffusion of innovation, collaborative extension systems improve service relevance [46].

Additionally, professionalization and capacity building of extension staff are key components of institutional reforms. Research indicates that farmer satisfaction and service quality are highly influenced by extension agents' motivation and competencies [4]. Advisory effectiveness is increased through training programs that improve technical knowledge, digital skills, and participatory extension methodologies. By boosting motivation and service commitment, incentive programs and career development possibilities enhance extension performance [43]. For extension systems to provide high-quality advising services, human resources must be strengthened.

Another goal of institutional reform is better coordination between research organizations and extension institutions. Linkages between research and extension guarantee that advisory content is up to date with scientific discoveries and technological advancements [46]. By facilitating the transmission of knowledge from research institutions to farmers, effective coordination mechanisms increase the impact and relevance of extension services. However, information flow and innovation adoption can occasionally be hindered by institutional collaboration gaps [10]. Innovation dissemination and service integration can be enhanced by strengthening stakeholder partnerships.

The goal of institutional reforms is to improve service effectiveness and update extension systems. To accomplish these goals, stakeholder collaboration, resource mobilization, and policy support are crucial. Reform measures can assist

sustainable agricultural growth and improve agricultural advising services by encouraging pluralistic viewpoints, professional development, and institutional coordination.

(iii). Climate Resilience of Agricultural Advisory Services in Ethiopia

Extension programs now incorporate climate-smart agricultural practices that increase adaptive capacity and reduce vulnerability to climatic shocks [23]. These practices include drought-tolerant crop varieties, soil conservation techniques, and water management strategies that improve agricultural sustainability. Research shows that farmers who adopt climate-smart technologies experience improved productivity and resilience under changing environmental conditions [10]. As a result, climate resilience has become an essential part of agricultural advisory services.

Through providing agroclimatic data and localized weather forecasts, climate information services further improve resilience. Climate data is distributed via digital platforms and extension systems to aid in risk management and production planning [4]. Farmers can choose suitable crop kinds, modify planting schedules, and implement adaptive management techniques when they have access to meteorological data. Research demonstrates that making decisions based on climatic information enhances agricultural results and lowers production risks [46]. However, widespread adoption is still hampered by rural areas' restricted access to climate services. Improving resilience requires increasing the transmission of climate information and building extension capabilities in climate adaptation.

Through encouraging conservation agriculture and sustainable land management techniques, advisory services also support environmental sustainability. Crop rotation, reduced tillage methods, and soil fertility management enhance soil health and long-term productivity [43]. These methods assist sustainable agriculture systems by reducing land degradation and improving ecosystem resilience. Extension initiatives that prioritize resource conservation and environmental care are in line with more general sustainability goals. The function of extension services in sustainable development is strengthened when climate and environmental factors are incorporated into advice content.

A developing aspect of agricultural advising services is climate resilience. Addressing environmental issues requires bolstering extension capacity for climate adaption, expanding access to climate knowledge, and encouraging sustainable activities. Long-term production and agricultural resilience will be improved by a climate-smart advice system that promotes environmental sustainability and farmer adaptation.

3.2. Review of Empirical Literature

For Ethiopian smallholder farmers to increase production and adopt new technologies, agricultural advice services are

essential. Recent research offers solid proof of these services' beneficial advantages as well as their significant drawbacks.

3.2.1. Contribution of Agricultural Advisory Services on Smallholder Farm Productivity and Technology Adoption in Ethiopia

Data consistently demonstrates that among Ethiopia's smallholder farmers, agricultural advice services play a significant role in increasing production and encouraging the use of new technologies. By reducing information asymmetry and facilitating the sharing of knowledge, extension services help farmers make well-informed agricultural decisions. [8] and [39] found that farmers who regularly interact with extension agents have higher yields because of improved input usage efficiency, better agronomic practices, and improved decision-making ability. These findings are supported by studies employing household panel data and impact evaluations. For example, it has been demonstrated that cereal production, especially for maize and wheat, is greatly increased by advisory interventions concerning fertilizer application and soil fertility management [10, 37].

Another important way that consulting services affect agricultural production is through the deployment of technology. According to empirical research, farmers that receive extension help are more likely to implement climate-smart agricultural practices, integrated pest management techniques, and better seed varieties [2, 28]. Participatory learning strategies like demonstration plots and farmer field schools, where farmers see real-world advantages and learn firsthand, help spread technology. Research shows that because demonstration-based extension lowers perceived risk and boosts farmer confidence in new practices, it greatly increases the likelihood of technology uptake [19, 48]. Learning environments that bridge the gap between research discoveries and on-farm application are produced by such interactive systems.

Technology adoption is another significant way that consulting services impact agricultural productivity. Empirical studies have shown that farmers who receive extension assistance are more likely to use improved seed varieties, integrated pest management strategies, and climate-smart agricultural practices [2, 28]. Technology is disseminated through participatory learning techniques including demonstration plots and farmer field schools, where farmers witness practical benefits and gain firsthand knowledge. According to research, demonstration-based extension significantly increases the possibility of technology adoption since it reduces perceived risk and promotes farmer trust in new practices [19, 48]. These interactive tools create learning settings that bridge the gap between research findings and on-farm deployment.

Advisory services also make it easier to enter markets and integrate into value chains. Extension agents help farmers gain greater market opportunities and higher returns by providing knowledge on post-harvest processing, quality requirements, and market prices [3, 18]. Market-oriented advising assistance

promotes income development and rural economic transformation by encouraging farmers to produce for commercial markets rather than just subsistence. Research indicates that farmers who possess market knowledge are more likely to participate in group marketing and bargain for advantageous prices, which increases profitability [11]. These interventions connect the goals of economic growth with agricultural output.

Although these achievements, different areas and socioeconomic groups have different advisory impacts. Due to high client-to-agent ratios and logistical limitations, farmers in isolated and marginalized areas frequently receive little extension contact [21]. Productivity disparities between disadvantaged and well-served communities are sustained by this unequal distribution of advisory services. Research indicates that by

providing advising coverage to underprivileged people, targeted outreach and decentralized service delivery can reduce these discrepancies [8, 30]. Therefore, equitable agricultural development depends on inclusive extension programs.

Although these achievements, different areas and socioeconomic groups have different advisory impacts. Due to high client-to-agent ratios and logistical limitations, farmers in isolated and marginalized areas frequently receive little extension contact [21]. Productivity disparities between disadvantaged and well-served communities are sustained by this unequal distribution of advisory services. Research indicates that by providing advising coverage to underprivileged people, targeted outreach and decentralized service delivery can reduce these discrepancies [8, 30]. Therefore, equitable agricultural development depends on inclusive extension programs.

Table 1. Contribution of Agricultural Advisory Services on Smallholder Farm Productivity and Technology Adoption.

| No. | Specific Contribution | Specific by actions by contribution of agricultural services | References |
|-----|---------------------------------|---|------------|
| 1 | Improved input use efficiency | Extension guidance enhances fertilizer application and agronomic practices, increasing productivity | [8] |
| 2 | Higher crop productivity | Advisory support improves soil fertility management and crop management, raising yields | [39] |
| 3 | Climate adaptation | Climate-smart advisory services promote drought resilience and sustainable practices | [37] |
| 4 | Technology adoption | Farmers with advisory contact are more likely to adopt improved seeds and modern inputs | [10] |
| 5 | Participatory learning | Demonstration plots and field schools increase experiential learning and technology uptake | [28] |
| 6 | Post-harvest loss reduction | Training on storage and handling reduces food losses and improves food security | [19] |
| 7 | Livestock productivity | Advisory interventions improve animal health and feeding practices, increasing income | [24] |
| 8 | Market access and profitability | Market information and quality standards enable better market participation | [18] |
| 9 | Value chain integration | Extension links farmers to input suppliers and markets, enhancing commercialization | [3] |
| 10 | Social capital formation | Group-based extension fosters collective action and shared learning | [28] |
| 11 | Gender and youth inclusion | Targeted programs increase participation of marginalized groups in innovation | [32] |
| 12 | Livelihood diversification | Advisory support encourages income-generating activities beyond crop farming | [31] |
| 13 | Financial access facilitation | Extension systems link farmers to credit and financial services | [7] |
| 14 | Risk reduction | Knowledge on risk management improves household resilience to shocks | [36] |
| 15 | Commercial orientation | Advisory services shift production toward market-based agriculture | [12] |

Source: Authors computation based on the available data (2025).

3.2.2. Challenges of Agricultural Advisory Services on the Livelihood of Smallholder Farmers

Despite the fact that agricultural consulting services have a

significant potential to enhance livelihoods, empirical research reveals enduring obstacles that compromise their efficacy. Limited institutional capacity, which is typified by insufficient personnel, inadequate training of extension agents, and resource limitations, is one significant limitation [21].

Farmers' access to timely and pertinent information is restricted by high client-to-agent ratios, which lower the frequency and caliber of advising encounters. Extension systems with limited financial and human resources find it difficult to sustain consistent outreach, especially in rural locations, according to research [8, 30]. Therefore, improving institutional capacity through hiring, training, and resource allocation is crucial for providing services effectively.

The mismatch between advising messages and the socioeconomic realities of farmers is another major issue. According to empirical data, recommendations for extensions are occasionally generic and top-down, ignoring local circumstances and resource limitations [32]. For instance, farmers with limited financial resources may find it difficult to implement input-intensive technology recommendations, which could result in low acceptance rates. Research highlights the value of participatory advisory methods that integrate farmers' viewpoints and contextual knowledge into the creation of programs [11, 18]. Advisory services that are context-sensitive improve relevance and raise the probability of technology adoption.

Other obstacles to equal access to advising services include gender and social inclusion. Due to competing household duties, limited mobility, and societal norms, women farmers frequently have lower involvement rates in extension programs [32]. Their access to productivity-boosting information and technologies is restricted as a result of this exclusion. Gender differences in extension contact and training opportunities are documented by empirical studies, and these differences lead to differences in agricultural outcomes [11]. To address these disparities and advance inclusive development, gender-responsive extension strategies such as focused outreach and adaptable training schedules are required.

The effectiveness of advisors is further limited by institutional coordination and financial sustainability. The long-term viability and continuity of underfunded extension initiatives may be compromised by their heavy reliance on outside donor

support [7]. Furthermore, coordination issues between advising agencies and research institutions might occasionally arise in decentralized extension systems, resulting in dispersed service delivery [3]. Strong ties between agricultural research and extension are necessary for effective information transfer in order to guarantee that farmers receive innovations on time. Information flow and service quality can be improved with better coordination methods.

There are difficulties with technological integration. Due to poor ICT infrastructure and low digital literacy in rural regions, adoption of digital advisory tools is still restricted even if they present chances for information transmission [41]. Due to their lack of cellphones and dependable internet access, many smallholder farmers are unable to take use of digital extension platforms. Research indicates that in order to improve digital inclusion, investments in rural ICT infrastructure and capacity building are necessary [27]. In order to ensure widespread accessibility, digital advisory systems should enhance rather than replace conventional extension techniques. Program efficacy is further hampered by gaps in monitoring and evaluation. According to empirical research, extension systems frequently lack strong performance assessment frameworks, which makes it challenging to evaluate results and put evidence-based changes into practice [36].

In a nutshell although agricultural consulting services are crucial for improving livelihoods, their influence is constrained by a number of issues. Service effectiveness is diminished by institutional capacity limitations, contextual misalignment, gender inequality, and technical obstacles [21, 32]. Comprehensive changes that put an emphasis on inclusive service delivery, participatory methods, and resource allocation are necessary to address these issues. In order to support sustainable agricultural development, improved extension systems can improve livelihood outcomes and productivity [7, 41].

Table 2. Challenges of Agricultural Advisory Services on Smallholder Livelihoods.

| No. | Specific Challenges | Manifestation and exacerbation | Citation |
|-----|-----------------------------|--|----------|
| 1 | Limited human resources | High agent-to-farmer ratios reduce service quality and outreach | [21] |
| 2 | Insufficient training | Extension agents lack updated technical skills and contextual knowledge | [22] |
| 3 | Resource constraints | Funding shortages limit field activities and service continuity | [7] |
| 4 | Geographic accessibility | Remote farmers receive limited advisory contact due to infrastructure barriers | [30] |
| 5 | Context misalignment | Advisory messages are sometimes generic and not tailored to local needs | [18] |
| 6 | Gender inequity | Women experience reduced access to extension services and training | [32] |
| 7 | Institutional fragmentation | Weak coordination among research and extension reduces innovation transfer | [3] |
| 8 | Digital divide | Limited ICT infrastructure restricts use of digital advisory tools | [41] |
| 9 | Monitoring weaknesses | Insufficient performance evaluation limits program improvement | [36] |
| 10 | Seasonal constraints | Extension activities conflict with peak farming seasons | [21] |

| No. | Specific Challenges | Manifestation and exacerbation | Citation |
|-----|-----------------------------------|--|----------|
| 11 | Knowledge gaps | Farmers lack awareness of modern technologies and benefits | [10] |
| 12 | Financial barriers | Farmers face credit constraints limiting technology adoption | [7] |
| 13 | Limited private sector engagement | Weak collaboration with agribusiness limits scalability of innovations | [18] |
| 14 | Social and cultural barriers | Norms restrict participation of women and marginalized groups | [32] |
| 15 | Sustainability challenges | Dependence on donor funding undermines long-term stability | [7] |

Source: Authors computation based on the available data (2025).

4. Discussion, Conclusion and Recommendation

4.1. Discussion

The review's conclusions show that one of the most important institutional tools for raising the standard of living for Ethiopia's smallholder farmers is agricultural consulting services. Extension and advisory interventions increase agricultural productivity by providing access to new technologies, technical knowledge, and better farm management practices, as the reviewed literature repeatedly demonstrates. Regular communication with extension workers increases the likelihood that farmers will use better seeds, fertilizer technology, climate-smart practices, and post-harvest management strategies, which will boost crop yields and improve food security. The agricultural innovation systems hypothesis, which highlights the significance of information transfer and interactive learning in agricultural transformation, is supported by these findings.

The review also shows that peer-to-peer learning systems, farmer field schools, and demonstration plots are examples of participatory extension strategies that are very successful in encouraging smallholder farmers to adopt new technologies and modify their behaviour. These methods lessen farmers' apprehension about new technologies by offering opportunity for hands-on and experience learning. Additionally, through value chain integration, market-oriented extension, and support for livestock production, advisory services are increasingly helping to diversify livelihoods. Through these initiatives, farmers can increase their market involvement, diversify their sources of income, and become more resilient to shocks related to the economy and climate.

The increasing significance of digital transformation in agricultural advising services is another noteworthy conclusion. Farmers now have more access to timely agricultural information thanks to digital climatic information systems, mobile-based extension platforms, and ICT-enabled advising tools. Particularly in isolated rural locations, digital technologies increase communication effectiveness and assist in overcoming geographical limitations. The evaluation does, however, also

point out that poor rural infrastructure, poor internet access, and low digital literacy among farmers and extension workers continue to be barriers to digital extension.

The effectiveness of agricultural advising services in Ethiopia is nevertheless threatened by a number of institutional and structural issues, notwithstanding the positive contributions. Service quality and outreach are greatly diminished by high farmer-to-extension-agent ratios, inadequate technical training, financial constraints, and poor institutional coordination. Advisory messages are frequently conveyed via top-down methods that disregard the socioeconomic reality of farmers as well as local agro-ecological variables. This erodes farmers' confidence and lowers the uptake of suggested technologies.

Throughout the reviewed literature, issues related to gender and social inclusion also surfaced as important concerns. Due to sociocultural hurdles, mobility limitations, and low engagement in decision-making processes, women farmers and marginalized groups frequently experience unequal access to extension services. Therefore, if explicit inclusion techniques are not used, extension systems may inadvertently perpetuate current disparities.

Additionally, inadequate monitoring and evaluation methods make it more difficult to gauge extension results and enhance program efficacy through evidence-based decision-making. The effectiveness of information dissemination and innovation transfer is also decreased by fragmented cooperation between local communities, private sector actors, extension agencies, and research institutions. Therefore, comprehensive, inclusive, and participatory advisory systems that combine technical innovation with institutional improvement and farmer-centered service delivery are necessary for Ethiopia to achieve sustained agricultural transformation.

4.2. Conclusion

In Ethiopia, agricultural consulting services continue to be an essential tool for improving smallholder farmers' livelihoods, agricultural output, and adoption of new technologies. Improved farm management techniques, higher crop and livestock output, climate resilience, market involvement, and income diversification are all greatly enhanced by advising services, as the reviewed literature shows. Farmers are better able

to accept new technology and make well-informed production and marketing decisions because to extension support, demonstration-based learning, and access to agricultural information. These contributions are crucial for boosting sustainable agricultural growth, lowering rural vulnerability, and improving food security.

A review also shows that new prospects for enhancing service responsiveness and accessibility have been made possible by the transformation of advisory services through digital technology and climate-smart approaches. Farmers now have better access to timely and pertinent information thanks to mobile-based advising systems, climate information services, and participatory extension models. This supports their ability to adapt and remain resilient in the face of economic uncertainty and climate variability.

Despite these beneficial contributions, institutional, technical, financial, and social obstacles still limit Ethiopia's agricultural advising services' efficacy. The quality and reach of extension services are diminished by inadequate funding, a lack of human resources, poor institutional coordination, sub-par infrastructure, and inadequate monitoring and evaluation methods. Additionally, top-down methods, geographical differences, and gender inequality restrict smallholder farmers' fair access to agricultural technologies and information.

Ultimately, the review comes to the conclusion that enhancing rural livelihoods in Ethiopia and attaining sustainable agricultural transformation need bolstering agricultural advising services. To maximize the impact of advisory services, it is essential to improve institutional capacity, encourage inclusive and participatory extension systems, integrate digital technologies, fortify research-extension connections, and guarantee sustainable finance mechanisms. In addition to increasing productivity and technology adoption, a more adaptable, climate-resilient, and farmer-centered advising system will support long-term food security, poverty alleviation, and resilient rural development in Ethiopia.

4.3. Recommendations

- 1) Improve extension agent-to-farmer ratio by recruiting and deploying more trained development agents, especially in underserved rural areas.
- 2) Strengthen continuous capacity building for extension workers through regular technical, digital, and participatory training programs.
- 3) Enhance funding sustainability by increasing government budget allocation and promoting public-private partnerships in extension service delivery.
- 4) Upgrade monitoring and evaluation systems to ensure evidence-based planning, accountability, and continuous improvement of advisory programs.
- 5) Promote climate-smart agriculture scaling by integrating adaptation practices such as drought-resistant crops, soil conservation, and water management into extension packages.

- 6) Strengthen farmer organizations and cooperatives to improve collective learning, bargaining power, and access to inputs and markets.
- 7) Expand market information services to help farmers make better production and marketing decisions and increase profitability.
- 8) Integrate traditional and modern knowledge systems to ensure advisory services are locally relevant and culturally acceptable.
- 9) Reduce regional disparities by prioritizing remote and marginal areas with targeted extension support and infrastructure development.
- 10) Encourage youth engagement in agriculture through innovation hubs, ICT-based advisory tools, and agribusiness training programs.

Abbreviations

| | |
|---------|---|
| AAS | Agricultural Advisory Services |
| AJOL | African Journal Online |
| DAs | Development Agents |
| ICTs | Information and Communication Technology |
| MoA | Ministry of Agriculture |
| NEI | New Extension Implementation |
| NEIP | New Extension Implementation Program |
| PADATES | Participatory Demonstration and Training Extension System |

Author Contributions

Disasa Ararsa: Conceptualization, Resources, Writing – review & editing, Validation, Software

Tesfaye Tura: Data curation, Methodology, Visualization, Writing – original draft

Conflicts of Interest

The authors fully declare that they have no conflicts of interest in publishing the manuscript.

References

- [1] Abate, G. T., Bernard, T., de Brauw, A., & Minot, N. (2021). Agricultural extension and technology adoption in Ethiopia. *Agricultural economics* <https://doi.org/10.1111/agec.12425>
- [2] Abebe, A. (2023). Farmers' willingness to pay for mobile phone-based agricultural extension service in northern Ethiopia. *Cogent Food & Agriculture*, 9(1). <https://doi.org/10.1080/23311932.2023.2260605>
- [3] Abraham, N., Kumera, B., & Tefera, Y. (2024). Decentralization and extension coordination in Ethiopia's regions. *Journal of Public Administration and Development*.

- [4] Admasu, K., & Bekele, H. (2021). Agricultural extension services and smallholder productivity in Ethiopia. *Journal details not provided*.
- [5] Ahmed, J. M., Haji, J., Jaleta, M., et al. (2024). Poverty and resilience impacts of conservation agriculture adoption against climatic shocks in Eastern Ethiopia. *Discover Agriculture. Journal of Agricultural Extension and Rural Development*, 13(2), 62–72.
- [6] Aker, J. C., Ghosh, I., & Burrell, J. (2021). The promise and pitfalls of ICT for agriculture initiatives. *Agricultural Economics*, 52(1), 75–90 <https://doi.org/10.1111/agec.12301>
- [7] Alemayehu, G., & Melaku, S. (2023). Financial sustainability of agricultural advisory programs in Ethiopia. *Journal of Agricultural Economics*.
- [8] Alemu, D. B., Teklu, T., & Fentahun, T. (2021). Impact of extension contact on smallholder productivity in Ethiopia: Evidence from panel data. *Journal of Agricultural Extension and Rural Development*.
- [9] Asfaw, S. (2024). Agricultural extension services in Ethiopia: A comprehensive review. Unpublished doctoral dissertation.
- [10] Bekele, A. Y., & Zerihun, W. (2022). Agricultural extension and technology adoption: A study on improved seed uptake among smallholder farmers in Ethiopia. *Agricultural Systems*.
- [11] Birhanu, B., Getahun, K., & Mengistu, T. (2024). Impact of PA-DETES on smallholder farmers' income in selected woredas of Amhara Region. *Journal of Sustainable Development*, 17(2), 1–15.
- [12] Birhanu, M., & Belay, Z. (2024). Equity and inclusion challenges in Ethiopian extension systems. *Journal of Rural Studies*.
- [13] Birner, R., Daum, T., & Pray, C. (2021). Who drives the digital revolution in agriculture? A review of supply-side trends, players, and challenges. *Applied Economic Perspectives and Policy*, 43(4), 1260–1285.
- [14] Christoplos, I. (2021). Agricultural advisory services and the transformation of extension systems. *Journal of Agricultural Education and Extension*, 27(3), 245–258.
- [15] Davis, K., & Sulaiman, R. (2021). The new extensionist: Roles, strategies, and capacities to strengthen extension and advisory services. *Journal of Agricultural Education and Extension*, 27(2), 123–136.
- [16] Davis, K., Babu, S. C., & Blom, S. (2022). Agricultural extension and advisory services: Global status and future directions. *Global Food Security*, 34, 100641.
- [17] Degefa, T. (2023). Monitoring and evaluation of agricultural extension programs in Ethiopia. Unpublished master's thesis.
- [18] Desta, A., & Tegegne, W. (2023). Relevance of advisory messages to farmers' socioeconomic contexts. *Journal of Agricultural Policy Research*.
- [19] Fikre, G., & Gebre, Z. (2021). Post-harvest technologies and extension support: Implications for food security. *Food Security Journal*.
- [20] Gacheno, D., Seyoum, C., & Lemma, T. (2025). Climate-smart agriculture and smallholder income in Ethiopia. *Discover Agriculture*.
- [21] Gebre, H., & Woldemariam, B. (2021). Barriers to effective extension delivery in Ethiopia. *International Journal of Agricultural Extension*.
- [22] Gebre, T., Worku, A., & Girma, H. (2022). Institutional constraints in advisory outreach. *Journal of Extension Systems*.
- [23] Gebreyes, M., Müller-Mahn, D., Teklu, A., & Simane, B. (2024). Local food system disruptions and smallholder livelihoods in Ethiopia. *Frontiers in Sustainable Food Systems*.
- [24] Getachew, Y., and Assefa, H. (2022). Implementation Challenges of New Extension Approach (NEA) in Ethiopia: The Case of Oromia Region. *Journal of Rural Development and Agricultural Research*, 2(1), 1-10.
- [25] Getahun, T., Wondimu, S., & Bekele, A. (2024). Advisory services and livestock productivity in Ethiopian pastoral zones. *Livestock Research for Rural Development*.
- [26] Girma, A., & Solomon, D. (2023). Digital transformation and extension service delivery in Ethiopia.
- [27] Haile, G., & Ayele, S. (2021). Rural ICT Infrastructure and Limitations for Extension Services.
- [28] Hawassa, H., Alemayehu, M., & Tessema, F. (2023). Demonstration plots and technology adoption in Southern Ethiopia. *Journal of Rural Innovation*.
- [29] *Journal of Agriculture and Food Research* (2024). Impact of climate-smart agricultural practices on farmers' resilience in Ethiopia.
- [30] Kebede, E., & Negash, M. (2020). Fragmentation of extension services in Ethiopia. *Ethiopian Journal of Development Research*.
- [31] Lemma, L., & Hailu, D. (2022). Livestock advisory and income diversification in Eastern Ethiopia. *Journal of Development Studies*.
- [32] Mamo, T., Haile, D., & Cherinet, T. (2022). Gender gaps in access to advisory services. *Journal of Gender, Agriculture, and Food Security*.
- [33] Miniywab, A. D., Mengistu, Y. A., & Tefera, T. D. (2024). Livelihood diversification and food security in Ethiopia. *Cogent Economics & Finance*.
- [34] Muleta, G. (2024). Impact of adopting improved wheat varieties on household income in Ethiopia. *American Journal of Agricultural Science, Engineering and Technology*.
- [35] Ragasa, C., Berhane, G., & Tadesse, F. (2022). Agricultural extension services and productivity in developing countries. *Food Policy*, 106, 102190. <https://doi.org/10.1016/j.foodpol.2021.102190>
- [36] Solomon, B., & Fikadu, A. (2023). Monitoring and evaluation gaps in agricultural advisory services. *Review of Agricultural Extension Practices*.
- [37] Solomon, T., & Desta, B. (2021). Climate-smart advisory interventions in Ethiopian agriculture. *Journal of Sustainable Agriculture*.

- [38] Spielman, D. J., Lecoutere, E., & Makhija, S. (2021). ICTs and agricultural extension in developing countries. *World Development*, 147, 105644. <https://doi.org/10.1016/j.worlddev.2021.105644>
- [39] Tadesse, G., Admasu, S., & Fikre, A. (2020). Extension services and crop yield in Oromia region. *African Journal of Agricultural Research*.
- [40] Taffesse, A. S., Abate, G. T., & Minten, B. (2022). Agricultural extension, productivity and commercialization in Ethiopia. *Food Security*, 14(3), 689-705.
- [41] Tesfaye, Y., Bekele, F., & Girma, S. (2024). ICT and Digital Advisory Tools in Ethiopia: Adoption Challenges and Policy Implications.
- [42] Tilahun, M. (2023). Sustainability of PADETES in Ethiopia: A Case Study. [Unpublished Master's Thesis].
- [43] Tsegaye, B., & Ayalew, Z. (2021). Market-oriented advisory services in Ethiopia.
- [44] Waje, S. S., Shano, B. K., Walelign, S. Z., & Kassie, W. A. (2024). The effect of agricultural information provision on smallholders' technology adoption and yield: Experimental evidence from Ethiopia. *Frontiers in Sustainable Food Systems*, 8, 1421442. <https://doi.org/10.3389/fsufs.2024.1421442>
- [45] Woldeyes T (2023). Data Challenges in Agricultural Extension Evaluation in Ethiopia. *Ethiopian Journal of Agricultural Sciences* 33(2): 1-15.
- [46] Worku, M., et al. (2022). Structural constraints and service quality in agricultural advisory systems.
- [47] Yimam, A. (2021). Agricultural extension services in Ethiopia: Performance and challenges. *African Journal of Agricultural Research*, 17(8), 1157–1168.
- [48] Yimam, K., Teshome, H., & Melese, A. (2023). Advisory services and adoption of post-harvest innovations. *Ethiopian Journal of Agricultural Sciences*.