

Introduction

Poverty reduction and enhancing the wellbeing of people are the most crucial points of the Sustainable development Goals of the 2030 Agenda at international and national levels. In order to achieve these goals, the 3 dimensions that are Economic, Social and Environmental have to be addressed well. The interconnected 17 SDGs are unique and cover issues that affect all nations, whether they are developed or developing. By addressing the economic, social and development needs of the people, they aim to reach the desired better future for the next generation. Developed and developing countries have different strategies to achieve the SDGs, depending on their realities. For developing countries, whose economies depend on agriculture, giving attention to agricultural development and to the food system is a fundamental strategy for achieving the desired 2030 goals.

For developing nations like Ethiopia, agriculture remains the backbone of the livelihood of people and their food system. Sustainable development efforts must address the needs of the smallholding farmers who are the majority of the rural population. The smallholder farming system has continued to be the dominant model in the rural economy, with an estimated 15 million agricultural households in the country according to the 2015 report of Ethiopia's Central Statistics Agency.

After decades of focusing on the development of smallholder agriculture, poverty remains prevalent in rural Ethiopia. The majority of smallholders continue to face food insecurity, with low income and vulnerability to climate shocks. This illustrates that current smallholder farming systems pose structural challenges inhibiting sustainable rural livelihoods and broader progress towards development goals. The Amhara Region in Ethiopia reflects this national context. Smallholder farming continues to be the primary type of livelihood for most of the region's population. It contributes significantly to the crop and livestock-production that drives the region's

economy.

Despite their contribution, food security and nutrition has not improved. The economic development and wellbeing of the people is still low, while infant mortality and stunting due to malnutrition remain high. Women and children are especially affected by the low production and consumption of agricultural products. Research on how to move forward on food production and towards sustainable forms of agricultural development is needed in order to reach the desired goals of the 2030 agenda.

The purpose of the thesis on which this summary is based was to give a broad overview of Smallholder Farming and to conduct a study of their contribution to achieving the Sustainable Development Goals. It was intended to provide technical details, highlight challenging areas, and provide clear guidance on accepted practices based on the economic, social and cultural aspects of the Amhara region. This research was conducted in a real-life context in relation to the social dynamics of the smallholding farmers of the Amhara Region.

The study demonstrates an interdisciplinary approach by examining agriculture through integrated lenses that incorporate the environment, infrastructure and institutions. This holistic framing aligns with calls for the transformation of smallholder farming through multidimensional policymaking. Overall, the study fills knowledge gaps and provides transferable lessons to guide sustainable solutions, enhancing smallholder welfare, productivity, and resilience across the Amhara region and in other regions in Ethiopia with similar contexts.

1. The Scope of Smallholder Farming

This section of the thesis included a broad range of literature in the review which will help to widen the scope of

Transforming Smallholder Farming in the Amhara Region of Ethiopia A Path to Achieving the Sustainable Development Goals by 2023

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knowledge to the selected area under investigation. This literature review will bring a clear understanding of Smallholding Farming and their contribution on the achievement of Sustainable Development.

1.1 Concept and Characteristics of Smallholder Farming

Concept of Smallholder Farming.

Across agricultural activities around the world, smallholder farming is a considerable dominant agriculture activity. Smallholder farming is still widely practised in most countries. The word "small scale" is used synonymously with "smallholding". There is no clearly stated and well-defined definition of smallholder farming. The most agreeable definition that we can find is that a "smallholding farmer is a producer who rears livestock, runs fisheries or produces crops on a limited scale which varies from 2 hectares to 10 hectares" (FAO 2012; Knight 2022).

From the above definition, we can see that the practice of the smallholding farmers varies in different agricultural activities. When it comes to land size, the main distinguisher of the segment "smallholding", the term "small" is relative to the size of farm in a particular society or community. When it comes to understanding who is producing how much of the global food supply, distinguishing between different scales/size and segments of "small-scale" becomes exceptionally important (FAO 2015).

Commonly, the term 'smallholding' or 'small scale' refers to a farmer who lacks extensive land and financial resources. Consequently, the definition and characteristics of small farming can vary from one country to another. Rapsomanikis (2015) classifies smallholdings based on land size, considering those with less than 2 hectares. However, this classification is not uniform across all countries; what is considered

small in one country might be medium or large in another. According to FAO survey results, the average farm size in Asia is approximately 0.32 hectares, whereas in Africa, examples from Kenya and Ethiopia show relatively larger sizes of 0.47 and 0.9 hectares, respectively. In Latin America, smallholdings can exceed 2 hectares (2015).

Characteristics of Smallholdings

Smallholder farming can be distinguished from big or commercial farming in terms of their land size, production method, limited access to land and capital, the decision-making process and so on. Smallholders can be found across all sectors of agricultural production. Land size and family farming can be considered as key distinguishing elements. Typically, smallholders own relatively small plots of land and have limited access to additional land compared to commercial farms.

There are 570 million farms in the world and among them 72% have less than 1 hectare while another 12% have less than 2 hectares (FAO 2014). Most smallholders are in rural (villages) or remote areas with underdeveloped infrastructure, no proper roads, health facilities, market access, or schools. Smallholding farmers, besides farming to produce food for their household/family, generate other incomes through different economic activities. Smallholders make decisions about what they produce (what to plant, which inputs to use, amount for consumption or for sale) and about other non-production related activities (education, health, off farming activities and activities of their family).

One of the key criteria in smallholder farming, the use of different types of labour—whether from family members, hired workers, or other sources of capital—is occasionally mentioned in the literature, but rarely discussed (Cousins 2010). Family farming, as a key distinguishing element, is synonymous with smallholding. It involves organising agricultural activities, forestry, fisheries, pastoral activity, and aquaculture production within a family unit. This system relies predominantly on family capital and labour, with contributions from both women and men.

The family and the farm are intrinsically linked, co-evolving to combine



economic, environmental, social, and cultural functions (FAO 2014). According to the FAO's definition, family farming serves as a crucial identifier in smallholder farming, where family members constitute the primary source of labour, regardless of gender. Family members are experts in the manual equipment needed to prepare the land, build fences and plant beds. Household members spend a large share of their daily time on agricultural activity (Paloma et al. 2020). Family labour is over-used; most family members work on small parcels of land. In developing countries, families farm small plots: they face low labor transaction costs,

engaging more workers per hectare than in other types of farms.

Family farms have their own advantages compared to large and small-scale farms. Michael Lipton in his discussion paper: "The Family Farm in a Globalized World" explains the benefits of small farms in developing countries. According to him, in developing countries, where land and capital are scarce while labour is plentiful, small farms inevitably have a productive advantage over larger farms since they have lower labour-related transaction costs (Lipton 2005). In terms of production, more labour leads to higher productivity and output per hectare. If

labour is reduced or displaced, it impacts the farm production process and may lead to a shift in the composition of labour used in production. (Paloma et al. 2020).

Smallholders exhibit significant diversity rather than homogeneity. They are a heterogeneous group, characterized by variations in sex, age, education level, income, and other factors. Additionally, smallholder farming itself is highly diverse due to the wide range of biophysical conditions affecting crops and the diversity in management practices (Gil et al., 2019).

When designing policies and strategies, it is crucial to recognize the inherent heterogeneity of smallholders. Although they form a diverse group, policies often treat them as a single category for development purposes. However, overlooking their individual characteristics can have implications for their future farming and economic activities within regional or national economies.

1.2 The Importance of Smallholder Farming

Family farmers or smallholding farmers were already at the centerpiece of several discussions prior to the SDGs, which have led to many new activities

for rural transformation (Terlau and Hirsch 2015). For the implementation and achievement of the Sustainable Development Goals, smallholders become the center of discussion and designing policies.

Much of the SDG 2030 focuses on agricultural productivity. This allows many international organizations to organize many side events regarding smallholders and the sustainability of their social, economic, and environmental dimensions. Smallholders must be at the heart of the SDGs for their achievement, and their voice needs to be heard at all levels, as Harriet Lamb from Fairtrade International Organization has maintained. She has stated that “We must listen to smallholder farmers and workers. Delivering the Sustainable Development Goals requires the voices of smallholder farmers and workers to be heard at the highest levels of government and commerce” (Lamb 2015).

Smallholder farming can indicate the level of poverty, food security/ malnutrition, and wellbeing of the people involved. The direction of development of smallholder farming can be the cause or effect of forward and backward development. The smallholding farmers/households are on the development agenda, and at the heart of achieving the

SDGs, due to many factors. Their contribution to sustainable development can be on economic, social, and environmental dimensions.

Economic contribution

The contribution of smallholding farmers to economic efficiency is significant, since they generate a rural economy by spending most of their income in the local economy. Using a mixed method of land system, they produce more food per hectare compared to large-scale farming (“Small is bountiful”).

One of the factors is their contribution to the production of subsistence foods, which can help to reduce or stabilize price reduction. Smallholding farmers are the main food producers in developing countries; increased smallholder agricultural production means more food enters the marketplace, leading to lower food prices and better diets (Dioula et al. 2013).

The other factor is, they generate more chances for the poor and unskilled workers and provide food items to the local market. With more people moving to cities, demand on urban food markets will grow, which in turn can generate job opportunities in all agricultural activities or the food system in general.



Social contribution

The incidence of workers living with their families is associated with employment in agriculture (Murekezi et al. 2018). The social interaction of smallholders is high since more employees (family members and those who are hired) are engaged on a small piece of land. They are more creative, close to nature, creating joy for themselves and others, and this helps them to grow more in integrity.

Contribution to the environment

Some of the benefits of smallholding farming are environmental protection, social interaction, and personal growth. During production and harvesting time, which are more intensive, they use different methods to protect the land and the soil. Through reduced fossil fuel dependency and energy requirements, smallholders' traditional practices also mitigate climate change by decreasing emissions and improving the carbon level of the soil. (FAO 2012).

1.3 The Production Pattern and Market Participation of SHF

Smallholders produce subsistence/-consumed foods in most developing countries. A study published on world development shows that five of every six farmers in the world with less than 2 hectares operates on only around 12 percent of all agricultural land and produces roughly 35 percent of the world's food (FAO 2021). Another study shows that smallholders, generally with less than 2 hectares, produce 70-80% of the world's food crop production (Ricciardi et al. 2018).

Smallholders' production is not only measured in quantity but also in its diversification. This is mainly because they produce for their consumption and, to get better diets, they produce different items. Smallholder's production is influenced mostly by their consumption but sometimes also by the land and the farming system (rain-fed or irrigation).

Smallholding farmers are producers of food items; in the meantime, they are entrepreneurs in what they do, since they try to be creative to avoid the risk of losing income or of not having enough food for their families. The production pattern differs based on many factors, like land size, topogra-

phy, technology and agricultural inputs used. The purpose of production is for daily consumption and only a certain amount is used to get an income to provide other necessities (FAO 2021).

Most smallholders, in addition to crop production, have livestock, and with this they produce dairy products for their consumption and to sell on the market. In addition, livestock can be useful in preparing manure and other fertilizers for the land. The smallholders also make additional income by selling their livestock.

The amount of agricultural output produced is influenced by land size and the means of production. Factors such as population size (demography), and the distribution of rural and urban areas determine the extent of farming land available. The relationship between production levels and farm size is not always straightforward; most studies reveal an inverse correlation. George Rapsomanikis, in his analysis of small-scale agriculture, emphasizes "technical efficiency"—the maximum output produced by a given input bundle. Smallholders tend to be more efficient, achieving output levels closer to the maximum, compared to larger landholders (FAO 2015). Various factors contribute to this conclusion.

While smallholder farming is primarily based on subsistence agriculture, smallholders also participate in the market to generate income. Most of them sell their products to cover household expenses, particularly for essential items like food. However, they typically sell only a small portion of their overall production. The cost of participating in the market poses challenges for smallholders due to factors such as limited infrastructure, their modest production volume, and dispersed locations, which hinder access to mechanized market systems.

Access to markets varies for smallholding farmers, ranging from no access to limited or frequent access, depending on their location, available infrastructure, and the existing market system. Research indicates that the marketing system (food chain) significantly impacts the quantity and quality of production among smallholders.

In today's modern market, smallholding farmers face significant constraints. Selling through sophisticated channels requires both strong managerial skills

and consistent supply. Analysts agree that individual small farmers find it challenging to supply supermarkets due to stringent food safety requirements, timing conditions, and the preference for large-scale farmers who can better meet these demands (Reardon et al., 2003; Rapsomanikis, 2015).

1.4 Challenges Faced by Smallholding Farmers

There are a high number of people in the world living in poverty or extreme poverty, in hunger and with malnutrition. Safe water and sanitary facilities are fundamental in nutrition and wellbeing improvement. Lack of safe water and proper sanitation facilities lead to diarrhea; living constantly with it results in undernutrition. Diarrhea is one of the primary causes of death among children under 5 years of age (Rapsomanikis, 2015).

Though there are other factors to be considered, the connection between smallholding activity and the level of poverty, hunger and livelihood is direct. It is alleged that the structural form of poverty is deeply rooted in the socio-economic-political and cultural institutions of a society or nation.

Many Smallholding households own their own dwelling, but their living condition is poor or on a low level. Many of those households are extremely poor and many family members might live in small houses with little or no access to clean water, electricity, or proper sanitation facilities (FAO 2012; Rapsomanikis 2015).

Rapsomanikis gives examples from Kenya and Nepal. In Kenya, most houses have dirt floors (74%) and lack brick walls (13%). Few have electricity (5%), telephone (0.1%), or proper sanitation (1.5%). In Nepal, smallholders' houses may have proper toilets (32%) and some access to running water (8%). Most are built with bricks (70%), but only a few have non-dirt floors (12%) or electricity (27%) (2 0 1 5).

The other main challenges in smallholder agriculture includes increasing productivity, diversifying production, adding value through processing, retaining a greater share of the final product value through improved marketing, and achieving environmental sustainability (Oxfam, 2000).

The right to property and the use of natural resources significantly influences smallholder farming. Klaus Deininger emphasizes the necessity of land rights, as they are crucial for motivating and enhancing productivity (2014). A lack of land rights can render smallholders vulnerable, ultimately affecting their ability to plan sustainable investments on their land.

Interestingly, while the number of smallholding farmers increases, the size of smallholding land (farmland) declines. This phenomenon occurs in countries where population growth outpaces the availability of additional land for agriculture.

1.5 The Future of Smallholder Farming

Smallholders are a major source of food for developing countries, especially for those that have an agriculture-based economy. In search of subsistence and healthy food, people can start farming in very small areas, even in a backyard. This makes smallholding farming sustainable compared to large farming and an important component of the plan of development.

Very recent studies show that there are 600 million smallholders around the world. They work on less than two hectares of land and are estimated to produce 28-31% of total crop production and 30-34% of food supply on 24% of gross agricultural area (Ricciardi et al. 2018). One of the main challenges smallholders can face is population growth and the need to increase production to meet the needs of the population.

Population growth increases the demand for food. As population rises, demand for food, energy, and income increases (Mekuria 2018). Increasing population, coupled with land degradation, aggravates the challenges to crop production (Mekuria 2018). This is especially true in the absence of adequate food production technology and integrated programs that simultaneously address community needs for food and productive health (PAI 2012). The current state of global security raises serious concerns as the number of hungry people has surpassed 1 billion people and emerging trends are further threatening global food supply (Fan 2010).

Conceptual links between population

growth and food security are further reinforced by studies examining the ability of the food production system to keep pace with long-term demographic changes in the developing world (UNDP 2012). Most of the countries with the highest number of people facing food insecurity also have high fertility rates and rapid population growth (PAI 2012). Sub-Saharan African countries are a good example. By 2050, even if fertility rates decline, the population of the region is projected to more than double, coupled with the lowest agricultural productivity in the world and the highest percentage of people living in poverty (PAI 2012).

The other challenges of smallholders are the use of natural resources without compromising the future. According to a policy paper by IFAD, across large parts of the developing world, the natural resources from which poor rural populations derive their livelihoods are being degraded or depleted through overuse, poor land management, and climate changes (2012).

Other factors like free trade, food supply chains and the need for sophisticated channels to make available food from producers to consumers are some of the challenges that the smallholders face to determine their future.

The smallholders' contribution to economic growth and development and climate resilience is significant. They are expected to produce more to fulfil the high demand for food created by unstoppable population growth and urbanization. The question is, how can they be at the heart of the solution with all the above challenges they face? What must be done to fill the gap between the production trend, the life of the smallholders, and the sustainability of their natural resources?

2. Challenges and Opportunities of Smallholder Farming in the Amhara Region of Ethiopia

Overview

The current study aims to analyse the livelihood patterns of smallholding farmers in relation to human development. It also investigates their contribution to the food system within the region and, more broadly, their impact on sustainable development in the Amhara Region and the country as a whole. The case study was conducted

in the North Shewa zone¹, based on predefined criteria for this research. A total of 180 smallholding households participated in the survey across three different districts (Ankober, Basona Worena and Merhabete districts, known locally as “Wereda²”).

From the case study and the survey conducted for the purpose of this research, several key findings have emerged. While all households encounter challenges across various survey categories, the impact and dimensions of these challenges on human development and livelihoods vary significantly among different selected districts in the research. Interestingly, some challenges are shared across households, while others disproportionately affect specific households within the same village and districts.

Based on data analysis and interpretation, the major findings of the current research largely address the initial research questions. Key institutional factors constraining smallholders include infrastructure gaps, limited external support services, financial exclusion, sociocultural rigidities that hinder gender parity, and risks related to natural resource degradation.

2.1 Major Challenges to the Smallholding farmers

Infrastructure and Access to Public Services

The findings indicate that households face severe constraints due to inadequate infrastructure, such as roads, water, and sanitation facilities. These limitations restrict access to basic services and economic opportunities. This observation aligns with existing literature emphasizing the critical role of infrastructure in inclusive rural development. Geographic isolation, highly pronounced in the Merhabete Wereda (district), worsens challenges for households, reinforcing the view that isolation increases vulnerabilities. Isolation contributes to factors that undermine self-reliance, weakening the capacity to absorb climate and market shocks without external assistance. Consequently, diminished autonomy extends vulnerability cycles, threatening intergenerational well-being.

Villages situated farthest from essential services are connected only by poor-quality earth roads, often impassable

ble during the rainy season. Multi-hour commutes on foot become the sole option for meeting basic needs and responding to emergencies. Isolation discourages social interactions and knowledge exchange—integral components of development. Limited market participation hampers incomes, while sparse access to healthcare threatens overall well-being.

Access to safe drinking water, adequate sanitation, and hygienic conditions is fundamental for human health and well-being. However, findings reveal significant gaps in these basic services within the study area. While water sources exist, the public tap model places heavy burdens on households in Merhabete Wereda Kebeles³ like Geren. Commutes of over three hours each way to fetch drinking water potentially compromise quality and expose households to risks. Limited private household connections exacerbate these challenges. Targeted interventions that bridge gaps through combined infrastructure-service delivery approaches, optimized for local contexts, hold the potential to strengthen capacities across diverse groups.

The Merhabete landscape, with its mountains, valleys, and rivers, complicates infrastructure rollout to remote communities like Geren⁴ Kebele. Concentrated efforts to improve infrastructure, particularly in remote areas, can reduce marginalization and promote inclusive development. Strategic prioritization, aligning infrastructure expansion with public service inclusion initiatives presented in clusters rather than isolated projects, may better address these constraints.

In summary, comprehensive infrastructure-led rural transformations remain crucial for equitably realizing the smallholder potential across different districts in the study area's agricultural hinterlands. Overcoming basic barriers systematically is essential in order to prevent certain smallholder communities from being left further behind.

The Effects of Production Factors on the Performance of Smallholding Farmers

Agricultural production factors are basic for smallholding farmers to perform well in their day-to-day activities. In this research, it has been

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Land

Observations indicate that all groups vary in terms of average land size, quality, and distance from households. Geographic isolation made land management particularly challenging for households scattered across Merhabete's rugged terrain. Due to topographic variation, households in this location face challenges related to land degradation and fragmentation. Similar to Merhabete Wereda, the other districts in this research allocate a minimal portion of land to agricultural activity.

Degraded land quality poses a constraint, compromising the overall potential for limited land productivity.



A decline in quality seems to be associated with reduced returns per cultivated area. Although most households in the study area have small landholdings, those in Ankober have an even smaller number of hectares, limiting backyard cultivation expansion. Fragmentation further restricts households, forcing them to concentrate production on small backyard plots.

In contrast, distance and inconvenient access to farmland pose challenges for households in the Basona Worena district. Topographic factors also disadvantage some communities. Steep hillside plots have hindered mechanization and accelerated erosive processes, depleting soil nutrition over time. Prioritizing ecosystem-based adaptation initiatives to restore degraded hillsides is essential for safeguarding asset bases threatened by environmental changes.

People rely heavily on their livelihoods from the land, but its quality is getting worse and it is less able to bounce back from the challenges faced. To be truly resilient, we need solutions that fit the specific situation on the ground. Also, there are too many people for the limited land available. Some people have left to find better opportunities elsewhere, but relying on money sent back home is not a good long-term solution.

Land is a fundamental agricultural resource, yet it faces various constraints for smallholders. Population pressures, tenurial ambiguity, topographic variability, and agroecological blind spots are the major challenges related to land. Redistributive reforms to alleviate fragmentation appear overdue in restoring viable farm sizes. Additionally, tenurial ambiguity compromises investment incentives, while the lack of land certification jeopardizes access to credit—essential for expanding cropped areas or optimizing existing holdings through irrigation. Properly administered land registration systems represent a prerequisite for unlocking agricultural potential. Key findings warrant deeper discussion and further study.

Agricultural Water and Inputs

Agricultural input accessibility and effectiveness emerge as major themes impacting smallholder productivity and resilience. Chemical inputs, while bene-

ficial for some, pose affordability challenges, necessitating public support. Education has bridged misunderstandings related to the appropriate application of inputs, considering environmental concerns associated with overuse. Integrated nutrient management training has facilitated knowledge-driven transitions toward sustainability.

Scarcity of quality seed stock represents a primary inhibitor limiting optimal yields for many households. Findings from the research indicate that there is a lack of distribution of farm inputs in most villages and remote Kebeles. Additionally, external support for different Weredas and Kebeles is inconsistent. Among the three districts/Weredas in the study area, households in Kebeles far from administrative towns or main road connections face a lack of farm input support from external organizations. The absence of institutions dedicated to producing quality seeds worsens this issue. For instance, in Ankober Wereda there is no institute, leaving private sellers as the sole option, which many households find unaffordable. Consequently, these households rely on their own resources, especially for obtaining quality seeds.

Dependency on seasonal rainfall proves deeply problematic across the zone. Rainfed agriculture restricts production cycles, exposing households to climate shocks such as erratic rains and capping overall output potential. Surface water endowments—such as rivers, lakes, and mountains—cloud the relatively well-watered zone, offering underutilized yet potentially transformative resource bases. Proper infrastructure, such as irrigation works, could open substantial expenses to higher-value commercial cultivation and exports. River basins intersecting Merhabete fit this profile.

Using irrigation systems that tap into underused inland water sources can help expand farmland and stabilize crop production. As water scarcity increases due to climate change, it is important to speed up the use of surface water for irrigation. Even though communities live near rivers, there are not enough irrigation systems for small-scale farmers. A better approach is to manage water more holistically, taking advantage of the natural water resources in

the area. This can lead to more resilient agriculture that meets people's livelihood needs and ensures food security.

The study looked at how different economic approaches affect people's ability to sustain their livelihoods. The findings have shown that relying heavily on rain for farming makes production risky, especially when there are no safety nets for unpredictable weather and market changes. Also, depending solely on rainfed systems limits what farmers can produce, making it harder to respond to market opportunities. These risks affect rural economies, leading to reduced growth. To make households more resilient, other ways of making a living needed to be explored.

Inconsistent Policy and Institutional and Public Service Barriers

Institutional factors have emerged as key influences shaping smallholder prospects. The lack of external support systems, of access to financial services, and of cooperatives pose notable constraints. Government extension networks remain crucial conduits linking science to the field. However, findings reveal that households in remote areas like Geren Kebele of Merhabete district received disproportionately little technical assistance, failing to optimize practices. Barriers such as geographic remoteness impair equitable outreach due to overstretched rural extension quotas.

Results point to financial exclusion as a key vulnerability across households. The lack of access to basic financial services, including saving and credit as crucial aspects of financial inclusion, is a particular constraint on households in the remote areas. This underscores the importance of expanding financial inclusion and prioritizing remote communities, especially through decentralized mechanisms that leverage existing platforms and structures. Savings and credit products suited to local realities, with affordable repayment terms, hold the potential to boost resilience, investment and opportunity sets across households.

Financial inclusion ranks among the priority enablers for household investment and risk mitigation strategies. Yet, the lack of tailor-made services in remote communities presents a binding constraint. Distance and remote



location hinder households in the Merhabete and Ankober districts from accessing savings. Additionally, households face challenges in accessing credit, which is important for managing consumption and spending opportunity sets. Among these districts, Merhabete demonstrates the highest lack of external institutional support compared to other locations in the study. In contrast, the Basona Worena district generally reflects strong external support.

Lack of institutionalised savings schemes curtail strategic investment options making smallholders reliant on unpredictable remittance streams as sole cash injections. Using better financial tools is important for long-term planning, helping households move beyond just getting by.

Concerted multi-stakeholder efforts combining financial deepening with infrastructure expansion delivers synergies promising to strengthen households' capacities more sustainably. Complementary initiatives cultivating risk mitigating social capital likewise seems valuable. By extending these services to rural areas, financial institutions can ensure that rural dwellers are not excluded from the formal financial system and can participate in economic activities on an equal footing.

Empowering grassroots cooperatives and collective action models strengthens smallholder bargaining power and partnership options. Capacity building and leveraging social capital within community-based entities builds economic agency from the ground up. Better water availability, extension linkages, input access and savings buttress coping/adaptive mechanisms. Relatively stable livelihood platforms position households proactively, pursuing opportunities from innovations and investments.

Stronger institutional incorporation and asset bases seem to expand households' resilience in Basona Worena. There are different co-operatives in all the Kebeles of the district. This helps them to work collaboratively to buy farm inputs and to sell their produce via the co-operatives. In addition, they are better mechanized than other districts. There is better cooperation among households in production, in harvesting and in sales strategy. Conversely, households in the other districts show less or no collaboration or collective action among households.

Traditional informal mechanisms can only marginally fill the emerging gaps. In this regard, collaboration and collective action among households in the Merhabete Wereda is mostly limited, with no formal organizational support. Households in the remote Kebele of the district like Geren demonstrate the greatest lack of external institutional support, compared to other groups in the study. In contrast, households in Basona Worena and some parts of Ankober districts demonstrate a generally strong status, reflecting good external support.

Socio-Economic and Cultural Factors

Sociocultural dynamics emerge as an important yet under-examined influence shaping smallholder prospects. Traditional practices reflect attempts to secure subsistence, however optimal productivity is inhibited by insufficient leveraging of indigenous ecological knowledge. Sociocultural norms appear to influence behaviours across groups through established preferences, risk-aversion and information asymmetries, impairing complete agency. Variations stem from geographic, economic and developmental variance, producing diverse exposure levels that mediate the impacts of social conditions across communities.

Based on the analysis and findings presented, all households under the study demonstrate sociocultural constraints related to agricultural practices and food consumption to a great degree. This is mainly due to the cultural practices they share and the religious commitments of the households. Cultural habits act as significant barriers to dietary changes needed for nourishing populations, especially considering production limitations.

The limited variety of consumption compromises nutritional outcomes across households heavily reliant on their own harvests for nourishment. Maternal situations suffer as a result, undermining development potential across generations. Unchanging attitudes reinforce weaknesses in the system, leading to a never-ending cycle of poverty caused by the interaction between cultural tendencies and economic realities.

Breaking restrictive norms, emphasizing agricultural transformation and enhancing the commercial focus of farms, aligned with expanding

dietary/nutrition demands, is enabled by rising prosperity. Enlightened engagements through community consultation, reconstructing the relationship between cultural traditions and objectives towards improvements thus rank among the priority needs for activating behavioural change.

Illiteracy depressed participation in production/consumption decisions is concentrated disproportionately in male domains of influence. Cultural norms that prioritize males require transformational shifts to redress imbalances. Engaging cultural institutions to bring about change holds promise. Integrated multi-sectoral approaches can accelerate the redressing of entrenched disadvantages across genders.

Historically, men have had more exposure to capacity development programmes, limiting women's access to valuable knowledge that could benefit household livelihood strategies. Rigid social norms have disempowered women, restricting their ability to navigate an increasingly unpredictable environment. Effective initiatives are urgently needed to build skills and confidence, addressing the root causes of exclusion.

Women's empowerment prominently features within sustainable development agendas. Findings underline the persistent obstacles across various dimensions that impair their full participation. Pronounced gender asymmetries appear normatively embedded into the social system, constraining the choices available to women for shaping their own destinies. Persistent gender disparities across groups are reflected in the divergence between men's and women's education status. Gender disparities in literacy stand out as a key finding warranting deeper discussion and further investigation.

All groups studied in the research demonstrate behavioural rigidities that impair the flexible responses required to improve livelihoods sustainably over the long term. Addressing these contextual difficulties is important for designing culturally sensitive developmental blueprints.

Heavy Incidence of a Subsistence Economy and a Lack of Strategy

From the findings, it is observed that most people derived their primary incomes entirely from fragile rainfed

harvests, leading to chronic insecurity as climate variability intensifies. Limited alternatives and weak safety nets reinforce the downward vulnerability that minor risks or disturbances may unleash.

Subsistence orientations have arisen from necessity but have limited potential for growth. Monocropping is primarily aimed at stabilizing household consumption, yielding minimal surpluses for value creation. Limited engagement in high-value markets restricts earnings, reflecting infrastructure gaps that hinder commercial development. Focusing on immediate needs results in minimal surpluses available for crucial long-term investments in productivity enhancement.

Flexible production arrangements, incompatible with changing demands, disrupt supply chains. Lack of knowledge transfer in polyculture limits options for mitigating climate volatility through species diversification. Moreover, limited off-farm opportunities hold back full diversification away from a single-string agrarian approach. Therefore, diversification has emerged as a key resilience strategy.

However, the findings show various hurdles that slow portfolio shifts across smallholders' agricultural activities. Capacity gaps compound the inability to participate in high value chains requiring strict standards. The lack of crossbred livestock constrains the opportunities for mixed farming. Inadequate institutional support, inhibiting optimized asset accumulation, has likely perpetuated these constraints. Resource deficiencies prevent the creation of larger livestock holdings or the processing ventures essential for creating regular incomes and stabilizing consumption.

Investing systematically in expanding human, social, natural, physical, and financial capital bases through customized programmes, is important for creating more balanced livelihood portfolios. Without alternative income sources beyond risky single activities, escaping poverty remains challenging. Concerted action across a range of activities, including livestock breeding, skills training, infrastructure development and collective initiatives thus appear indispensable elements for building pathways out of the current low-level equilibrium, through multi

plying opportunities and creating additional risk cushions. Such integrated enabling frameworks promise transformative impacts aligning smallholder success with sustainability objectives.

Comprehensive strategies facilitating a milieu conducive to inclusive rural transformation stand out as prerequisites for optimizing smallholder participation in commodity value chains and for promoting overall economic growth in agriculture-dependent settings. Capital injections across various realms hold immense potential for progressively overcoming the constraints that hold back the evolution of livelihoods and the general improvement of welfare across remote village communities.

2.2 Integrating Research Findings into the SDG and the Amhara Region Development Plan

Linking Findings to the Sustainable Development Agenda

Many constraints identified directly impact progress on crucial SDGs related to poverty, food security, health, education, water/sanitation, gender equality and environmental sustainability that are foundational to smallholder prosperity. Persistent barriers threatening lives and livelihoods from multiple angles demonstrate the interlinkages between humanitarian and development challenges that must be resolved through integrated solutions attuned to local realities.

For example, productivity-constraining factors like poor market access, gaps in agricultural inputs, land degradation and water scarcity undermine the achievement of SDGs 1 and 2 aimed at eradicating poverty and hunger. Limited health awareness and infrastructure jeopardize SDG 3 on well-being, while gender disparities and educational barriers impair progress across goals devoted to inclusion and empowerment.

These findings highlight that transformative interventions must simultaneously strengthen human, social, physical, natural, and financial capitals if resource-dependent communities reliant on the land are to realize their full potential and build resilience against unfolding climate threats. Narrow interventions are unlikely to remedy systemic deficiencies perpetuating vulnerability across generations through complex feedback dynamics.

Moreover, evidence underscores

that sustainable futures depend on tailored, localized solutions that genuinely empower communities as active agents of change, able to navigate transforming conditions through diversified, rights-based livelihood options, optimized around natural resource stewardship. Top-down approaches that ignore grassroots agency risk jeopardizing the long term sustainability of development outcomes.

Above all, findings emphasize the urgency of multi-stakeholder coordination for delivering integrated development, enabling an environment conducive to human flourishing within planetary boundaries. Unless binding constraints are alleviated proportionately across remote yet vitally important agrarian regions, prospects appear slim for Ethiopia and other nations to achieve the systemic transformations envisioned under the 2030 Agenda.

In summary, this analysis sheds light on the constraints faced by human progress, which sustainable development aims to address through integrated, people-centred approaches. Lessons from the study can inform more impactful policies and programs, emphasizing the crucial role of smallholders in advancing the Amhara region's developmental goals. Customized, innovation-driven approaches tailored to livelihood contexts offer an optimal pathway for transformative progress.

Research Findings and the Development Plan of the Amhara Region

The regional 10-year plan and Growth and Transformation Plan (GTP) emphasize poverty reduction, food security, employment, and resilience. Targeted interventions integrating WASH (Water and Sanitation), health, and nutrition could help boost smallholder productivity and mitigate risks, as implied in the plans. However, the research highlights how smallholders still face numerous constraints related to land, inputs, markets, and training, which hinder productivity improvement and lower incomes.

The study also reveals vulnerabilities among smallholders concerning food security, nutrition, and resilience. The findings suggest that more attention may be necessary to ensure the equitable provision of essential services across communities. Additionally, limited infrastructure access emerges as

a key challenge exacerbating other issues for certain groups. Addressing these barriers in an integrated manner could better support agricultural transformation, as envisioned in the plans.

The Amhara regional strategy focuses on industrialization, but this research highlights the challenges faced by smallholders in markets and the need for opportunities to improve their livelihoods. The regional strategy should rather better prioritize support for smallholders in integrating into markets and fostering entrepreneurship.

The environment is one of the dimensions that must be addressed in order to have a sustainable form of development. In this regards, environmental sustainability is highlighted in both national policies and research findings. However, findings showed more work may still be required regarding natural resource management training, input use and land degradation mitigation in order to advance sustainability goals.

The findings suggest that customized strategies should be developed, especially for marginalized communities. These strategies should involve active collaboration with communities to optimize diverse livelihoods in harmony with natural resource management. Imposing top-down directives that do not align with local contexts and priorities can lead to unsustainable and unfair systems, jeopardizing long-term development goals.

Addressing these localized, interconnected vulnerabilities through multifaceted solutions offers an opportunity to galvanize more inclusive, productive food systems, supporting the region's rural transformation agenda aligned with Ethiopia's commitment to achieving the 2030 SDG targets through people-centred pathways.

This research provides empirical evidence underscoring the continued prioritization of the smallholder sector as implied in the plans. However, it also highlights specific intervention areas that require renewed focus to better operationalize those policies and advance regional SDG achievement. A multisectoral approach must be implemented. The study findings emphasize inadequacies that demand modified conceptualizations, better capturing structural impediments, and call for concerted action across sectors to unlock untapped drivers of progress.

Key Takeaways /Endnote

The study has highlighted various opportunities and strengths among smallholder groups, especially related to social capital and indigenous knowledge. Despite the challenges faced by smallholders, the study shows that their social capital and indigenous knowledge can contribute to their role as the backbone of the region's economy.

The study suggests that strengthening human, social, natural, physical, and financial capital in an integrated way could help boost smallholder productivity, food security, income diversification, and overall resilience. The findings emphasize the need for context-specific solutions co-created with farmers in order to overcome localized barriers against the SDGs.

The interpretation and discussion provides a micro-level perspective, contrasting somewhat with national level statistics that depict agricultural progress. The findings suggest that

aggregate portrayals can sometimes hide inequalities, emphasizing the need for a disaggregated understanding to ensure fairness. For example, statistics describing the overall crop yield across the region can seem fine on average. But this can cover up that certain marginalized groups or remote communities, have much lower yields than others, masking inequalities between different groups within the larger population.

The findings can inform the better targeting of policies, institutions and investments to improving the lot of marginalized smallholding communities, through coordinated, multi-stakeholder approaches. A multi-dimensional approach is needed to address inter-linked barriers related to infrastructure, institutions, environment, gender, and market access.

3. Pathways to achieving the SDGs by 2030

The findings indicate that smallholder farming plays a major role in the food

system and economy of the Amhara Region, significantly contributing to crop and livestock production. Despite their substantial contributions, most smallholders have not experienced meaningful improvements in their livelihoods and well-being. The current food system, which relies on smallholders, has serious problems. To achieve its development goals, the Amhara region must address these issues. If left unaddressed, these challenges will worsen vulnerabilities and slow down sustainable development.

Smallholders face obstacles due to traditional practices, climate vulnerability, lack of infrastructure, and cultural factors. These challenges affect their ability to ensure food and nutrition security. Unfortunately, these persistent issues also hinder progress on several Sustainable Development Goals (SDGs), including those related to poverty, hunger, health, gender equality, and environmental sustainability. To



address these complex constraints and achieve the SDGs, a comprehensive and holistic approach is needed. Focusing solely on agriculture will not be enough.

While open to improving practices, transformative changes will take sustained, coordinated efforts across sectors over the long term. Priority action areas include strengthening cooperative structures for access to finance, technologies, and markets; expanding climate-smart production through extension and appropriate inputs; developing processing and storage to reduce post-harvest losses; diversifying diets and livelihoods through nutrition education programs; and investing in multi-purpose rural roads, energy, education, and health facilities. For sustainable impact, stakeholders must participate in an inclusive planning process to address underlying cultural dimensions and design context-specific strategies. Demonstrated best practices can guide intervention models if adapted locally through an integrated approach.

An integrated approach combines essential ‘hardware’—like infrastructure improvements—with ‘software’ interventions that enhance human capabilities and build institutional capacity. This involves coordinated action across different sectors and administrative levels, tailored to specific contextual needs. A key focus is the empowerment of smallholders, encouraging their active participation in driving localized solutions.

By addressing interlinked smallholder challenges holistically, such an approach can catalyse inclusive rural transformation in alignment with sustainable development. It necessitates partnership between actors in the private sector, civil society, and communities. Further research on integrated programming can help strengthen the evidence base towards impactful policies supporting prosperous, resilient smallholders who are essential to progress at regional and national levels.

Multi-sectoral Coordination

Using integrated approaches across different sectors and involving various stakeholders, we can address interconnected challenges holistically and align efforts for greater impact. By coordinating efforts and forming partnerships across sectors and administrative levels, from regional government down to local

communities, we can foster essential collaboration among multiple stakeholders in order to transform smallholder farming.

The findings indicate that a one-size-fits-all policy and strategy to design and implementation will not work. Differentiated strategies are needed, considering each group’s unique constraints and capabilities. The focus should be on unlocking inherent potential through coordinated, multi-sectoral interventions.

Here are some suggestions on how the regional government can identify and promote differentiated strategies based on the realities of smallholder households in the different groups that have been analysed:

- Conduct localized research/analysis to thoroughly understand all context-specific challenges and opportunities. This could involve, among other techniques, focus group discussions, household surveys and key informant interviews.
- Set up an inclusive consultative process engaging diverse stakeholders – farmers, experts, civil society – to identify needs and priorities.
- Support participatory rural appraisals enabling communities to self-analyse their realities and identify solutions.
- Provide resources and flexibility for decentralized bottom-up planning based on local priorities.

A paradigm shift towards comprehensive strategies holistically addressing economic, social, institutional, and environmental conditions through equitable stakeholder participation is required. Integrated interventions strengthening production foundations, market partnerships and adaptive capacities while safeguarding natural, social, and human capital bases over the long term are vital. Moving smallholder agriculture from sole dependence on rainfed subsistence practices to more market integrated and resilient systems necessitates ‘Marshall Plan’ scale investments across infrastructure, inputs, value addition and collective action. Comprehensive support frameworks recognizing heterogeneous realities through localized bottom-up approaches are imperative.

General Conclusion

The purpose of this research has been to explore how the current food system, which relies on smallholder farming, impacts sustainable development in the Amhara Region, Ethiopia. Specifically, it has examined the role and challenges faced by smallholding farmers within this system and how this affects the ability of the region to achieve the Sustainable Development Goals (SDGs) by 2030. Additionally, the study aimed to identify strategies that can enhance their contribution to sustainable food systems and livelihoods, aligning with the SDGs.

An analysis of different documents and policies has found that Ethiopia's development strategies rightly prioritize agriculture-led industrialization and aim to modernize smallholder farming through the ADLI (Agricultural Development Led Industrialization) framework. However, implementation challenges, a lack of coordination across sectors, and insufficient focus on different dimensions risk undermining progress. Food and nutrition insecurity persist despite agricultural contributions to the national economy.

Despite all the constraints and challenges, opportunities exist to upgrade smallholding systems through integrated interventions customized to community contexts. The analysis has highlighted opportunities to build on social capital strengths, indigenous knowledge, and external linkages to enhance productivity, incomes, and long-term sustainability. While changes will be gradual, targeted efforts across sectors can offer hope for the realization of smallholders' potential role in food systems and development. Success will depend on accelerating integrated progress toward overcoming challenges of risk, access, and empowerment. Future research can lend deeper insights into nutrition, indigenous knowledge systems, women's roles, livelihood strategies and natural resource management.

In conclusion, the current smallholder farming systems in the Amhara Region present significant challenges to achieving the Sustainable Development Goals by 2030. Transforming these systems and improving smallholder welfare will be an evolutionary, long-term process requiring committed coordination across all relevant sectors

and levels based on the priorities and realities of smallholders themselves. If addressed comprehensively through multi-dimensional and people-centred approaches, smallholders possess great potential to develop more sustainable and equitable food systems, contributing to regional and national sustainable development.

NOTES

1. Zone: a second administrative level in the regional legislation
2. Wereda: a third administrative level in the regional legislation
3. “Kebele” is the lowest administrative level of the government; it is a subunit of a Wereda.
4. “Geren” is the name of a Kebele in Merhabete Wereda; it is one of three Kebeles selected for the case study.

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