ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES INSTITUTE FOR PEACE AND SECURITY STUDIES

PROMOTION OF GENETICALLY MODIFIED SEEDS IN ETHIOPIA: EPISTEMIC VIOLENCE ON FARMERS AND THE LAND

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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN PEACE AND SECURITY STUDIES

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October 2024

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Acknowledgment

First and foremost, I want to praise the Almighty God for giving me the courage throughout my journey. My advisor, Dr. Fana Gebresenbet, also deserves gratitude for his continued support and insightful comments and feedback. I highly appreciate the guidance and encouragement I received from Dr. Yerasework Kebede. I would want to express my thanks to my family and, friends who have helped me in this study. Everyone who participated in the discussion and the interview is appreciated, too.

Contents

Acronyms and Abbreviations

ADP Agricultural Development Programs

ATA Ethiopian Agricultural Transformation Agency

Bt Bacillus thuringiensis

CBD Convention on Biological Diversity

CRISPR Clustered Regularly Interspaced Short Palindromic Repeats

DGI Dematerialized Genetic Information

EAA Ethiopian Agriculture Authority

EABC Ethiopian Agricultural Businesses Corporation

EBI Ethiopian Biodiversity Institute

EBMIT Ethiopia Bio and Emerging Technology Institute

EIAR Ethiopian Institute of Agricultural Research

EPA Environment Protection Authority

ESA Ethiopian Seed Association

ESE Ethiopian Seed Enterprise

FAO Food and Agriculture Organization of the United Nations

GM Genetically Modified

GMOs Genetically Modified Organism

HYV High-Yield Variety

IK Indigenous Knowledge

IPR IP Right

IPRs Intellectual Property Rights

KI Key Informant

LMICs Low- and Middle-income Countries

MOA Ministry of Agriculture

TK Traditional Knowledge

UNDROP United Nations Declaration of the Rights of Peasants

UPOV International Union for the Protection of New Varieties of Plants

Abstract

The introduction of genetically modified (GM) seeds and the policy intentions to formally allow the use of GM seeds in Ethiopia's agriculture have sparked considerable debate regarding their impact on farmers and the environment. Advocates of GM seeds argue that they lead to higher yields and offer resistance to pests and drought. However, critics warn of environmental risks, reduced biodiversity, and the consolidation of control by multinational corporations. This thesis examines the promotion of GM seeds in Ethiopia through the lens of epistemic violence. Drawing on Paulo Freire's concept of epistemic violence, which refers to the suppression of the perspectives and knowledge of oppressed groups by dominant power and knowledge relations. Hence, the study argues that the use of GM seeds can be viewed as a form of epistemic violence. This includes the imposition of Western scientific paradigms on traditional agricultural practices, the disregard for local knowledge systems, and the resulting impacts on sustainability and food sovereignty. The study advocates for policies and practices based on farmer-led research and accessible resource management to address epistemic violence. It aims to promote dialogue and cooperation among stakeholders for a more sustainable and equitable agricultural future in Ethiopia. It explores the historical, socioeconomic, and political factors contributing to the promotion of GM seeds, the narratives that legitimize their use, and the perceptions of Ethiopian farmers regarding this technology. The impact of promoting GM seeds on agricultural biodiversity and socio-economic relationships at both local and national levels is examined. While the study highlights numerous controversial issues and paradoxes surrounding GM seed promotion, it underscores the tensions between technological innovation, agricultural sustainability, and social justice. It reveals how epistemic violence exacerbates existing inequalities, particularly marginalizing smallholder farmers and the larger farming community. Using interdisciplinary and qualitative research methods, the study analyses various aspects of epistemic violence in the promotion of GM seeds in Ethiopia. It advocates for a more inclusive and participatory approach that values the voices and knowledge systems of local communities. The findings suggest alternative actions to reconsider the promotion of GM seeds in Ethiopia in a manner that is more socially acceptable.

Keywords: Epistemic violence, Genetically Modified Seeds (GMOs), Indigenous knowledge (IK),Capitalism

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

The initial focus of the research was to investigate the influx of smuggled GMO seeds from Sudan into Ethiopia, particularly near Metema. However, due to regional unrest and security concerns, the scope of the research was expanded. The current study examines the potential consequences of promoting GMO seeds in Ethiopia's agricultural sector. Specifically, it focuses on two main areas of concern; first, the widespread adoption of GMOs could result in the loss of valuable traditional agricultural knowledge held by Ethiopian farmers. Secondly, the introduction of GMOs may lead to increased control by seed corporations, potentially impacting farmers' autonomy and traditional seed selection practices. Overall, whether GMOs enter through smuggling or official channels, the research highlights the significant threat of marginalizing existing knowledge systems, leading to epistemic violence.

In recent decades, the promotion of genetically modified (GM) seeds has "become one of the contentious issues in global agriculture, with wide-reaching impact on food security, environmental sustainability, and social justice" (Shiva, 2016: 22). Nowhere are these implications more salient than in Ethiopia, where GM seeds have become a subject of heated debates, sparking questions about the future of the country's agricultural endeavours (Scoones et al., 2019: 87). "Considering rapid population growth, a changing environment, and persistent food insecurity, the Ethiopian government and transnational agribusiness corporations have treated GM seeds as silver bullets to the country's agricultural problems" (Kloppenburg, 2014: 211). However, the uncritical promotion of GM seeds in Ethiopia has raised concerns about epistemic violence, or the suppression of Indigenous knowledge (IK), which is "the systematic undoing and weakening of alternative perspectives" (Mies & Shiva, 2014: 63). This effectively reflects the use of power, which, in the GM seed promotion discourse, consists of promoting Western Science and silencing indigenous forms of agriculture and attendant knowledge on sustainability and food sovereignty. Paulo Freire referred to this as epistemic violence.

The introduction of GM seeds in Ethiopia is within a broader historical and socio-economic context characterised by colonial legacies, neoliberal adjustments, and agricultural transformation. According to Kloppenburg (2014: 100), "Since the 1990s, Ethiopia has made

significant policy changes to liberalize the agricultural sector and attract foreign investments." These changes, along with pressures from global development agencies and multinational corporations, have led to the advocacy of GM seeds to enhance agricultural productivity and food security.

However, the adoption of GM seeds in Ethiopia is contentious. Critics argue that GM seeds represent a form of technological imperialism that threatens agricultural diversity, disregards traditional farming methods, and promotes dependence on multinational corporations. Furthermore, the uncritical promotion of GM seeds marginalizes smallholder farmers and indigenous communities, exacerbates existing inequalities, and deprives them of their land and livelihoods (Desmarais, 2017: 127). Against this backdrop, this thesis aims to investigate the promotion of GM seeds in Ethiopia and its consequences for farmers and land. As suggested by Kloppenburg (2014), the investigation will employ a wide array of interdisciplinary research methods, with a particular focus on the perspectives of farmers and broader communities.

Moreover, this thesis delves into the concept of epistemic violence, aiming to explore and evaluate the implications of promoting GM seeds in Ethiopia. It seeks to address the complexities and contradictions involved and to consider the best approach for aligning with or distancing from current information. This study also seeks to reopen avenues to knowledge that can contribute to Ethiopian agriculture, food autonomy, and social justice alternatives. Additionally, the thesis investigates how the assertive expansion of capitalism may negatively impact the Ethiopian seed market, potentially leading to antagonistic consequences.

In conclusion, the upcoming chapters will explore the historical legacies of promoting GM seeds in Ethiopia, the socio-economic and political drivers that facilitate their spread, their problematic implications for agricultural biodiversity and food security, as well as the perspectives of Ethiopian farmers. Overall, the analysis will argue for a more inclusive and participatory approach to agricultural development that respects and acknowledges IK, upholds the rights of smallholder farmers, and advocates for agroecological practices as pathways for a fair and sustainable future for Ethiopian agriculture.

1.2 Statement of the Problem

The main argument of this thesis is that the promotion of genetically modified organisms (GMOs) seeds in Ethiopia could represent a form of violence against farmers and the land. This violence perpetuates the dominance of Western scientific paradigms, disregards local knowledge systems, deepens existing inequalities, and makes farmers more vulnerable to the

capitalist market, leading to dependence on Western commodities (Spivak, 2020). The researcher uses an interdisciplinary approach to analyze the promotion of GM seeds, unravel the complexities of their promotion, examine the consequences of their production and use for agriculture and social justice, and advocate for an alternative agricultural model based on agroecology and the empowerment of farmers.

The prioritization of short-term profits by capitalist economies often results in the promotion of GMOs in Ethiopian agriculture without considering the long-term ecological and social impacts (Harvey, 2011). This is driven by encouraging farmers to replace traditional seed-saving practices with commercially viable GMOs, erasing valuable IK and potentially leading to farmers losing control over their food systems. The rich diversity of traditional Ethiopian seeds and the associated cultivation knowledge, as well as the value of IK, are threatened by the promotion of GMOs (Gebretsadik, & Kiflu, 2018) The study argues that this constitutes a form of epistemic violence, undermining the self-determination and cultural continuity of Ethiopian farmers.

In the next scenario, focusing on a few high-yielding GMO varieties can reduce seed diversity, posing a threat to food security and resilience in the face of climate change or pests. As a result, IK often preserves a wider variety of seeds adapted to local conditions, and farmers may become dependent on corporations for GMO seeds and associated inputs, increasing their vulnerability and economic hardship. Moreover, farmers are vulnerable to the capitalist market structure; traditional knowledge (TK) emphasizes seed saving and self-sufficiency[1] at any rate.

However, in the capitalist mode of production, there is a deception. Capitalism at its heart is about "the mass production of goods to cater to as many people as possible." This concept was as revolutionary as extending property rights to everyone, irrespective of their parents or social status (Mitchell, 1966). The most problematic aspect of capitalism is that it allows the most vulnerable members to claim an indisputable right to their labor and property. This did not result in equality of property, but capitalism ensured that nobody else had the right to question what belonged to everyone. This had the effect of shifting the power from the producers to the consumers, who then drove what was produced in an economy. This powerful shift has shaped world history since then, and all this needs to be considered in discussions of capitalism (Harvey, 2020).

[1] *Key informant 10, April 26, 2024, Addis Ababa*

The argument presented above highlights the limited knowledge policymakers and researchers have about violence in a country and the extent to which this knowledge remains inadequate compared to the use of GMOs. It explores the connection between GMOs, epistemic violence, and food insecurities, suggesting that further research in this area is necessary. The text also discusses the "epistemic gap" that forms between lived experiences and practices, emphasizing the need to address this gap (Ndlovu-Gatsheni, 2018).

In his paper, Bierdz (2020: 1726) raises questions about how knowledge is produced and how we understand the world we live in. He also questions the kind of information that is being served, who benefits from it and how, as well as the purpose it serves. These questions frame the thesis. Furthermore, large multinational corporations (MNCs) play a significant role in the development, production, and distribution of GMO seeds. Many capitalist countries prioritize profit margins and expanding markets over long-term environmental and societal needs.

Furthermore, traditional Ethiopian farmers possess valuable IK about their local environments, agricultural practices, and seed varieties. The promotion of GMOs, often accompanied by corporate control over seeds and know-how, undermines this body of knowledge. There is also a risk that farmers may be compelled to abandon their time-honoured practices in favour of using GMOs, even if these new seeds are unsuitable for local conditions and this pressure, along with the devaluation of their knowledge, can be seen as a form of epistemic violence (Yirga, 2012).

Therefore, the article raises concerns about how capitalist forces can weaken the power of farmers in Ethiopia by promoting GMOs. Additionally, the lack of transparency and inadequate resources provided to farmers can limit their understanding and decision-making about GMO technology. This restriction can hinder their ability to make informed choices about whether to adopt GMOs. These leading arguments support the problem statement of the study, which argues that IK systems are undermined in the process of introducing GMO seeds, leading to systemic epistemic violence that ultimately impacts the farmers and the seed.

1.3 Objective of the Study

1.3.1 General Objective

The main goal of this study is to investigate the relationship between the promotion of GMOs and the resulting epistemic violence on existing IK. Additionally, the study aims to reverberate the capitalist logic as it relates to GMOs, the environment, and the economy.

1.3.2. Specific Objectives

The study aims to:

- Scrutinize the impact of introducing GMOs from the perspective of epistemic violence;
- Explain and analyze how capitalism is reaching rural Ethiopia through GMOs and the seed business;
- Assess the existing knowledge of farmers about breeding and local practices;
- Examine how the promotion of GMOs will affect local seed and breeding practices, indigenous knowledge, and the autonomy of farmers and farming systems.

1.4 Research Questions

The study's main objectives are to address the following questions:

- How does the introduction of GMOs impact established knowledge?
- What is the connection between the phenomenon of capitalism and GMOs?
- How does epistemic violence manifest in the promotion and advancement of GMOs in Ethiopian agriculture and environment?
- What are the primary factors that have the most significant impact on a country's economy in relation to GMOs?

1.5 Scope of the Study

This study examines the promotion and adoption of GM seeds in Ethiopia. It explores how this practice affects farmers' lives and land, analyzing it through the lens of epistemic violence. Additionally, it delves into the historical context of GMO adoption in Ethiopia, current trends among those promoting GM seeds, relevant policies, and initiatives influencing the use of GMOs in the country.

The research will delve into this concept to explore its prevalence in agriculture. It will examine how it contributes to IK, marginalized experiences, and its impact on traditional farming. Furthermore, it will address the threat it poses for smallholder farmers, specifically focusing on the environmental effects of cultivating GMOs. This includes its impact on agroecosystem disruption, soil softness, loss or extinction of ecological species (biodiversity), and it impact on ecosystem stability. Furthermore, case study examples from Ethiopia will offer an understanding of specific cases of epistemic violence associated with the promotion of GMOs and their impact on farmers, communities, and the environment. Additionally, this will explore

the consequences of epistemic violence on IK systems, cultural identity, and traditional livelihoods in connection to the promotion of GMOs. Finally, the study will examine policy implications and recommendations to mitigate epistemic violence in promoting GMOs, with a focus on ensuring that all stakeholders participate in decision-making and the involvement of IK in the formation process, while also exposing agricultural policies.

1.6 Significance and Implication of the Study

The study holds great importance as it seeks to generate recommendations for policy development that involves local communities and support IK inclusively and transparently. It also advocates for the implementation of fair agricultural policies that prioritize the well-being of smallholder farmers and promote sustainable production.

Additionally, the study seeks to contribute academically by enhancing the literature on GMOs, epistemic violence, and IK. Conducting a case study in Ethiopia can help shed light on the broader initiative of promoting GMOs in developing countries.

Furthermore, the study aims to assess and raise awareness among NGOs, policymakers, and advocates about the problems and risks associated with promoting GMOs. It also supports Ethiopian farmers in their endeavours to diversify and preserve their traditional livelihoods.

1.7 Limitations of the Study

Although this study aims to offer a comprehensive analysis, it is essential to acknowledge its several limitations. These limitations encompass restricted access to current data on GMO cultivation and its effects in Ethiopia, as well as the reliance on secondary sources and reports, which may affect the depth of the research. The following limitations are directly associated with the research process.

The research process has some limitations. The findings are specific to Ethiopia and may not apply to other situations, so they cannot be generalized. Additionally, focusing only on epistemic violence may lead to overlooking other ways to promote GMOs. The complexity of the issue, including interconnected economic, social, and environmental factors, makes it difficult to determine the direct impact. Therefore, the study may face challenges in considering biases in the interpretation of GMO effects, especially given the divisive discussions around biotechnology.

During the interview, the researcher encountered different challenges from both individual professionals and systemic institutional issues. To mention a few, the following challenges have contributed to the study's limitations.

- During the interview sessions, one agricultural sector expert couldn't provide information due to a Non-disclosure Agreement (*NDA*[2]) with his employer.
- Another experience occurred with a major research center in the country. Following the submission of a formal letter to the institution requesting data collection support, the feedback received was informal, non-standard, and consisted of only a single-line statement.

1.8. Research Design and Method

This section will focus on the research design and methods to be utilized in examining the practice of promoting genetically engineered GMO seeds within Ethiopia, which can lead to epistemic violence against its farmers and land. The proposed information will be organized into the following sections, methodology and research design applied, sampling techniques used, data sources and tools for collection implemented. Furthermore, the scenario will be analyzed, focusing on data analysis and interpretation.

1.9 Research Design

Given the interdisciplinary nature of the topic and the need to address social, environmental, and economic aspects, it would be highly appropriate to use a qualitative method (Creswell & Poth, 2017). Qualitative methods, a tools are such as interviews, can help capture the nuanced experiences, perspectives, and voices of Ethiopian farmers and local communities it will affect by the introduction of GM seeds. This enables an exploration of the social and cultural contexts of agricultural practices and the effects of GM seed use on livelihoods, TK, practices, and community relations.

An in-depth review and analysis of policy documents, scientific literature, media reports, and NGO reports has provided valuable insights into the discourses, narratives, and power relationships that underpin the promotion of GM seeds in Ethiopia. Analyzing these documents helps researchers uncover the historical development, policy background, and ideological

[2] NDAs are common in many workplaces and restrict employees from sharing confidential information.

framework of the promotion of GM seeds. It also helps identify the key players, interests, and perspectives involved in the debate as capitalism finds fertile ground in the country.

By using a qualitative approach that combines data from qualitative research methods and document analysis, this study provides a comprehensive overview of the promotion of GM seeds in Ethiopia and its impact on farmers and the environment. According to Bowen (2009), this approach enables researchers to benefit from triangulating data, corroborating results from various methods, and generating contextualized insights that can support policy development, advocacy work, and future research projects.

The study applied qualitative research methods to investigate the nuanced impacts of GMO promotions in Ethiopia. Data was collected through interviews and document analysis to achieve the research objectives and thoroughly address the research questions.

The researcher conducted an interviews to gather detailed information about the experiences, perceptions, and attitudes of various stakeholders, including farmers, agricultural experts, policy-makers, and non-governmental organizations working on environmental issues. Individuals were selected based on their current or potential involvement with GMOs, as well as their professional expertise, qualifications, and experience in relevant agricultural fields. To allow for flexibility and cover the main topics, semi-structured interviews were used. These interviews were guided by open-ended questions to encourage meaningful conversations.

Furthermore, document analysis provided a comprehensive overview of the policies, regulations, narratives, and initiatives concerning the promotion or use of GM crops in Ethiopia. The data sources included government policies, regulations, official reports on agriculture, biotechnology publications, and reports from non-governmental organizations involved in agriculture, biotechnology, and environmental protection.

The study used additional tools such as, case studies to explore the specific impacts of GMO promotion on agriculture, farmers, and the environment at a local level. The selection of case study locations took into account the adoption rates of GMOs, variations in farming methods, and ecological factors within the country.

1.10. Sampling

In this study, non-probability sampling was used, specifically purposive and snowball sample designs, for our qualitative research. Non-probability sampling involves intentionally selecting elements for the sample without specific chances of being chosen from the population. The researcher approach includes identifying and involving stakeholders, experts, and scholars in

the field, as well as gathering leads from articles and colleagues. It's important to emphasize the need for high-quality data to make informed decisions at subsequent levels and to ensure that the data is effectively managed with the available resources.

The study utilized purposive sampling techniques to select Key Informants. A total of ten (10) Key Informants were chosen to provide credible and trustworthy insights into the phenomenon under investigation and to address the specific research questions guiding the methodology. The population included seed system advisors, policy counselors, experts, commercial farmers, and senior researchers.

Purposive sampling was employed to enable generalizations from the sample based on their qualifications and ability to draw conclusions. This method is particularly suitable for qualitative research, as it encompasses a variety of non-probability sampling techniques. However, a notable limitation of this sampling method is its susceptibility to researcher bias (Campbell et al., 2020).

1.11. Data Collection and Analysis

The qualitative data collection methods used in this study used a tools include semi-structured interviews, document analysis, and case studies. These methods were chosen to capture the perspectives, experiences, and narratives of Ethiopian farmers and local communities. Additionally, the study employed thematic data analysis, a qualitative research method aimed at gaining insight and interpreting specific information within a given context.

According to Braune and Clarke (2006), as cited in the thematic method of analysis, this approach is a comprehensive way of recognizing, understanding, and presenting data. It enables thorough exploration and explanation of various aspects of the data. To ensure the accuracy of the information, the researcher will employ triangulation (Triangulation, 2014).

1.12. Ethical Consideration

The study follows the University's formal research ethics procedure for conducting interviews and accessing necessary information and documents. The researcher adheres to research ethics protocols during interviews and ensures that the presentation of findings accurately reflects the research outcomes without distortion.

The researcher ensured obtaining informed consent from participants before conducting interviews with farmers, agricultural experts or anyone else. This involved clearly explaining the purpose of the research, any potential risks and benefits of participation, and the right to

withdraw from the study at any stage. It's also important to maintain anonymity and non-disclosure of all participants. Additionally, the researcher should address concerns in the study and obtain clear agreement consent. Transcripts of interviews should be made unidentifiable, and personal information should be eliminated from any notes (Cresswell, 2014: 183).

The research methods are clearly described in the study, making it easy for anyone to understand how the study was set up, how the data was collected, and how it was analyzed. The study offers a balanced perspective on the issue, presenting both sides of the debate those who support the use of GMOs in Ethiopia and those who are against it. The researcher ensures that the research data (both physical and electronic) is kept confidential. Any informants are assured that their privacy and anonymity are protected (Petrova et al., 2016).

1.13. Organization of the Study

In the context provided, this study is divided into four chapters. Chapter one covers the introduction, including the background, problem statement, study objectives, research questions, scope, delimitations, significance, and limitations, outlines the methodology and research design employed by the researcher as well. This chapter also delves into the organizational structure of the thesis. Chapter two consists of a review of relevant literature in the fields of GMOs, capitalism, epistemic knowledge, and indigeneity, as relevant to the researcher's study. The theoretical and conceptual framework also addresses the issue of GMOs. Chapter three, considered the central chapter, focuses on data presentation and research analysis. Finally, chapter four is a recap of key points discussed in the paper, addressing epistemic violence in GMO promotion, reflecting on broader implications for agricultural development and social justice in Ethiopia, and offering a call to action beyond GMO, Gene-editing and Seed Breeder Rights. This chapter also includes the study's conclusions.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

Targeted promotions in favour of GM seeds need to be understood concerning agricultural innovation and TK systems. It is also important to consider the harmful impact of certain types of reasoning about farmers and the land, which can be seen as epistemic violence. Therefore, this literature review aims to summarize and synthesize the important themes, perspectives, and findings on the adoption of GMO seeds in Ethiopia. It does so by examining the struggles faced by farmers in terms of knowledge and the implications for the complex relationship between communities and their land. Additionally, the paper also delves into the impact of capitalism on the consumption of IK for its benefit and explores the conflicting views on GM crops within the context of knowledge theft from farmers. It focuses on the social and economic aspects of this issue and how it exposes the country to security challenges.

Ethiopia has a diverse agricultural landscape with various agroecological zones that support different farming systems and Indigenous Technical Knowledge (ITK). Many studies have confirmed that Ethiopian farmers have accumulated knowledge over generations, which is well-documented in terms of local seed varieties, soil management practices, and sustainable farming experience (Tesfaye et al., 2022). This rich knowledge base forms the foundation of resilient and adaptable agricultural systems throughout the country.

Contextualizing the introduction of GM seeds into Ethiopia at global, national, and local levels. Internationally, there is an "industry-influenced" side of the argument in previous literature (Abebe et al., 2019), emphasizing the power dynamics of international organizations, biotech companies, and governmental policy. The promotion of seeds is influenced by a complex interplay of economic, political, and scientific factors. These underlying forces shape the broader agricultural landscape in Ethiopia. Consequently, the push for seed promotion can create a situation where seed security is compromised.

According to Fricker (2007: 63), epistemic violence is defined as the marginalization of TK systems in the process of promoting GM seeds in Ethiopia. Fricker expressed his concern that the hegemony of Western scientific paradigms within the discourse could undermine or disregard the IK that Ethiopian farmers have to offer, creating cycles of epistemic violence.

It is crucial to understand how farmers perceive and make decisions when it comes to promoting GM seed. According to a study by Deressa and Hassan (2019) cited in the work of Destaw &

Fenta (2021), Ethiopian farmers' attitudes range from a desire for increased yields to concerns about food security and unfamiliar crops that could threaten sustainability and displace local culture. The decision to adopt GM seed is influenced by various factors, including economic and social-cultural considerations.

Employing GM seeds in Ethiopia has both positive and negative impacts on farmers and the environment. While some studies (Birhanu et al., 2020) emphasize economic opportunities, others draw attention to environmental risks such as gene flow to wild relatives or loss of agrobiodiversity. This debate underscores the need for a comprehensive assessment of the adverse socio-economic and environmental impacts arising from a sole focus on GM seeds.

The literature on the adoption of GM seeds in Ethiopia also addresses the complex interplay between TK systems, global agroecological trends, and potential epistemic challenges. As Ethiopia undergoes this transformation, it is crucial to gain a broader understanding of farmers' perspectives and experiences, the dynamics of seed distribution, and the impacts on people's lives and the environment. After introducing the main concepts related to GM seeds in Ethiopia, the following sections will provide a detailed examination of the factors that contribute to the challenges in understanding the increased exposure to GM crops and the complex relationship between traditional farming practices and the surrounding environment.

2.2. Theoretical Framework of Epistemic Violence in Ethiopia

The study is founded on several interconnected philosophical theories and frameworks. However, it primarily relies on strong conceptual foundations such as postcolonial theory, environmental ethics, and political economy to analyze and interpret different aspects of the issue. Specifically, it is influenced by the postcolonial theories of Gayatri Chakravorty Spivak (2020), Edward Said (2003), and Homi Bhabha (2012). The focus is on the concept of epistemic violence resulting from the promotion of GMOs in Ethiopia, which will impact both farmers and the land in terms of existing knowledge.

The main idea here revolves around the marginalization and devaluation of local knowledge systems, which leads to what is known as epistemic violence. This has an impact on the voices and perspectives of marginalized groups, as well as the interaction between colonizing and indigenous cultures. Some may argue that the study becomes irrelevant when considering the history of colonial conquest in Ethiopia. However, the study is not focus on physical colonization, but rather on epistemic colonization through the invasion of cognitive empire with its modernist influence on civilization and development (Hailu, 2020).

This theory is significant because it examines how colonialism affects the long-term survival of cultures, societies, and knowledge creators. Spivak (2020) emphasizes the critical concept of epistemic violence, demonstrating how Western-dominant scientific paradigms and agricultural technologies push centuries-old IK systems across Ethiopian geography to the margins. This theory also provides a framework to consider the introduction and promotion of GMOs as a form of neocolonialism epistemic violence. It highlights how new agricultural systems, often promoted by large corporations and international bodies, are increasingly replacing traditional local practices. The key elements to consider are how local knowledge systems are marginalized and devalued, the perspectives of those with less power, and the complex interactions between colonizing and indigenous cultures that give rise to mixed identities.

Besides, the philosophical stances developed by David Harvey (2011) and Amartya Sen (1991), respectively in the fields of political economy and social capital, examine the relationships between economic systems, power structures, and social practices. This viewpoint is essential for comprehending the advocacy in Ethiopia, as it requires investigating the purposes of multinational corporations, global trade policies, and state interests that affect agricultural knowledge. It also analyzes the economic dependency established by the adoption of GMOs and the consequences for the independence and means of living of local farmers, leading to security impasses.

Additionally, this means the accumulation and concentration of capital in a small number of hands at the expense of the rest of us /capital accumulation, the transformation of goods, services, culture, and ideas into commercial products for sale/commodification, and the process of turning the world into one interconnected global economy, often driven by capitalist interests/globalization (Kloosterman & Lambregts, 2007).

Postcolonial theory offers a critical framework to analyze how the promotion of GMOs perpetuates neocolonialism and epistemic violence. Additionally, Political Economy examines the economic and power dynamics driving GMO promotion, shedding light on issues of dependency, autonomy, and inequality. By utilizing these complementary philosophical perspectives, the research reveals how the promotion of GM seeds in Ethiopia is deeply connected to the beliefs and practices of farmers, with far-reaching implications for their knowledge and the land itself. As a result, the study provides a significant and multidimensional critique.

Spivak argues that colonialism involved a systematic process of “othering” colonized populations. This was achieved through a complex interplay of power dynamics, knowledge production, and cultural representation. The colonizer, from a distance, constructed the

colonized as inferior, backward, and different to justify domination and exploitation (Spivak, 2020). Therefore, epistemic violence refers to the harm and violence inflicted on individuals or groups through the processes of knowledge production and dissemination. It is specifically concerned with the construction of the colonial Other, where power dynamics and inequalities lead to marginalization and oppression through knowledge systems. This concept highlights how certain knowledge frameworks can perpetuate injustices, silence voices, and perpetuate inequalities within society (Bezgrebelna, 2022).

According to Paulo Freire (2018: 70), epistemic violence involves "the negation of various types of knowledge that reduce culture to a single, dominant narrative," privileging the dominant meta-narrative. In the context of GM seed advocacy, Mies, and Shiva (2014) argue that this definition results in Western scientific worldviews dominating decision-making processes and disregarding indigenous farming methods. Consequently, epistemic violence leads to dependency on external resources, disempowerment of local farm producers, and increased social stratification (Shiva, 2016).

Before delving into the context of GMOs, it is important to understand the concept of Epistemic freedom in Africa. In discussing why Africa holds a unique epistemic position (Ndlovu-Gatsheni, 2018: 3) noted that Africa has been a site of colonial genocides and has suffered from a "theft of history" (Goody, 2012), epistemicides[3], and its linguicides.[4] Hence, the struggles of African people in the epistemic realm are both historical and current (Ngugi wa Thiong'o, 2009). In this way, deprovincialization[5] and decolonization are not simply a critique of the African experience, but a study of the politics of knowledge itself. African struggles for epistemic freedom serve as a stark reminder of the perennial philosophical question; what is to be done? Nevertheless, Africans have often been portrayed in history from a Eurocentric perspective. Conventional philosophy of history, along with much of the academic discourse about history produced within modern universities, continues to be Eurocentric and normatively neo-Enlightenment, neo-Hegelian, neo-Marxist, neo-Modernist, and Habermasian (Ndlovu-Gatsheni, 2018: 2).

[3] Elimination of knowledges of the indigenous peoples.

[4] Elimination of languages of the indigenous peoples.

[5] Protestant Reformation, Enlightenment Reason, Modernity, imperialism, colonialism, and globalization have played significant roles in shaping the world. These complex processes have impacted not only time and space but also the very concept of humanity and human subjectivities, as well as the humanities. The colonization of the humanities began with the epistemic invasion of the mental universe of colonized people (Ndlovu-Gatsheni, 2018). In this instance, **deprovincialization** is a set of attitudes characterized by two sides: a nuanced and fresh perspective on the in-group culture and an open and accepting attitude toward other groups(Verkuyten, Voci & Pettigrew, 2022).

Hence, these scholars argue that a major problem with many historical accounts of Africa is their Eurocentric bias. They claim that what is commonly referred to as "African history" particularly in the Western world, is often interpreted within the ideological frameworks of colonialism, nationalism, or Marxism. They criticize the colonial paradigm of "discovering" Africa, pointing out that Africa had a rich and ancient history long before it encountered Europe. This suggests that African societies had sophisticated knowledge that sustained them over many centuries. (Ndlovu-Gatsheni, 2018: 2).

To understand and take a position on epistemic violence, it is important to comprehend the concept of the epistemic line. According to Sousa Santos, this epistemic line is upheld by what he refers to as 'abyssal thinking', an imperial rationale that categories some people as human and others as subhuman.[6] Essentially, the epistemic line is also an ontological line. Therefore, epistemic freedom entails the freedom to think, to theorize, to interpret the world, to develop one's own methodologies, and to write from one's own perspective without being hindered by Eurocentric tendencies (Ndlovu-Gatsheni, 2018: 3).

Epistemic freedom is a broad and profound concept that speaks to cognitive justice. It requires us to consider what we are free to say and by whom. Cognitive justice acknowledges the unique ways in which people comprehend and make sense of the world around them. Epistemic freedom shifts the concept of 'knowledge' from singular to plural, which is 'knowledges'. It also opposes the Eurocentric tendencies present in intellectual, social, and educational spheres. It is a crucial element in the broader struggle for decolonization, as it fosters the necessary critical decolonial consciousness (Ndlovu-Gatsheni, 2018: 4).

Epistemic violence can be interpreted in multiple ways. For those who have experienced enslavement, colonialism, capitalist exploitation, cultural imperialism, forced religious conversion, gender and race discrimination, as well as political domination and repression, silence is a pervasive aspect of their lives (Ndlovu-Gatsheni, 2020: 30). Epistemological violence is also evident in psychological research and literature, where interpretations of empirical findings implicitly or explicitly portray the Other as inferior or troubled, without empirical evidence to support these characterizations. Such interpretations have negative consequences for the Other, and the act of subject-against-object interpretation can be considered a form of violence (Teo, 2010: 298).

In the Ethiopian context, Yirga emphasizes the importance of critically examining the imposition of Western knowledge on Ethiopia in the name of education. Yirga suggests that to

6. i.e., people who have no knowledge.

understand the violence of this empire, one must not think within its rationalities. Additionally, there is a challenge to the notion that violence can be best displayed by genuinely making an effort to include and acknowledge the inadequacies of the epistemic fields subdued by its presence. Yirga (2017: 10) also points out that in Ethiopia, colonial brutality is obscured by an autonomous narrative that disguises duplicated thoughts and practices as local initiatives.

Colonialism aims to instill colonial consciousness by perpetuating a violent form of knowledge. Western knowledge is perceived through Western languages, categories, lexical tones, and types of ideas, as established by the Western tradition (Yirga, 2017: 10). Epistemic violence not only shapes new perspectives but also forces the colonized mind to adopt the colonial viewpoint, undermining and discarding its traditions (Yirga, 2017). This involves reshuffling, deeming tradition as inferior, and adopting aspects of Western traditions.

Epistemic infractions, as evidenced by three examples (Mignolo, 2009: 15), suggest the necessity for a radical form of civil disobedience to reach an irreversible conclusion. Modern western epistemology[7] holds that civil disobedience can only result in reforms, not transformations (Fernandes, 2015: 3).

Why should we be concerned with accounts of Epistemic Freedom? Well, they are mainly interesting because they promise to explain the feeling that we are free to think and make decisions. These accounts can also help us understand why, even if we are not truly free, we still feel like we are (Velleman,1989). They can explain from a Soft determinism perspective to help us understand if our sense of freedom aligns with Soft determinism. In any case, we can gain valuable insights from these accounts. What sets epistemic accounts is that they explain the experience of free will without being tied to specific ordinary beliefs. They rely on less mysterious beliefs than the apparent feeling of freedom that we are trying to understand. (Fernandes, 2015: 3).

The case of Ethiopian farmers is related to epistemic violence and can be categorized as epistemicides.[8] Also “the erasure of Ethiopian IK has occurred through psychic colonization, affecting Ethiopians and the environment” (Yirga & Belachew, 2021: 67). According to Bunch (2015) Epistemic violence can be classified into three categories, discriminatory, testimonial, and distributive. Hence, this research falls into the category of distributive epistemic violence.

[7] Greek, Latin and six vernacular European modern and imperial languages.

[8] Murder of indigenous people's knowledges.

2.2.1. Epistemic Violence in Ethiopia's Seed Sector: Silencing Farmers' Knowledge

The concept of epistemic violence, as outlined by Freire (2018), is important for understanding the promotion of GM seeds in Ethiopia. Freire argues that Western scientific paradigms ignore local knowledge and disrupt traditional farming practices, leading to a reliance on external inputs like synthetic fertilizers and industrial pesticides. This perpetuates inequality, undermines autonomy, and increases economic dependency in the Global South. Engaging critically with Freire's work can help develop more equitable and democratic approaches to agricultural development that prioritize local agency and social justice for smallholder farmers. Several scholars, including Miranda Fricker (2013), Cynthia Townley (2006), and Patricia Hill Collins (2013), have highlighted the negative effects of testimonial epistemic violence. This type of violence harms intellectual courage, impairs epistemic agency, and damages the intellectual traditions of entire groups. The denial of linguistic reciprocation also constitutes epistemic violence.

Epistemic practices with a paternalistic profile affect our private and public lives, often without our awareness. Sometimes, selective information is presented to us, or information is deliberately withheld. Understanding the full extent of epistemic violence within the seed sector requires analysing the contributions of various academic disciplines to this issue.

2.2.1.1. Epistemic Violence on Health Arena

Global South academics need to consider methodologies that allow them to step back from psychology and focus on how language shapes experience and behaviour. They should view the accounts given by Western psychologists as discourses rather than facts about behaviour and experience that normalize certain things and pathologize people who do not fit in, outsiders from the global south regions. There is a need for critical thinking in the global South that takes into account both international perspectives and local contexts, as all psychological concepts are shaped by particular historical and existential conditions (Teo, 2010). Furthermore, Teo (2010) emphasises that indigenous understandings can provide an alternative to this epistemic violence by offering interventions and ways of being that are better suited to local history and ecological conditions.

The health arena faced can be described in such ways as far as Epistemic violence is concerned.

> In their general forms, hermeneutical injustices occur when the capacity of a person or group to make intelligible certain of their bodily, existential, and social experiences to themselves or others is unjustly constrained or undermined. The effort to make sense of

> our social experiences requires an array of hermeneutical practices and resources – appropriate language, metaphors, and images, shared and recognised within a community, through which we can make sense of the structure, significance, and complexities of the lived experience of ourselves and others. Often, creating and actively updating this understanding comes naturally, especially to the members of hermeneutically privileged groups members of racial majorities, say, whose characteristic social experiences are complexly supported by a rich supporting structure that typically, if not automatically, renders them intelligible. But this is not the case for the hermeneutically marginalised, those who cannot create or share asense of their social experiences in comparably involuntary, lucid ways (Kidd and Carel, 2018: 219)

Two types of epistemic injustice differ in severity. One type simply increases the chances of injustice happening, while the other directly causes it to happen. Both are problematic, but the latter is more urgent because it actively builds injustice into the systems and practices of a community. According to Kidd and Carel (2018), there are many critics internal to biomedical science and healthcare systems who call for enriched estimations of the sorts of epistemic resources pertinent to the understanding and amelioration of illness. Such expansions of the imagination are obvious in the rise of 'humanistic', 'person-centred', 'values-based', and 'participatory' healthcare.

> In addition, as long as ill persons are deprived of credibility and intelligibility by epistemically unjust agents, structures, concepts, and environments, they will continue to face epistemic harms and wrongs, including those pathocentric epistemic injustices that obstruct possibilities for epistemic enrichment and activity while also contributing to their epistemic oppression (Kidd and Carel, 2018: 232)

Overall, the examples provided offer insight into the extensive epistemic violence encountered within the healthcare sector.

2.2.1.2. Epistemic Violence on Education Arena

Education, as a primary site of knowledge creation, has often perpetuated the colonial Western paradigm, marginalizing IK systems. This dynamic constitutes a form of epistemic violence. Case in point,

> The indigenous education systems, based on African knowledge, did not survive colonialism. It also discusses the struggles of an African university and how even universities established as part of African nationalist decolonization movements were Western in their systems and orientation (Ndlovu-Gatsheni, 2018: 162).

South Africa is a notable example of epistemic violence in higher education. The country has faced numerous challenges, and the marginalization of IK is a significant barrier.

In 2015, South African students and academics started a movement to update university curricula. They aimed to challenge the overwhelming emphasis on Western perspectives, histories, and figures. This movement advocated for the incorporation of various voices, experiences, and knowledge systems from South Africa, Africa, and around the world. The objective was to transform education by focusing on marginalized perspectives (Heleta, 2016).

The colonial elites were crucial in perpetuating epistemic violence in the country using various methods. According to Heleta (2016), they played a key role in this process. South African universities were created by colonial powers with the purpose of promoting European culture and values. These institutions aimed to produce a white elite capable of upholding colonial dominance. They were explicitly Eurocentric, mirroring the structure and curriculum of European universities, thus reinforcing the idea of Western intellectual superiority.

In the context of South Africa, apartheid and epistemic violence are closely connected. Heleta highlights how apartheid systematically oppressed and marginalized the IK system.

> After the apartheid system was established in 1948, the epistemic violence and racism at universities were taken to another level. During apartheid, higher education was 'designed to entrench the power and privilege of the ruling white minority'. The 'conception of race and the politics of race shaped the higher education policy'. This included designation of institutions for the exclusive use of particular racial groups. writes that the councils and administrators at the historically white Afrikaans-medium universities gave full support to the apartheid regime and the white supremacy project. He adds that these 'instrumentalist institutions' were governed in a top-down and authoritarian manner (Heleta, 2026: 3).

Reconstructing IK systems is a complex challenge. As these systems have diverged significantly from their origins, it is difficult to fully restore them to their original form. Instead of valuing diverse knowledge systems, educational institutions often selectively focus on the perceived merits of Eurocentric education. According to Heleta (2016: 3),

> Thus, what we have in most fields of study (and particularly in the humanities and social sciences) is Eurocentric indoctrination, which marginalises Africa and is often full of patronising views and stereotypes about the continent. 'European and white values are [still] perceived as the standards on which the country's education system is based and rooted'. Eurocentrism, which dominates the curriculum, 'seeks to universalize the West and provincialize the rest'. Such education does not critically interrogate the 'outcomes

> of a history of patriarchy, slavery, imperialism, colonialism, white supremacy and capitalism'. Quite contrary, the one-sided and subjective 'epistemological truth' promoted by those who are trying to maintain the status quo is a 'reproduction of epistemological blindness that silences other knowledges and ways of creating knowledge'.

The examples mentioned above show instances of epistemic violence. This includes not only stealing IK but also rebranding and selling this knowledge as new and original. By creating a new story around this stolen knowledge, the perpetrators continue a cycle of power and marginalization. Epistemic violence takes on various forms in the Ethiopian context and has impacts across different sectors of society. Yirga (2012: 63) emphasized that

> A shift occurred when traditional guardians became critics due to the influence of Western teachers and books. Asres explained the subtle method used to bring about this transformation. To turn intellectuals into traitors, Western education first had to denationalize their minds by promoting individualism and social ambition. This led to their isolation from the community and instilled frustration about their place in the social hierarchy, turning them into rebels. Unlike traditional intellectuals, who fully endorsed the social hierarchy because they understood its justifications, Westernized Ethiopians are dissatisfied with it, believing that exposure to Western education alone should determine their status and authority.

To dismantle the structures of epistemic violence within the education system, we must prioritize IK systems, decolonize curricula, and empower marginalized voices. Only through a concerted effort can we create truly comprehensive and equitable learning environments.

2.2.1.3. Epistemic Violence on Language

Language, as a fundamental tool of colonization, has been used to suppress indigenous cultures. By imposing colonial languages and narratives, dominant powers have silenced and marginalized IK systems. This imposition constitutes a form of epistemic violence. To counteract this, decolonization efforts must prioritize the reclamation and revitalization of indigenous languages.

> The writing of Māori, of other indigenous peoples and of anti/postcolonial writers would suggest, quite clearly, that that language of possibility exists within our own alternative, oppositional ways of knowing. Even though these may not be seen to connect with current socioeconomic realities, the fact that we adhere to, that we can imagine a connection suggests a resistance to being classified according to the definitions of a

> dominant group. Furthermore, the language of possibility, a language that can be controlled by those who have possession of it, allows us to make plans, to make strategic choices, to theorize solutions. Imagining a different world, or reimagining the world, is a way into theorizing why the world as it currently is unjust and posing alternatives to such a world from within our own world-views (Denzin & Giardina, 2016: 357).

The following paragraph emphasizes the idea that language is a powerful tool. It shows that language does not only serve as a means of communication, but also actively influences everyday life and reinforces societal hierarchies. This process, which often stems from colonial influences, has led to the marginalization and silencing of many cultures.

> The proponents of the African languages invoke ontological and epistemological arguments, duly buttressed with the rhetoric and rage of cultural nationalism, that language is the carrier of a people's culture, it embodies their system of ethics and aesthetics, and it is a media for producing and consuming knowledge, a granary of their memories and imaginations. Ngugi wa Thiongo is perhaps the best known advocate for African languages among African writers and intellectuals. He has argued consistently that the African intelligentsia has a historic responsibility to promote and modernize their languages. Historical analogies are often summoned for support, that the currently dominant languages of Western Europe were once seen as provincial and primitive vernaculars, or that Japan and the economic tigers of South East Asia modernized by importing western techniques not tastes, by supporting not surrendering their languages (Zeleza, 2006: 20).

Challenging the hierarchies established during colonialism through new language policies to empower local languages will involve confronting existing dominant ideologies and actively promoting multilingualism. The only way to achieve linguistic justice is by revitalizing and protecting our endangered languages exclusively.

2.2.1.4. Epistemic Violence and 'Othering'

According to Fricker (2006), epistemic violence takes two forms, reduced credibility and silencing. When credibility is diminished through epistemic violence, prejudice influences the listener to discredit the information they receive from the Other, regardless of any expertise the Other may have.

In epistemic literature, feminist and postcolonial perspectives are often utilized to deconstruct and challenge dominant knowledge systems within the five-spectrum.[9] This literature review underscores how these theoretical frameworks are commonly employed in epistemic literature to analyse power dynamics and the production of knowledge.

According to Dotson (2011), epistemic violence, in her view, refers to a situation in which reciprocity is compromised by what she calls 'pernicious ignorance' on the part of the audience. Pernicious ignorance is a harmful form of ignorance that is associated with the trustworthiness of beliefs only to the extent that it can be expected to occur reliably and only within a certain group of listeners (the harmful part). The crucial concept here is that if an audience is unable (in various ways) to accept what a speaker has said as intended, speakers become reliant on their listeners for successful communication. If this ability is lacking, it will result in silencing speech.

2.3. Rooted in Wisdom: The Enduring Legacy of Indigenous Knowledge

IK is often compared to a domino effect, spreading rapidly and causing significant changes that extend far beyond the starting point. However, in our current case, we primarily access the root of this knowledge, such as seed-saving. This disconnect from the rooted IK system weakens the overall impact and risks losing the complete wisdom of the past. (Whyte et al., 2018)

Also, IK known as TK, has existed in our local communities and societies since ancient times (Sharma et al., 2009). It is the knowledge used by the first settlers who have lived in an area for a long time and have a deep connection to nature, including rivers, land, and forests (Parajuli et al., 2013).

IK encompasses TK systems held by local communities, integrating cultural, social, and ecological dimensions. It differs from mainstream knowledge due to its deep connection to specific biocultural contexts, contributing to the long-term maintenance of social-ecological systems and biodiversity. Mainstream knowledge often overlooks IK, but recognizing and incorporating it into sustainability approaches can lead to alternative futures that prioritize both people and nature, challenging dominant perspectives on sustainability. Despite historical biases perceiving it as backward or anti-development, IK offers a valuable approach to addressing development issues and promoting a more inclusive and holistic understanding of complex systems. Recognizing IK as equal partners in environmental governance is crucial for

[9] These are (i) miscellaneous nonexplanations, (ii) liberal imaginations, (iii) materialistic groundings, (iv) feminist postcolonial perspectives, and (v) decolonial state-centered approaches. (Brunner, 2021)

fully realizing the contributions of local communities to sustainable management practices (Mannix, 2023).

Furthermore, awareness of local and IK is important because it supports sustainable development by maintaining beneficial practices and social and ecological structures within society. Local communities use IK for their livelihoods and contribute directly to the Sustainable Development Goals (SDGs) related to sustainable consumption and production patterns. Integrating IK into adult education programs can contribute to regional development and social advancement. The storage and application of IK benefits society by promoting socio-economic development, as every society has specific knowledge required for its development programs. To realize successful development progress, we need an open mindset that accepts different IK systems and practices without restrictions based on social class. Meeting local realities and embedding IK within an overall framework for sustainable development is essential to develop a more respectful, beneficial, and diversified society (Bekalu et al., 2023).

The text can be distilled into three main points about IK, Firstly, IK is specific to a particular environment, whether natural or cultural. Second, it is shared and developed concerning certain activities. Lastly, IK is empirical and practical (Morris, 2010). Ethiopia has a rich history of crop cultivation dating back at least 5,000 years. Implements for cutting and grinding seeds have been discovered in Stone-Age sites, such as Melka Konture by the Awash River in central Ethiopia. The exact start of crop cultivation in Ethiopia is unclear, but the long history is evident in the country's high agricultural biodiversity. This includes endemic crops, with the well-known cereal teff (Eragrostis tef) being a prime example. The extensive diversity in crop species and genetic variation within crops reflects Ethiopia's environmental and cultural diversity (Edwards et al., 2007).

In considering GMOs, it is essential to understand the relationship between IK and Ethiopian agriculture. IK encompasses traditional practices, crop varieties, and local technologies passed down over generations. This knowledge is closely linked with sustainable agriculture, biodiversity conservation, and cultural heritage in Ethiopia.

Traditionally, smallholder farmers in Ethiopia have relied on their own saved seeds for over 90 percent of their total sowing. However, the Ethiopian Seed Agency started promoting and distributing higher-yielding crop varieties for local food processing or export by 2004. This led to the rapid erosion of farmers' varieties in some moister and more accessible areas, as these new varieties became more prevalent.

The erosion of indigenous practices not only diminishes cultural heritage but also harms the environment. The expert stated that,

> The continuing introduction of High Yielding Variety seeds (HYVs) is attracting pests, leading to the availability of chemical controls for farmers. However, the use of pesticides often lacks proper understanding of safe storage, as well as correct mixing and application. Misuse of pesticides and fertilizers poses severe impacts on human health, leading to recorded deaths and pollution of the surrounding environment (Tadesse and Asferachew (2008) cited in Edwards et al., 2010: 247).

For example, Ras Mengesha Seyoum served as a leader in Arsi during the Emerior H/Selase regime. He showcased the work of Arsi farmers to American visitors, who were known as the 'Four Corners', as a good example of the connection between Ethiopian farmers and traditional farming practices. He said,

> I vividly remember a farmer named Mr. Birru who lived in the Ticho suburb of the Seire district when I was in Arusi. He was a successful farmer, owning 80 hectares of farmland. Despite using traditional farming techniques, his yields were nearly as good as those from modern farming methods. His success was solely based on his knowledge and management, and the results of his farming were impressive. The Minister of Agriculture, the Honourable Balamberas (Chief) Maheteme Selassie, and the Point Four Peace Corps visited Mr. Birru's farm. During the visit, the Minister was amazed by the growth of the plants and the size of the wheat and teff kernels. The American visitors admired him and asked Mr. Birru how he achieved such impressive results. He explained that despite rotating seeds, allowing the land to rest, and using local fertilizer, he has never used any modern fertilizer. (Seyoum, 2010: 75)

There are different kinds of indigenous farming systems practiced in Ethiopia, based on the diversity of agro-ecological zones. These may include traditional irrigation mechanisms, mixed cropping approaches, and the use of indigenous seed types that are best suited to the environmental conditions (Mengesha, 2015: 618). These practices not only contribute to food security, but also promote increased resilience to environmental changes.

According to Tewolde Berhan (1991), the Ethiopian civilization flourished in a mountainous area, isolated from the rest of the world for over a thousand years. Once contact with the outside world began, the resulting disruptions affected the traditional methods of managing soil resources and gene pools, leading to severe soil and genetic erosion. The loss of soil has already resulted in serious economic, social, and political disturbances. Ethiopia is one of the twelve Vavilov centers of crop genetic diversity,[10] where much of the crop gene pool owes its survival

[10] Regions where a high diversity of crop wild relatives can be found.

to the prevalence of age-old traditional crop production systems based on peasants. The ongoing genetic erosion will not only impact Ethiopia but the entire world. To halt both soil and genetic erosion, the issue of the Ethiopian mountains must be recognized as central, not peripheral, to development needs.

Indigenous seed varieties are crucial for maintaining genetic diversity. Local land races are less susceptible to pests, local pathogens, and climate fluctuations compared to higher-yielding commercial varieties (Almekinders and de Boef, 2000). Additionally, the introduction of GMOs is likely to displace these land races, resulting in reduced economic and social importance. This, in turn, would lead to a loss of biodiversity and unique agro-cultural heritage.

The issue of integrating IK into modern agriculture revolves around understanding how it can be combined with modern agricultural practices such as GMOs. There is often a lack of acknowledgment and appreciation of IK systems by the scientific community and policy-making bodies. Additionally, GMOs are protected by proprietary rights and intellectual property laws, which can pose a threat to traditional practices of seed saving and exchange.

Therefore, IK refers to local knowledge exclusive to a specific culture or society. It plays a crucial role in conserving biological resources across different altitudes and climatic variations. Communities rely on this knowledge to conserve biodiversity, which is essential for their own survival and for the environment as a whole. However, globalization, environmental threats, lack of knowledge transfer to younger generations, and exclusionary practices are causing the gradual disappearance of unique cultures and knowledge. Poverty and unequal policies also contribute to making IK more vulnerable, ultimately affecting biodiversity (Parajuli et al., 2013).

IK has been utilized by rural communities in various aspects of their lives, including maintaining soil fertility through mulching, using watermills for grinding food grains, employing ash in agriculture to control pests, and utilizing selective burning in forests to promote nutrition. These practices and technologies are farmer-friendly, economically and environmentally sustainable, socially accepted, and suited to specific local and environmental conditions (Sharma et al., 2009). They include seed treatments, storage methods, and farming tools (Shrestha et al., 2008). While IK systems may have their limitations, rural communities have developed skills to cope with harsh environmental conditions. The TK and practices used by these communities in the past can be valuable in mitigating the impact of climate change and other environmental challenges. It is important to highlight the significance of IK (Parajuli et al., 2013).

Communities living in close proximity to nature are highly dependent on natural resources and biodiversity. IK contributes to the conservation of biodiversity, which in turn supports the survival of these communities. Their socio-cultural relationships with biological systems have significantly contributed to the sustainable conservation of biodiversity.

2.3.1. Seeds of Discord: Indigenous Knowledge vs. GMOs in Ethiopian Agriculture

This thesis does not aim to debate the myths or risks of GMOs. Instead, it explores whether promoting GMOs could disrupt traditional practices such as seed saving, breeding, and storage for future planting. This disruption could lead to the erosion of IK and make farmers more reliant on capitalist market forces, potentially impacting their autonomy and control over their land. IK emphasizes passing down traditions and practices to future generations. The commercialization of seeds within a capitalist framework can pose significant risks to food security.

Experts contend that the promotion of GMOs constitutes a form of epistemic violence. The broad range of genetic diversity existing in Ethiopia, particularly the indigenous and wild gene pools, is presently subject to serious genetic erosion and irreversible losses. This threat results from the interaction of several factors and is progressing at an alarming rate. The most crucial factors include the displacement of indigenous landraces by new, genetically uniform crop cultivars, changes and development in agriculture or land use, destruction of habitats and ecosystems, and drought (Melaku, 2000: 146).

To overcome apprehension and ensure acceptance, it is important to engage farmers in the introduction and evaluation of GMOs. Participatory trials should be conducted where farmers themselves grow and test GMO crops, allowing them to see the advantages and disadvantages first-hand. This hands-on experience is important to give confidence in the technology (Bentley, 1994). Establishing feedback mechanisms that allow farmers to voice their challenges and how well intervention programs work is essential. Partnerships also provide a bridge for reporting farmer field data back to researchers and policy-makers (Cornwall & Jewkes, 1995).

Consequently, to overcome challenges in farmers' engagement, it is important to involve them in participatory activities, even though it may require more resources such as time, money, and experts. The essential problem is the value and accessibility of such resources (Cleaver, 2017). Meanwhile, Sumberg et al., (2003) suggest that farmers are not a monolithic group; they have diverse needs and concerns that can range widely.

It is important for various engagement strategies to be sensitive to this diversity of opportunities if they are going to operate in an inclusive manner. IK is a fragile resource. Unlike codified

knowledge, it is primarily transmitted orally and through practice. Therefore, maintaining skilled practitioners and fostering continuity within communities is crucial to ensure this invaluable knowledge doesn't vanish.

2.4. Background on GMOs and their Promotion in Ethiopia

The FAO defines GMOs as “organisms into which one or more genes (transgenes) have been introduced from another organism using recombinant DNA technology” (FAO, 2011: 1). The Cartagena Protocol on Biosafety (2000) defines a 'living modified organism' as “any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology.” GM foods have been further elaborated in the following years (OECD, 1993a; OECD, 1996; OECD, 1998).

The focus of GMOs has largely been on crops, with the urgent and widespread need to improve food production and agricultural resistance. However, the existing food supply is considered safe, based on its long history of use, even though most foods are presumed to contain many anti-nutrients and toxicants, some of which could produce adverse effects in humans and animals at certain levels of intake (Davies et al., 2002). Hence, three scenarios could be envisaged, the GMO plant or GMO food is substantially equivalent; substantially equivalent except for the inserted trait; or not equivalent at all.

The discussion below was raised during an expert consultation in Geneva, Switzerland in May/June 2000. The consultation aimed to evaluate experiences gathered since the 1996 Consultation. Topics included substantial equivalence, unintended effects of genetic modification, food safety, nutritional effects, antibiotic resistance marker genes, and antigenicity. The environmental effects of GMOs are intricate and diverse. While they offer potential benefits such as reduced pesticide usage and improved land-use efficiency, they also pose risks. Potential impacts on biodiversity, the potential transfer of genes to wild relatives, and changes in pesticide usage patterns are all important factors to consider when assessing the environmental implications of GMOs.

The consultation supported the idea of substantial equivalence as a practical approach for assessing the safety of GM foods. It was concluded that currently there are no suitable alternative strategies available. The application of the concept serves as a starting point for safety assessment rather than an endpoint. It helps to identify similarities and potential differences between the GM food and its appropriate counterpart, which should then be further assessed (FAO/ WHO, 2000b).

Former Director of the Ethiopian Biodiversity Institute, Dr. Melaku Worede in his interviews with, Sheger Fm 102.1 (2023, September 13[11]), stated that Ethiopia has a rich biodiversity, which is at risk of disappearing without proper management. Organizations like the Ethiopian Biodiversity Institute (EBI) are working to conserve this heritage. Unlike the United States, where agriculture is largely corporate-driven, Ethiopian farming is deeply rooted in local knowledge and practices. This TK, honed over generations, is essential for maintaining seed diversity and ensuring food security. While increasing crop yields is crucial, simply replacing traditional seeds with new, potentially GM varieties is not the solution. Instead, a more sustainable approach involves combining IK with scientific advancements. By preserving and improving local seed varieties, we can enhance food security while respecting cultural and ecological heritage.

In Ethiopia, the introduction of GM seeds has been influenced by various interrelated socio-economic, political, and environmental conditions. As noted by Kloppenburg, the Ethiopian state has endorsed GM seeds to "solve the country's agricultural problems" in collaboration with global agribusiness corporations (Kloppenburg, 2014: 211). These issues include food insecurity, a decrease in agricultural production, and the emergence of climate change "hotspots" (Scoones et al., 2019: 87). The promotion of these novel seeds by the state occurs within a broader set of reforms and a transition to a more neoliberal capitalist logic, which has enabled increased globalization and technological change within the agri-food sector (Desmarais, 2007: 98).

2.4.1. The GMO Debate: Untangling Science, Ethics, and the Future of Food

Genetic engineering emerged in the 1970s, following significant discoveries in the field of molecular genetics. This led to the introduction of genetically engineered products into our food systems, sparking widespread controversy. In the US Midwest, farmers face challenging decisions regarding the adoption of genetically engineered organisms for their crops and livestock. Meanwhile, corporations are pushing the envelope with new genetically engineered products, and public universities find themselves at the forefront of research in this area. At the same time, there's a growing global demand from consumers for foods free from genetically engineered ingredients. This information is highlighted in a position paper on genetic engineering from 2000. Consequently, the use of GM crops has led to conflicting views that

[11] On 31 July 2023, the Ethiopian Biodiversity Institute (EBI) announced that Melaku had died. This recording was aired to honor the legacy of Dr. Melaku Worede after his passing.

create ambiguity over their effects on IK, farmer seed-saving practices, and their broader social and economic impacts, challenging the principles of sustainable development.

The concept of sustainable development is a point of contention in the GMO debate, with both sides using it to justify their positions. However, the lack of a shared definition hinders productive discussions. Current research suggests that GMOs themselves might be the primary driver of the erosion of IK or increased corporate control in the seed market.

The adoption of GM seeds in Ethiopia has significant social and environmental implications. Smallholder farmers, especially women and marginalized communities, may face challenges such as displacement of TK and decreased autonomy in decision-making (Mies and Shiva 2014: 105). The use of GM seeds can also lead to genetic pollution, loss of biodiversity, and other ecological harm (Kloppenburg 2014: 33). Critics argue that GM seed technology may reduce crop diversity and threaten ecosystem resilience (Scoones et al., 2019: 112). On the other hand, proponents claim that GM seeds offer benefits such as improved germination and pest resistance, but critics argue that the financial burden on farmers outweighs these benefits (Desmarais, 2007: 127).

The promotion of GM seeds also has economic impacts, with benefits disproportionately favoring large-scale farmers and transnational corporations. While some farmers face market instability and cultivation obligations, others stand to profit from the high demand for GM seeds (Shiva, 2016: 178).

> It's worth noting that genetic modifications needed for GM seeds vary between countries. Determining the best type and quantity of genes to introduce is a complex challenge. For instance, the addition of Vitamin A to golden rice requires careful consideration of the specific form of Vitamin A and its potential impact on different crop varieties (Melaku, 2023).

Including the community in conversations about GMOs will ultimately build trust among farmers, scientists, and policy makers. Pretty (1995) argues that when farmers feel that their concerns and knowledge are respected, transparent communication and participatory decision-making processes can be facilitated. By involving communities in the assessment and testing of GMOs, farmers will have greater awareness of both the advantages and drawbacks. Participatory approaches enable the farmer to see for themselves how GMO crops work locally (Chambers, 2014).

Involvement of the community gives a voice to the farmers, allowing them to participate even in research and development. It also enables the customization of GMO technologies to the

local context and social arrangements, making them more relevant and effective (Scoones & Thompson, 2009)

Thus, involving farmers as active contributors to research helps ensure that their informal knowledge and experiences are considered in GM crop development. This will assist in ensuring that scientific research is integrated with local agricultural systems and their requirements (Sumberg et al., 2003). These dialogues are complemented with regular community meetings and workshops, which encourage interaction between farmers, scientists, and policymakers. Cleaver (2017) points out that in these forums, farmers get the opportunity to raise concerns, ask any questions they may have, and also get informed about GMOs.

2.4.2. Community Apprehension to Accept GMOs

It's important to address the factors contributing to communities' skepticism about using GMOs as a food source in order to successfully integrate GMOs into local agricultural systems. The expert gives emphasis,

> Ethiopian farmers traditionally rely on locally adapted seeds and shared practices with neighbors, which may make them less inclined to adopt GMOs compared to farmers in other areas.[12]

There are at least three main sources of community apprehension, lack of information, cultural and religious beliefs, and economic concerns. Many farmers have little understanding of the advantages and disadvantages of GMOs. Knight (2009) suggests that cultural and religious beliefs can also influence public perception of GMOs, often due to a lack of information fostering fear and skepticism. Some communities view the use of GMOs as inherently unnatural or in opposition to traditional agriculture, therapies and other practices (Juma, 2011). Additionally, the high cost of GMO seeds and inputs, as well as fears of becoming reliant on multinational corporations, are factors that make farmers hesitant to switch to GMOs (Glover, 2010).

GMOs and gender are central to the erosion of existing knowledge in the realm of epistemic concerns. So according to the existing literature, this 'gender gap' is lamented by the International Food Policy Research Institute (IFPRI), which highlights that “information about impacts on women, gender-specific perceptions and how laws taking into account of female desires are often non-existent,” using biotechnology decisions-making (Chambers et al., 2014 cited on Schnurr et al., 2020: 3). The percentage gap by gender across the countries is worrying

[12] *Key informant 1, April16/2024 Addis Ababa*

as women represent essential parts of food production and farming activities in LMICs (Low- and Middle-income Countries); more often than not, however, they are marginalized from main agricultural decision-making and resource control.

Generally, this body of literature suggests that the impact of new technologies on rural development will vary according to whether women control cropping methods, variety selection, labour allocation and use of their income (Schnurr et al., 2020). According to Schnurr et al., (2020), literature can be grouped around two sets of findings; The first group finds that GM crops decrease the workload for women farmers and laborers, while the second demonstrates how GM crops can increase labor demands.

The empirical literature points these "growing burdens" could serve to exacerbate intrahousehold conflict, or divert women's labor away from other activities, such as the cultivation of crops for household consumption (Addison and Schnurr, 2016: 967). This research serves as a reminder that the causal relationships underpinning the potential labor benefits that can accrue to women farmers—decreases in pests, weeds, or disease spur increased yields, which boost demand for female labor and, in turn, raise women's earnings—depends upon the specific context into which a particular GM variety is introduced. (Schnurr et al., 2020) In addition, Carro-Ripalda and Astier (2014), Falnikar and Dutta (2019), Leguizamon (2019), Pole and Reda (2007), and Tandon (2010) are cited in Schnurr et al., (2020), echo the concern about the tendency for GM crops to marginalize women. This is evident in the erosion of their TK of seed management and the devaluation of their role as seed savers, as supported by empirical evidence.

2.4.3. Lost Knowledge, Lost Land: Case Studies of GMOs

The following cases present studies that examine the harmful effects of GMOs on indigenous agricultural practices in some African countries. Current data shows that GMOs continue to be adopted in South Africa at an accelerating rate, with millions of hectares being planted annually with GMO crops. However, the debate about GMOs and questions regarding their potential dangers or benefits remain contentious. The subsequent paragraphs demonstrate the investigations into country-specific challenges and the negative impacts on sweet potato, cassava, and maize.

The GM virus-resistant sweet potato was a GM showcase project for Africa. Florence Wambugu, the Monsanto-trained scientist leading the project, was hailed as the savior of millions, claiming that the GM sweet potato had double the yield of non-GM sweet potatoes.

Forbes magazine even named her as one of a select few individuals worldwide who would "reinvent the future" (Robinson et al., 2015: 152).

Cassava is a staple food in Africa, and the potential of GM technology to enhance cassava production by combating a virus has been promoted since the 1990s. It was advertised that GM cassava could alleviate hunger in Africa by increasing yields up to tenfold. Even after it was evident that the GM cassava had experienced a technical failure and lost resistance to the virus, media reports continued to suggest that it was addressing hunger in Africa (Robinson et al., 2015: 153).

A GM soy and maize farming project involving impoverished black farmers in South Africa was initiated in 2003 with the backing of the Eastern Cape government. However, the project resulted in disaster for the farmers, as per a study by the Masifunde Education and Development Project Trust and Rhodes University. "We witnessed a deepening of poverty and people returning to the land for survival," stated Masifunde researcher Mercia Andrews (Robinson et al., 2015: 154). Additionally, Bt (Bacillus thuringiensis) brinjal (eggplant) in Bangladesh, Hawaiian papaya, Kona *coffee* producers' opposition, and the failure of GM wheat, which was only grown in field trials, impacting US export markets, serve as demonstrations of GM failures in the field. (Robinson et al., 2015: 156)

South Africa has been a major adopter of GMO technology in agriculture and is among the seven countries in Africa that permit GMOs. The nation started commercializing GMO crops in the late 1990s, with maize, soybeans, and cotton being the primary focus. Farmers have been adopting GM crops due to promised benefits, such as higher yield and increased resistance against pests and drought. The government of South Africa, through the Department of Agriculture Forestry and Fisheries (DAFF) and the national Department of Health, plays a significant role in regulating GMOs. They have approved the commercialization of GM crops and supervise their sale under certain safety conditions.

The use of GMO technology has been adopted by a few South African farmers because it is believed to improve productivity and result in fewer crop losses. Multinational biotech companies such as Monsanto (now part of Bayer), DuPont, and Syngenta are leading the way in creating new GMO crops in South Africa. However, environmental and consumer groups in South Africa have voiced their concerns against the potential unwanted aspects of GMOs for the environment and health. These groups call for stricter regulation of GMOs and labelling regulations to make their usage more transparent to consumers. (Ajoykumar et al., 2021)

Proponents argue that the most revolutionary benefits of GMO crops are that many are designed to be resistant against pests and diseases, leading to the application of fewer chemical pesticides.

Additionally, GMOs are sometimes created to be more resistant to drought, which is crucial for places like South Africa facing water shortages. Critics claim that GMO crops also come with unintended environmental consequences, such as the creation of herbicide-resistant weeds and unpleasant side effects on non-target organisms (Ajoykumar et al., 2021). There are also concerns about its implications on seed sovereignty and the domination of biotech companies in the market.

Regulatory authorities in South Africa have an extensive regulatory system for GMOs, such as the GMOs Act in 1997. This act requires crops to pass through a set assessment before being approved for commercialization to ensure they are safe for humans and do not pose a threat to the ecology.

Current data shows that GMOs continue to be adopted in South Africa at an accelerating rate, with millions of hectares being planted annually with GMO crops. However, the debate about GMOs and questions regarding their potential dangers or benefits remain contentious.

Kenya: Challenges in Kenya's agriculture, such as harmful pests, diseases, and climate changes, have led to discussions about the potential of GMOs. Scientists believe that GMOs could help create crops resistant to pests, better suited for droughts, and with higher yields.

Like South Africa, the Kenyan government, particularly the Ministry of Agriculture, Livestock, and Fisheries, is responsible for regulating GMOs. They approve which GMO crops can be grown and ensure biosafety regulations are followed.

Smallholder farmers, who make up a significant portion of Kenya's agricultural workforce, face challenges such as limited resources and manpower. The overall produce of PBS agent de coopération France International small-scale irrigation on the farm is affected by poor techniques in this sector due to a lack of manpower and resources, as compared to other agencies involved in the agricultural sector (Araya et al., 2019).

International biotech companies, including Monsanto (now part of Bayer) and Syngenta, in collaboration with local research institutions, have been conducting trials to develop GMO varieties suitable for Kenyan agriculture. However, concerns have been raised by several civil society organizations and consumer groups. They are critical of inadequate regulatory mechanisms, lack of transparency surrounding genetically engineered foods, environmental safety, and protectionism against traditional farming knowledge. Additionally, they are worried about the potential negative effects of GMOs on the environment. For example, they fear that GMOs could lead to the development of “super weeds” or insects that are resistant to herbicides and could cause a loss of genetic diversity among crop species.

Therefore, opponents of GMOs fear the risks associated with consuming GMO food and express concern about the potential loss of traditional seed-saving and planting practices. Some stakeholders doubt the government's ability to effectively regulate GMOs.

Kenya has implemented policy frameworks for managing GMOs, such as the Biosafety Act of 2009 and the National Biosafety Authority (NBA), which oversees the commercialization of GM crops. However, there have been concerns raised about the transparency and accuracy of these regulations. To date, Kenya has carried out various field trials for GMO crops, including maize and cotton, but there are very few cases of commercialization. The government also engages in public consultations and stakeholder engagements to address concerns and influence GMO-related policies.

In conclusion, this case study focuses on understanding the dynamic influences of science, economics, political factors, and social forces, showcasing a varied range of perspectives and interests that contribute to how biotechnology within agriculture is approached in the countries that have driven the final adoption of modern biotechnology through GMOs, fostering in South Africa and Kenya.

2.5. The Challenge on the Agricultural Research Arena

The promotion of GMOs in Ethiopia will be one of the greatest challenges to agricultural research, with various scientific, economic, social, and ethical issues needing to be addressed. WHO leader Margaret Chan stated that these challenges affect the promotion and adoption of GMOs and also impact local research institutions and agricultural innovation in Ethiopia. Ethiopia lacks the agricultural research infrastructure found in more advanced economies, with many research institutions lacking adequate funding, technology, and human resources to support research in the field of GMOs (Spielman et al., 2011).

There is a significant lack of local understanding regarding the long-term ecological and potential chronic health implications of the technology, as well as its suitability to Ethiopian agro-ecological zones. This lack of local knowledge leads to uninformed decision making and policy development (Beyene, 2016). Most GMO research in Ethiopia relies on foreign experts and financing, which can result in limited autonomy in determining research priorities. This dependency hinders research, leading funded projects to reflect the interests of the funding organization rather than the immediate or local needs of the people (Herrera-Estrella & Alvarez-Morales, 2001). Agricultural research in Ethiopia is consistently underfunded, which limits the scope and scale of research efforts. Consequently, this restricts opportunities to conduct large-scale field experiments or long-term studies related to GMOs.

The funding was provided by various development partners, including IFAD ($78.2 million), the EU ($17.84 million), and the Bill & Melinda Gates Foundation Adaptation for Smallholder Agriculture Programme Grant (US$10.5 Million). *(Ethiopia and International Fund for Agricultural Development signed USD 106.54 million financing agreement. (n.d.). https://www.mofed.gov.et/blog/ethiopia-and-international-fund-for-agricultural-development-signed-usd-10654-million-financing-agreement/#:~:text=The%20funding%20was%20provided%20by,Grant%20(US%2410.5%20Million)*.

Regulatory arrangements for GMOs in Ethiopia are still under development. Inconsistent policies, regulatory uncertainties, and bureaucratic requirements might slow the process of researching and introducing new GMO strains.

Navigational difficulties in the realm of GMO intellectual property rights or seed breeders' rights. However, Ethiopian researchers and institutions may have greater difficulty negotiating with transnational corporations that own patents on these GMO technologies to allow the technology to be developed independently or adapted at home (Kloppenburg, 2014).

Despite widespread public skepticism and resistance against GMOs due to alleged adverse health effects, environmental threats, commercialization, and loss of traditional farming practices— all issues surrounding GMOs in Ethiopia. All this distrust, skepticism, and suspicion regarding GMOs obstruct research efforts and the acceptance of this technology (Adenle, 2011). According to Shiva (1997), the ethical consequences of introducing GMOs are far-reaching. There remain major obstacles to research and adoption, including concerns about food sovereignty. This issue not only involves smallholder farmers but also includes a moral right to alter genetic material. Additionally, Chambers (2014) mentions that one of the difficulties or challenges in this connection is how to ensure that research is calling for and taking into account knowledge from farmers. All too frequently, the priorities for relevant research are established without the participation of communities who stand to gain or lose by an area's use for taking up GMOs.

Developing local experts and institutional capacity is essential but also extremely difficult. Extensive training and education programs are necessary to build a solid group of highly trained, capable researchers to conduct high-quality independent research. It is also crucial to have strong monitoring and evaluation systems in place that can help us understand the effects of GMOs. However, the absence of this kind of structure in Ethiopia creates a problem when it comes to evaluating the effect of GMOs on agriculture and the environment in the long run (Maredia et al., 2000: 3).

The promotion of GMO technology in the Ethiopian agricultural sector presents various challenges across scientific, economic, social, and institutional dimensions. Overcoming these challenges will require comprehensive solutions, including increased capacity and funding, enhanced policy support, and research practices that value and incorporate local knowledge systems. It is essential to address these challenges to ensure the sustainable adoption of GMOs and to guarantee that it is fair and beneficial for all stakeholders.

2.6. Theoretical Framework

The researcher argues that by using a critical theoretical framework that encompasses various perspectives on epistemic violence and agricultural development when considering the socio-environmental impacts of adopting GMOs, this study can be guided effectively. The research will incorporate post-colonial theory to explore how power relations, hegemonic knowledge processes, and worldviews underlie the discursive practices of selling GM seeds in Ethiopia. The theoretical framework will involve assessing the intersection of epistemology, agriculture, and social justice to provide a comprehensive perspective on the issues related to promoting GMO practices and their impact on both farmers and the environment in Ethiopia.

The theoretical framework combines elements from postcolonial theory and political economy to understand the promotion of GMOs as epistemic violence in the context of Ethiopian farmers. Various players are entering the agricultural sector under the banner of food security.

This concept is introduced and explored by scholars like Spivak (2020), who suggest that a dominant group silences the knowledge systems of marginalized groups. The promotion of GMOs by Western actors can be understood through the lens of epistemic violence, which is associated with unjust colonial and imperial uses of knowledge.

Similarly, we can consider Said's (2003) critique of the Orientalist nature of the West and its way of knowing the East. Furthermore, promoting GM crops may facilitate a binary of 'Western' technology (good) and 'traditional' practices (bad), drowning the voices and experiences of Ethiopian farmers.

In his work, Sen (1991) argues that the promotion of GMOs should be evaluated based on their potential to contribute to the well-being of farmers (livelihood, agency), rather than just their ability to increase yields. He emphasizes the importance of prioritizing social justice and equity in this evaluation.

The introduction of GMOs, as a form of expansion and entrenchment of capitalist economy, could exacerbate social inequalities by displacing small-scale farmers and allowing big

agribusiness to dominate the industry. This unequal development is a concern in some areas over others.

Additionally, Bhabha (2012) ‘mimicry’[13] discusses the concept of 'mimicry' in relation to GMOs, pointing out that it is essential to consider how farmers will interact with these technologies while being cautious of the potential for mimicry to erode important IK in the long run (Bhabha, 2012: 86).

Furthermore, the discussion about GMOs suggests that traditional Ethiopian agricultural knowledge is seen as outdated and in need of replacement. The promotion of GMOs could create a division, where Western technology is portrayed as superior. It's important to consider the ability of farmers to utilize GMOs (livelihoods, decision-making) and the issues of fairness and justice. There's also the concern that the introduction of GMOs might prioritize the interests of large agribusiness over those of small-scale farmers. This could lead to farmers imitating these practices, leading to a “third space” - a space of uncertainty between the colonizer and the colonized. This “third space” can be an area where new identities are formed, and existing power structures are challenged. Bhabha (2012) highlighted both the potential risks and benefits of GMOs in relation to TK.

The promotion of GMOs in Ethiopia could potentially violate the TK systems of farmers, as well as their experiences and concerns about their land and crops. This could also raise concerns about food security in the region. IK represents the valuable and unique wisdom specific to particular cultures or societies. This knowledge is continuously developed and passed down by communities to effectively adapt to their agro-ecological and socio-economic environments. (Fernandez, 1994). This creation emerges from a methodical process of closely observing local conditions, testing out different solutions, and adapting previously identified answers to align with evolving environmental, socio-economic, and technological factors (Brouwers, 1993). IK is invariably transmitted orally from one generation to the next and through cultural rituals. It has been the cornerstone for agriculture, food preparation and preservation, healthcare, education, and numerous other activities that sustain a society and its environment in many parts of the world for centuries (Senanayake 2006 & Mhache 2018).

Senanayake (2006) argues that much of IK is lost due to the influence of foreign technologies and development concepts that offer short-term gains or solutions without being able to sustain them. Even if there is an argument that IK systems are not effective in providing for the

[13] Mimicry refers to adopting and, adapting or even copying, such as copying of language, culture, manners, and. ideas.

population, a report from the United Nations Food and Agriculture Organization (2003) warns about the dangers of ignoring IK (Mhache, 2018). The loss of this knowledge exposes rural communities to food insecurity, making IK critical for sustainable development. Therefore, it is important to develop and preserve innovative mechanisms for protecting IK. Many IK practices can be integrated into local, national, regional, or global development efforts. Therefore, it is justifiable to advocate for a collaboration between the two knowledge systems to achieve effective outcomes and long-term sustainability (Ponge, 2011). The loss of knowledge has already led to increased vulnerability and risks associated with climate change, sustainable development challenges, and the preservation of global biodiversity (Sultana et al., 2018).

2.7. Widening and Deepening: A Parameter for Analysis

The widening and deepening framework is a useful tool for examining how the introduction of GM seeds in Ethiopia will cause harm to farmers and the land. This framework has two dimensions, one related to the widening of socio-economic disparities and the other related to the extension of its ecological and cultural impacts. As a result, we can see how the spread of GMOs is worsening the situation and eroding local knowledge systems across various aspects. Some scholars argue (MeinzenDick et al., 2019; Quisumbing 2003; Udry et al., 1995 and Addison and Schnurr 2016; Gouse et al., 2016) that the promotion of GMOs could lead to increased economic inequality within and between countries. This is because only large-scale commercial farmers can afford the high costs associated with patented seed varieties, patents, and agrochemical inputs. This can further marginalize smallholder farmers who are unable to afford these expenses, deepening rural poverty and income disparity (Moyo, 2016). The introduction of GMOs, as described by Holt-Giménez and Patel (2009), will potentially lead to increased dependence of farmers on transnational seed companies in pursuit of higher yields and profits. This would involve the utilization of more patented GM seeds along with corporate agro-chemical inputs. Unfortunately, this scenario only exacerbates the oppression of marginalized farmers who lack access to these resources. It ultimately perpetuates a system where people remain dependent on and exploited by others.

The adoption of GMOs could exacerbate ecological degradation through monocropping, intensive farming, heavy chemical use, and loss of biodiversity. The promotion of unsafe GM crops relies on sophisticated laboratory cultivation methods. The widespread reliance on insect-resistant plants limits access and reduces diversification. Furthermore, monocropping policies compel farmers to cultivate a single universal crop, relying on GMO seeds to maintain desirable qualities and prevent depletion or genetic adulteration through human intervention. These

practices can have long-term implications for soil health, water quality, and ecosystem resiliency, exacerbating problems such as soil erosion and water pollution (Altieri & Pengue, 2006).

The promotion of GMOs disregards traditional farming practices and IK systems, widening the gap between Western scientific approaches and local wisdom. This marginalization of IK may lead to the loss of cultural identity and increased social disparities in rural communities (Escobar, 1995). More importantly, promoting GMOs can have a significant impact on erasing cultural heritage. This is because it targets traditional seed-saving practices, crop diversity, and indigenous agricultural knowledge. The loss of such social identity could undermine the resilience of agricultural systems against environmental and socio-economic stressors (Kloppenburg et al., 2010). This alienation may be felt by those who have put considerable effort and time into their food production. Hence, the promotion of GMOs will deepen social disruption with conflicts over land rights, seed sovereignty and access to agricultural resources. Shiva (2016) argues that all these incorporations of biotech animals and plants cause social tensions within the communities and displace smallholder farmers breaking their TK and livelihoods system that multiplies furthering socio-economic inequalities and marginalization.

Therefore, this tool is, widening and deepening providing an insightful framework for the promotion of GM seeds in Ethiopia. This framework takes into account the perspectives of both farmers and the land. It highlights the apparent socio-economic disparities, as well as the often overlooked ecological and cultural impact. When we extend our analysis to include international politics, it becomes clear that it is possible to address and mitigate the persistent effects caused by these dynamics. These widening disparities and deepening impacts require holistic responses that acknowledge IK systems and prioritize social equity and environmental sustainability.

2.8. Epistemic Violence in the Context of Agricultural Development

In a general sense, epistemic violence refers to the violence inflicted upon individuals or groups as knowers and knowledge-bearers. This means that other people purposefully or inadvertently harm other individuals based on their knowledge or the existence of knowledge. It can include the marginalization of knowledge or its essence, as well as devaluation and even invalidation. The term has become widely used after Gayatri Chakravorty Spivak's essay "Can the Subaltern Speak?", where she refers to the silencing and marginalization of subalterns in colonial contexts. Therefore, it is important to consider the various forms of epistemic violence.

Epistemic violence relating to agricultural development refers to a process by which IK systems are unacknowledged as valid sources of new and complex ideas. This encourages the imposition of heteronomous learning paradigms upon subaltern peasant societies (Mignolo, 2009).

The Green Revolution in India, starting in the 1960s, introduced HYV seeds and chemical inputs, often replacing traditional agricultural practices. This approach, based on Western science, disregarded the knowledge and methods of local farmers. A Corteva seed developer discusses the existing challenges faced by farmers, separate from GMOs.

For example, Shiva (1991) argues that traditional Indian intercropping and organic pest control methods were replaced by Western monocropping and chemical pesticides. This led to a decrease in biodiversity in food production and increased soil erosion.

GM crops are seen as a threat to indigenous agriculture, and this holds for Burkina Faso as well. When Bt-cotton was introduced, traditional local varieties that were well-suited to the region's climate were abandoned (Greenberg, 2004). As a result, farmers started to experience economic losses due to receiving lower-quality cotton. This shift away from their local knowledge had negative consequences.

The issue with GMOs is that they are often patented by multinational corporations. This means that farmers are prohibited from saving seeds for planting in the next season. This not only challenges the ability of our community to hold onto its traditional practices but also indirectly criminalizes and can be considered theft of this age-old tradition. Monsanto's aggressive litigation for patent infringement against farmers in the United States is widely known. Their policies have led to cases where farmers have faced legal action, ultimately resulting in bankruptcy. For instance, in the case of Schmeiser & Goodman (2010), the farmers' crops were unknowingly cross-contaminated on their farms.

Agricultural extension services often use top-down approaches which prioritize Western scientific knowledge over local practices. This can lead to ineffective recommendations at local levels. For example, in Tanzania, the promotion of maize as a staple food overlooked the more resilient and nutritious traditional crops such as sorghum and millet, which would have been better suited to the environmental conditions (Speranza, 2010: 185).

Considering the issue of donors and funding priorities, research tends to allocate funds to genetically engineered high-tech solutions rather than low-tech sustainable agricultural practices. This bias limits opportunities for research on traditional and agroecological systems. For example, in Kenya, agroecological practices that have proven to be more beneficial for smallholder farmers and biodiversity receive far less funding and support compared to research on GM crops such as Bt-maize (Mwangi & Ely, 2021).

2.9. Importance of Considering Epistemic Violence in Discussions of GMO Promotion

First and foremost, it is crucial to recognize the presence and harmful impact of epistemic violence in inclusive agricultural development. This involves acknowledging the voices and knowledge of indigenous and local communities for their contribution to the development of agriculture-related policies at all levels. When farmers are actively engaged in decision-making and information sharing on a specific topic, approaches to agricultural research can lead to more sustainable outcomes that respect the ongoing process of knowledge acquisition (Chambers, 2014).

It is important to address the issue of epistemic violence and ensure justice for IK. This involves acknowledging the historical marginalization of IK and working to redistribute power in knowledge creation and distribution. The Nagoya Protocol on Access and Benefit-Sharing developed under the Convention for Biological Diversity (CBD, 1992), aims to ensure that benefits from TK and genetic resources are retained by indigenous communities (UNEP, 2010). Furthermore, incorporating IK can help ensure the sustainability and resilience of agricultural systems. Practices rooted in TK, such as those seen in Ethiopian agriculture, have sustained resource management strategies and contributed to long-term sustainability and conservation of soil fertility (Nyssen et al., 2007).

Therefore, being aware of epistemic violence and taking steps to include more local knowledge systems can help empower the community. This can enhance the community's ability to innovate and adapt to changing circumstances, reducing reliance on external inputs and technologies. Furthermore, various training methods used in multiple countries have combined scientific and local knowledge to improve farmers' best practices and empower them (Braun et al., 2006).

CHAPTER THREE

3. FINDINGS AND DISCUSSIONS

3.1. GMO Promotion in Ethiopia

3.1.1. History of GMO Introduction and Promotion in Ethiopia

Since the 1990s, there have been debates about GMOs in Ethiopia. These discussions centre on their potential impact on human and animal health, the environment, plant diversity, and the global food chain. Some people believe that GM crops can improve food security by increasing crop productivity and quality. However, there are concerns about the possible risks to living things and the environment, which should be carefully evaluated case by case. The establishment of a regulatory framework at the country level should take into account the current biosafety context, as well as the implications and responsibilities outlined in the CBD and Cartagena Protocol on Biosafety (Gebretsadik & Kiflu, 2018).

The CBD was the result of intergovernmental negotiations primarily involving ministries of the environment. It was established due to concerns that developed countries were exploiting the biological diversity of developing countries, using new and stringent forms of intellectual property rights for derived products, and then selling them back (Jain, 1994 as cited in Fowler, 2004). The introduction of GMOs into Ethiopia is a recent development, as the country has only recently started to consider their introduction. Influenced by global agricultural trends and the impact of multinational corporations, the Ethiopian government has been evaluating the introduction of GMOs since the early 2000s. The CPB Proclamation No. 362/2003 and CBD Proclamation No. 655/2009 may offer a framework for the introduction of GMOs in Ethiopia. Initially, there was significant resistance due to the country's reliance on traditional farming methods and concerns about the impact on biodiversity and culture.

In 2009, Ethiopia passed a comprehensive biosafety law called Proclamation No.655/2009, along with its accompanying directives (Directives No.1 to 6/2009). Despite Ethiopia's stance on GM crops, neighboring countries like Sudan and Kenya have already started producing GM crops, resulting in the presence of GM seeds in Ethiopia due to illegal and uncertified seed exchange across borders.

Therefore, Ethiopia should consider revising its biosafety regulations to promote the active involvement of foreign technology providers and local researchers in the biotechnology sector,

which would help the country take full advantage of advancements in modern biotechnology[14]. In 2016, the Ethiopian Parliament made amendments to the GMO law through the 'A Proclamation to Amend the Biosafety Proclamation,' which relaxed the previous, more stringent GMO policy by allowing Ethiopian researchers to initially work with non-edible crops (Gebretsadik & Kiflu, 2018). The promotion of GMOs in Ethiopia has been spearheaded by various entities such as international biotech organizations, aid agencies, and research institutions (Abraham, 2013). Currently, a common narrative supporting GMOs is their potential to increase crop yields, improve food security, and enhance resistance to pests and diseases.

Ethiopia has made some steps in adopting GMOs in its agriculture. In 2009, the country passed its first Biosafety Proclamation law, laying the foundation for GMO research. This law was later amended in Proclamation No. 896/2023, which defines a "Modified Organism" as any biological entity with artificially altered genetic material. In 2023, the Ethiopian government approved the cultivation of Bt cotton, marking the country's first legal GMO crop planting. However, there have been reports of smuggled Bt cotton varieties invading the northern part of the country (Kedisso et al., 2023: 10). In response, a new GM cotton variety (Bt Gt cotton) has been developed.

In recent years, there have been discussions about GM maize field trials and their potential to enhance food security in the face of climate change. For example, the first African Biotechnology Congress[15] in Addis Ababa in 2024 showcased 'TELA-MAIZE' as a GM maize variety. Despite these developments, certain GM crops, such as TELA-MAIZE, have not been widely adopted by Ethiopian.

Additionally, Proclamation No. 1288/2023Seed Proclamation defines "A Variety of Significant National Interest" as a variety identified through a special study by the Ministry, with the agreement of the Authority, for its development interest specific to improvement of export trade, import substitution, supply of raw materials for agro-industries, food & nutrition security. However, there is a gap in the proclamation and law as they fail to directly address the potential negative impact on IK. Currently, the emphasis seems to be on 'national interest' rather than incorporating the valuable knowledge of local farmers. To avoid a potential attack on farmers' knowledge and a disruption to their traditional practices and the land, a shift is needed. The

[14] *Key informant 3. May 13/2024, Addis Ababa*

[15] 1st African Biotechnology Congress, June 4-7, Elilly Hotel , Addis Ababa, Ethiopia.

policy should be reshaped by integrating the deep understanding of farmers gained through their past experiences with seed selection.

> As the Ethiopian Biodiversity Institute (EBI) continues its work, it remains crucial for safeguarding local knowledge by conserving genetic resources and providing seed samples for research purposes[16].

There are major findings are stated:

Legal findings

GM crops have been a topic of significant debate, particularly concerning their impact on IK and traditional agricultural practices. Legal findings regarding GM crops vary significantly from country to country, leading to various legal cases and international agreements that address related issues. In the case of Ethiopia, the patenting of GM seeds by multinational corporations can limit access to genetic resources and undermine IK systems, which often depend on freely shared and adapted seeds. **(**Kloppenburg, J. (2017) Additionally, GM crops can negatively impact biodiversity, as they may outcompete native species or contaminate them through cross-pollination. This disruption can erode the ecological knowledge and practices that indigenous communities have developed over generations. Additionally, there have been legal challenges related to farmers' rights to save and exchange seeds, which can be restricted by intellectual property laws protecting GM crops.[17] On the other hand, international agreements like the Convention on Biological Diversity (CBD) emphasize the importance of protecting IK and genetic resources. However, the implementation of these agreements can vary widely across different countries and regions.

Social findings

The introduction of GM crops has significantly impacted indigenous communities worldwide.[18] GM crops often require specific inputs and management practices that can conflict with traditional agricultural knowledge and practices as well as seed saving mechanism. This can result in a loss of valuable cultural heritage and create dependency on external inputs, which diminishes the autonomy and self-sufficiency of IK. Furthermore, the introduction of GM crops

[16] *Key informant 4. June 07, 2024, Addis Ababa*

[17] Despite their ratification of the Cartagena Protocol, most African countries do not have fully operational biosafety legal frameworks. The African Model Law on Biosafety, if domesticated by member states, has the potential to protect peasants' right to maintain and control their own seeds, including by protecting them against GMO contamination. This is all the more important given the new issues raised by genome editing technologies. (Kloppenburg 2014: 50)

[18] The AU and African states shall take all necessary measures to ensure that nonstate actors respect and strengthen the right to seeds. States shall address the detrimental impacts that plant-related patents have on peasants' capacity to source seeds and breeding material freely to develop varieties and populations adapted to their local conditions and social needs. (Kloppenburg 2014: 66)

can challenge Indigenous control over their food systems, potentially undermining their food sovereignty. Many GM crops are viewed as symbols of Western dominance and modernity, which may erode indigenous cultural identities. There are also concerns about the potential long-term health effects of consuming GM crops, especially for indigenous populations with unique dietary needs and cultural practices.

Economical findings

GM crops have significant economic implications, especially concerning capitalism and the role of farmers. One key finding is that the patenting of GM seeds by multinational corporations has resulted in greater corporate control over the agricultural sector. This situation has limited farmers' access to genetic resources and increased their dependence on these companies. On the other hand, farmers who adopt GM crops may encounter higher input costs, including seeds, fertilizers, and pesticides, which can reduce their profit margins. Furthermore, the dominance of multinational corporations in the GM seed market can lead to decreased competition and increased prices for farmers. As a result, the market for GM crops can be prone to price fluctuations, making it challenging for farmers to plan their production and manage their finances effectively, which leads to security impasses. As a result, reliance on GM crops and related technologies can diminish farmers' autonomy and control over their production processes, making them more vulnerable to market forces and external shocks.[19] Additionally, adopting GM crops may result in the loss of traditional agricultural knowledge and practices, which could be more resilient to changing conditions. Furthermore, the benefits of GM crops, such as increased yields, are not always distributed evenly within agricultural communities. This disparity can worsen existing social inequalities and marginalize small-scale farmers. Moreover, the costs of fertilizers and pesticides still fall on the shoulders of farmers and, questioned food security in the country.

In addition, several expert are arguing in different stance such as,

> ..., there's a lack of knowledge or experts required to develop high-yielding variety seeds. Furthermore, this type of seeds cannot be replanted (recycled) from the harvest, creating a dependency on purchasing new seeds each season.[20]

Proponents of GM present two primary arguments,

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[19] Mechanisms should be established to ensure the coherence of the AU and national agricultural, economic, social, cultural and development policies with the realization of the right to seeds, including actively protecting and supporting peasants' right to seeds and seed systems. African laws and regulations relating to IP and seed marketing, and biodiversity conservation policies, shall respect and take into account the rights, needs and realities of peasants. Peasants' rights to save, use and exchange seeds shall not be disproportionately hampered by plant health requirements. (Kloppenburg 2014: 66)

[20] *Key informant 2. April 26, 2024, Addis Ababa*

> Public opinion on GMOs is often divided. Two key challenges arise, there is a knowledge gap among many in the agricultural sector regarding GMO technology; and there are potential conflicts of interest among agricultural input manufacturers. Lack of awareness about GMOs has led to skepticism and mistrust. Additionally, some manufacturers of organic products may create controversy around GMOs to promote their own products.[21]

those two main issues are among the findings.

3.1.2. Factors Driving the Promotion of GMO Seeds

The main driver of the economy is improved agricultural productivity. Proponents of GMOs argue that they can greatly increase crop yields, help prevent significant losses caused by pests and diseases and contribute to the economic sustainability of agriculture. However, in the past, intellectual property and seed marketing laws have presented serious challenges to protecting the rights of peasants to seeds. The lines between peasant and commercial seed systems are flexible. In this context, commercial seed regulations severely limit or, in some cases, prohibit peasants' right to use, save, exchange, and sell farm-saved seeds. In some countries that have adopted laws compliant with UPOV (International Union for the Protection of New Varieties of Plants) 1991, peasants may face civil and sometimes criminal penalties for saving, reusing, and exchanging farm-saved seeds from commercial varieties actions that should be considered legitimate and beneficial to society's interest in sustainable agriculture and food security (Peschard et al., 2023: 26).

Recent advancements in biotechnology and genetic engineering offer promising prospects for developing crops that are tailored to address specific production challenges such as drought resilience and enhanced nutritional value. International organizations like the World Bank and the International Monetary Fund have also supported the promotion of modern agricultural technologies, including GMOs, as part of broader economic development programs. Furthermore, multinational biotechnology companies have been actively seeking entry into the Ethiopian market. Government policies and initiatives supporting GMO adoption have incorporated biosafety laws and regulatory frameworks. The Ethiopian government has established a biosafety regulatory framework aimed at minimizing the risks associated with the release of GMOs to human health and the environment. This framework provides cover for GMO producers and requires government licensing for producers.

[21] *Key informant 2. April 26, 2024, Addis Ababa*

Additionally, agricultural growth programs (AGP) indirectly endorse the use of GMOs by promoting modern production methods, expanding the market, and safeguarding producers' rights. The biosafety regulatory framework also facilitates the establishment of institutional cooperation between international research bodies in GMO processing[22].

3.2. Effects on Farmers

Smallholder farmers are being alienated from their TK and practices due to the introduction of modern non-traditional crops. This has led to the abandonment of tradition and traditional crops in Ethiopia. According to the expert[23] source, the Cartagena Protocol of 2003, established under proclamation 655/2009, has not fully addressed the needs in the area. In contrast, proclamation 896/2015 is more open and progressive, allowing for research on GMOs for educational and environmental purposes. Therefore, the aforementioned response indicates that GMOs are more favorable for green initiatives in the area. Hence, the government's policies have favoured GMOs, leading to the replacement of locally grown traditional crops by these reliant crops.

The use of GMOs has resulted in farmers becoming dependent on external seed inputs every year, as GMO seeds do not reproduce. This has led to the abandonment of traditional seed-saving and planting methods.

However, scholars are debating. Expert[24]stated that

> The most concerning aspect might be the dependence itself. While I haven't personally encountered scientific evidence of chaos resulting from GMOs in my role as a policymaker, the fear of such chaos remains a significant obstacle.

The proponents of GMOs disagree with the aforementioned perspective. Expert[25] says,

> To safeguard against potential external threats, we are actively researching and developing alternative seed varieties. He added Opponents of GMOs often misunderstand the technology. They mistakenly perceive GMOs as consisting of small, potentially harmful particles. However, the use of bacteria in GMOs is not new; for instance, Bt bacteria, which has been used in organic farming since the 1960s, is a prime example. This historical context highlights the need for a more nuanced understanding of biotechnology.

[22] *Key informant 3. May 13/2024, Addis Ababa*
[23] *Key informant 3. June 7/2024, Addis Ababa*
[24] *Key informant 2. April 26, 2024, Addis Ababa*
[25] *Key informant 4. June 07, 2024, Addis Ababa*

According to Peschard et al., (2023: 26), the UNDROP (United Nations Declaration of the rights of peasants) enshrines the main elements of peasants' right to seeds. These include the rights, (1) to maintain, control, protect, and develop their own seeds and TK, (2) to the protection of TK, innovation, and practices relevant to seeds, (3) to participate in decision-making on matters relating to seeds, (4) to equitably participate in the sharing of benefits arising from the utilization of seeds, and (5) to save, use, exchange, and sell farm-saved seed or propagating material.

So, supposed "that most African countries[26] have no biosafety regulatory framework to guarantee peasants' right to maintain and control their own seeds and to protect peasant seed systems from GMO contamination. Only eleven countries have authorized field trials and/or commercial production, but contamination can also happen through importation of GM foods and food aid" (Peschard et al., 2023: 49). Despite Ethiopia's efforts, the fundamental elements of peasants' seed rights are still compromised in various ways, pushing farmers towards a security deadlock.

3.2.1. Seed- Security: Exploring the Nexus of Seeds in Security Studies

For thousands of years, peasants have freely saved, selected, exchanged, and sold farm-saved seeds to produce food. These rights have been recognized in the Plant Treaty, which acknowledges the right of peasants to farm-saved seeds without distinguishing between peasant varieties and IP-protected varieties. The Plant Treaty, adopted by consensus at FAO in 2001, led to the recognition of similar entitlements in Article 19 of UNDROP. Article 19.1d of UNDROP enshrines peasants' rights to save, use, exchange, and sell farm-saved seed or propagating material, covering both peasant varieties and IP-protected varieties (Peschard et al., 2023: 29).

> The issue at hand is that African farmers have long been nurturing seeds, which are fundamental to life. These seeds are not only used for growing food, but they also provide income, healthy sustenance for families, and are an essential part of their communities. However, large seed companies are pressuring farmers to abandon these traditional seeds in favor of purchasing new hybrids every year. This practice poses a threat to the rich diversity of indigenous varieties, as it replaces them with those better suited for large-scale, single-crop agriculture. Additionally, it undermines farmers'

[26] As of 2021, seven African countries cultivated GM crops commercially (Eswatini, Ethiopia, Kenya, Malawi, Nigeria, South Africa, and Sudan), and five had ongoing field trials (Burkina Faso, Ghana, Mozambique, Rwanda, and Uganda). AUC, Continental guidelines, 7

ability to adapt to changing climates. Thankfully, there is a growing movement among African farmers who are reclaiming their seed heritage. They are bringing back high-yielding and resilient local varieties and establishing farming networks to preserve, share, and trade this diverse and nutritious food source (AFSA – Transitioning to Agroecology., 2020).

The relationship between seeding, capitalism, and GMOs in Security Studies is a complex field that encompasses economic, political, social, and environmental dimensions. There is an interconnected pattern where capitalism drives the development and commercialization of GM seeds as an economic system. Biotechnology corporations conduct research and development to create GM seeds with specific traits such as pest resistance, herbicide tolerance, or higher productivity potential. The capitalist market further stimulates the development and distribution of GM seeds in the agricultural sector, leading to security challenges. Biotechnological companies are primarily driven by profit and market share, and their intellectual property, including patents and proprietary technologies, is based on the capitalist model of biotechnology innovation. This system also influences the development of agricultural practices and paradigms, with agribusinesses promoting the use of GMOs to enhance agricultural productivity, efficiency, and profitability (Pinto, 2023).

The next level of analysis pertains to the seeding process, which involves the dissemination and propagation of GMO seeds. This process is driven by business interests and capitalism, influencing the distribution of seeds in different countries and the farming models employed. Understanding the seeding patterns within a capitalist economy is vital for evaluating the societal, political, and environmental impacts of GMO adoption on securitization patterns.

Seeds are integral to a nation's ability to achieve food sovereignty and govern its agricultural destiny. When farmers have control over their seeds, they can adapt to changing conditions such as climate shifts or market fluctuations. However, the promotion of GMO seeds can be viewed as a form of oppression, as it prioritizes foreign technology over the knowledge and practices developed by local farmers. This lack of support for farmers who cannot afford GMO seeds exacerbates the power imbalance and marginalizes small-scale farmers (Wittman et al., 2010).

3.2.2. Loss of Autonomy and Control Over Seed Resources

The use of GM seeds also unfairly diminishes the TK of crop seed farming that local farmers possess, leaving them with no foundation to rely on. As Bassett and Crummey point out, it appears to belittle the vast knowledge accumulated over centuries by billions of ordinary people

and instead depends on alternative methods to interpret extensive and detailed information (Rohde, 2003: 267).

Expert commented that,

> While Ethiopia may be in the early stages of GMO adoption, promoting them without careful consideration can lead to several negative consequences. These include creating dependence among farmers, hindering domestic research efforts, and prioritizing profit over long-term sustainability. Strong legal frameworks are essential to address potential legal issues associated with GMOs. Furthermore, a thorough economic assessment and a social impact study are crucial before widespread adoption. These studies should evaluate the potential impact of GMOs on farmers' livelihoods, cultural practices, and the environment.[27]

However, the Expert[28] are argued that

> Ethiopia, as a centre of crop diversity but not necessarily a centre of origin, faces agricultural challenges that are the biggest concern. While there's potential for GMOs to increase yields, as demonstrated by the success of Bt cotton, the country must carefully consider the risks and benefits. The impact on traditional farming practices and potential environmental consequences requires thorough evaluation. Positive influences, such as increasing yields, are among the potential benefits of GMO adoption.

Hence, this is where the promotion of GM seeds reveals its impact by ignoring traditional farming practices like polyculture and crop rotation. Instead of supporting diverse farming systems, GM crops promote monoculture. By prioritizing GM seeds over indigenous seeds that are adapted to local ecosystems, the GM industry reduces biodiversity and resilience in agriculture.

Based on the interview one of the Expert, reflect,

> Many Ethiopian farmers heavily depend on established traditional farming systems. This reliance can be attributed to factors such as limited exposure to new varieties, including GMOs. Furthermore, the continued practice of indigenous farming techniques, handed down through generations, holds significant value for these farmers.[29]

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[27] *Key informant 2. April 26, 2024, Addis Ababa*
[28] *Key informant 4. June 07, 2024, Addis Ababa*
[29] *Key informant 1, April16/ 2024, Addis Ababa*

The expert[30] clarify the above statement dependence by stating that,

> Biotechnology provides a variety of tools for plant improvement, including traditional methods such as breeding and selection. These techniques, when combined with modern advancements, contribute to the development of new and improved plant varieties.

Furthermore, this informant added that,

> Traditional farming methods and seed selection practices in our country have hindered agricultural productivity. The farmer uses seed, not grain.

On the other hand, this failure leads to epistemic violence by undermining native cultural identities and disrupting the sacred interconnection between IK and intellectual practices. The promotion of culturally unsuitable technology, when funds are allocated to incorrect technology, is unproductive. This affects every area of the farmer and his farm because it does not allow the person to integrate their method of personal life. For example, Zheng et al., (2019) demonstrated that the competitive design of culturally unsuitable technologies creates a division between familiarity with innovation and farming practices, as the mechanisms would be unfamiliar to farmers. An expert reflects that,

> Over the past three years, I have been working with Corteva, formerly known as Pioneer, to develop hybrid maize seeds. Our focus is on seed production rather than food cultivation. We cultivate male and female-pollinated maize plants specifically to produce seeds for farmers. Once harvested, these seeds are delivered to the organization. The pricing structure varies, and although they have promised to provide training on the technology involved, this has not materialized yet. Our seed development process also involves the use of chemicals[31].

In an interview with a commercial farmer, he reflects that

> Although Ethiopia currently does not widely use GMOs, there are difficulties associated with the use of hybrid seeds. Unlike traditional varieties, hybrid seeds lose their beneficial traits when replanted. This means farmers cannot save seeds from their harvest for the following season. Some farmers who try to reuse hybrid seeds experience a significant decrease in yield compared to the first planting. However, farmers are reluctant to switch to other maize varieties offered by the Ministry of Agriculture because these non-hybrid options do not produce yields as high as the initial hybrid

[30] *Key informant 4. June 07, 2024, Addis Ababa*

[31] *Key informant 5, May 29, 2024, telephone interview*

> planting. This puts farmers in a dilemma they can either accept the lower yield from replanting hybrid seeds or sacrifice the higher initial yield by switching to a less productive, but reusable, variety[32].

The evaluation of hybrid seeds using indigenous farming practices revealed weaknesses. Therefore, the spread of GM seeds without prior informed consent and proper utilization of TK may lead to the propagation of such TK without due regard to local people's practices. “IK consists of a comprehensive body of understanding around issues, such as, soil fertility or water use or pest control, which are typically ignored in the generic application of technology.”[33] The failure to properly and appropriately demonstrate this knowledge is another form of epistemic violence that prevents it from being acknowledged in the context of impoverished agrarian communities. The promotion of GM seeds also exacerbates economic inequality. It disproportionately benefits large corporations, rather than small, deserving farmers who rely on their own TK. The most affected are the small-scale farmers who cannot meet these standards, ultimately leaving them with no opportunity to earn a reasonable income.

The way GM seed promotion is presented in Ethiopia does not adequately address the traditional farming practices and IK of the farmers. On the other hand, these intuitive farmers are very open to learning about improved practices and incorporating them into their existing systems. Instead of ignoring or replacing their methods with GM technology, these farmers are willing to adapt and refine their practices. The lack of recognition and validation of farmer-led innovation is a form of epistemic violence that undermines the agency of local people. This approach prevents them from developing context-specific solutions and hampers the natural evolution of IK. The failure to incorporate IK in the introduction of GM seeds in Ethiopia can be considered a form of epistemic violence, as it disregards the diverse and sustainable practices embedded in local agricultural methods.

In the views of opponents,

> The development of GMOs may seem comparable to advancements in other technologies such as mobile phones or cars. However, the implications for agriculture are significant. Our main focus should be on supporting farmers, which includes helping them improve their livelihoods by building better homes

[32] *Key informant 5, May 29, 2024, telephone interview*

[33] The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) was adopted by the General Assembly on Thursday, 13 September 2007**,** by a majority of 144 states in favour, 4 votes against (Australia, Canada, New Zealand and the United States) and 11 abstentions (Azerbaijan, Bangladesh, Bhutan, Burundi, Colombia, Georgia, Kenya, Nigeria, Russian Federation, Samoa and Ukraine). https://social.desa.un.org/issues/indigenous-peoples/united-nations-declaration-on-the-rights-of-indigenous-peoples

> for their families, ensuring their children have access to education, and introducing technologies that can reduce their workload and increase their productivity[34].

Therefore, to promote more inclusive, culturally sensitive, and sustainable agricultural development in Ethiopia, it is crucial to acknowledge the gap between external technological interventions and IK and work towards reducing it. Achieving a balance between integrating external technologies and preserving IK is essential for building resilience and promoting equity while strengthening agricultural systems.

3.2.3. Socioeconomic Implications for Smallholder Farmers

Although some farmers may benefit from increased yields and income, for others, the costs of adopting GMO technologies could be prohibitively high. This could widen the gap between wealthier farmers who can afford to invest in such technologies and poorer farmers who cannot (Wiggins et al., 2010).

The expert argue,

> The introduction of GMOs in Ethiopia is a complex issue that requires careful consideration. While some people might push for immediate adoption, it's important to address potential drawbacks. For instance, the introduction of hybrid maize has already led to some erosion of local knowledge among farmers. This reliance on hybrid seeds, combined with their high black market price (estimated at around 20,000 birr per quintal?), creates challenges for farmers. If not managed carefully, GMOs have the potential to worsen these problems to a much greater extent.[35]

However, the concerns about GMOs have been countered by one of the expert[36], who pointed out that similar bacteria are already consumed in our daily lives, for instance,

> Bt-cotton uses bacteria commonly found in our food supply. Despite the familiarity of this bacteria in various forms, such as in air and dust, its introduction into crops raises concerns about potential health implications.

As agriculture becomes more commercialized due to the increasing adoption of GMOs, smallholder farmers are displaced from their land, while large agribusinesses buy large portions

[34] *Key informant 6, April 16, 2024, Addis Ababa*
[35] *Key informant 2. April 26, 2024, Addis Ababa*
[36] *Key informant 4. June 07, 2024, Addis Ababa*

and conduct farming on a larger scale (Mittal et al., 2013). However, this process comes at a cost to rural communities and traditional forms of livelihood.

> We believe that relying on GMOs worsens rather than solves the issue of food insecurity. This is because it promotes an over-reliance on a small variety of crops, putting long-term food security at risk by reducing agricultural biodiversity. Additionally, GMOs do not effectively address agricultural emissions.
>
> *Sustainable development goal 2: Zero hunger*. (n.d.). Retrieved from https://ethiopia.un.org/en/sdgs/2

Diverse cropping systems are essential to protect plants against pests, disease and the impact of changing climatic patterns to ensure sustainable food production in Ethiopia. Furthermore, advocating for the use of GM seeds in Ethiopia is not a simple task, as it has a significant impact on both the farmers and the land. According to Berkhout et al., (2020), GMOs are often presented as a solution to issues such as low yields and pests in agriculture. However, they also pose a threat to IK and seed sovereignty, ultimately leading to economic hardships for smallholder farmers. This underscores the importance of the government establishing an appropriate framework to address these challenges and ensure that the benefits of modern agricultural technology are accessible to all.

The introduction of GMOs in Ethiopia has implications for farmers, communities, and the environment. This will have several consequences. Proponents argue that the benefits of GMOs include increased farm income and productivity, reduced pesticide use, and contribution to food security. However, more investigations and reports are needed to understand the long-term environmental impact, socio-economic disparities, and bioethical aspects as the topic is still controversial.

On the other hand, maintaining biodiversity is not as simple as keeping GM crops out of the country. Experts conclude that the most serious threats to both crop biodiversity and biodiversity overall are not from GM, but from habitat destruction, urbanization, the abandonment of cultures, alien invasive weeds and pests, and insufficient attention to indigenous peoples and agriculture in general (see Brown & Fedoroff, 2004).

Besides, in the 2023 Global Hunger Index, Ethiopia is ranked 101st out of 125 countries in terms of food security. It's important to note that hunger is not caused by a lack of food, but rather by a lack of access. Even in areas experiencing hunger crises, there is often an abundance of food available for those who can afford it. Hunger is a complex issue that is deeply rooted in social, political, and economic inequalities. GM technology is not thus necessarily the solution.

For instance, in India, millions suffered from hunger in 2012 while tons of grain rotted. Claims of GM technology as a cure for hunger divert attention from real solutions. Some leaders have criticized the exploitation of hunger by the biotech industry in its promotion of GM (Robinson, 2015: 151).

While some expert view GMOs as a potential solution for unproductive land, we must consider the limitations of scaling up production on such land.

> GMOs offer potential benefits but also come with risks. It is important to thoroughly understand and minimize these risks before widespread adoption, especially considering our growing population and limited land resources. To ensure food security, increasing agricultural productivity is crucial. Techniques such as vertical farming and potentially GMOs can be valuable tools. However, the responsible use of these technologies requires a deep understanding of their potential impacts[37].

However, some expert contest the validity of this argument,

> A vicious cycle can emerge when farmers rely on GMOs. The initial increase in seed prices can push farmers towards using recycled GMO seeds, which can then lead to declining productivity. This decrease in productivity in the yield as well as the land might force farmers to migrate, causing social and land disruption[38].

3.2.4. Disruption of Agroecosystems and Biodiversity

The introduction of GMOs disrupts conventional agricultural practices in Ethiopia, where farmers often act as breeders, selecting varieties that sustain soil fertility and manage pests over time. However, integrating GM crops can lead to monocultures, which are less efficient. This poses a challenge in redesigning the agricultural system.

Genetically engineered food crops not only raise safety concerns but also lead to a decrease in agricultural diversity, mainly through monocultures. The introduction of GMO crops can disrupt local biophysical conditions and cultural practices that have traditionally made certain crop varieties well-suited to specific environments. This can result in increased vulnerability to pests, diseases, and unfavorable climatic changes in agricultural systems due to a reduction in genetic diversity. This decline in genetic diversity is widely recognized as one of the main reasons for agricultural losses (Altieri, 2009).

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[37] *Key informant 7, April 26, 2024, Addis Ababa*

[38] *Key informant 2. April 26, 2024, Addis Ababa*

There is evidence that GM crops can have effects on non-target species. For example, Bt crops produce insecticidal proteins that may impact other insects, including beneficial ones. This has the potential to disrupt the food chain and alter the ecosystem (Lövei & Arpaia, 2005). Moreover, long-term cultivation of GMOs can be harmful to soil health. Another issue is the continuous use of herbicides and fertilizers for growing GMO crops, which leads to soil degradation and a decrease in organic matter and microbial biodiversity (López-Bellido & López-Bellido, 2001).

Critics of the introduction of GMOs argue that there is a lack of transparency and local understanding surrounding the technology. They raise several key points,

> Firstly, the process of creating GMOs, from initial development to large-scale production, is unclear and inaccessible to most people. Additionally, the potential impacts of the introduced genes on the seeds, the land, and the environment after cultivation require further investigation. Furthermore, our nation currently lacks the scientific expertise needed to fully comprehend the complexities of GMO technology. Moreover, we don't have the necessary laboratory facilities to conduct in-depth research on GMOs and their potential effects. These points highlight a concern that Ethiopia isn't adequately prepared for widespread GMO introduction due to a lack of knowledge, infrastructure, and scientific capacity[39].

Overall, this has a significant impact on life both above and below ground, dramatically undermining the resilience in ecosystems. Different ecosystems are more resilient to a range of forms of environmental stress. Monocultures, on the other hand, do not have this resilience mechanism. Hence, they are susceptible to different pest attacks or outbreaks of diseases, and thus, appear to be affected by the impacts of the climate (Tilman et al., 2002).

Additionally, a major environmental issue is the emergence of herbicide-resistant weeds. Most GMOs are engineered to tolerate a specific herbicide, leading to more extensive use of these chemicals. Consequently, over time, herbicide-resistant weed species can develop in a more widespread manner (Benbrook, 2012).

The opponents argue that

> The complex nature of GMOs, resulting from combining genetic material across species, makes it challenging to fully predict their long-term effects. Currently, there seems to be a lack of comprehensive assessments in Ethiopia to evaluate the potential impacts of GMOs on the environment and agriculture.

[39] *Key informant 2. April 26, 2024, Addis Ababa*

Traditional Ethiopian farmers have well-established mechanisms for seed preservation. However, integrating GMOs into these practices might be difficult due to concerns about adapting them to Ethiopian conditions. Additionally, limited resources and experts in Ethiopia make it challenging to determine which seeds are currently present in the country.

On the other hand, Ethiopia does have established systems for biodiversity conservation. These include field stations that preserve seeds throughout their life cycle and gene banks managed by the Ethiopian Biodiversity Institute. These facilities have the capacity to store and safeguard traditional seeds.[40]

Furthermore, gene flow is another issue, referring to the transfer of genes from GMOs to non-GM plants through cross-pollination. This can have serious consequences for the wild relatives of crops and significantly impact the local ecology (Ellstrand, 2003).

In addition, the introduction of GMOs in Ethiopia is a controversial topic. Although there is a biosafety law in place, its implementation is facing challenges. Firstly, while there are strong advocates for GMOs, there is a significant knowledge gap among the general population. The law exists, but public awareness and understanding are lacking. Secondly, Ethiopia is a center of origin and diversity for several crops. Introducing GMOs poses a risk of contamination to these native seeds, potentially harming the country's rich biodiversity. Thirdly, a robust control mechanism is lacking, including limitations in the technical capacity of the regulatory system and laboratory infrastructure to effectively assess and monitor GMOs. Finally, there is no established system for tracking and monitoring the potential consequences of GMO introduction, raising concerns about how to address any unforeseen issues that might arise[41].

While GMOs have potential downsides, opponents choose to prioritize,

In today's interconnected world, embracing new technologies like GMOs is crucial for our nation's progress. As institutions, it's our responsibility to guide Ethiopia towards a secure future by understanding the needs of our people. Careful evaluation is key, we need to analyze potential risks, acquire necessary knowledge, and develop storage facilities to mitigate these risks. Farmers, in turn, require training on the behavior and types of seeds they're using. Ethiopia possesses immense potential, but to fully utilize it, we need to invest in advanced research capabilities. The success of the Enset research

[40] *Key informant 2. April 26, 2024, Addis Ababa*
[41] *Key informant 2. April 26, 2024, Addis Ababa*

> project at the Holeta institute, where scientists developed climate-resilient varieties in controlled environments, demonstrates our capacity for innovation in GMO technology[42].

Similarly, while GMOs such as Bt-cotton are developed to resist pests, the excessive use and plantation of this crop will also involuntarily induce traits of resistance in pests. The phenomenon has been detected worldwide and acts as a considerable barrier to sustainable pest control (Tabashnik et al., 2013).

3.3. Epistemic Violence on Indigenous Knowledge

Edward Said (2003: 351) framed the Western tradition, stating that "colonial consciousness is first created and maintained through the violence of knowledge." As Edward Said's seminal work showed, Western knowledge constructed the concept of the Orient using language, concepts, beliefs, values, and emotions that are internal to its own Western tradition. In relation to the chosen focus, narrowing down through a juxtaposition of epistemic knowledge can help reason out the philosophies between different areas of view on criteria for GM crops in Ethiopia. Understanding epistemic knowledge assists in identifying how oppressive ideas function in farming areas.

According to Spivak, epistemic violence involves the deployment of knowledge which leads to a new vision of the world. Spivak defines epistemic violence as "the construction of a self-immolating colonial subject for the glorification of the social mission of the colonizer" (Spivak, 2020: 127). She also refers to it as "a set of human sciences busy establishing the 'native' as a self-consolidating other."

Epistemic knowledge is always bound to a specific culture and depends on the collective intelligence found in that community. While genetic modification seeds do not have a long history in the country and its agriculture, one can derive insights implicitly from traditional agricultural practices due to a localized mindset. The issue remains contested, as expert on the opposing side hold differing views,

> The introduction of GMOs aims to improve specific crops in agriculture. It's crucial to understand the target pest or problem these GMOs are designed to address. There isn't necessarily a conflict with traditional farming practices, but careful use of GMOs is essential.

[42] *Key informant 7, April 26, 2024, Addis Ababa*

> One concern is the potential impact of GMOs on beneficial insects. GMOs are engineered to target specific pests, which can be preferable to using broad-spectrum external chemicals. However, the long-term effects of GMOs on the ecosystem and beneficial insects need to be thoroughly assessed before widespread adoption.
>
> Traditional farming practices, particularly with open-pollinated varieties, often allow farmers to save seeds from their own harvest or share them with neighbors. Cross-pollinated varieties require more caution in this regard. However, the argument that GMOs constitute "violence" against traditional practices seems like an overstatement. In the past, farmers practiced careful seed selection for optimal results.
>
> The key difference with GMOs is that they might require specific instructions or limitations on reuse compared to traditional seeds. This doesn't necessarily equate to violence against TK[43]

It is crucial to understand the cultural basis of epistemic knowledge in order to comprehend how the promotion of GM seeds can lead to epistemic violence. Neglecting or underestimating the value of local wisdom systems can result in a loss of diverse agricultural knowledge that has been passed down through generations.

> Those opposing the use of GMOs in Ethiopia have raised several key points. Firstly, while there is a biosafety law in place, its implementation is facing challenges due to a lack of public awareness and understanding. Secondly, Ethiopia's status as a center of origin and diversity for various crops raises concerns about the potential contamination of native seeds by introducing GMOs. Thirdly, there are limitations in the technical capacity and laboratory infrastructure of the regulatory system to adequately assess and monitor GMOs. Lastly, there is no established system for tracking and monitoring the potential consequences of GMO introduction, raising concerns about addressing any unforeseen issues that may arise[44].

Furthermore, epistemic knowledge encompasses traditional, scientific, and experiential knowledge. There are multiple dimensions to consider, with scientific support for GM seeds on one side, and skepticism from traditional agriculture on the other. Additionally, epistemic knowledge is not compartmentalized but interconnected, with one domain dependent on various other fields of knowledge. For example, the case of GM seeds involves interactions and mutual exclusions between scientific knowledge, traditional practices, and environmental concerns.

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[43] *Key informant 7, April 26, 2024, Addis Ababa*
[44] *Key informant 2. April 26, 2024, Addis Ababa*

Historical epistemic knowledge is the transmission of knowledge to future generations. Ethiopian traditional agriculture reflects a heritage of experiences that past generations learned over millennia to sustain their communities.

Therefore, understanding the historical context and intergenerational knowledge of promoting GM seeds is crucial. The introduction of new technology that displaces the current knowledge system cannot be isolated from epistemic violence.

An expert argued that,

> Ethiopian farmers have religious and cultural sensitivities, and thus, approaches need to ensure they understand the composition of GMOs and that their communities are fully informed about GMO development details[45].

How power influences what is considered valid knowledge is evidence of a linear pattern influenced by the production and dissemination of knowledge. In the context of marketing GM seeds, power imbalances have a significant impact on the creation and spread of stories about biotechnological advancements.

> Introducing GM seeds in Ethiopia could lead to a situation where farmers become reliant on large corporations for seeds. This reliance could jeopardize traditional seed recycling practices, which have been fundamental to Ethiopian agriculture for generations. Additionally, farmers might be at the mercy of pricing decisions made by seed providers, potentially affecting their livelihoods. While GMOs are often associated with promises of increased productivity, the long-term effects of these seeds in Ethiopia are not yet fully understood. Therefore, it is important to proceed with caution and prioritize research before widespread adoption of GMOs[46].

Spivak argues that understanding these imbalances is crucial for progress, emphasizing the need to comprehend how certain knowledge is privileged while others are marginalized or silenced. This approach can open up opportunities for theorizing power and exploring more equitable manifestations (Spivak, 2020 cited in Gozli et al., 2019: 169).

Regardless, the question of what counts as knowledge can never be entirely divorced from one's underlying ethical and value systems. "Ethical dilemmas arise when considering whether to adopt GM seeds in Ethiopia. This is a complex decision that has scientific implications, but the ethical dimension will be based on how it affects local communities, biodiversity, and future generations" (Srushti, 2022: 373). This is part of the point, one thing about epistemic knowledge

[45] *Key informant 2. April 26, 2024, Addis Ababa*
[46] *Key informant 2. April 26, 2024, Addis Ababa*

is that it is always changing and evolving in reaction to an ever-altering set of circumstances. Consequently, in agriculture, the expansion of epistemic know-how is demonstrated by the evolution of farm practices that adapt to environmental changes and socio-economic variations.

It is important to acknowledge the value of shared epistemic knowledge within traditional Ethiopian farm communities, as it supports their involvement in decision-making processes. In order to promote GM seeds, decision-making processes should involve extensive community engagement while being sensitive to the local communities' epistemologies and voices, without causing any harm. In dealing with the complexities of biotechnological innovation diffusion, it is necessary to recognize the critical characteristics of epistemic knowledge about GM seeds in Ethiopia, cultural embeddedness, diversity interconnectedness, historical context, power dynamics, ethical tendencies, and community entrance criteria. Recognizing these characteristics can lead to resilient and equitable strategies for agronomic innovations involving different stakeholders. The transition to new agricultural practices should respect and uphold local wisdom instead of going against it.

3.3.1. Marginalization of Indigenous Knowledge Systems and Imposition of Western Scientific Paradigms

The promotion of GMOs in Ethiopia often comes at the cost of marginalizing IK systems. Traditional agricultural practices that have been maintained and improved over centuries are being replaced by modern technological farming techniques. This shift not only marginalizes local and IK but also diminishes the autonomy and sustainability of peasant farmers (Altieri, 2004). According to Shiva (1997), knowledge erosion occurs as farmers adopt GMO crops, leading to the abandonment of TK such as seed selection, crop rotation, and organic pest control. This erosion of collective knowledge weakens community-based farming systems, making it harder to respond to environmental shifts.

Furthermore, the introduction of GMOs in Ethiopia exemplifies the imposition of Western scientific paradigms on indigenous agricultural systems. This Western bias leads to the prioritization of technological practices, disregarding those of local people and undermining their capabilities and relationships with nature. This perpetuates a cycle of information that maintains power for those already in position, ultimately resulting in epistemic violence (Patel, 2013).

Most Western scientific approaches provide one-size-fits-all solutions that are not suitable for the diverse agroecological contexts found in Ethiopia. In contrast, Indigenous practices are

highly adapted to individual locales. The imposition of GMOs results in suboptimal agricultural outcomes and increased vulnerabilities in the local farming systems (Escobar, 1995).

3.3.2. Epistemic Violence and Traditional Livelihoods

The adoption of GMOs in Ethiopia may lead to the loss of cultural identity among farmers. Farming is deeply intertwined with social rituals, structure, and local knowledge within many communities, serving as more than just an economic activity. The rise of GMO production undermines these traditional practices (Richards, 1985: 32).

Additionally, GMOs can create economic pressures that undermine traditional farming professions. The high costs and time-consuming nature of GMO production make it difficult for smallholder farmers to compete with industrialized farms that can afford the technology. This economic marginalization may force farmers to abandon their traditional subsistence methods and move to urban areas, further disconnecting them from their land culturally (Kloppenburg, 2014).

Based on expert assessment, the pressure is exceeding expectations.

> From a capitalist standpoint, GMOs present a clear opportunity to control knowledge. By exerting this control, corporations can establish monopolies and manipulate supply chains. Additionally, terminator technology, which renders seeds infertile after one harvest, can be used to force farmers to rely on the company for new seeds each season, further tightening control over the agricultural sector[47].
>
> Kloppenburg contends that the global seed industry is predominantly controlled by Western corporations and donors. This concentration of power facilitates the industry's integration into capitalist markets[48].

Additionally, this corporate control raises significant security concerns. Nevertheless, the promotion of GM seeds to the people in Ethiopia will have a devastating long-term impact on both land and local peoples. The environmental impacts associated with GM crops such as herbicide resistance, gene flow, and decline of biodiversity are among the most serious issues facing sustainable agriculture. To further complicate things, there are long-range implications on soil health with the disruption of agroecosystems.

The introduction of GMOs can be seen as a form of epistemic violence against IK systems. It also marginalizes traditional agricultural practices and imposes Western scientific paradigms.

[47] *Key informant 2. April 26, 2024, Addis Ababa*
[48] *Key informant 8. March 17, 2024, Zoom*

This can lead to the destruction of cultural identity and livelihood for Ethiopian farmers. To address these challenges, we need to take a nuanced approach that respects and integrates traditional and IK with scientific agricultural innovation, to ensure fair and sustainable benefits from these advancements.

3.3.3. Early Warning, Existential Threat: Securing Ethiopia's Future Beyond GMOs

We need further research on early warning signals related to GMOs in Ethiopia for sustainability. It is necessary to carefully monitor the socio-economic and environmental impacts of increased GMO adoption on biodiversity, traditional farming practices, and the income sources of smallholder farmers.

Ethiopia's recent conflict serves as a troubling example. Powerful groups exploit resources and manipulate ethnic tensions for their own gain. In this context, efforts to introduce GMOs may appear threatening, but they could also serve as an early warning signal of future exploitation by capitalist interests.

In summary, focusing on a small number of high-yielding GMO varieties might reduce seed diversity, posing a risk to national food security and the health of our crops when they encounter new pests or changing climates. TK systems generally preserve a wider diversity of locally adapted seeds. However, this forces farmers to depend on such corporations for GMO seeds and inputs, leaving them at the mercy of these global companies and causing further economic stress and dislocation to this already vulnerable population. It would be beneficial to gather TK, commit to storing seeds, and grow your own. Additionally, reliance on GMOs would make Ethiopian farmers partially or completely reliant on external suppliers for their seeds, risking the loss of sovereignty over their food systems and, consequently, jeopardizing their very livelihoods and IK. In light of this, has incorporating IK empowered farmers with cultural continuity and self-determination?

3.4. Blindsided by the Curve: The Impact of Corporate Seeds on Ethiopian Farmers

Henry Kissinger, the former U.S. Secretary of State, emphasized the significant influence of controlling food sources on people (Lovel and Mager, 2008). This is because food is a fundamental necessity for survival and can serve as a powerful tool for controlling individuals and nations, allowing those in control to impose their will. Many countries in need have been subject to the authority of powerful nations or corporations that dominate food production. This

notion is often used by critics of GM food production as an argument against its implementation (Mahgoub, 2016).

Harvey suggested that capitalism acts like a painkiller, temporarily alleviating symptoms while the underlying problems persist. He illustrated this idea by saying,

> Independent relations can become metabolic, drastically changing the rules of their engagement. For example, someone with a headache takes a painkiller and feels better. The next day, they still feel unwell, so they take another painkiller. This is an independent relation: the person feels sick, and there are painkillers available. But at a certain point, this can become an interdependent, metabolic relation leading to opioid addiction. The painkillers and the person in pain are initially independent, but over time, they become interdependent and habitual, with the addict unable to exist without opioids, and the production of opioids dependent on the existence of addiction (Harvey, 2020: 74).

The promotion of GM seeds in Ethiopia is influenced by capitalist features and principles. Epistemic violence often occurs when IK, which has been using effective techniques for centuries, is overshadowed by examples of legitimate knowledge introduced by outside communities or by centralised technology. This is valuable in understanding how capitalism impacts IK, extending beyond implications for farmers and land use.

The introduction of GMOs blindsided Ethiopian farmers, leading to unforeseen challenges. The study shows that the farmers cannot recycle the seeds, focusing on the vulnerability of Ethiopian farmers and their indigenous seeds.

This study examines the various challenges faced by farmers and the land, with a particular focus on future threats. It also explores the potential dangers posed by capitalist forces hidden within the seed industry. Corporate seed companies often promote a single, standardized variety, leading to a decrease in the use of diverse, locally adapted seeds. This erosion of TK weakens farmers' resilience in dealing with pests, diseases, and changing weather patterns.

The debt and dependence on the hand of capitalists, farmers may be pressured to buy expensive corporate seeds and associated chemicals, leading to debt and dependence on corporations. This cycle can make them more vulnerable to price swings and corporate control.

> According to a resource,[49] states, Ethiopian farmers are taking on debt to purchase fertility boosters, chemical fertilizers, and hybrid seeds. This suggests that these inputs are expensive and may not be sustainable for farmers in the long run. The introduction

[49] *Key informant 1, April16/2024 Addis Ababa*

> of these commercial seeds could be seen as a form of 'capitalist invasion' into the Ethiopian agricultural sector, potentially placing an unrealistic financial burden on farmers.

Moreover, the increasing debt burden for farmers, coupled with the erosion of TK, threatens food security in Ethiopia. Both internal and external institutions often hold this valuable knowledge, further impeding farmers.

In addition, since capitalist influence is decentralized and influenced by the forces of the market, it is highly difficult to control or anticipate. The rapid technological innovation and quick changes in consumer demands can cause widespread economic conditions that challenge businesses, policymakers, and the status of individuals.

The rise of capitalism has led to the replacement of old ideas with new products, markets, and business models. While innovation drives progress and economic growth, it can also lead to epistemic violence by limiting access to knowledge and turning it into commodities. This volatility puts the economy at risk, leading to fluctuations in selling prices of financial assets, interest rates, and currency values. The global financial crisis of 2008 was a prime example of this instability.

Capitalism exacerbates social and political tensions, creating issues of inequality and disparity that can lead to social and political unrest. These disparities can challenge capitalist institutions and encourage the search for alternative solutions.

In summary, describing capitalism as a “curve ball” captures its complex nature, presenting opportunities, solutions, and challenges that are unpredictable and nonlinear. As capitalism strives for economic development and innovation, it is crucial to address these issues to ensure prosperity and well-being for all.

3.5. Beyond the Jungle's Law: Protecting Indigenous Knowledge in a Seed Zoo

Capitalism may not be immediately apparent, but it becomes apparent after it gains traction. The consequences are displayed based on expert.

> More profit means more wealth and power. As Marx says, capital is not just when you first take money and buy things, but when there is a need, an urge, or even an addiction to take the surplus value created through the production process and the gained profit and reinvest it. This initiates the circulation of capital, leading to a metabolic relation. (Harvey, 2020: 63)

Capitalism has evolved significantly since entering the seed market. According to the expert,

> Marx discusses pre-capitalism as a process emerging from independent relations and the gradual construction of a metabolic relation. This is similar to addiction, likened to opioids. Capitalists are now so engaged in seeking profit and reinvesting it to create even more value and surplus. This results in what Marx calls the spiral form, rather than simply the circulation process. In order to transition from a capitalist system to a socialist system, intervention in the metabolic relation is necessary. (Harvey, 2020: 68)

Capitalism is often compared to a jungle due to its focus on competition. Seed companies, driven by profit, fiercely compete to develop and sell their GMO seeds. This competitive pressure can lead to a focus on short-term gains rather than long-term sustainability. Additionally, it is associated with the principle of survival of the fittest; just as only the strongest survive in a jungle, only the most profitable companies thrive in a capitalist system. This can result in the marginalization of smaller seed companies and farmers who rely on traditional methods. Moreover, within a capitalist system, resources are exploited for maximum profit, which can lead to the exploitation of Ik and the patenting of seeds, restricting access for Ethiopian farmers.

On the other hand, control, artificiality, and commodification are prevalent in the capitalist sphere. Similarly, large corporations can control the seed market through patents and intellectual property rights. This control limits farmers' choices and can make them dependent on corporations for seeds. Furthermore, animals in a zoo often live in artificial environments that don't reflect their natural habitats. Similarly, GMO seeds may not be well-suited to the specific Ethiopian climate and soil conditions. Additionally, zoos often turn animals into commodities for entertainment. In the capitalist world of seeds, Ik and traditional seed varieties can be seen as commodities to be exploited rather than valued aspects of Ethiopian agriculture. In general, this metaphor argues that the promotion of GMO seeds in Ethiopia represents an extension of the capitalist jungle and zoo. Large corporations, driven by profit, enter the Ethiopian agricultural landscape like aggressive predators in a jungle, seeking to exploit resources and control the market. Ethiopian farmers, with their TK and seed varieties, risk being relegated to the margins, like animals in a zoo, unable to compete with the powerful corporations. This ultimately leads to epistemic violence, where the valuable knowledge and practices of Ethiopian farmers are devalued and replaced by corporate-controlled GMO seeds.

This metaphor effectively highlights the potential negative impacts of capitalism on Ethiopian agriculture and the importance of protecting IK. Pre-capitalist seed management can be imagined as a vibrant jungle where indigenous communities have nurtured diverse seed varieties for generations, adapted to local conditions, and freely shared knowledge. On the flip

side, the Seed Zoo represents the control and commodification of seeds under capitalism. This includes patenting (where corporations patent seeds, restricting access and control for farmers), standardization (focusing on a few high-yielding varieties, displacing diverse local varieties), and dependence (farmers become dependent on corporations for seeds and inputs).

3.6. Epistemic Violence in the Arena of Capitalism

Capitalism tends to turn knowledge into a commodity that can be bought and sold for financial gain. This often marginalizes other knowledge systems and reinforces dominant narratives favoured by those in power. For example, when multinational corporations control and patent plant genetic resources, traditional farming practices of seed sharing are eroded, along with IK systems (Shiva, 1997).

There is the issue of knowledge monopolization, under capitalism, powerful actors seek to monopolize knowledge and information for their own gain, potentially silencing other voices and limiting opportunities to encounter new knowledge. An example of this is corporate control of media, where news content may serve corporate interests, limiting the range of available information and contributing to epistemic inequalities (McChesney, 2004: 182).

In addition, knowledge extraction and exploitation. Capitalism not only exploits natural resources but also knowledge, often without proper compensation or credit. Pharmaceutical companies, for instance, engage in bioprospecting without consent or benefit-sharing agreements with indigenous communities, potentially exploiting their knowledge of plants with curative properties (Adams et al., 2003).

CHAPTER FOUR
4.CONCLUSION AND RECOMENDATIONS

4.1. Summary

The paper primarily focuses on the promotion of GM seeds in Ethiopia and how it should be informed by experts and farmers. It highlights Ethiopia's uncertainty about incorporating GMOs into their agriculture, that directs to violence and impasse the country. The paper also discusses the implications of implementing GM seeds, balancing enhanced farming efficiency with potential risks of socioeconomic disparities and environmental concerns. It touches on the impact of epistemic violence, where Western farming and science paradigms are imposed on Ethiopian farming practices, potentially affecting IK and self-determination. Furthermore, it addresses the themes of capitalism and the knowledge gap through GM seed, emphasizing the impacts of corporate giants and global capitalist structures on Ethiopian smallholder farmers. The paper concludes with policy implications and recommendations, advocating for inclusive and fair regulatory systems to direct GMO seed production, safeguard nature, comprehend indigenous farming systems, and ensure security.

As a researcher, consider that the widespread adoption of GM crops poses a significant threat to national security. The control of seeds is a powerful tool that can influence both individuals and entire nations. Protecting seed sovereignty is essential for protecting both human well-being and national security. So, the erosion of indigenous knowledge systems due to the influence of GM crops creates a dangerous disconnect. Returning to traditional practices becomes increasingly difficult over time. This disruption of indigenous knowledge can have far-reaching consequences for individuals, communities, and nations.

4.2. Call to Action for Addressing Epistemic Violence

Another way to resist the harmful impact of promoting GM seeds is to promote inclusion and dialogue. This can be achieved by involving a wide range of stakeholders, including farmers, non-farmers, scientists, policy-makers, and indigenous communities in the decision-making process regarding the adoption of GMOs. Additionally, it is important to increase transparency and provide access to information about GMO technologies, including both their benefits and risks, to enable local communities to make informed decisions. Furthermore, it's important to promote the recognition and integration of indigenous agricultural practices and knowledge systems in scientific research and policy formulation.

The traditional agricultural practices play a crucial role in ensuring the country's food security. However, there are concerns that the distribution of seeds in the future could be exploited to control population growth. Critics worry that organizations such as the Bill & Melinda Gates Foundation, (GMF[50]), which is primarily based in the Global North, might use seed access as a way to influence family size.[51] There is a fear that farmers with larger families could be denied access to seeds, raising concerns about potential population control. [52]

4.3. Call to Action Beyond GMO: Gene-editing and Seed Breeder Rights

Ethiopia continues to grapple with new issues related to gene-editing technologies and seed breeder rights that extend beyond GMOs, such as, CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) and, DGI (Dematerialized genetic information). It is important to establish strong regulatory authorities to oversee these novel gene-editing technologies to ensure their safe and equitable use. This should also involve protecting the IK rights of seed breeders and upholding the legal issues outlined in Ethiopian law, as well as adhering to international declarations such as, CBD. Therefore, any campaign to introduce GM seeds in Ethiopia should take into account various dimensions beyond just increasing crop productivity. It should also focus on preserving TK and socio-economic rights, as a commitment solely aimed at increased productivity may yield only minimal benefits. Before registering new varieties, it's crucial to acknowledge and respect the role of IK in seed conservation. IPRs (Intellectual property rights) are playing pivotal role in seed breeder right.

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[50] Bill and Melinda Gates on the 'single biggest determinant' of progress on the SDGs "Rapid population growth, particularly in Africa, represents the greatest threat to progress in reducing global poverty, according to the Bill & Melinda Gates Foundation, whose founders are calling for greater investments in human capital to transform the 'youth bulge' into a development opportunity…" (Cheney, 9/18).

[51] *Rapid population growth, especially in Africa, threatens progress on reducing poverty, Gates Foundation report says; Bill Gates comments on U.S. foreign aid, Mexico City policy*. (2018, September 18). KFF. https://www.kff.org/news-summary/rapid-population-growth-especially-in-africa-threatens-progress-on-reducing-poverty-gates-foundation-report-says-bill-gates-comments-on-u-s-foreign-aid-mexico-city-policy/

[52] Rapid population growth in some of Africa's poorest countries could put at risk future progress towards reducing global poverty and improving health, according to a report by the philanthropic foundation of Bill Gates. Demographic trends show a billion people have lifted themselves out of poverty in the past 20 years, the report found. But swiftly expanding populations, particularly in parts of Africa, could halt the decline in the number of extremely poor people in the world, and it may even start to rise.
"Population growth in Africa is a challenge," Gates told reporters in a telephone briefing about the report's findings. *Reuters.com*. (n.d.). reuters.com. https://www.reuters.com/article/idUSKCN1LY0HE/
https://www.weforum.org/agenda/2018/09/africas-rapid-population-growth-puts-poverty-progress-at-risk-says-gates/

Protecting breeders' rights, along with the necessary public interest clause described above, is essential to enable innovation, improve seed quality, and support sustainable agriculture.[53]

In general, Ethiopian farmers have historically played a crucial role in developing and preserving a wide variety of seeds. However, they have not formally registered or protected their intellectual property (IP) rights through patents or breeder's rights. This lack of formal recognition creates a situation where newcomers, like GMO companies, can register these seeds, potentially undermining Ethiopian farmers' knowledge and contributions to agriculture.

4.4. Policy Pathways: Guiding the Future

Policy Pathways could be an organization that advocates for specific policies related to GMOs. It might focus on regulations for GMO development and testing, labelling of GMO products, farmer access to and control over seeds, and environmental impact assessments of GMOs. In this regard, EPA influences how governments approach GMOs, potentially shaping legislation and regulations. However, policy pathways could be relevant to the conversation surrounding GMOs, shaping policy frameworks, facilitating public discourse, highlighting equity and justice, and promoting knowledge sharing and capacity building. By fostering epistemic freedom, we can contribute to overall national security.

Policy pathways also could organize forums, workshops, and educational materials to facilitate informed discussions about GMOs. These efforts may involve bringing together stakeholders such as scientists, farmers, consumers, and policymakers to openly discuss the potential benefits and risks of GMOs. By fostering open dialogue, they could help navigate the complex ethical, economic, and environmental issues surrounding GMOs. Additionally, policy pathways might advocate for policies that ensure fair access to the benefits of seed technology, addressing issues such as seed monopolies controlled by large corporations, the potential impact of GMOs on small-scale farmers, and the distribution of benefits between developed and developing countries. By focusing on equity, they could contribute to a more just and sustainable approach to GMO development and use.

Finally, knowledge sharing could help bridge the gap in understanding related to GMOs. For instance, it could facilitate the exchange of knowledge between scientists and farmers, support capacity-building programs in developing countries, and provide educational resources for the general public. By enhancing understanding, knowledge sharing could empower individuals to actively participate in policy discussions about GMOs ATA (Ethiopian Agricultural

[53] Organization and legal regimes governing seed markets and farmers' rights in Ethiopia, n.d.

Transformation Agency), EIAR (Ethiopian Institute of Agricultural Research), ESA (Ethiopian Seed Association), ESE (Ethiopian Seed Enterprise) are among the stakeholders. Regulatory bodies focused on policy development have the potential to play a crucial role in shaping regulations, fostering dialogue, promoting equity, and enhancing knowledge related to GMOs such as, EPA.

In addition, the policy implications call for a participatory approach to involve rural women and indigenous people with local knowledge in the decision-making process, ensuring dignity rights based on agriculture policies and fair distribution of gains from GMO adoption. It is recommended to employ a precautionary strategy by promoting rigorous scientific determination, socioeconomic assessment, and environmental repercussions to protect the public's best interests and biodiversity.

And so, the following policy recommendations are suggested. Firstly, prioritize farmer knowledge and participation. Then, develop participatory policy frameworks that actively involve farmers in decision-making processes related to GMO introduction. Next, support seed security and seed sovereignty are among the solutions. Therefore, implement policies that promote seed security and sovereignty, such as the EBI (Ethiopian biodiversity institute) and EBMIT (Ethiopia Bio and Emerging Technology Institute) efforts to conserve local crop varieties by supporting the development and preservation of local seed banks.

Additionally, encourage research into participatory plant breeding, such as initiatives by the International Institute for Rural Reconstruction programs that incorporate farmer knowledge, elaborating on the credo of the IIRR,

> "Go to the people, live among them, learn from them, plan with them, work with them. Start with what they know, build on what they have. Teach by showing, learn by doing. Not a showcase, but a pattern. Not odds and ends, but a system. Not piecemeal, but an integrated approach. Not to conform, but to transform. Not relief, but release." (Mission & history, 2022)

Furthermore, a lack of transparency and robust regulations for GMO development and testing can create uncertainty and distrust. Therefore, establish clear and transparent regulatory frameworks for GMO introduction, including rigorous independent assessments of the potential environmental and social impacts of GMOs. Also, advocate for mandatory labeling of GMO products to inform consumer choice, similar to existing labeling regulations in the European Union or proposed regulations in the United States.

Furthermore, the limited scientific experts and public understanding of GMOs can hinder informed decision-making. Therefore, there should be increased investment in research on the

long-term impacts of GMOs on Ethiopian ecosystems and agricultural practices. Additionally, it is important to support educational programs for farmers and the public about GMO technology, potential risks and benefits, and alternative agricultural methods (Drèze, J., & Sen, 1991).

By implementing these recommendations, policymakers can create a more equitable and sustainable approach to agricultural development in Ethiopia, one that respects farmers' knowledge, protects the land, and promotes informed decision-making about GMOs.

This paper emphasizes the need for transparent and equitable agricultural policies to combat the epistemic violence created by the capitalist system. These policies should be based on and responsive to smallholder farmers' needs, conserving biodiversity, and ensuring inclusive access to resources and markets.

Governments, through budget reforms and investment policies, should ensure that agricultural subsidy programs are aligned with financial incentives to support smallholder farmers engaged in sustainability, rather than favoring large agribusiness through subsidies.

Finally, Recognition and appreciation of IK are essential for addressing epistemic violence in capitalist societies. IK systems contain valuable information on sustainable agricultural practices, biodiversity conservation, and climate adaptation for sustainable development. Protecting IK is crucial for preserving local seed varieties; traditional seeds are often well-suited to local conditions and resistant to local pests and diseases. Also, seed sovereignty, or farmers' control over seeds, is crucial for food security and cultural preservation.

4.5. Future Directions for Research

It is necessary to conduct more research on how the adoption of GMOs has impacted smallholder farmers in the socio-economic context. Additionally, it is important to consider the bioethical issues related to the use of biotechnology and the effectiveness of policy paradigms in regulating the development and spread of GMOs. Furthermore, the study emphasize the importance of interdisciplinary collaboration and community engagement to encourage more inclusive agricultural development strategies aimed at improving research outcomes.

Finally, the Chile farmer have famous quote

> *"One should take pride in one's land and culture. There is a popular saying in Aymara: "They cut our branches, they burn our leaves, they pull out our trunks... but never could they overtake our roots." This was addressed to the Spaniards." Aymara yapuchiri of Chile*

Despite external pressures, Ethiopian farmers maintain a strong connection to their traditional agricultural practices. This resilience highlights the ongoing struggle against epistemic violence, which seeks to undermine and replace IK systems. Unresolved doubts and security measures shall be on the wings.

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Appendixes

I. **Guiding Interview question**

Interview guide questions

Questions Related to GMOs:

1. What are your thoughts on the use and promotion of genetically modified organisms in agriculture?
2. How does the adoption of GMOs affect the preservation of indigenous agricultural knowledge?
3. How can you understand the effects of GMOs on biodiversity and overall ecological balance?
4. How does the introduction of GMOs affect or disrupt existing agricultural knowledge systems in your field of expertise?

Questions Related to Epistemic Violence:

5. What are the roles of indigenous knowledge in implementing sustainable and culturally resonant agricultural practices?
6. Before the introduction of GMOs, what were the traditional knowledge and agricultural practices in your community??
7. How do you think that the introduction of genetically modified organisms affects the transmission of knowledge from generation to generation in the community??

Questions Related to the link between GMOs and Capitalism

8. What is the role of economic factors, such as market dynamics and profit motive, in promoting and adopting GMOs in our country?
9. Comment on any economic imbalances or changes observed in the agricultural sector related to the introduction of genetically modified organisms?

II. The participant of the interview includes:

Code of the informant	**Name of the institution**	**Location of interview**
Key informant 1, April16/2024	Ethiopian Seed Association	Addis Ababa
Key informant 2. April 26 2024	Expert, Seed system advisor and policy counselor	Addis Ababa
Key informant 3. May 13/2024 and 7/6/2024	Environmental Protection Authority	Addis Ababa
Key informant 4. June 07, 2024	Ethiopian Institute of Agricultural Research	Addis Ababa
Key informant 5, May 29, 2024, telephone interview	Farmer based on Jimma	Over the phone
Key informant 6, April 16, 2024	Ethiopian Institute of Agricultural Research	Addis Ababa
Key informant 7, April 26, 2024	Ethiopia Bio and Emerging Technology Institute	Addis Ababa
Key informant, 8. March 17, 2024	One Seed	Online Zoom call
Key informant 9. April 4/2024	Expert	Addis Ababa
Key informant 10, April 26/2024	Ministry of Agriculture	Addis Ababa

Declaration

This thesis titled, "**PROMOTION OF GENETICALLY MODIFIED SEEDS IN ETHIOPIA: EPISTEMIC VIOLENCE ON FARMERS AND THE LAND"** is a new contribution of mine. The sources of all the information utilized in the thesis are properly cited, and it has not been presented for a degree at any other institution.

Declared by:

Name of the student:_____

Signature:_____

Date of submission:_____

Approved by:

With my endorsement as a university adviser, this work has been submitted to Addis Ababa University's Institute for Peace and Security Studies (IPSS) for examination.

Name of Advisor:_____

Signature:_____

Date of submission: _____