



One Fruit – Many Issues: Perceptions of Environmental Challenges in the Global Banana Complex

GEO 511 Master's Thesis

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15.04.2026

Acknowledgments

Whenever I talk to people about the topic of my master's thesis and my studies of geography in general, I feel extremely privileged. I feel privileged to still be curious and interested after having spent over a year with the following thesis. I feel privileged to have acquired so many tools to critically assess the processes in our world. And I feel privileged to be able to study and live in Switzerland. This thesis would not have been feasible in this form without the support of many people.

I want to express gratitude to Prof. Dr. Christian Berndt, who supervised and supported the process of this study. Dear Christian, thank you in the first place for introducing me to economic geography at the University of Zurich and for drawing my interest to commodity chains and agriculture through several seminars and modules. During the work on this thesis in the last year, I am incredibly thankful for your expertise, encouragement as well as your critical remarks. I do not take it for granted that I always left our meetings with new insights and excitement. Thank you also to Soledad and the whole economic geography team at UZH for your inputs, knowledge and exchanges about the topic.

An enormous appreciation is dedicated to my interview partners for their valuable time and insights into their work. You have contributed the most important content for this thesis. It was extremely helpful to encounter your openness and learn about your opinions. Thank you – I guess – for introducing me to new levels of complexity of the banana industry with every interview. These findings would not have been possible without you.

Lastly, and certainly most importantly in the long run, I want to thank my friends and family for their emotional and financial support during my academic career and the work on this thesis. Thank you Eli, Sarah and Dominique for firstly providing me with food during tough times, as well as with food for thought while proofreading my thesis. I am very grateful!

Abstract

Bananas are among the most traded and consumed fruits globally, with cultivation taking place in the Global South and consumption in the Global North. The global banana trade roots in colonial history and is still affected by uneven development. This entails socio-economic as well as environmental challenges, such as the effects of climate change, spread of diseases or emissions in cultivation and transport. By examining the trade not as a straightforward supply chain but as a global banana complex in which historical, social and environmental relationships as well as their reciprocity are considered, this thesis explores the perception of environmental challenges by actors in the Global North. The data consists of interviews with representants of stakeholders in the Global North and a text corpus of reports and media articles. Through qualitative content and discourse analysis, the study finds that actors are aware of the intertwined challenges that affect banana cultivation and trade, however, the issues are merely considered urgent if trade, supply and thus competitiveness is affected. While many actors agree that the price of bananas does not reflect the true costs and is thus too low, the responsibility to increase prices is shifted along the actors within the complex by focusing on the price sensitivity of consumers as well as the need for governmental regulations. These perceptions of economically powerful actors in the global banana complex show the limitations to address issues with a long-term approach within an economic and market-driven system.

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1 The Root - Introduction

Bananas are only grown in the equator region of the world, but they are available in almost every country, in every supermarket on every day of the year. They are affordable and popular in every age group and for people with different economic prerequisites. International trade and globalization have made bananas indispensable in non-producing regions, the fruit is “among the most produced, traded and consumed fruits globally” (FAO, 2025a). Regarding cultivation, yield and produced calories, bananas belong to the top ten crops on the planet, and while a majority is produced for local consumption, 15% of global production is exported (Varma and Bebbber, 2019). For 2024, this equals 19.7 million tons of bananas (FAO, 2025b). Producing countries in tropical and subtropical regions are familiar with different varieties of bananas in all shapes, colors and tastes. This selection is inexistent on a global scale. Although there are over 1000 known varieties of bananas, practically all of global trade depends on the Cavendish variety (Voora *et al.*, 2023; Saladino, 2024), the yellow crescent which international supermarkets are accustomed to. According to Bebbber (2023), this dependency on one variety is due to economies of scale; it is easier and more cost-effective to manage monocultures and process identical fruits, as well as the Cavendish being relatively robust.

With banana trade being a large industry, the livelihoods of over 400 million people depend on banana plantation or trade (Grivat, 2019). Rural households in the Global South are reliant on bananas as an essential source of income, however, the World Banana Forum by the Food and Agriculture Organization of the United Nations (FAO) calls for action as significant environmental and social challenges arise due to the reliance on “agrochemicals in production and the decreasing prices for producers” (World Banana Forum, no date). Furthermore, monocultures and homogeneity of Cavendish varieties for global trade come with risks of susceptibility in an adapting environment (Saladino, 2024). A changing climate is predicted to affect banana cultivation and yield; and as the crop is crucial for subsistence and trade, it is “surprising how poorly represented bananas are in global assessments of climate change impacts on food and nutritional security” (Varma and Bebbber, 2019, p. 752). The cause and the impacts of climate change are unevenly distributed around the globe. The Global North with Europe and North America is accounted for 70% of carbon emissions since the mid 19th century, however the “worst effects of climate change will be felt in the global South” (MacKinnon and Cumbers, 2018, p. 335). Geographically, this results in a climate debt of the Global North to the Global South and the acknowledgment of responsibility, as not all regions are affected similarly (*ibid.*). Regarding the system from a planetary perspective, however, it is naturally all humans on the planet that are responsible for tackling issues collectively.

At the intersection of climate change, globalization and capitalism, several challenges for the international banana trade occur. As documentation of these issues is only starting to increase with urgency, actors working in the global banana trade perceive them differently. This thesis focuses on how these challenges concerning climate change are reported, how they intertwine as well as how they are perceived by actors within the global banana complex. A combined approach of content and discourse analysis of current debates and interviews aims to gain a

perspective through the lens of different actors in the Global North involved. Thus, I want to assess what the future of the global banana complex requires and how the challenges can be tackled. This is achieved by primarily discussing theoretical concepts applied in this study, such as the framework of uneven development. Moreover, banana trade is not a straightforward supply “chain” but influenced by several factors in different spheres. Therefore, the theoretical framework of the global banana complex is presented, followed by the unboxing of commodity chains as well as the planetary perspective. A next section provides an overview of historical developments, the current state of banana trade and its issues, followed by the elaboration of the methodology applied in this qualitative research. Subsequently, results and findings are discussed based on the research questions.

2 The Plantation - Conceptual Frameworks

Global trade and distribution of economic power is conceptualized in many fields. Through the lens of the following economic-geographic frameworks, this thesis will analyze the banana industry and the environmental issues within it. This chapter introduces the concept of uneven geographies, the global banana complex, a feminist lens on commodity chains as well as a planetary approach to frame global banana trade. These frameworks provide the ground for the analysis of the research questions which are presented at the end of the next chapter.

2.1 Uneven Geographies

Within the field of economic geography, the issue of uneven development is central, meaning that the economy develops unevenly across different regions, sectors or social groups (Smith, 2008). This entails significant differences in wealth, power and opportunity (ibid.). Geographically, uneven economic development refers to the uneven development of economies at different scales, from urban disparities to international differences. Christophers (2009) states numbers of employment rates, income levels or rates of economic growth as examples of uneven economic development. Indirectly, consequences of climatic changes that affect different areas of the world unevenly are an issue of uneven development (MacKinnon and Cumbers, 2018).

Human geography attributes these processes of inequality to the capitalist mode of production and thus critically assesses whether economic growth and development are always desirable, as negative consequences are observed to originate with uneven growth patterns (Christophers, 2009). Uneven development is predicted to persist an issue for as long as “the world economy remains largely a capitalist world economy” (Christophers, 2009, p. 17). The banana trade, occurring in a capitalist world economy, is a paradigm for uneven development as it combines uneven distribution of power, wealth and climate change exposition. Modernization theory (Christophers, 2009) would suggest banana-exporting countries to follow the development path of countries in the Global North through integration into global markets, which should foster economic ‘takeoff’. However, economic geography critically contradicts this assumption with two theories of dependency and unequal exchange. Banana trade in countries of the Global North is structurally linked to “underdevelopment” in countries in the Global South (peripheral producer countries). The Global North depends on low-cost banana production abroad and maintains this dependency with trade rules, corporate power and pricing structures. Thus, producing countries remain dependent. Trade furthermore reproduces uneven development through unequal exchange, as low labor costs and weak economic agency and power in producing regions result in value that is generated for multinational companies and retailers in the Global North. Bair and Werner (2011) explore the reproduction of uneven development within global capitalism by applying a ‘disarticulation’ perspective on commodity chains. Rather than assess commodity chains and its connections as motors, it is also important to analyze patterns of inclusion and exclusion that allow for commodity chains to evolve in an unequal world (Bair and Werner, 2011). With the discussed theory of uneven development in

economic geography and its subsequent processes, this thesis aims to explore the global banana trade through the perspective of a global banana complex rather than a chain.

In addition to uneven development, this thesis applies the framework of Global North and Global South, a concept for the analysis of prosperity and international power distribution (Kenny, 2025). Regarding the global banana complex, the framework of the Global North and the Global South help to differentiate the actors. Most exporting countries belong to the Global South, “a term that refers to developing countries located mostly in the southern hemisphere, with generally low income levels and facing different structural problems”, whereas the importing countries are often situated in the Global North, which refers to “developed countries concentrated in the northern hemisphere, characterized by high levels of income, technological advancement, well-developed infrastructure, and macroeconomic and political stability” (Kowalski, 2021, p. 1). Although the framework is criticized for vagueness, simplification or the reinforcement of unequal power relations (Tavares, 2025), it is suitable for the analysis in this thesis as an expression of uneven development. The Global North is reported to be responsible for a majority of emissions leading to climate change and global warming, which most severely impacts countries in the Global South (MacKinnon and Cumbers, 2018; Hadžić, 2024).

2.2 Global Banana Complex

The word supply or commodity “chain” implies that the commodification of a product is easy to trace and analyze, as well as steps and relation between the actors are simple.

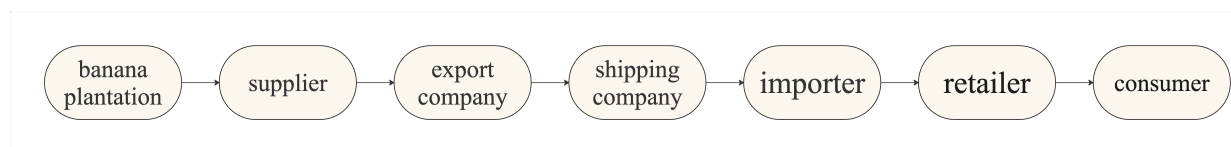


Figure 3: Visualization of a linear/traceable commodity chain of bananas (visualized with miro.com)

However, the global banana trade is not a “linear progression from producer to consumer” but rather a “dense, tangled food web” (Fajardo, 2019). In fact, the banana industry and trade are an entanglement of many involved parties. This thesis aims to approach the banana trade similarly to how Werner, Berndt and Mansfield (2022) emphasize the complex interplay of economic, social and environmental dimensions in the case of the pesticide glyphosate. They examine “glyphosate as a socionatural assemblage understood as a (spatial) arrangement of heterogeneous elements that entangle chemical substances, production technologies, agrochemical companies, and corporate strategies with crops, seed science, state regulation, and agricultural production methods” (p. 21). The global banana trade is likewise an assemblage or entanglement of economic, environmental and social actors, historical developments, human-nature relationship as well as state and trade regulations that all accrue in a capitalist framework (figure 2 is an attempt to visualize these actors and dynamics that are all intertwined, however the graph does not claim to be exhaustive). Maselkowski and Olenius (2014)

demonstrate this interconnectedness of different spheres and different actors well in their analysis of governance within the industry:

“The global banana trade is shaped by a large range of actors and stakeholders: plantation workers, farm owners, service suppliers, traders, wholesalers, retailers, consumer, state government, ministries, NGOs, labelling and certification companies or supranational regulatory bodies. Governance of global affairs is therefore present on very different levels: corporate, sectorial, collective, institutional etc. The stakeholders are embedded not just on a regional level but further in the wider production network in which power configuration constitutes a crucial part, and processes as well as relations can be rather complex.” (p. 12)



Figure 4: Visualization of the Global Banana Complex with stakeholders, spheres and frames which stand in reciprocal relations with each other (no claim to completeness, visualized with miro.com)

Due to these complex entanglements and intransparency, this thesis analyzes not the global commodity chain but the *global banana complex* following the concept of the “global pesticide complex” that takes into account the importance to analyze the reciprocal relationships among

actors within the entangled complex (Mansfield *et al.*, 2024). The framework of the global banana complex as well as the following frameworks will help me to analyze the findings in the data and categorize them theoretically. They set a frame of current theories in academic literature around global commodity chains and a critical self-reflection of the subject of economic geography.

2.3 A Feminist Approach: Unboxing Commodity Chains

By approaching commodity chains with a feminist framework, Collins (2013) supports the view of a complex rather than a straightforward chain. She chooses this approach to “overcome closed boxes” of commodity chains and therefore analyzes underlying and invisible dynamics and spheres within trade. The path of a commodity only seems linear from an economic logic and economic models became “mainstream” to assess commodity chains in the early 2000s, however they ignore several entanglements such as historical influence or social inequalities (Collins, 2013). As the assessment of commodity chains had been dominated by neoclassical economics, a more critical view and challenging perspectives are difficult to imagine (*ibid.*).

Commodities, according to Collins (2013), veil the social relations that are part of the commodities’ production and circulation, essentially its coming to life. By cracking open these boxes of social relations, research can retrieve important factors that are concealed in “neoclassical economics [...]: living, breathing, gendered, and raced bodies working under social relations that exploit them, bodies living in households with persons who depend on them and on whom they depend; and bodies who enter into the work of making a living with liveliness, creativity, and skill” (p. 27).

A feminist lens on global commodity chains thus offers new possibilities for visualizing these invisible relations and “for tracking global connections” (Collins, 2013, p. 36). While production and consumption of commodities are spatially distant, the consumption of bananas in the Global North has direct consequences for people in the Global South. These connections only become visible when commodity chains are analyzed as an interplay of relations, people and power. Collins’ approach can uncover the complex interactions of waged work as well as the social reproduction of labor. Historical evolutions and the formation of power relations and hegemony in the world-economy are also included in a feminist analysis of commodity chains, as the flow of commodities has created “dimensions of inequality” (Collins, 2013, p. 29).

The scholar describes four ways in which critical feminist analyses of commodity chains can uncover more than economic numbers and statistics (Collins, 2013). Firstly, by regarding waged work not as a cost, but as a complex social relationship, formed by the art of labor, how the workplace is controlled and how gendered and ethnic social relations are formed by the demand for waged work. Additionally, social reproduction can be made visible in the form of what is involved to propagate humans as labor force, either as unpaid domestic work or through producing commodities necessary for production. More importantly for the global banana complex regarding environmental challenges, a feminist commodity chain analysis emphasizes the role and exploitation of nature and resources that are not considered in economic analyses.

Thus, they ignore the costs of “pollution of rivers and streams, the clear- cutting of forests, the creation of urban brownfields, and the extinction of species” (Collins, 2013, p. 35). However, feminist commodity chain research explores these costs and values of natural resources that are not infinitely available. The approach finally offers further perspectives to trace global connections. This means, including social and cultural relations that influence the path of a commodity in different ways. In conclusion, feminist analyses of a commodity acknowledges said commodity chain not as a “thing”, but a “fiction, a mnemonic device, and a rubric for organizing complex information” (Collins, 2013, p. 36). They include spheres, historical influences and social connections that are usually ignored in economic analyses of commodity chains. The framework of a global banana complex rather than straightforward commodity chains welcomes a feminist analysis of the systems and connections working within it. This thesis will combine this perspective with a complementary one: the planetary approach.

2.4 A Planetary Approach

Global commodity chains and trade complexes have driven globalization and vice versa. However, the concept of globalization or the way it is understood set boundaries to understanding the current and future challenges that we are facing. Verne, Marquardt and Ouma (2025) focus on an approach further than globalization (a human-made “political, capitalist, technocratic system”) to assess what “the planetary” is and how it relates to the global. They understand the planetary as a concept that exceeds globalization by focusing on the interconnectedness of ecological reflexivity and the urge for a reconstruction of the understanding of humanity’s relationship with the planet Earth and all its forms of life. Scholars are requested to “embrace a perspective where global environmental questions, ‘the economy’ and historically constituted racialized and gendered hierarchies that facilitate particular patterns of human- and non-human exploitation at a planetary scale are at the center of attention“ (Verne, Marquardt and Ouma, 2025, p. 10).

Stefan Ouma critically reflects on the field of economic geography and how its research has been shaped. Within that, the importance of acknowledging the planetary footprint of capitalism is stressed, as well as regarding the “plantation as a transhistorical formation, and the plantationocene as a geological epoch” (Verne, Marquardt and Ouma, 2025, p. 9). A multi-perspective approach is called for, where the logic of plantations is deconstructed as well as the voices of the subaltern are heard (Verne, Marquardt and Ouma, 2025). Through these perspectives, systems or economies beyond capitalism can be imagined and made use of. On the topic of banana trade, this critical self-reflection of economic geography stresses that issues which arise within the global banana complex cannot be separated from the planetary context they occur in. Socio-economic and environmental perspectives should thus be assessed as interplays rather than separate issues. Rural areas can be regarded as spaces of conflicts of these challenges, but also as “a place of the imagination and practice of alternative futures” (Verne, Marquardt and Ouma, 2025, p. 7). My thesis will contribute to this imagination of alternative futures through understanding the current interconnectedness of challenges within the global banana complex.

An important contribution to the discussion of the planetary and the global stems from Dipesh Chakrabarty. In his book *The Climate of History in a Planetary Age*, he calls for a new political thinking in the Anthropocene (Chakrabarty, 2021; Vatter, 2024). He opposes ‘the globe’ to ‘the planet’, the former being formed by humans and globalization processes that exclude the earth systems as agents, and the latter decentering the human and including planetary processes. Climate change crises and global warming depict that capitalist systems cannot be disconnected from the environment in which they act. He also acknowledges, however, that society has only known the ‘global view’ and is thus used to capitalist practices. Referring to the global and the planetary perspectives, Vatter (2024) summarizes Chakrabarty’s ideas as follows:

“In this context, Chakrabarty makes an interesting division between ‘one-worlders’ who are called into action by the climate change crisis and hold on to the oneness of humanity and ‘post-colonials’ who instead focus on what divides humanities into hierarchies of domination: race, sexuality, ethnicity, ‘politics of difference’. For Chakrabarty, the former actors are operating with a planetary vision, while the latter retain the global one. But his point in the book is that there is a need to find a discourse that can articulate both perspectives.” (p. 381)

Furthermore, Chakrabarty (2021) discusses how the current global economic and environmental systems have been and still are structured by colonialism. Thus, the environmental impact that the global economy has on the planet is also influenced by colonialism. Regarding climate change challenges, these must be examined from a planetary perspective and not from global perspectives with local and national borders. In terms of the global banana complex and its challenges, Chakrabarty’s arguments provide ground for analyses. The interconnectedness of human and environmental systems in the banana trade reveals how it is affected by climate change, deforestation and agricultural practices. These challenges are not local, but ought to be regarded from a planetary perspective. Thus, vulnerable areas that contribute to climate change but are also affected by it must be included in the planetary picture. As a reimagining of capitalist processes within the global banana complex is difficult, an approach to tackle the issues is to internalize the environmental costs of banana production. Further approaches where the planetary can be engaged with are discussed in this study.

Overall, these theoretical frameworks provide the conceptual basis to answer the research questions and analyze the empirical data. They enable a broader perspective on the global banana complex by combining different viewpoints and analyzing actors’ perceptions within wider socio-economic and environmental relations. The selected frameworks assist the thesis in a human-geographical and critical engagement with the global banana complex as well as the actors’ attitudes towards environmental challenges within a capitalist system. The following chapter intends to provide information and discuss academic literature on the current state of research in the banana industry.

3 The Soil – State of Research

3.1 History Repeats Itself – How Bananas Became a Global Commodity

Evidence of domestication of ancestral plants of bananas dates back to the Holocene, around 7000 years ago in the regions of today's India to southern China (Bebber, 2023). Archeological findings suggest that bananas were cultivated in Africa around 2700 years ago, and it is believed that the plant had arrived in Latin America before the conquest of the Europeans (ibid.). However, to understand the current state of banana production and trade in a globalized world, a comprehension of the last 150 years is of higher importance than the biological and geographical expansion of the fruit before the 19th century. The history of global banana trade is one of economic power dynamics and dates back to the late 19th and early 20th century during which countries in Latin America were systematically exploited by transnational corporations (Bebber, 2023)¹. Technical advances, the spread and the globalization of agriculture resulted in the drastic decrease of diversity of food consumption, with nowadays 80 percent of our calorie input stemming from only twelve different species (Dunn, 2017). Acres by acres have been created to feed the growing population, which has simplified the landscape and led to a bigger surface of acres than wild grassland on the planet (ibid.).

Commercial trade of bananas started to organize around the year 1870 and was closely connected with the transportation industry (Abbott, 2009). In countries like Costa Rica, Guatemala, Colombia and Honduras, the construction of railways and of banana plantations developed simultaneously, as railways provided support to deliver bananas to the ports (ibid.). Furthermore, efficient shipping as well as cooling was of importance and thus developed over time for the fruit not to rot during transport. Before the turn of the century, many different individuals or firms imported bananas to the United States of America, however in 1899, a merger of smaller companies led to the incorporation of the United Fruit Company (today known as Chiquita Brands International) (Abbott, 2009). The new company not only owned many acres of land in several countries (including banana production), but also railroads and ships (Abbott, 2009). Due to its rapid growth and domination of the world trade of bananas at the turn of the century, United Fruit Company is considered one of the most important players within the development of global banana trade (Abbott, 2009). Its economic success is attributed to strategic vertical integration (more than other competitors):

“The economics of the trade required close coordination of production, harvesting, transport to port and shipping, marketing and distribution within the target market; and where these successive phases were under the same ownership, or owned by associates and subsidiaries that could be tightly controlled, success was ensured” (Abbott, 2009, p. 9).

¹ The podcast “There will Be Bananas” by NPR provides insights on the historical geopolitical development around banana trade and is thus recommended: <https://www.npr.org/2020/01/07/794302086/there-will-be-bananas>

The industry furthermore profited politically: from absent interference of governments of the banana producing countries. While large parts of land and jungle had to be cleared, labor imported or exploited as well as whole ‘enclaves’ built around banana plantations, the governments often “chose not to exercise [their] sovereign powers [...] to let the banana economy flourish” (Abbott, 2009, p. 10).

Other important banana trading companies next to the United Fruit Company were the Standard Fruit & Steamship Company (today known as Dole Food Company), the Del Monte Corporation (today: Fresh Del Monte Produce) as well as the Fyffes Group (today: Fyffes) (Abbott, 2009). Until the 1980s, these companies controlled at least 70% of the global banana trade (Kessler and Hermann, 2019; Banana Link, no date). This is due to their vertical integration and thus involvement in production, sourcing, transport, sale as well as marketing (Kessler and Hermann, 2019). However, their market share declined throughout the years as they withdrew from production and focus mainly on logistics today, it nowadays forms around 40% (Kessler and Hermann, 2019; Kohli and Paganini, 2020). Since 2009, the market leader Chiquita’s European headquarters is based in Switzerland (Kohli and Paganini, 2020). Within the global banana market, the share of powerful players has been filled with other companies, including major supermarket chains in the European Union and the United States “due to their dominance in the retail segment and the fact that they increasingly source from smaller wholesalers or directly from growers” (Kessler and Hermann, 2019, p. 464).

With the expansion of global banana trade, one variety became popular for export: the Gros Michel. Not only since the consumers enjoyed the flavor and aroma, but also due to logistical reasons. Gros Michel bananas had thick skin that did not bruise as easily as others and it took a longer period to ripe, which made it practical to ship and not overripe or rot on the journey. Furthermore, the variety produced high “bunch counts”, meaning that one bunch produced a high number of “hands” (fruits) and was thus efficient for trade. The dependence on the Gros Michel variety would however become fatal for the industry. (Soluri, 2005)

Dunn (2017) reports that the Gros Michel bananas were the most productive plants to exist, but while large sums of money were gained and invested in trade and logistics of the fruit, nearly no attention was given to the biological understanding of banana plants. It was simple to reproduce the Gros Michel as clones of each other by replanting cuttings from other plants. This resulted in all bananas that were grown in Latin America and produced for export being genetically identical to each other. While this was practical and efficient for trade, the plants were extremely susceptible to pathogens. Scientists had warned about the susceptibility of the Gros Michel clones on monocultures, as pathogens that would attack one banana plant could wipe out all of them due to their genetical identity. They promoted planting a diversity of varieties to be more resilient to diseases, however, the industry focused on efficiency rather than resilience. This facilitated a pathogen to spread across many banana plantations; the Panama disease (or Fusarium wilt, explanation see below). It was first documented in 1890 and wiped out nearly all Gros Michel banana plantations in the following 60 years. Soils that were affected by the disease would not be able to grow Gros Michel clones for decades. Banana companies were forced to react to the pathogen and found another variety called Cavendish (the banana the global trade nowadays is used to). Although it was different in taste and optics, it

was the only variety resistant to the pathogen, meaning that it could be planted in soils that were affected by the Panama disease that killed the Gros Michel crops. An advertisement campaign that underlined the benefits of the banana supported the acceptance of the Cavendish banana in the importing countries. After 1950, the Gros Michel banana was fully replaced by the Cavendish variety on the same or larger monocultures as before. For the industry, it subsequently proved to be an efficient plant for plantation, trade and profit. However, as the Cavendish banana plants – like their predecessor Gros Michel - are all genetically identical as well, they are also susceptible to other pathogens. A new strain of Panama disease (or TR4², see below) developed, one that can eliminate Cavendish plants and is spreading across banana plantations worldwide. (Dunn, 2017)

Figure 3: Pathogens in Banana Plantations

This study focuses on attitudes towards challenges in banana trade, of which diseases are an integral part. Thus, a brief explanation of pests and diseases is of importance, however the detailed biology of the plants and the pathogens are omitted³.

All crops are susceptible to pathogens and diseases. Banana plantations, especially monocultures relying on clones of a variety (nowadays Cavendish), are particularly susceptible and vulnerable to diseases and changes of the environment (Drenth and Kema, 2021; Zeng *et al.*, 2026). The challenges are twofold; there are diverse causes for diseases such as fungi, bacteria, viruses and animal pests. Secondly, the impact of diseases like Fusarium wilt or Panama disease can eliminate entire plantations and disrupt global supply chains (Zeng *et al.*, 2026). Although over 180 banana diseases are known, the two most discussed are Fusarium wilt and Black Sigatoka (Hemmes, 2025; Zeng *et al.*, 2026). Fusarium wilt or Panama disease is caused by “Fusarium oxysporum f. sp. cubense race 1 (Foc R1) and tropical race 4 (Foc TR4)” (Zeng *et al.*, 2026, p. 63). Foc R1 destroyed the Gros Michel crops until the 1950s and is also referred to as TR1, as the new variant tropical race 4 (TR4) affects the Cavendish crops (Dunn, 2017). Sigatoka (black or yellow) is caused by a fungus and causes damage among the plants, however, it can be largely controlled by the spraying of fungicides (Zorrilla-Fontanesi *et al.*, 2020; Zeng *et al.*, 2026). Fusarium wilt, on the other side, cannot be controlled by pesticides, only by sterilizing the soil, which destroys the soil microbiome and is too expensive (Zorrilla-Fontanesi *et al.*, 2020). It leads to root decay and foliage wilt that affects the soil for decades (Dunn, 2017; Zeng *et al.*, 2026). Although several advances like treatments, crop rotation, intercropping, biocontrol strategies or breeding for disease resistance have been experimented with, there are limitations in implementation “in terms of cost-effectiveness and impact constrain their utility in effectively mitigating the scourge of Fusarium wilt across extensive banana plantations” (Zeng *et al.*, 2026, p. 63). As of the beginning of 2026, there is no antidote to TR4 or Panama disease.

² “Fungus Fusarium oxysporum f. sp. cubense tropical race 4 (Foc TR4)“ is „[a] deadly strain that causes Fusarium wilt of banana“ (Zorrilla-Fontanesi *et al.*, 2020, p. 599).

³ For more information on biological details see Blomme *et al.* (2017); Zorrilla-Fontanesi *et al.* (2020) or Zeng *et al.* (2026).

3.2 Production and Markets – Current Numbers

Bananas are the most exported fruit on the planet, its trade worth being estimated at around fifteen billion US dollars (OEC, 2025). They are cultivated on monocultures of various sizes, mostly in tropical and sub-tropical regions (Kessler and Hermann, 2019). Global consumption and thus production of banana has increased in the last decades and reached a total of 139.3 million tons in 2023 (FAO, 2026a). The average yield gain of banana plantations has additionally increased to nearly double the gain of fifty years ago and it has been largely attributed to efficient monocultures (Zorrilla-Fontanesi *et al.*, 2020). In some countries, however, climatic changes led to yield increase as well (ibid.), however, climate change predominantly predicts challenges for current and future banana production, which this thesis will explore. Only a small amount of the bananas is traded globally. The majority of bananas are produced for local consumption, with the largest producing countries being India, China, Indonesia, Nigeria and Ecuador (FAO, 2026a). Within these domestic markets, the fruit is important for food security, nutrition and reducing poverty (Blomme *et al.*, 2017; Sethuramanujam and Fernandez Cedi, 2025). In India, the acreage of banana plantation as well as production has increased in the last decades, and the country produces around 38 million tons annually (MUKUL, 2024)⁴. Around 50% of the market share in India are native banana varieties and the Cavendish variety is expanding rapidly (ibid.). Of the 15% of globally produced bananas being exported, Ecuador is the leading country with over six million tons of bananas annually, followed by the Philippines, Costa Rica, Guatemala and Colombia (FAO, 2025c, 2026a). These nations account to nearly 80% of the global export (ibid.) Asia, primarily the Philippines, exports around 15% and “the rest by growers from African countries, which can be seen as emerging competitors for producers from Latin America” (Kessler and Hermann, 2019, p. 464).

The European Union (EU) accounts for the majority of banana imports (around 30%), followed by the United States of America, China, the Russian Federation and Japan (Kessler and Hermann, 2019; FAO, 2026a). Past decades have been shaped by trade agreements between the EU and Caribbean countries leading to the EU reducing import tariffs and maximum rates (Kessler and Hermann, 2019)⁵. Countries in the EU and the Global North constitute significant markets for producers, exporters and retailers, e.g. in Germany, bananas follow apples on the ranking of most consumed fruits (Kessler and Hermann, 2019). Although representing a smaller market, the consumption of bananas in Switzerland is also high, making them the most imported exotic fruit. In 2022, bananas made up 40% of the imported fruits (Pelosi, 2023). In 2024, Switzerland imported 105’557 tons of bananas or around 11.7 kg per capita, which is around 17% more than 10 years ago (FAO, 2021; BAZG, 2025). The Swiss market is primarily supplied by bananas from Latin America. In 2024, nearly two thirds of the total quantity was

⁴ References in capital letters indicate sources (media articles and reports) used in the text corpus for the data analysis of this study, predominantly in chapter 5 where results are discussed

⁵ See Kessler and Hermann (2019): “Dating back to 1992, a series of disputes in the World Trade Organization was concluded in November 2012 when the Geneva Agreement on Trade in Bananas was signed. It was negotiated in 2009 between the EU and Latin American banana producers. The agreement resulted in the adoption of new commitments on MFN1 tariffs on bananas by the EU” (p.465).

imported from the two countries Ecuador (35%) and Colombia (28.8%) (BAZG, 2025). Panama (12.3%) and Peru (8%) are also important supplier countries for Switzerland (ibid.).

While bananas are consumed in vast quantities worldwide and constitute one of the most important globally traded fruits, only a minority of consumers are aware of the far-reaching consequences associated with their production. In particular, the social and environmental costs of banana cultivation - most notably its negative effects on farmers' livelihoods and local ecosystems - remain largely invisible to end consumers (Kessler and Hermann, 2019). Although various political initiatives and economic agreements entailed progress in addressing these challenges, significant social and environmental problems persist, especially in banana-exporting countries in the Global South (ibid.). The following sections therefore engage more closely with these unresolved issues, after first outlining the contemporary global complex of banana production and trade and the key actors involved.

3.3 Follow the Banana

Although bananas may seem to be a fresh product with a straight-forward commodity chain from plantation to supermarket, the fruit resembles more a manufactured product due to complex steps within this chain. Moreover, the global banana trade involves many different actors and stakeholders that engage in a market sphere dictated by capitalist rules but also national and international agreements, which a straightforward chain does not do justice to, it is rather a global complex (as discussed in section 2.2). The bananas exported, however, are grown in different regions of the world than they are consumed in. This section follows the commodity path (which takes place within the global banana complex) and the involved actors the fruits encounter between farm and consumer.

The post-harvest commodification (which takes around two to three weeks from plantation to shelf) includes various processes, chemicals and transportation (Sheffi, 2023). These processes are dictated by the requirement of “freshness” and quality standards, which are maintained throughout the commodification (Evans *et al.*, 2022). As discussed above, most fruit produced for international trade is grown in Latin America. The majority (around 80%) of bananas from this region are produced on large plantations, while around 15'000 smallholder farmers in Ecuador, the Philippines, Colombia, Peru and the Dominican Republic export to the global market (Maselkowski and Olenius, 2014; Voora *et al.*, 2023). Temperatures between 15-35°C, a high humidity of 75-85% and sufficient water in the soil, as well as fertile soils with good drainage are optimal for the growing of bananas (Elsayed, 2025; Kramer and Ware, 2025; Banana Link, no date). Often mistaken for trees or palms, banana plants belong to the classification of herbs, take nine to twelve months from sowing to harvesting and are planted and harvested continuously without a particular growing season (Banana Link, no date). If harvested for export, the plants are cut off at 75-80% maturity, “allowing them to withstand a three-week journey” (Elsayed, 2025, p. 90).

Workers on plantations cut down bananas, wash and pack them into boxes while they are still green. They are shipped and stored in refrigerated containers at 13.6°C to pause the ripening

process (Evans *et al.*, 2022). Arriving at a port, they undergo quality control, as Evans *et al.* (2022) describes the situation at a port in the South of England:

“A sample of these are selected for quality control and quality assurance exercises where their colour is visually assessed against a chart, their girth is measured using banana callipers, their length with a tape measure, and their temperature with a probe.” (p. 465)

Still refrigerated, the boxes are transported to ripening facilities. The actual ripening of the fruit, shortly before it is transported to the shelves in the supermarket, presents itself as more of a technical than a natural process. Ethylene gas is injected in the ripening rooms, leading to a controlled and monitored ripening of the right amount of bananas required (Evans *et al.*, 2022; Sheffi, 2023; Voora *et al.*, 2023). All these steps of the commodity chain involve many different resources in the form of labor, material inputs, equipment and knowledge. While efficient processes have been developed in the commodity path of bananas, the global production entails high postharvest losses between 20 to 50% due to “mechanical injuries, inappropriate ripening processes, unsuitable storage conditions, and postharvest pathogens” (Elsayed, 2025, p. 88). Although the process from plantation to supermarket has been designed efficiently, bananas are one of the products with a high contribution to food waste, either during transport or at retail and consumer level (Sethuramanujam and Fernandez Cedi, 2025).

A study calculated the carbon footprint of an Ecuadorian banana consumed in Spain to be 1.28 tons of CO₂ per ton of banana (Roibás, Elbehri and Hospido, 2016). They state the farming stage to be the highest contributor to emissions due to fertilization practices. Other scholars furthermore state that besides emission-intense farming, the transport on refrigerated ships can equal up to two thirds of the total emissions of a banana (Reay, 2019).

3.4 Power Imbalance in Banana Trade

While historically the market situation of a few transnational companies owning most of the market share was a classic oligopoly, the distribution of power has broadened in the last years. The market share of Chiquita and its competitors decreased, and the gap and economic power has shifted towards the retailers. The banana industry and commodity chain transformed from a producer-driven to a buyer-driven chain, in which retailers and supermarkets “dominat[e] the market and the price structure” (Morazán, 2010, p. 14). This switch arose due to the liberalization of the EU market leading to a higher supply than demand from transnational companies, which gave retailers more choice and thus power (Maselkowski and Olenius, 2014). They are now considered the most important players as they connect the producers of bananas to the consumers and define the prices, and this gatekeeping role is a powerful one (Kessler and Hermann, 2019). As bananas are a popular commodity in supermarkets and thus sold in large quantities, they entail large turnovers and expected profit (*ibid.*). These profits stem from the quantity of sales, as the prices for bananas remain low. By dictating these low prices, retailers ensure customers to choose their products, and simultaneously put pressure on the whole commodity chain, especially farmers and workers (*ibid.*). Different studies and reports illustrate that only around 1-6% of the retail price reaches the plantation workers, while the majority goes

to the supermarket (Humbert, 2014; Maselkowski and Olenius, 2014). Furthermore, banana prices have remained low in recent years, while other products became more expensive. In the UK for example, prices in real terms for coffee, apples or bread slightly increased in the last 30 years, while banana retail prices declined (Bebber, 2023). This puts producers under even more pressure, as their costs of living and for production have increased in the last years due to standards and certifications, application of fertilizers or pesticides, fuel or irrigation (Kessler and Hermann, 2019). Supermarkets are observed to remain prices low to attract price sensitive costumers and remain competitive, while partially even compensating the low banana prices with the margins of other products like bread, eggs, milk or sugar (Maselkowski and Olenius, 2014; Kessler and Hermann, 2019). The powerful position of supermarkets shifts the social and environmental responsibility to consumers, who are often unaware of the consequences of the products they buy. Thus, calls for governmental guidelines and national obligations are made, as there is a governance and participation gap within the industry, where especially actors in the exporting countries are in weak positions (Maselkowski and Olenius, 2014; Kessler and Hermann, 2019). The imbalance of power between the Global North and the Global South is prominent in the banana trade. Additionally, external environmental costs are not reflected in the retail price of bananas. There remain challenges on several social, environmental and economic levels within the banana industry, which will be addressed in the following chapter.

3.5 Challenges in the Banana Industry

As bananas are one of the world's most consumed fruit and its production involves many people, there is necessity for a socially and economically sustainable production. The commodification of bananas has been a topic of academic research in different fields for a long time. Geography, bioscience, agricultural studies as well as economic research have analyzed the complex interplays of human and nature under capitalist regulations. Prior to analyzing the data collected for this thesis and how actors perceive environmental challenges, this section focuses on what challenges scholars in academic literature discuss. This thesis emphasizes the environmental challenges within the banana industry, yet these cannot be regarded fully separately to socio-economic challenges since they interconnect in different aspects. The following section outlines selected issues that are widely discussed and therefore considered the most urgent, without claiming to be exhaustive.

Within the supply complex of bananas, environmental, socio-economic and distribution of power challenges are reported (Kohli and Paganini, 2020; Castro Vargas, 2023; Varma *et al.*, 2025; FAO, 2025a). From an industry point of view, these include “increasingly erratic and adverse weather conditions, rising costs of production, tight producer margins, and the spread of plant pests and diseases” (Varma *et al.*, 2025; FAO, 2025a). The (FAO, 2026b) states the factors affecting banana trade in the first nine months of 2025 as the following:

- *“Substantially higher supplies from some key producing countries, importantly Colombia and the Philippines.*

- *Production shortages caused by adverse weather conditions in several other supplying countries. Losses and additional costs stemming from the spread of plant diseases, importantly the Banana Fusarium Wilt Tropical Race 4.*
- *Low profitability for producers amid high production costs and limited trickle down of price rises along the value chain.*
- *Surging import demand from China, driven by lower domestic production.*
- *Fast growth in imports by the Russian Federation, following several years of lower quantities.*
- *Declining import demand in the United States of America on the back of rising unit values and prices at import, wholesale and retail level” (p. vi)*

The market-oriented industry point of view, however, is only one perspective within the supply complex of bananas. Socio-economic issues such as wage dumping on plantations, health problems due to contact with chemicals as well as environmental issues like contamination of ground water have raised concern for decades (Soluri, 2005; Kohli and Paganini, 2020; Castro Vargas, 2023). Kessler and Hermann (2019) summarize reoccurring social, economic and environmental problems in their chapter about sustainability in the banana sector, which are presented here as a primary overview, while selected issues are discussed in more detail below:

Table 1: Variety of Challenges in Banana Industry (adapted from Kessler and Hermann (2019, p. 467))

Social Challenges	Economic Challenges	Environmental Challenges
○ Insufficient salary for livelihood of workers ○ Minimum wages are underscored by unpaid overtime ○ Discrimination of migrant workers and women ○ Pressure against forming and organizing in trade unions	○ Lack of transparency of cost distribution along supply chain, due to amount of stakeholders ○ Retailers’ control of the market, their power and influence on the entire value chain	○ Susceptibility of plants to pests on monocultures and thus high use of pesticides ○ Exposition of workers on plantations to pesticides spraying by aircrafts ○ Plastic waste as bananas are wrapped for protection ○ Soil-erosion, groundwater contamination and destruction of aquatic ecosystems due to the imbalanced use of agrochemicals

One challenge that summarizes the issues above and is discussed in several studies is the market price of bananas. Low retail prices set by supermarkets for customer attraction and competitiveness directly affect producers, farm workers and farm owners (Kessler and Hermann, 2019). Prices for bananas have furthermore declined in recent years, thus Bebbber (2023) argues that externalized costs of environmental damage in soils and waters as well as

social issues of working conditions and low wages are to be internalized in the cost of bananas for the end consumer. He also supports the emphasis on regenerative agriculture, biodiverse agroforestry systems for local consumption as well as the rebalance of power dynamics to focus on the voices of workers. These investments into social and environmental sustainability are not made as retail prices remain unsustainably low (Maselkowski and Olenius, 2014). While certifications (which entail higher prices) promise to address these challenges, they require much finance and administration and are also perceived critically. Kessler and Hermann (2019) support the argument, that certifications are not the only solution that tackle all the existing issues. They emphasize that “[s]ystemic questions need to be asked in broader settings, where various stakeholders are willing to align their efforts and contribute to joint actions, especially in the pre-competitive field” (p. 477).

Since the 1970s, voluntary sustainability standards (VSS) have been introduced in the banana industry to tackle socio-economic and environmental challenges (Voora *et al.*, 2023). These standards define “requirements that producers need to comply with and support farmers in adopting them” (Voora *et al.*, 2023, p. 6). There are four main types of VSS in the banana industry: *GlobalG.A.P.*, *Fairtrade*, *Organic* (IFOAM – Organics International) and *Rainforest Alliance* (Bebber, 2023; Voora *et al.*, 2023; Croppenstedt, 2025). Considering that bananas can be certified with more than one scheme, Voora *et al.* (2023) estimate that in 2019 between 9% to 20% of the total banana production were VSS-compliant. The standards focus on different aspects of sustainability, e.g. organic certification emphasizes environmental aspects such as fertilizers or biological disease control (Bebber, 2023; Croppenstedt, 2025). *Rainforest Alliance* “includes a broader range of criteria including ecosystem and wildlife protection, water conservation, good working conditions, occupational health and safety, and community relations” (Bebber, 2023, p. 666). The organization *Fairtrade International* focuses primarily on social issues such as the insurance of cost cover for sustainable production, however their standards vary depending on the industry (Bebber, 2023). The most common certification is the business-to-business certification *GLOBALG.A.P.* for quality management (*ibid.*).

These different kinds of certifications entail issues that are critically uncovered in academic literature. Bebber (2023) explores that the measuring of the impact, sustainability improvement and efficacy of these standards is challenging due to the entanglement of historical dynamics, different parameters and financial and administrative inputs. Thus, there is necessity for better evidence of the impact of certifications also to clarify it to consumers. While social and environmental improvements with certifications and standards can be observed, they should not be overestimated (Bebber, 2023). Fairtrade certified farms were linked to a higher satisfaction of workers and improved conditions regarding education, transport or healthcare for workers compared to non-certified farms (Van Rijn *et al.*, 2020; Bebber, 2023). However, sustainability standards often require substantial administrative and financial input, raising questions about whether a certification delivers meaningful benefits. Studies examining their effectiveness in improving sustainability outcomes and market access in banana production remain limited and mixed, partly due to the individuality of the study area. Existing studies suggest that while certifications like Fairtrade may contribute to certain social benefits, they show little effect on wages or job security (Van Rijn *et al.*, 2020). Similar results were found when organic and conventional farms were compared. Nevertheless, it is difficult to make broad conclusions, as

the impacts of voluntary certification vary strongly by local context and production structure (Bebber, 2023).

Additionally, calls for ethical commodity chains to increase the welfare of workers on plantations and the pursuit of social change have been around for decades (Murray and Raynolds, 2000; Hughes, 2001). However, certifications such as “Fairtrade bananas” have also been criticized by science to reproduce postcolonial dynamics like asymmetries of power, the prioritization of knowledge from the Global North instead of local knowledge as well as the reinforcement of “the role of farmers in the Global South as producers of food for consumers in the Global North” (Wilson and Jackson, 2016, p. 20). While this reproduction is due to Fairtrade bananas also being traded within a capitalist system, it ignores the producers agency and knowledge as well as their role as consumers themselves (Wilson and Jackson, 2016). Brown (2013) argues that fairtrade programs had been introduced into a “complex institutional framework” and within that framework produce new uneven geographies (p. 2587). It has also been criticized that Fairtrade ideas and programs only focus on one level of exploitation and precarity while ignoring pre-existing inequalities in a global capitalist system (Zaglul Ruiz, 2024).

Furthermore, academic research is often critical towards certifications, as sustainability has been used as a business model to ‘accumulate green capital’ (Ponte, 2019). The focus on sustainability certifications in a capitalist logic is said to only be applied if it ensures competitive advantage for companies. These strategic paths allow further exploitation as the pressure on suppliers increases (and thus social and labor conditions may be lowered) and raise “entry barriers for smaller, less organized and/or more marginalized actors – especially in the Global South” (Ponte, 2019, p. 233). Ponte (2019) therefore argues for further actions than sustainability certifications in the business context to tackle challenges of climate change:

“While the business of sustainability is leading to some environmental improvements in some places, and better use of resources in relative terms in some industries, the overall pressure on global resources is increasing [...]. The ‘green capital’ that business accumulates through sustainability management accrues at the cost of degrading environmental conditions. Green capitalism and the unsustainable exploitation of nature continue to go hand in hand.” (p. 253)

Future research should thus understand that these strategies are not contributing to an overall solution to ecological limits or actual sustainable impacts on suppliers in the Global South as they stem from a logic of growth and expansion (Ponte, 2019). The interplay of everyday practices and power dynamics in commodity complexes are important to considerate (ibid.).

Climate change and its entailing rising temperatures are suggested to have enormous impacts on banana trade and endanger economic sustainability. The *International Institute for Sustainable Development* (Voora *et al.*, 2023) analyzed the current interweavement of social and economic challenges and found changing temperatures and less reliable precipitation patterns to be even more challenging in the future. Since “nearly 100% of internationally traded fresh bananas” are Cavendish varieties, they are vulnerable to pests and diseases, calling for

more resilient farming practices (Voora *et al.*, 2023, p. 1). As retailers have the most economic power and since the market is sensitive to weather and climate change, these changes can lead to price volatility which eventually burden the most vulnerable actors in the complex of banana trade; small producers. There are several challenges to be tackled for banana trade to become more sustainable and resilient to planetary changes, for example the internalization of external costs, reduction of greenhouse gas emissions, introduction of sustainability standards and a greater transparency of the trade (Voora *et al.*, 2023). Climate smart approaches such as intercropping with coffee, improved water management or organic farming methods are already adopted by some producers (Reay, 2019; Voora *et al.*, 2023).

Due to rising temperatures caused by climate change, Varma *et al.* (2025) found that by 2080, it will not be sustainable to grow bananas for many countries in Latin America. The adaption or relocation of plantations is constrained by socioeconomic factors including labor availability and infrastructure. They thus propose to support banana producers to expand irrigation on plantation as well as breed banana varieties that are heat- and drought resistant. Other studies find that countries like India, Brazil, Colombia and Costa Rica will be affected by declining yield due to climate change by 2050 (Kramer and Ware, 2025).

From a bioscientific point of view, the dependency on one variety, the Cavendish banana, is said to be dangerous as the variety has been affected by diseases that have emerged and expand more easily with climate change (Drenth and Kema, 2021). Monocultures of Cavendish variety are thus vulnerable to these diseases, while replacement varieties or other genetic solutions are not available (Drenth and Kema, 2021). The most prominently discussed disease is the Panama disease or TR4 and its vast spread. The fungal disease is affecting Cavendish crops and has been detected in Asia, India and Africa before it reached Latin America (Colombia) in 2021 (Kramer and Ware, 2025). In September 2025, a first case of TR4 was confirmed in Ecuador, the biggest exporting country of bananas (Hemmes, 2025). While investments are made to fight the disease, the amount of alarmed voices increases. They call for increased support for farmers and exporting countries to “stabilize the supply chain. Otherwise, the banana may disappear” (Hemmes, 2025).

Other studies find narratives of the extinction of bananas due to TR4 an exaggeration, although damage has occurred already (Ploetz, 2021). Furthermore, there are said to be few effective measures against TR4. Solutions such as genetically modified replacements of Cavendish bananas are perceived critically, thus other replacements may be developed (Ploetz, 2021). Other solutions against the TR4 are strategies such as diversification of the plantations for the crop to become more resilient as well as approaches to develop genes resistant to the TR4 (Zorrilla-Fontanesi *et al.*, 2020). In addition, it has been proposed to develop the banana trade into a circular economy (Fiallos-Cárdenas, Pérez-Martínez and Ramirez, 2022). This approach can be regarded as holistic as it would require stakeholders to overcome numerous “[intellectual and technological] barriers associated with economic and cultural issues” (*ibid.*, p. 541).

3.6 Research Questions

Climate change affects agriculture globally and entails changes in cultivation, availability and thus price of commodities. With bananas being the fourth most important food crop globally after wheat, rice, and maize, they play a crucial role in food security and everyday nutrition in many regions of the world. Beyond consumption, millions of people depend directly or indirectly on banana production and international trade for their livelihoods. Global demand for bananas is expected to continue to rise, particularly due to growing markets in the Middle East and Africa (Kramer and Ware, 2025). Simultaneously, consumer demand in the Global North for organically produced and sustainably sourced bananas is increasing.

These developments stand in growing tension with environmental challenges that banana production and trade are facing. Climate change is widely reported to intensify pressures such as declining yields, increasing pest and disease prevalence, and suitable areas for banana plantation. Academic research and industry actors have documented these challenges within their respective domains; however, the interconnectedness and reciprocal relationships of actors and nature within the global banana complex are often neglected. As a result, structural dynamics and power relations across different spheres of the commodity chain risk being overlooked. From the perspective of consumers in the Global North, environmental challenges remain largely invisible. Bananas continue to appear as a readily available, affordable, and standardized product in supermarkets, seemingly unaffected by disruptions in producing regions. Yet actors in the Global North occupy diverse and powerful positions within the banana complex, including roles in trade, retail, certification, and agenda-setting. Despite this, empirical studies into how these actors perceive environmental challenges and interpret their own roles and responsibilities remain limited.

Research on climate change impacts on food and nutritional security in banana trade is scarce, even though banana cultivation and trade are significant for livelihoods in many parts of the world (Varma and Bebbber, 2019). Given the scarcity of this research, studies on attitudes towards environmental challenges as well as imaginaries of the future are also rare. Existing case studies are frequently conducted or commissioned by retailers themselves, making them difficult to assess critically as they are often driven by economic interests. Despite increasing calls for action within the Global North to ensure the long-term viability of the global banana trade, research on possible futures is rare.

Against this backdrop, this study seeks to contribute to research on global trade, uneven geographies and planetary and feminist approaches by examining how actors operating within the Global North of the banana industry perceive environmental challenges, how they react to them, and how they imagine the future of the global banana trade. Attention is paid to questions of responsibility, exploring how responsibility for addressing environmental challenges is understood, negotiated, or deferred within the Global North of the banana commodity chain. This results in the following research question(s):

How do actors of the Global North within the global banana complex perceive environmental challenges?

- **Which challenges are focused on?**
- **How do the actors address these challenges?**
- **How do they imagine future banana trade?**

To address these research questions, this thesis conducts qualitative research that allows for an in-depth exploration of perceptions, interpretations, and practices among actors in the Global North of the banana industry. By focusing on the perspectives of different actors, the study seeks to capture how environmental challenges are assessed, framed, and responded to. The following section outlines the methodological approach, including data collection and analysis.

4 The Cultivation - Methodology and Research Design

This chapter focuses on how the research question and design was created, as well as what methodology was used to collect and analyze the data. The aim is to present a detailed path of the choosing of the research design to answer the research question, the data collection, analysis, personal experience as well as challenges encountered during this process. The chapter will also address how these challenges were met.

The final research question and scope of the thesis developed over conversations with Prof. Dr. Christian Berndt, Dr. Soledad Castro Vargas and other members of the economic geography team at the University of Zurich. As global commodity chains and especially the case of banana trade has been an interest of mine since early on in my studies as well as in my bachelor's thesis, I wanted to engage in this field for my master's thesis again. We held discussions about possible research on pineapples in Costa Rica, however I felt that since I am conducting research in the Global North, I wanted to focus on that also within the research. Through familiarizing myself with studies on global banana trade as well as different frameworks, the research questions were established.

The research questions are answered using a qualitative research design. This research method enables a more in-depth data about human behavior, subjective perception and motivation (Winchester and Rofo, 2016; Kuckartz and Rädiker, 2022). While quantitative research is conducted with large amounts of data, it remains crucial to also focus on the in-depth analysis subjective opinions, the deconstruction of social structures as well as individuals' experience of issues (Winchester and Rofo, 2016). Qualitative research allows for flexibility during the process as well as the understanding for the connection of complex social or cultural processes and the context in which these take place (Kuckartz and Rädiker, 2022). It does not test hypotheses, but it aims to explore new findings in the respective topic. Although the research design is open, in order to formulate the research question, the researcher needs an initial understanding of the topic as well as a literature review (Misoch, 2019; Van Der Waltd, 2025).

Since the global banana trade has been a widely discussed and researched topic already, there was a lot of literature to be considered. The commodification of bananas and the complex interplay of human and nature under capitalist regulation is observed in fields of geography, bioscience, agricultural as well as economic research (see Brown, 2013; Maselkowski and Olenius, 2016; Drenth and Kema, 2021; Ronner *et al.*, 2023; Zaglul Ruiz, 2024). The topic is located at a crossroad of social, environmental and economic studies. However, these studies often only conduct research in their own field without considering other areas. The aim of this study is thus to provide insights that combine factors and layers, as the global banana complex can be investigated from different perspectives and entangles several fields of studies. It wants to observe and analyze these different perceptions and motivations by focusing on different actors within the Global North and their perception of the commodity chain. To engage with subjective attitudes and opinions of the actors, the qualitative research approach of expert interviews was chosen. Semi-structured, guided interviews are suitable to focus on subtopics of the research throughout all interviews, while leaving room for interviewed people to construct

their thoughts (Helfferich, 2009). Since the aim is to gain more insight on the attitude of actors within the Global North, different people working within the Global North of the banana complex were contacted and eventually interviewed. Since these actors differ in background and motivation of the respective organization they work for, a broad set of perspectives can be collected. The Global North essentially also includes the public. Thus, media articles about banana trade which address different actors in the Global North were gathered to create a text corpus of reports on the topic. Therefore, the data consists of transcripts of interviews as well as media and online reports that were analyzed.

4.1 Data Collection

4.1.1 Interviews

In expert interviews, it is important to define the terminology of experts and criteria for being suitable as an expert, issues which are debated in social sciences (Misoch, 2019; Döringer, 2021). Prevalent issues with expert interviews are an unclear selection process of experts or not addressing experts' personal biases, as well as evaluating the "quality" of experts interviewed (Gläser and Laudel, 2010; Von Soest, 2023). For this study, experts who work in the Global North within the field of global banana trade were contacted and interviewed. They are considered experts since they acquired knowledge about the topic the research focuses on through their occupation and they possess knowledge or insights that do not fall under the definition of "general knowledge" (Gläser and Laudel, 2009; Misoch, 2019).

The sphere of the Global North in the context of banana trade is vast. Thus, the initial idea was to contact representatives from Swiss or European retailers to focus on their perspective because retailers are observed to have the biggest economic power within the supply chain of bananas (Maselkowski and Olenius, 2014; Voora *et al.*, 2023). However, many retailers rejected the inquiry for an academic interview due to absent capacity, no interest or too many requests. Eventually, two interviews with representatives of retailers were conducted and one representative answered six questions in written form. Next to retailers, there are also a lot of other actors in the Global North, whose perspectives are interesting to answer the research question. Therefore, I broadened the enquiries to actors within the global banana complex who operate in the Global North and are thus in powerful economic positions as well.

Helfferich (2009) states that scope of the sample is often determined by accessibility of the experts. Potential interview partners were contacted in various ways; through existing contacts of earlier collaboration, representatives mentioned in reports, online contacting via email (if displayed) or through anonymous online forms. One way which proved to be effective was the request via the social media platform LinkedIn. On LinkedIn, the snow ball system (Helfferich, 2009) was applied; if a contacted person did not suit for an interview, they were asked if they knew someone who was suitable. Over 30 requests were sent out in total. Eventually, the number of oral interviews was N=7 plus one person who answered questions in written form. The interviews lasted between 40 and 70 minutes, one was conducted in person, the rest via

Zoom. Two of them were conducted in German and five in English. All were recorded for transcription with the consent of the interviewed opposite. The audios were transcribed with the AI transcription tool by MAXQDA, applying the rules of transcription by Rädiker and Kuckartz (2019). This means that each change of speaker was marked by a new paragraph, the interviews were transcribed literally and in summary as well as vocalizations were marked in parentheses. Furthermore, all information that allow identification of the interviewed person was anonymized, e.g. their names or the names of their organization or company (Rädiker and Kuckartz, 2019). Within days after the interviews, the transcripts were manually anonymized and adapted, mostly for punctuation. In the German transcripts, some words and phrases had to be changed for the statements to be comprehensible. An excerpt of a transcript can be found in the appendix.

Table 2: List of Interview Partners

Occupation	Organization	Name of anonymized Interview file	Abbreviation	Date	Length of Interview (hh:mm:ss)
Coordinator	Organization for Actors/Stakeholders	Actor 1_Organization	Org_1	26th September 2025	00:43:27
Advisor Bananas	Certification	Actor 2_Certification	Cert_2	2nd October 2025	00:51:21
Sustainability Team Member (written answers)	Retailer Switzerland	Actor 3_Retailer	Ret_3	7th October 2025	-
Person 1: Sustainability Team Member Person 2: Purchase Fruit and Vegetables	Retailer Switzerland	Actor 4_Retailer	Ret_4	8th October 2025	01:07:57
Sustainability Team Leader	Retailer EU	Actor 5_Retailer	Ret_5	31st October 2025	00:52:27
Researcher and Consultant	Research Program	Actor 6_Research	Res_6	13th October 2025	00:49:34
Coordinator	Organization for Actors/Stakeholders	Actor 7_Organization	Org_7	18th November 2025	00:50:41
Employee in Sustainability and Marketing	Multinational Company	Actor 8_Multinational	Mult_8	20th November 2025	1:00:52

4.1.2 Interview Guides

Within qualitative semi-structured interviews, the guide is a central element to structure and navigate (Misoch, 2019). In the case of this study, my background knowledge of the literature research as well as the simultaneous collection of the text corpus (see 4.1.3) certainly shaped the guide. According to Helfferich (2009), guides in qualitative research ought to allow openness for respondents, not contain too many questions and be easily manageable so that the focus of the interviewing person remains towards the interviewee. Furthermore, guides help to structure the conversation, focus on the relevant topics and allow for data to be compared (Misoch, 2019).

The guide was adapted for each interviewee depending on their occupation, tasks and background. However, all the guides listed the relevant topics and were formulated openly in order for the interviewed person to answer freely and according to their knowledge and focus (Misoch, 2019). The questions acted as a structure; however, this structure was modified in some conversations due to the answers that led to another question that suited better. All the interviews covered the topic of current challenges within the banana trade, possible solutions, responsible actors (subjective views), changes over the last years as well as an outlook into the future of the banana trade. Specifically, how the interviewed person views the future of the banana trade and how many years away that “future” is.

Figure 4: Example of an Interview Guide for “Actor 8_Multinational”

1. Could you explain what your role at [company] contains? What are your tasks?
2. You have been working with bananas and at [company] for nearly [x] years. What changes have you experienced over that time?
3. What do you understand when people speak about sustainable bananas?
4. From your perspective at [company]: What are the main challenges when it comes to banana trade?
5. What are the biggest challenges regarding climate change?
6. Which actors within the banana commodity/supply chain play the most important role when it comes to tackling those challenges of climate change?
 - a. *What can these actors do to tackle the challenges?*
 - b. *Are they successful?*
 - c. *Does it change over time? / Has it changed over time?*
7. International Companies like [company] are said to have economic power within the supply chain. What is your perspective on the economic power distribution within the global banana trade?
 - a. What about the retailers?
 - b. What about the consumers?
8. From your point of view: what are possible solutions against challenges regarding climate change?
9. How do you imagine the future of the banana industry?

4.1.3 Text Corpus

The aim of the text corpus is to contain texts with a Global North perspective that address readers and actors within the Global North. Both general media as well as economically driven magazines should be considered, thus, the text corpus consists of texts from the following data bases as well as online research:

- **Nexis** (access via university): a data base that contains news sources as well as reports on companies, countries and law (*Datenbanken*, 2025)
- **Factiva** (access via university): Swiss and international newspapers and economic reports (*Datenbanken*, 2025)
- **Swissdox**: media archive of over 600 Swiss and international media sources like newspapers, magazines, radio and TV shows (*Medienarchiv*, 2025)
- **NZZ Archive** (additionally to Swissdox): archive of articles in the Swiss newspaper “Neue Zürcher Zeitung” since 1780 (*ZeitungsArchiv NZZ - E-Paper*, 2025)
- **Google**: online research for current articles and reports on bananas, climate change and challenges

The texts were retrieved between 10th June 2025 to 6th October 2025. For online medias and reports, Google searches were conducted to find recent articles on climate change and banana trade. The results were manually sorted and relevant reports on congresses or forums as well as media articles were selected. A larger part of media articles, however, was retrieved from Swissdox as well as from the NZZ archive. In these databases, all the articles that appeared with the keywords “Bananen” and “Klimawandel” were consulted and manually sorted for articles that are relevant for the topic. For example, if articles were written on climate change and mentioned “Bananen” in the context of a “Bananenrepublik” or in the context of a gorilla eating a banana as well as the impacts of climate change on their habitat, the article was considered irrelevant for the topic of banana production and trade. The temporal scope was initially set to the last four years for information to be current, however it was broadened to also consider articles that were written on the matter earlier. The online news articles and reports from forums or organizations were written between 2019 and 2025. The earliest newspaper article from Swissdox is thus an article by Tagesanzeiger from 2015, where the threat of the Panama Disease was discussed already. From the NZZ archive, an article from 2003 on Fairtrade bananas, retailers and climate change is the oldest article. Nevertheless, most of the articles are from more recent years, which is when the topic has been discussed more widely. This was also noticeable in the data bases Nexis and Factiva. To successfully find articles that are relevant for the aim of this study, the search was conducted using very specific commands. This was necessary as the search would give over six thousand results in Factiva only with the search terms “banana AND climate change AND future” without a temporal restriction. In a first attempt, text from last year were searched using the command “banana production AND climate change” or only “banana production”. These led to some texts suitable for the topic, however not a sufficient amount of data. Therefore, most of the texts were retrieved using a different command and no temporal restriction.

After different attempts, the search was restricted to the following command: “(hl=banana) AND banana AND climate change AND future”. This means that the headline had to contain the word “banana” as well the text had to contain banana, climate change and future. Most of the 194 results of this search in Factiva were from the last six years (see figure 5), as a lot of studies and reports on the current and future challenges on banana production and trade have been published during this time.

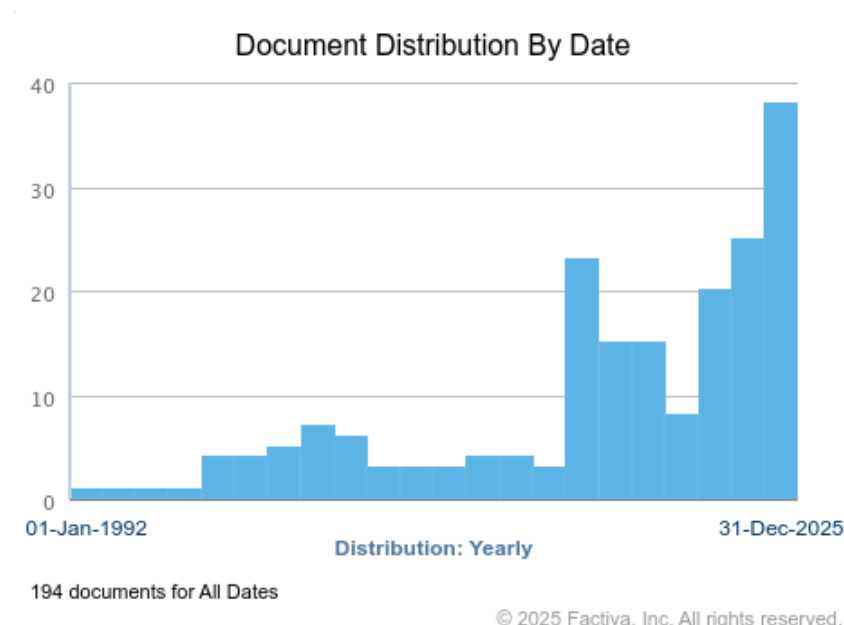


Figure 5: Temporal Distribution of the initial 194 Articles in Factiva, before sorting (Factiva, 2025)

These 194 results were manually sorted for duplications or irrelevant articles. Subsequently, the number of suitable texts was reduced to 40 (see table 3). The same procedure was executed in Nexis. Here, the search had to be restricted even further to retrieve articles that match the aim of the thesis. The search command “überschrift(banana) UND banana UND climate change UND future UND challenge” led to 112 results (see figure 6). These were also manually sorted and duplications within the results or with articles found in Factiva were omitted, leading to 43 suitable texts for the corpus.

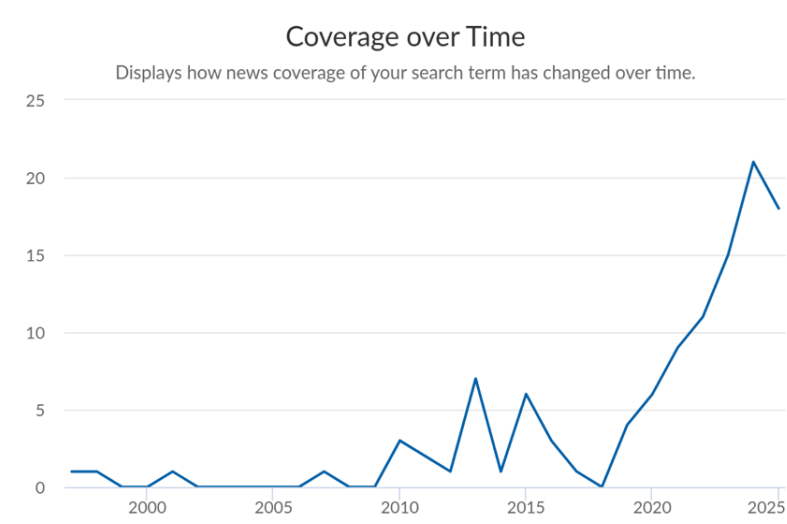


Figure 6: Temporal Distribution of the initial 112 Articles in Nexis, before sorting (Nexis, 2025)

In both scientific data bases as well as in the Swiss media archive, the temporal distribution of reports and articles was noticeable. The increase of articles on the global banana trade after 2020 is striking, however, coverage on the environmental challenges occurred in some earlier articles already. By the end of the 1970s, the Washington Post reported on the importance of genetic diversity, as “with a single variety or a few closely related varieties, entire harvests can be wiped out by one disease” (*THE WASHINGTON POST*, 1979). The Observer addressed the unsustainability of “banana price wars” in supermarkets in 2009 as well as the entailed risks for farmers in the Global South (DOWARD, 2009). In 2013, scientists’ concern regarding the threat of diseases for banana plants in connection to climate change was reported (WITHNALL, 2013) and two years later, the Swiss *Tagesanzeiger* discussed the topic of a potential extinction of the Cavendish variety (RATHS, 2015). Thus, knowledge on current and future issues existed, but the call for broad research on the topic as well as larger public interest was only formed around 2020.

Table 3: Composition of Text Corpus

Database	Examples of sources	Range of year of publishing	Number of texts
Online media	bbc.com, freshplaza.com, time.com, indiatoday.com	2019-2025	10
reports	World Banana Forum, IPPC, Fairtrade	2024-2025	5
NZZ archive	NZZ	2003-2018	3
Swissdox	Tagesanzeiger, Der Standard, Kronen Zeitung, SRF	2015-2025	17
Nexis	The Independent, CE Noticias Financieras English, Daily Star Online	2010-2025	43
Factiva	The Washington Post, Canadian Broadcasting Corporation, The Sun	1979-2025	40
Total:			118

4.2 Positionality and Reflexivity

As qualitative research and analyses like this study rely on the interpretation of both manifest and latent meanings, the position of the researcher is integral to the analytical process. Thus, this section reflects on my positionality as well as the collection of data, its analysis and interpretation.

By growing up in a very privileged environment in Switzerland, I have gotten to know bananas as a fruit that is always available in supermarkets. Regarding the global banana complex, I am used to the role of the consumer in the Global North, which puts me in an economically powerful position. My family did not financially struggle, and I was early on taught to care about the environment, thus I chose organic and certified fruits and vegetables whenever I can. It was only in my studies where I learned to reflect critically on food systems, global supply chains and to question the role of certifications. My academic background of a bachelor's degree in Geography with a focus on economic geography shaped my interests in global commodity chains and all the systems and dynamics that are responsible for how the current trade works. I regard global trade and imbalances from a capitalist critical position as well as through a feminist lens. These interests and critical thinking have impacted the way I prepared interview guides as well as conducted the conversations. Thus, although from a cultural point I have more in common with the actors in the Global North than with the banana producers in the Global South, I sympathize with social and environmental attitudes more than with market-driven ideologies. Whilst I do understand where these ideologies come from and that price and margins are important in the global market, I found myself being more critical towards these attitudes. After interviews, I often reflected on the utterances about market dynamics and capitalism. Furthermore, the global banana complex became even more complex throughout the work on this thesis. While I already commenced with a deep knowledge on globalization, banana production and trade, every interview uncovered more complex structures and challenges. These personal attitudes and the knowledge have influenced the research question(s) and the interpretation of the data and are thus important to acknowledge in the scope of this thesis. However, a reoccurring reflection on my positionality supported me to focus on academic frameworks I apply in this study.

Regarding the process of the interviews, I encountered a well-known challenge: rejections. As stated above, it was difficult to find interview partners. Although I inquired possible actors a lot of time in advance (which allowed for persistent following up and re-inquiring), I received several rejections. Most rejections argued that their teams did not have enough human resources for academic interviews, as this example by a representative of a Swiss retailer via LinkedIn: *"[...] Due to temporal resources interviews are not possible, since we have a lean structure and thus not the required resources to pursue all inquiries. Sorry."* These responses were certainly met with understanding, yet they evoked the impression that sustainability in supply chain management might be of diminishing importance for retailers and other actors.

Nevertheless, several people confirmed an interview and provided substantial insights into the global banana complex, including the roles and interests of different actors. Despite their

demanding schedules, the interview partners devoted considerable time to the interviews and warmly welcomed me into their tasks and perspectives, which I am grateful for.

The combination of interviews and text corpus proved to be insightful as well, as the (media) reports in the text corpus are from different geographical regions and target a more general audience. However, the creation of the text corpus - specifically limiting it - was challenging. It required several attempts to find the right command to receive appropriate reports. And although the texts were systematically organized and duplicates were removed, the manual processing of the material occasionally appeared to involve arbitrariness. The same applied to the coding process.

4.3 Data Analysis Procedure

After the interview transcripts were adapted and the text corpus was selected, the analysis of the texts with the program *MAXQDA* started. This qualitative data analysis tool allows for transcription of audios, for texts to be coded and codes to be summarized and compared. There are of course many more functions of *MAXQDA*, which I however did not use in the scope of this thesis. For a methodological guideline to focus on, I primarily worked with literature by Udo Kuckartz and Stefan Rädiker, however I consulted other texts on qualitative content and discourse analysis as well. To extensively answer the research questions, I conducted a content analysis of all the material, and in a second step a discourse analysis of chosen material. A qualitative content analysis means that texts are considered material, and the data in a text is coded, extracted and evaluated (Gläser and Laudel, 2010). Kuckartz and Rädiker (2022) discuss several scholar's definitions of a qualitative content analysis and formulate their definition as follows (translated from German):

“Qualitative content analysis is understood as the systematic and methodologically controlled scientific analysis of texts, images, films, and other contents of communication. Not only manifest but also latent content is analyzed. Qualitative analysis centers on categories that are relevant to the research question(s) and with which the material is coded. Category development can be deductive, inductive, or deductive-inductive. [...]” (Kuckartz and Rädiker, 2022, p. 39)

The interview questions were openly formulated and provided ground for long and open answers, which are interesting to analyze in-depth. To not only focus on content but also on *how* different topics are discussed, a mixed approach of content analysis as well as discourse analysis was applied. With content analysis, the aim is to analyze themes and topics that reappear in the texts. Latent content can be analyzed as well, however, to further analyze rhetorics and power structures, especially in the interviews, I applied a discourse analysis. A discourse analysis focuses on the language, words and on structures within statements (Rädiker and Kuckartz, 2019).

Critical discourse analysis (CDA) centers around how language creates power, knowledge and social realities. It explores the creation of knowledge and of ‘objective’ realities and analyzes

the connection to power relations (Mattissek, 2022). Central to CDA are questions regarding situational, institutional or social contexts and positions within discourse is created (ibid.). Furthermore, it analyzes power within language, rhetoric figures of speech and how something is formulated – as well as what is not said (Tenorio, 2011; Jäger *et al.*, 2024).

The CDA was applied as a second step in the data analysis. All the data was re-analyzed and segments were coded with rhetoric codes, produced deductively-inductively. These included the positionality of the Global North as well as the perception and classification of challenges. What challenge was mentioned first? How was it described, as an existential or manageable issue? Which voices are heard in the reports and how are utterances evaluated? Statham (2022) underlines that media articles are not “merely the unfiltered view of a journalist but [...] discourse which is the product of institutional practices which contribute to the language we are investigating” (p. 100).

While coding helped to gain an initial structure, memos played a crucial role in this analysis. Next to segments in the interviews and texts or on my notepad, I wrote down what my own thoughts or connection to other segments and possible findings. These memos, together with the coded segments, provided ground for a critical discourse analysis of the data, and to eventually discuss the findings to the research questions in this study.

4.4 Coding

According to Gläser and Laudel (2010), content analysis requires a category system that was deductively built before analyzing, different units of text to analyze as well as the search of texts for relevant information and the coding or categorizing of these text passages. This summarizes how the analyses in this thesis were conducted. The deductive building of a category system started with the creation of the interview guides, as the questions were formulated to focus on topics related to the research question(s) (Rädiker and Kuckartz, 2019). When working with the codes of this category system, further codes or subcodes can be created (inductive coding). To focus on answering the research question, it is crucial that the category system is regarded dynamic and adaptable, however always clear and structured (Rädiker and Kuckartz, 2019). For the analyses in this thesis, a category system was constructed deductively according to research questions and interview guides, however it was inductively adapted while working with the material. Thus a mixed approach of concept and data driven development of codes was chosen, with the category system being formed and subcodes generated while working on the data (Kuckartz, 2019). The codes selected (see list of codes below) fall under the different functions of codes in the category system according to Rädiker and Kuckartz (2019, p. 68):

- *Fact categories*
- *Content and thematic categories*
- *Analytic categories*
- *Evaluative categories*

Especially evaluative categories were applied in a second step for the discourse analysis. Prior to that, the material was coded with fact, content and analytic codes. MAXQDA contains a function to code texts using artificial intelligence (“AI Coding”), which I tested, however results would become confusing and unclear. Therefore, I coded the material manually, using the following category system.

To perform an evaluative qualitative content analysis (Kuckartz and Rädiker, 2022), the interview transcripts and texts of the corpus were coded manually in MAXQDA (for examples see excerpts). Already during this process as well as after conducting the interviews, memos and possible findings were noted. These laid the groundwork for the analysis of the data. After all the texts were coded, segments belonging to one category were more thoroughly analyzed and compared with other categories. The functions of the program MAXQDA were helpful in this process, as it was very intuitive. Furthermore, the AI functions of the program supported this stage of the analysis, as it provides possibility to summarize codes or to “chat with coded segments” to find commonalities and text passages according to a finding. This function was only used as support to summarize, as it sometimes assigned one text or transcript too much weight in the summary. I thus assessed the segments and content manually with the help of the tool. Keeping the research questions in mind was essential during these analyses, as there was a lot of interesting data to be extracted which was not necessarily connected to the aim of the study. Kuckartz and Rädiker (2022) comment on this phenomenon as a “data overload” (p. 256)).

28 S1: How do you do you feel that power imbalance in your, in your everyday work or maybe also if when working with farmers.

29 S2: No, for me, I don't see because especially climate change is a topic that we consider easier to convince people and environmental in general, because everybody wants less pesticides, everybody wants less water, everybody wants better quality of products. No. So but my colleagues that work with socio and especially economic, it's more complex. No. Because about the price of banana, about the salary that they will pay for the worker. This I think it's more complex in mine. I think, uh, maybe one area that can be a bit like this is that we we are trying to start to work. That is regarding the relationship between the pressure from supermarkets. For sure. You go to Switzerland, any supermarket, the fruits are perfect without scratch, without look like even fake. No. And this can also trigger a lot of food waste in producing countries because they will not accept this. The banana don't have five bunches, the banana don't have the right color, don't have a have a scratch, have something. So for that they put a lot of plastics, plastics with pesticides. They have to apply lots of products, use lot of energy in order to make this perfect banana that sometimes it's just cosmetic. No, I mean the quality of one with a scratch or two. But we can reduce a lot the footprint if the consumers are willing to. And this maybe I feel a bit because the, the supermarkets and even the European Commission, they, they don't want he just want if his bananas produced by ultramarine territories of France or from Canary Islands, then they accept all the problems. The European will buy these bananas if come

5/18 MAXQDA

Figure 7: Excerpt of an Interview Transcript with Actor 1_Organization with Codes, edited in MAXQDA (own screenshot)



Figure 8: Excerpt of a Media Report by The Independent with Codes, edited in MAXQDA (own screenshot)

Subsequently, the material extracted from the data (transcripts and text corpus) was summarized and analyzed. Results and findings of these analyses are discussed in the following chapters of this thesis. Quotations from spoken data were adapted for legibility (e.g. exclusion of repetition) whilst maintaining direct statements and content and quotes from German interviews which are displayed in this thesis were translated into English.

4.5 Limitations

While the field of human geography provides an interdisciplinary ground for the study and the research question(s), other fields of studies would have focused on different issues or challenges. Thus, the scope and perspective of a human geographer as a scholar is to be considered.

When interpreting the findings of this study, the methodological and analytical limitations should be considered. All qualitative research is subject to interpretive nature, and one limitation in this thesis is the number of interviews. The length and amount of interviews allow for a hermeneutic interpretation (Helfferich, 2009) and for analysis of the data and its commonality, however more interview partners and thus perspectives might have led to further interpretations or focuses within the research questions. Furthermore, as most of the interviews were conducted in English, not all interview partners spoke in their mother tongue, which might lead to misunderstandings or someone not expressing the entirety of their thoughts.

The manual coding of the interview transcripts and texts as well as the construction of the category system led to interpretative decisions in the analytical process. These decisions were influenced by the researcher's positionality (see 4.2) as a Global-North based scholar engaging with actors in the Global North, which may have influenced both the framing of categories and the interpretation of the transcripts and texts. This limitation was addressed through continuous engagement with relevant literature, iterative coding and reflecting during the analytical process.

5 The Harvest and Transport - Results and Discussion

The reoccurring topics that were stressed in the interviews as well as in the text corpus are explored, analyzed and discussed in this section of the thesis along the research questions. The first section focuses on the different challenges and narratives. Within the interviews, several more aspects, attitudes and issues could be uncovered, however, this thesis focuses on the perception of environmental challenges. Subsequently, - along the research questions - I will discuss how the mentioned challenges are addressed as well as how the actors and reports are talking about the future of the banana industry. Within this chapter, excerpts from interview transcripts or from the text corpus are displayed, discussed and interpreted in the same sections. These interpretations stem from a combination of content and discourse analysis of the data, the two approaches are combined for the discussion of the findings and aim to finally answer the research question of how actors of the Global North within the global banana complex perceive environmental challenges.

5.1 Challenges and Narratives

This section aims to answer the first sub-research question of which challenges are focused on in the data. Although I had conducted an extensive literature review and was aware of the multiple entanglements and issues in the global banana complex prior to the data collection, the interviewed actors introduced me to new spheres of complexity with every conversation that I had. The actors who are working in different fields in the Global North of the banana complex provided a lot of new insights that we discussed extensively during the interviews. Whether it was a deeper explanation of EU guidelines for banana imports (that differ whether bananas are imported from Latin America or from the Canaries), the diverse motivations of the different retailers and corporations when it comes to sustainability or the interconnectedness of environmental and human rights issues – the conversations and explanations aided to further comprehend the dynamics within the supply system of bananas. Some actors worked in organizations that aim to improve social and environmental issues, while with others, competitiveness in the market was of more importance. As motivations and their professional backgrounds differed, so did their opinions on certain topics. Two examples are the attitudes towards diseases (respectively how to combat them) or the imaginaries of the future. The latter differed from optimistic scenarios (bananas being an efficient industry that will last long) to pessimistic forecast (TR4 is going to eradicate the Cavendish varieties). The question about responsibility within the commodity chain of bananas was met with different self-reflection, as well as the recent or historical changes that have happened in the industry. Descriptions of the history of the Gros Michel variety and its disappearance were mentioned in several interviews, especially when explaining the current situation or when speaking about long-term planning. It is not surprising that within a capitalist economy, the subject of the market price of bananas was emphasized in every interview. Therewith, the different factors that influence the price along with the price-sensitivity of the consumers were highlighted.

5.1.1 Variety of Environmental Challenges - Which Challenges are Focused on?

There is a vast variety of environmental challenges reported by media articles and discussed in the interviews. The issues are twofold; the banana industry being affected by environmental changes but also contributing to them (CLERCX *et al.*, 2025). Thus, when discussing environmental challenges, climate change is omnipresent. In current trade, weather extremes caused by changing climate are one of the most stressed challenges as they are unpredictable and entail issues on farms in producing countries as well as for logistics. Additionally, the frequency and severity of these events is increasing. Weather extremes highlighted are droughts, floods, hurricanes or storms that cause crop damage, yield fluctuation or destruction of infrastructure and making it difficult for farmers to plan and adapt. Furthermore, extreme temperatures cause suffering of banana plants, while heat is especially destructive: *“The study highlights that temperatures exceeding 30°C—projected to become more frequent—harm banana growth, reduce yields, and heighten risks of pests and diseases”* (THE TICO TIMES, 2025). Not only heat, however, also unexpected cold temperatures can cause injuries on plantations. For logistics, heavy rain and storms lead to delay of shipment, like one representative of a retailer explains: *“[...] at the beginning of the year [...] there were delays of shipment that we felt. That is where we have big issues, to even get bananas here”* (Ret_4, 2025). It is thus shifting and intensifying weather extremes that cause unpredictability to farms as well as for transport. Floods and heat especially are contributing to the faster spread of pests and diseases, with one of the central topics being the threat of TR4 (which will be discussed in a next section). However, the spread of diseases is directly linked to the application of chemicals on plantations, which in turn harm the soil, the landscape and workers.

“[...] climate change is leading to more stressed plants, and that is being used by some producers as a kind of, like a reason to use more chemicals, more pesticides. Because the plants are becoming [...] more vulnerable to disease. [...] It's like a vicious circle. Yeah. [...] Which then leads back to the soil not being healthy. And then the work is not being healthy. Yeah. So that's [...] a really big challenge, of climate change for sure” (Org_7, 2025).

In context of diseases and pests, the reliance on the Cavendish variety and its susceptibility is recognized by many actors, as they discuss the fragility of the crops. The two diseases Sigatoka and TR4 are primarily mentioned in the data, however a focus on TR4 can be observed. Actors and reports might have TR4 more present than the Sigatoka fungus, as the latter can be treated with chemicals, whereas there is currently no solution for TR4. This might be one of the reasons that within the text corpus of this study, segments on TR4 are more frequently found than on Sigatoka.

An increased media coverage on environmental challenges in the banana industry can be observed in the first quarter of 2025, when two important studies on banana cultivation and future challenges were published (Kramer and Ware, 2025; Varma *et al.*, 2025). Research from the University of Exeter by Varma *et al.* (2025) studied the effects of climate change on Latin American and Caribbean countries, as well as the socio-economic factors that constrain adaption to climate change. By analyzing climatic, edaphic and socio-economic factors, they

find that two thirds of the areas that are currently producing bananas for export will not be suitable by 2080. This is not only due to environmental changes that would make different regions more suitable for production, but also due to socio-economic limitations such as human population density and the need for areas of cultivation to be close to shipping ports. The second report was published by the UK charity Christian Aid. Its title '*Going Bananas: how climate change threatens the world's favourite fruit*' indicates the summarizing character of the report. By referring to studies such as the one by Varma et al. (2025) and individual farmers experiences in exporting countries, they outline the main concerns within the global banana complex. This includes the susceptibility of the Cavendish, the reliance of US and European markets on Latin American bananas (a region that is predicted to be impacted heavily by climate change) as well as weather extremes and the threat of diseases.

Different factors presumably led to the studies being well received by the media. For example, the studies state clear findings that are easily understandable for a broader audience. These findings are furthermore alarming for the Global North as they predict an uncertain future of banana cultivation and trade. This combination promises attention and engagement for media companies. In addition, both studies were summarized concisely in a press release, which was reflected in several articles. Many reports copied the press release of the Christian Aid report with quotes of farmers directly and thus they did not vary in content. The titles on the study findings, however, differed in language of severity and attention-grabbing. As the charity report itself contains the warning word "threat", the media titles adopt the severity and alerting message. Table 4 provides an overview of titles connecting to the report by the charity. While many recycled the term "threat", some intensify the warning images by employing fatal expressions such as "killing", "wiped out" or "disappear". Nonetheless, some reports also chose more neutral language and appeal to the reader, for instance by using the question "Why should you have to think about climate change when you eat bananas?" as the title (CE NOTICIAS FINANCIERAS ENGLISH, 2025a).

Table 4: Selection of Titles for Coverage of Christian Aid Report (Kramer and Ware, 2025)

Title of Article	Source
<i>Climate change threatens banana exports, key to the Latin American economy</i>	(QUESADA WEBB, 2025)
<i>Why should you have to think about climate change when you eat bananas?</i>	(CE NOTICIAS FINANCIERAS ENGLISH, 2025a)
<i>Banana trade under threat from change to climate in main regions</i>	(SPEARE-COLE, 2025)
<i>Banana crops 'being killed by extremes'</i>	(WESTERN DAILY PRESS, 2025)
<i>Yes, we could have no bananas - as rising temperatures are killing crops</i>	(EXPRESS AND STAR, 2025)
<i>World's favourite fruit at risk of being wiped out by climate crisis, study warns</i>	(MISHRA, 2025)

<i>The world's most popular fruit could disappear by 2080: 80% comes from Latin America and is endangered</i>	(CE NOTICIAS FINANCIERAS ENGLISH, 2025b)
<i>Agriculture: Climate crisis and the death of bananas</i>	(KUMBHAR and MEMON, 2025)

Reports that cover the study by Varma et al. (2025) are predominantly formulated more neutral, however also utilize alarming expressions like “devastate”, “disappear” or “threaten”. As the study is peer-reviewed, the focus on “research” can be observed in the titles to increase credibility.

Table 5: Selection of Titles for Coverage on the Study by the University of Exeter (Varma et al., 2025)

Title of Article	Source
Bananas could disappear from supermarkets due to one major threat	(GEISLER, 2025)
Research reveals that banana production will be affected by climate change	(CE NOTICIAS FINANCIERAS ENGLISH, 2025c)
World: Climate change threatens future of banana sector	(FOOD AND BEVERAGE: UKRAINE AND THE WORLD, 2025)
How Climate Change Could Devastate Banana Farming in Costa Rica	(THE TICO TIMES, 2025)
University OF Exeter: Climate change threatens future of banana export industry	(ENP NEWSWIRE, 2025)
Major banana exporters could face ‘60% drop’ in growing area due to warming	(TANDON, 2025)

Although these studies and media reports provide an overview of some of the prevalent issues within the banana industry, they illustrate a simplification of the global banana complex. Several spheres of influence and relations or historical context are omitted, which displays the issues as being resolved easily.

These environmental challenges that appear most pressuring in the data align with the topics the World Banana Forum engaged with in its global conference in 2024. The forum which is hosted by the FAO, discussed the impact of the climate crisis, the cost of energy and fertilizer as well as the spread of TR4 (FAO, 2024a). Additionally, environmental challenges that are discussed in the text corpus range from soil health and biodiversity to plastic use and food waste. Emissions and carbon footprint of the banana trade are also issues that actors focus on. Since the quantity of banana sales is very high (in most supermarkets one of the top-selling product), so are the emissions that stem from pesticides and agrochemicals that are airborne, shipment as well as cooling on transport (Ret_5, 2025). The employee at a multinational company recognized the high emissions of vessels in transport and mentions biofuel. However, emission reductions are only desirable if they reduce costs (Mult_8, 2025).

It was insightful to observe which environmental challenges the actors focused on initially when asked about challenges and environmental challenges, as the questions in the interview were formulated openly. The representative of a multinational company extensively focused on the twofold ways to regard environmental challenges; the company's impact on as well as how they are impacted by climate change (Mult_8, 2025). The actor elaborated on plastic use in the supply chain, on synthetic fertilizer as well as fossil fuels in machines on farms and in vessels. They add that it is hard to decarbonize the shipping industry, as well as stresses that “[the company has] a relatively small fleet of vessels” (Mult_8, 2025), which I interpreted as a defense strategy to downplay responsibility as their impact is smaller than the one of other companies as they own less vessels (an in-depth analysis of how responsibility is addressed in section 5.2.2). Assessing the impacts that climate has on the banana trade of the company, the interviewee demonstrates weather extremes such as drought and flood risks in exporting countries that cause crop damage and thus yield loss. These issues are addressed by the representative of a certification (Cert_2, 2025) by similarly speaking about weather phenomena that affect “*farms and plantations that are vulnerable already*”, especially due to low prices and thus missing capacity of farmers to invest in measures to protect themselves from weather extremes. Interview partners working for organizations as well as research also focus on issues on farm levels by addressing the susceptibility of the Cavendish crop to pests and diseases as well as maintaining productivity without the high input of chemicals.

The answers by the actors who work for retailers all focused on disruptions in the supply chain due to harvest failures because of weather extremes. These are incidents that they are already familiar with from recent years and that lead to direct loss of profit for them. Certainly, the different motivations of the actors result in the different focus they voice. Actors who rely on selling bananas and rely on trade are more concerned with issues in the supply chain due to weather extremes, whereas organizations, certifications and research have a more long-term desire for farms to be productive and sustainable. A commonality of all the challenges that are stated by the actors is the concern for rising costs due to environmental issues or the impacts of climate change. As the price was a reoccurring topic in all interviews, it will be analyzed more thoroughly after assessing the complexity of the industry, historical and recent changes as well as the entanglement of environmental and socio-economic changes.

5.1.2 Complexity of the Global Banana Complex

Reports and interviewed actors repeatedly stress the complexity of the industry of banana trade. A representative of a retailer acknowledges that “[y]ou have got so many challenges on so many levels” (Ret_5, 2025) as well as an article in a business magazine underlines that “[i]t's not just about a fruit; it's about an entire ecosystem - of farmers, consumers, trade networks, and national economies” (KUMBHAR and MEMON, 2025). While some reports mention the interconnection of different actors and spheres, some give the impression of an omniscient view on the banana industry as they argument straightforward. Of course, some reports focus on one issue and are written with little elaboration. While media articles also focus on catching the readers' attention with suggestive titles like “*Bananas could disappear from supermarkets due*

to one major threat” (GEISLER, 2025), they often focus on one issue or report and neglect the variety of issues and the complexity of the system (in this case the article contained around 250 words, which also makes it impossible to report extensively). In longer reports or conversations, the complexity of the banana industry is uncovered more thoroughly. In several interviews, when speaking about one issue, the actors themselves connect it to other issues and focus on the complex interactions they are confronted with in their professional tasks, revealing that they are aware of as well as concerned about these multi-level issues: *“it's difficult to have an opinion on this because of course I'm working in a very difficult, industry. I sometimes I try to close my eyes and do my work, but I know that it's one of the most difficult”* (Res_6, 2025).

The actors refer to these complexities with different formulations and make different connections. As the banana industry is a billion-dollar industry, the issue of costs reoccurs. Reduction of carbon footprint or investments against climate change are available, however an actor within a multinational company mentions the higher cost they come with (Mult_8, 2025). Changes in this direction are desired by consumers, retailers, governments, stakeholders and companies. However, they entail higher costs for companies which concludes in a trade off with lower employment wages on farms and plantations. Another example was given by a researcher when talking about certifications. They explain that it is complex as farmers depend on selling bananas for money, but certifications need investments and result in less banana sales (Res_6, 2025). The power imbalance of the industry is engaged with by organizations particularly: *“The buyers have a lot of power and the banana industry is complex. [...] It's a complex economic, social and environmental value chain”* (Org_1, 2025). They connect environmental issues often to decision making and actors in powerful positions. And as these actors primarily concentrate on low prices for consumers, the motivation for solutions lacks. However, exporting countries and consumers are not disconnected.

Ripple effects that environmental issues in banana trade have for consumers in the Global North are also discussed. Reports assess the threat of climate change in exporting countries for the food security and other consequences in the UK and all of the Global North if measures are not implemented (GONÇALVES, 2023; *CE NOTÍCIAS FINANCEIRAS ENGLISH*, 2025c). Other levels of complexity were discussed when speaking about geopolitical connections and consequences. The sphere of geopolitics with international agreements or national regulations is important as it adds complexity to market dynamics and challenges different actors. One actor of a retailer emphasized the strong connection within actors in exporting countries that differs in the banana industry. They refer to corrupt, intransparent and non-regulated structures in the banana industry that they have not experienced with other commodities: *“With bananas, there are billions in turnover and that is an interesting construct if you think, how well they are linked up among each other”* (Ret_4, 2025). Consequences for workers on banana plantations in connection to climate change and geopolitical situations were elaborated on by an actor of an organization when explaining the dynamics at the border between the Dominican Republic and Haiti. Due to dry soils as the climate changes, Haiti extracted water from a river for irrigation which led to a dispute that resulted in tension.

“I think [...] the border being closed and all visas for Haitians being like, put on freeze. And in the banana industry in Dominican Republic, like 80% of the workers are Haitian,

SO that's like a really big problem. And it's all kind of linked. So yeah, I guess you're seeing that these kind of issues related to climate change [...] can even have these big geopolitical consequences that then also affect, you know, banana producers at the farm level with their workers” (Org_7, 2025)

In addition to local challenges, broader dynamics occur in the banana industry. And although these challenges do not directly result in effects in the Global North, they interfere in the “smooth” trade and efficient value chain of bananas, partly also in higher costs for banana production. Independently of the origin of higher costs, if they are not covered by buyers, the farmers and plantations suffer under the dynamics and are left with existential questions. An actor of a certification stresses this importance of value distribution along the supply chain, as climate change, logistics or other issues can entail economic consequences: *“If you are not economically viable as a business, with all this chaos, geopolitical chaos, you are dead. You have to start thinking how I exit this farm, this production and convert to other thing.”* (Cert_2, 2025). This reveals the impact that the interconnectedness of different issues has and stresses the focus on the financial dependency of all the actors. The way in which the actors refer to these connected issues underline that the value chain of bananas is of economic, social and environmental complexity, on which the next section will focus.

5.1.3 Entanglement of Socio-Economic and Environmental Challenges

Reports and interviews reveal clearly that environmental challenges cannot be separated from socio-economic issues and consequences. They intertwine on various levels and ought to be assessed as interplays rather than separate issues, as Verne, Marquardt and Ouma (2025) argue. Especially the narratives around certifications display the interconnectedness of environmental and socio-economic challenges that the banana industry faces. The vulnerability of farmers and plantation workers is stressed at the World Banana Forum, demonstrating that environmental issues such as weather extremes, floods or droughts hit producers hard since their livelihoods are already fragile. Hence, measures to combat these issues entail higher costs and thus add pressure (SMITH, 2024). This connection is also illustrated by a representant of a certification (Org_2, 2025). They use the metaphor of a pyramid when stating the importance of farm viability. It is thus important to have a solid basis, *“a feasible and financially viable farm”* (ibid.). This means a farm that has enough financial resources to combat environmental and social issues. Only on this basis, elements of sustainability can be added, like different agrochemicals or issues of human rights. With this argumentation, the actor connects the socio-economic and environmental issues through viability, which eventually implies the demand of banana prices that cover costs for farms and not constant deterioration in pay and conditions (MacKinnon and Cumbers, 2018). An interconnectedness of socio-economic vulnerability and environmental vulnerability is also elaborated on by Collins (2013). In applying a critical feminist lens on commodity chains and complexes, she includes more factors that influence waged work and its occurrence along the supply chain, in this case also environmental issues. Viability of a farm in the Global South is also directly connected to the price that consumers in the global north pay for bananas. A price that rarely includes external costs of nature and social reproduction. She furthermore stresses the simultaneity of challenges in social reproduction in

a commodity complex which classic economic analyses omit. This simultaneity of environmental and socio-economic challenges is acknowledged by mostly certifications and organizations that focus not only on economic growth but social and planetary sustainability.

The linkage of cost and prices to environmental issues that want to be tackled by certifications is also elaborated by the actor working in the field of research. When speaking about recent changes, they argue about the problems that certifications entail (Res_6, 2025). Labels that work towards organic bananas and try to tackle environmental issues require a lot of expenses from the producer. Oftentimes, these producers are not supported, as the labels still aim for low prices: “[...] when you talk to the farmers, nobody is happy with [certifications]. It’s really like this. We don’t like because we have to invest more and we can sell less banana and it’s just too complex. [...] It is getting less and less efficient for us.” (Res_6, 2025). This example displays the entanglement of socio-economic and environmental issues exemplary, as also more actors and spheres are involved and the tackling of environmental challenges is said to depend on more financial inputs, which no actor is willing to pay. Thus, the economic pressure on the farmers and producers increases.

5.1.4 Certification Paradox

Although certifications are one way of improving financial and ecological standards and often mentioned as a possible solution in the data, they are also perceived critically. Retailers find themselves in the center of this dilemma. Certifications like Fairtrade guarantee a minimum price to farmers (HUBER, 2024; SMITH, 2024). They furthermore set “*social, economic, and environmental standards for the companies and farmers involved in the supply chain*” (SOUTHEY, 2023). The certification is also described as well-known and advanced in European markets especially (SOUTHEY, 2023; Org_1, 2025). The retail representants interviewed all address certifications like fairtrade and other standards as important factors when it comes to sustainability of bananas (Ret_3, 2025; Ret_4, 2025; Ret_5, 2025). Nonetheless, the person responsible for the purchase of bananas at the retailer Ret_4 (2025) discloses their numbers which show that customers do not show a preference to one certification, respectively that they might not be aware of what the different labels represent: “*But there you have to say that the customer does not really differentiate between [label partner organization] and Fairtrade. It is questionable whether the customer knows the difference. Maybe it’s our mistake that we do not communicate it enough, but we cannot see a difference [in the numbers]*” (Ret_4, 2025). While this reflection addresses the responsibility of the supermarket in clear communication, implying a responsibility also of the education of the consumers, it additionally reveals the interchangeability of the labels for the retailer. The banana with the label of the partner organization has a cheaper price, and if consumers do not show a preference towards a more expensive, Fairtrade labelled banana, the retailer interprets it as a signal of indifference. In a market driven environment, a focus towards cheaper, more efficient bananas results.

An actor working for an organization addresses the dilemma as well. On one side, they praise the Fairtrade certification for having made improvements that led to “*transformation in the*

farmers and the communities”, while on the other side, they also critically reflect on the maintaining of standards on farms: “[S]ometimes they came and then they pretend; like ‘ah certifications is coming’. They just adjust a little bit. Is everything working fine? And then the certification goes away and come back to work without shoes or whatever. Without any protection. Yeah. This can also happen.” (Org_1, 2025). This issue of audits with certifications is also acknowledged by another retailer. They state that they are aware of it and tackle it by “going one step above the certification, by e.g. evaluating suppliers or send our own auditors to examine more thoroughly” (Ret_5, 2025). They are furthermore aware that it is difficult for consumers to be properly informed about the different labels, as there are various certifications and standards. This variety can increase mistrust towards existing quality labels, which is where they see retailers and others in the responsibility of education of the consumers (Ret_5, 2025).

From a scholarly perspective, certifications are perceived critically as they reproduce postcolonial power imbalances and prioritize knowledge from the Global North (Wilson and Jackson, 2016). Certified bananas are furthermore traded in a capitalist system, in which they can reproduce new uneven geographies (ibid.). Including a feminist analysis, they are also criticized to ignore pre-existing inequalities in a global capitalist system (Collins, 2013; Zaglul Ruiz, 2024). These perspectives, as well as an intransparency for customers and actors within the global banana complex show that certifications cannot be considered the only solution to tackle environmental and socio-economic issues. A broader analysis of the system ought to be included, not only a classical economic analysis that centers around accumulation of capital and ignores other perspectives.

5.1.5 Historic Changes and Roles of Geographic Regions

With the global banana trade existing for over 150 years, many processes and dynamics have changed over time. And while there are still a variety of challenges to tackle within the banana industry nowadays, the last centuries have shown improvements in some areas. Increased efficiency and transparency along supply chains were praised in the interview with an employee of a multinational company. While intransparency is not stressed or also criticized by other actors, the alignment within the supply chain is reported to have evolved also due to the involvement of retailers as powerful actors (Mult_8, 2025). Changes that are observed include a higher occurrence and visibility of labels and certifications. More bananas that are sold are certified under different labels, and it has evolved from bananas only being Global G.A.P. certified (Ret_3, 2025; Org_1, 2025). However, the increase of certifications is also critically perceived, as it involves investment of farmers: “So I think that's the biggest change that I've seen in the last year, that you see more and more and more of these stickers and certifications in bananas that make you seem like a good person selling these type of bananas here in Europe. But when you see the background, it is not as nice as it sounds” (Res_6, 2025). Certifications thus not only entail positive socio-economic or environmental impact. The consequences for workers on plantations ought to be assessed precisely. That is an issue that was also discussed in the context of wages. Retailers have pushed towards living wages for plantation workers, which is a progress as they collaborate throughout the supply chain and recognize “that it's like a kind of systemic issue that they will need to share the responsibility for” (Org_7, 2025). These

efforts, however, remain efforts by retailers as there is no concrete change fathomable: *“But whether that has actually led to concrete improvements for workers yet, I don't think we've seen any evidence of that so far”* (Org_7, 2025). These efforts in socio-economic issues with wages can be compared to efforts in environmental issues. Actors are aware of the issues and aim to tackle them to maintain an efficient banana trade in the future, however concrete evidence of change is not visible. The increased reliance on monocultures and the Cavendish variety in the last centuries is of no aid to tackle these issues (Org_7, 2025). In addition, the banana price over these years have stagnated, although production costs have increased (SPEARE-COLE, 2024; Ret_5, 2025).

Bananas grow in tropical and subtropical regions and are exported globally. The main exporting countries are in Latin America and the Caribbean (FAO, 2026a). However, that countries in these regions face severe threats from climate change and diseases as they are susceptible to environmental changes are reoccurring topics in the text corpus. In this context, the case of the Philippines as one of the main exporting countries is interesting. According to Res_6 (2025), the country has dealt with Fusarium wilt TR4 for about 30 years already and they are still among the top exporting countries. This is possible due to inefficient and unsustainable practices:

“And in the most dignified, farms they do it like that. Every year new plants and of course more expensive or and when the soil is already like super, super full of Fusarium, they just take the whole farm and they move to another place. And then they forget about the other places. Just abandoned farms. [... It] is bad for the environment, but they have the money to just go up to the mountain to buy more, more, more, more, and just left behind abandoned farm. That's I know for a good source that happens in in the Philippines” (Res_6, 2025).

These practices presuppose much availability of land as well as financial resources. Cultivating new land and a high use of pesticides cause further issues connected to climate change. The interconnectedness of environmental issues, geopolitical dynamics and costs are also displayed in another country. The biggest exporter, Ecuador, was mentioned in connection to different issues. In autumn of 2025, while I conducted the interviews, initial detections of Panama disease or TR4 in Ecuador were made. These occurrences were mentioned in different conversations along with either expression of concern or along relativizing the impact. Concern was expressed as follows: *“Because in theory, you cannot grow bananas where this disease is present. And recently [it] arrived to Ecuador which is the main exporter. So that's a big call of attention”* (Res_6, 2025). Other actor relativized the impact since the national banana industry is well organized and a lot of influential actors engage in it: *[R]ight now, I think last week it was detected the first case in in Ecuador, [...]. But you have, the banana chamber is huge. Very powerful. The president, the papa from the president was one of the most important banana producers in the world. So this is a family. So the Minister of Agriculture is a banana producer. Also banana plantation. So there is this political leverage that the industry has to be able to invest and to take the measures”* (Cert_2, 2025). They are referring to the father of Ecuador's president Daniel Noboa, Alvaro Noboa, who is often referred to as a “banana tycoon” (Swissinfo, 2023) as well as the previous prime minister Danilo Palacios, who was involved in the export of bananas (Sopisco News, 2023). In comparison to other countries, there is faith for

Ecuador to tackle the issues of the disease due to political and personal interest, although it is known to be fatal for crops. While the certification representant relies on Ecuador's industry to take measures against TR4, they raise concern about shifts in market dynamics, especially regarding the regions that Ecuador exports its bananas to. While it has commonly exported mainly to Europe and the USA, there is a shift of market dynamics towards Russia and China (Org_2, 2025). This shift is attributed to the lower sustainability standards that these countries have, which makes it easier and cheaper to export to them. These shifts in exporting countries might make it more difficult for Europe and the USA to import bananas from their usual countries. More competition for banana imports from Ecuador or other Latin American countries could furthermore results in higher prices. Consequently, the price of the bananas dominates most of the discussions about environmental challenges of bananas, thus the following chapter assesses the narratives.

5.1.6 Centrality of the Price

Discussions about issues in the global banana complex in the Global North either start with or turn to the topic of market price and cost distribution in the supply complex. Every interview and several reports in the text corpus address the issue of the price, predominantly agreeing that bananas are sold too cheap, considering the cost of production and trade. In interviews, it was often one of the first connection that was made to environmental issues. As several of the interviewed actors are employed in a market driven environment, the issue of low prices was addressed, however a long-term solution was often missing. Retailers and multinational companies require low prices to stay competitive. Organizations, research and certification criticize this competition driven perspective, while still acknowledging the capitalist structures of the system. As the price is a reoccurring and predominant topic in the data for this thesis, different narratives and arguments are discussed in this section. Firstly, the aspect and arguments of the current prices of bananas being too low are examined, followed by a discussion of bananas being 'loss leaders' for supermarkets. The historical developments of the price are analyzed as well as the predictions that prices might increase due to uncertainties and increased production costs.

Banana prices are stated to be too low and have been too low for decades (SPEARE-COLE, 2024). Different actors underline this statement by comparing the prices to those of other fruit and vegetables. *"The retailers they don't want to change the price to the market. It's not moving. Even inflation is moving. Apples are more expensive, mandarins, whatever fruit you will see is expensive. Except bananas"* (Cert_2, 2025). Nearly identical arguments about the comparison of prices were made by several more actors:

- *"It's not possible that a banana that came from Costa Rica is cheaper than an apple that came from here."* (Org_1, 2025)
- *"Even the apple from [local country] is more expensive."* (Ret_5, 2025)
- *"And people know, like, well, apples are grown here. How are bananas cheaper? Like, it's obvious to think we should be paying more for them."* (Org_7, 2025)

- “[T]he price of banana is ridiculous in my opinion. It is too cheap considering that [...] a kilo of apples is [...] more expensive than a banana. When the bananas are brought from a different continent.” (Res_6, 2025)

As mentioned above by Cert_2 (2025), the low prices are often claimed to be the retailer’s obligation. Supermarkets are called to act and introduce policies against the low prices that do not reflect the costs on the farm (Res_6, 2025). Org_7 (2025) addresses the high production costs of bananas that are not reflected in the supermarket price, as retailers treat bananas as “loss leaders” to attract more consumers. This results in bananas being sold too cheap and the supermarket balancing the lost profit with the margin on other products (this is not legal everywhere). While this practice works for supermarkets, the actor criticizes that producers do not have the possibility to balance out low income as they fully depend on bananas and are thus put under more pressure by low purchase prices paid by supermarkets. Some actors interviewed stress that this process is not legally allowed and thus they do not perform it, however, the ‘loss leader’ character of bananas is still acknowledged; and with it, the aim to keep retail prices low.

Retailer and international corporations drive at maintaining banana prices low as they fear decreasing sales and less customers if prices increase. The employee of a multinational company mentions the (from an economic perspective deterrent) example of a retail chain in Germany that “went 100% fairtrade and lost 30 or 40% of their banana sales in a matter of weeks” (Mult_8, 2025), implying that it is bad for sales to address issues within the banana industry and increase prices. While organizations or certifications would applaud this step as an attempt to tackle the interwoven environmental and socio-economic issues, the attitude towards this occurrence reflects the market-driven mind set of retailers and multinational companies. Retail and company representants equate higher prices to a loss in sales and are thus to be prevented. The hyper fixation on prices, costs and margins was also present when the actor talks about an imagined scenario of higher prices: “If banana prices went to, from, let's say, I don't know, €2 per kilo in Europe to 12, I mean, these are the things would immediately slow down consumption and would have very bad consequences. I'm taking an extreme scenario, but just so you understand where I'm coming from. [We] want to be able to continue business [...]” (Mult_8, 2025). To be able to continue business and selling bananas, consumer behavior is prioritized over other challenges within the supply complex. Retailers report that customers have become more price sensitive in recent years, thus they offer different labels of bananas (Ret_3, 2025; Ret_4, 2025). On one side, bananas are the most sold product, and on the other it is one of the ten products consumers know the price of (Ret_5, 2025). The entry-level price at Ret_4 (2025) had been lowered even more two months prior to the interview. If competitors reduce prices, the pressure intensifies on other retailers as they fear to lose customers (Ret_5, 2025).

The innate fixation on price in banana trade can be explained by the capitalist environment in which the actors engage, but also with historical evolutions. Ret_5 (2025) explains that the purchase of bananas is historically driven by market economy, where new price negotiations and contracts are renewed annually. Every year, retailers bargain the purchase price with their suppliers, who in turn bargains it with the producers. This annual negotiation gives economic power to the retailer but is perceived as pressuring. The purchaser of fruit and vegetables of

another retailer explained in an interview in October 2025 that they had just sent out offers, *“meaning that the suppliers send their offers and then we go into negotiations and try to fix the best price possible. Then we negotiate until the end of December and hopefully have a good portfolio for the next year”* (Ret_4, 2025). In connection to these processes that occur every autumn, the actor stresses that their purchase team is under a lot of price pressure, as purchase prices have increased in the last years, whereas consumers are still used to equal or even lower prices in retail (Ret_4, 2025). They affirm the enquiry whether potentially they could deal with new supplier every year due to renewal of contracts, however state that it is mostly not the case. The argument, however, implies that the retailer possesses economic power in these negotiations as they decide who they collaborate with every year. *“Overall, we are organized in a way that we try, of course, to cooperate with suppliers long-term. It is untypical, that someone is excluded from one season to the next. Well, in this case not only the price is crucial, but probably many things led to the decision, like that quality standards were not met or because of supply interruptions [...]”* (Ret_4, 2025). The beginning of the argument is formulated very vaguely with the use of ‘overall we try’, implying that there are a lot of factors where long-term cooperation is not desired. The economic relevance of short-term contracts additionally caused friction with the sustainability team member of the same retailer, who was interviewed together with the purchaser. When they implement sustainability projects, they aim to collaborate with suppliers for longer than a year, however, they observe that long-term commitments shift the economic power to the producers and suppliers, when *“all the others say we will tell you next year whether we buy again or not. Then the price rises automatically because they know we are tied to them and depend on being able to source from them. Meaning: in these situations that revolve around sustainability, the supplier receives more power or a leverage that makes it hard for retail. That’s why I cannot say that retail overall has the most powerful position”* (Ret_4, 2025). This segment displays that combating environmental issues through sustainability projects stands in direct friction with the market driven environment the retailer engages in. And within, sustainability teams are aware of the limitations this system holds and operate according to these limitations, which impedes taking more responsibility. Tackling challenges caused by climate change but staying profitable by maintaining low prices is displayed to be difficult for retailers.

Although the price sensitivity of the consumers and the maintenance of low prices are central for retailers and corporations, the actors agree that prices should be higher and reflect the true production and environmental costs of the fruit. Furthermore, the representant of an international retailer relativizes the focus on the price sensitivity of consumers (Ret_5, 2025). They elaborate on conducting internal studies which show that *“special offer price of bananas or other fruit and vegetables do not influence consumer behavior as much as we thought”* (Ret_5, 2025). Although not representative, this is an observation that could influence discussions on prices and the friction between tackling environmental issues while maintaining the lowest price. The retailer where the actor Ret_5 (2025) is employed is known to have an intrinsic motivation to offer more sustainable products. They summarize the challenges of these efforts within a neoliberal system and a *“free market economy, where everyone is concerned about the price. Your intentions can be good, but if it does not add up economically, then [these intentions] are in vain [...]”* (Ret_5, 2025). The price dominates the measures to approach environmental issues, with the current price not reflecting the true cost of banana production

(DESSON, 2024). Many externalities are not included in the retail price of bananas, and thus not valued by consumers (Org_7, 2025; Ret_4, 2025). On one side, prices should be higher due to environmental pressure *“like hurricanes and drought and, increased rainfall, heat, etc. on crops and [...] that creates increased production costs”* (Org_7, 2025) but also *“the chemicals, the fertilization, the work labor is the same. So there [are no compensations] for these kinds of decisions in the market of bananas. So, I think this is a big problem”* (Res_6, 2025). On the other, broader side, these externalities according to Collins (2013) include the pollution of the land, the social relations that lead to work as well as the “fictitious commodities” like land, water and labor (Polanyi, 1944)⁶. A direction of a feminist analysis is made by an actor of Ret_4 (2025) themselves when they demonstrate the work that is included from farm to customer, which is veiled with the very low retail price. The connection between consumers in the Global North with people who were involved in the creation of the product would thus be increased with a transparent, higher price. Calls for a higher price in the future are also made by Org_1 (2025), by stressing that *“[a] sustainable price [...] allows farmers and producers to invest in sustainable intensification and also [...] pay better salaries to workers and so on. I think the key is the price that has to go up, and there are studies that say the consumer doesn't care if it's 20 cents more per kilo in Canada and US. And this has a huge impact in the value chain”*, and again directly linking the consumers to the producers.

The increasing costs of environmental issues caused by climate change are addressed in further interviews and reports. The prediction of banana prices increasing due to environmental changes are shared by more actors. Climate change is said to make certain groceries like coffee or bananas more expensive, and with further global warming, this inflationary spiral is predicted continue and pricing strategies will have to adjust (MITTNER, 2021; KAPPELLER, 2024; STRAILEY, 2025). An employee of a multinational company argues that there are many measures to reduce carbon footprint of the company, but many of them entail higher costs and are thus not profitable (Mult_8, 2025). However, if these measures eventually lead to reducing costs, they are willing to find solutions. When predicting banana price evolution, they claim that *“probably everything will get more expensive, bananas included, not as an exception, but just part of a general trend because yeah, as the climate gets more unpredictable, producing food will become more difficult and therefore more expensive”* (Mult_8, 2025). The focus on price itself forms a contradiction within these arguments, as little expensive measures to reduce the carbon footprint are taken, which in turn contributes to climate change that entails unpredictability and thus more expensive production and products. From a market driven perspective, reaction to changes is easier and more profitable (at least in the short-term) than taking initial action.

If incentives are given, however, tackling environmental issues is reported to be possible within a market-driven system, as Cert_2 (2025) elaborates. Although they propose generally higher prices to cover production and external costs, they acknowledge that retailers will not change their competitive practices. However, they have projects where more sustainable farming

⁶ Karl Polanyi's criticized capitalist development to treat land, labor and money to be fictitious commodities, yet they ought to be treated as real commodities. He explored that this contradiction would entail issues as “society would eventually fight back against the environmentally and socially destructive effects of such treatment” (Jessop, 2007, p. 115).

practices led to higher productivity and improved soil health. Since less irrigation was then needed, the water and carbon footprint was reduced as well as the costs lowered: *“We always need to create incentives. And the most important incentive is money in the pocket. So the money in the pocket here is less cost per box, so more margin for the producer. [...] Indirectly the incentive [is] better resilience for climate change”* (Cert_2, 2025). These practices are not yet applied on a large-scale but provide an example of how maintaining sustainability works within a capitalist system.

As has been discussed, the price and cost of bananas in the global banana complex can be read as one of the most pressuring environmental challenges due to the interdependency of financial resources and the targeting of issues on farms and in the system. Retailers with economic power have a leverage to react to these challenges, however, their competitive market orientation often hinders actions. Due to this conflict, environmental and social challenges are only profitable and implemented if the economic scale is considered (Ret_5, 2025). The economic scale, however, concentrates on measures and “short-term benefits at the expense of long-term benefits – and, for that matter, at the expense of long-term sustainability” (Dunn, 2017, p. 10). Additionally, external costs such as land, water, labor, fertilization or weather insecurity are not reflected in the price of the banana on the shelves in the supermarkets. Financial resources on farms to cover increasing production costs and risks include the mitigation of diseases, such as one of the most pressuring fungal threats, which will be analyzed in the next chapter.

5.1.7 The Fungal Disease TR4 (or Fusarium Wilt or Panama Disease)

Although it is an indirect environmental challenge, the threat of the Panama disease is discussed widely in the data. With warming temperatures and weather extremes due to climate change, diseases such as TR4 spread more easily, but the spread is also an issue of trade (Org_1, 2025). If people move between plantations, they can carry TR4 to other farms and cause harm (Cert_2, 2025). As discussed in an earlier section, the disease has been detected in the largest exporting country Ecuador in autumn of 2025, after having spread in numerous countries across Africa, Asia and Latin America (IPPC, 2024a; Res_6, 2025). While for some actors, the issue of TR4 is not the most pressuring as there are other issues they view as more important, others are more concerned about the damage that TR4 can cause in the banana industry. This discussion focuses on the reoccurring arguments when discussing TR4 as well as the perception of the severity of the disease.

The disease has been known for many years, but as it did not affect countries important for banana production and trade initially, little attention was paid to it. With its spread in numerous countries and the entailing harm on plantations, reports about the disease increased – a temporal distribution that can be observed in the text corpus. Reports addressing TR4 in the banana industry were most prevalent in the last five years. However, an article in the Swiss newspaper *Tagesanzeiger* warned about the disease in 2015 already (RATHS, 2015). Despite the disease not having been present in Latin America and the number of bananas imported to Switzerland was lower than today, the narratives about the disease reflect current ones. Also today, the destructive impact is one of the main focal points in articles and conversations. The fungal

disease that causes TR4 is soil-borne and clogs the vascular system of banana roots, thus they cannot take up nutrients and dry out (RATHS, 2015; HARVEY, 2025). Its threat to banana production and the potential to eradicate entire plantations - especially those of identical Cavendish plants - is repeatedly stressed (RATHS, 2015; MURIGI, 2025; SHRIVASTAVA, 2025; IPPC, 2024a). The continuous spread of the disease and the difficulties in managing or eradicating it are further arguments which are prominent in the data. As the spread of TR4 is unstoppable, the discussions focus on managing and controlling it, which proves to be challenging, as *“the most effective strategies involve preventing its entry into non-affected areas and immediate containment upon detection. It is thus critical to implement proactive phytosanitary measures and innovative approaches”* (IPPC, 2024a). These strategies and phytosanitary measures were introduced at a time where the disease was already present in many regions of the world, and thus impossible to isolate. The longevity of the fungus also entails challenges, as once it is present in the soil, it survives for 30 to 40 years, during which growing bananas is unfeasible (EURASIA REVIEW, 2024; IPPC, 2024; Res_6, 2025). As it is too late for prevention of the disease, the combating ought to be cooperated globally and not regionally. Attempts for global collaboration and exchange were made by the World Banana Forum which is organized by the FAO. The conference in 2024 focused on discussing challenges faced by banana producers regarding the spread of TR4, as well as leading global initiatives to tackle the spread of TR4 through international efforts and standardized plant protection protocols (FAO, 2024b). In addition to environmental threats of the disease, the social and economic impact that TR4 entails are discussed in interviews and reports. Countries that rely on banana exports for national income are threatened by a potential eradication of banana plantations (IPPC, 2024b). Furthermore, it can lead to reduced income for farmers or unemployment as in some regions, other crops than bananas are not financially feasible (EURASIA REVIEW, 2024; SPEARE-COLE, 2024). Indirect economic threats of the disease are less investment by foreign investors or financial support once TR4 is detected in an area, which might *“lead to under-reporting of the disease's spread if systematic monitoring is not in place”* (EURASIA REVIEW, 2024).

The various imminences of TR4 are prominent within the banana industry, however not all actors agree on the severity of the disease. Some estimate it to be devastating for the industry, while others describe the threat as manageable or downplay the impacts it has. The Food and Agriculture Organization of the United Nations ranks the fungal disease *“as one of the most aggressive and destructive [...] in the history of agriculture and the world's greatest threat to banana production”*, which is a clear statement implicating a potential crisis (HARVEY, 2025). A sense of crisis is also evoked with comparisons of TR4 to the COVID-19 pandemic, where rapid spread and potential shortages are implied (GRAY, 2022). Other phrases used in connection to the disease are a *“probable death to the Cavendish banana”* (DODWELL, 2019) or the reoccurring *“devastation of the Cavendish banana”* (LIMB, 2025; MURIGI, 2025). The long-term impact on livelihoods and the ecology are furthermore stressed with the urge to *“take this seriously”* (EURASIA REVIEW, 2024). All these comparisons, framings and the choice of language to express severity emphasize that for many, TR4 is perceived as an agricultural crisis that has the potential to disrupt social and economic spheres.

While the majority of the discourse around the disease assesses it critically and acknowledges the damage it causes and will cause, there are opposite opinions or more tempered perspectives. Some discussions modify the severity of TR4 due to its slow movement and thus more time to adapt for farmers and plantations (DODWELL, 2019). Others are convinced that the disease is manageable with measures, especially if the governments and cooperatives in exporting countries are organized and collaborate to take action against it (EURASIA REVIEW, 2024; STRAILEY, 2025; WATSON, 2025).

The manager of a German fruit importer is interviewed in the *Lebensmittel Zeitung* about the future of global trade in general as well as specifically about the future of banana trade (KRÖNERT and SCHADWINKEL, 2025). Bananas are the most important fruit for the company, thus the interviewer asks the management about the possible eradication of plantations. The manager acknowledges the existence of TR4, *“but if you manage and control the farm well, then also this disease is controllable”* (KRÖNERT and SCHADWINKEL, 2025). Firstly, this conclusion does not consider damage that is already happening due to TR4 on farms in exporting countries. From a Global North point of view, it is easy to ignore the effects the disease has, as the importer occupies an economically powerful role within the trade. The statement also implies that they do not feel dependent on the regions they usually source bananas from, as if they are affected by diseases and not able to produce bananas, the corporation will collaborate with other plantations which are not affected. Thus, the company is not concerned with the disease. While this perspective ignores any responsibility of companies and actors in the Global North, it secondly imposes the responsibility of tackling and controlling the disease fully to actors on farms. The use of the expression *“if you manage and control the farm well”* excludes any subjective involvement in the issue and others the actors in the Global South who are battling with the disease, implying that *they* ought to deal with it.

While the interviewed retailers also acknowledge the disease and its threat, they do not attribute the highest significance to it as other environmental and social issues are more fundamental in their opinions. Examples of downplaying the issues are not detected with interviewees working at retail level. The representant of another multinational organization that was interviewed, however, reacts similarly to the manager of the German fruit importer:

“It’s widely exaggerated. I think the research is going to advance and we see solutions already emerging against TR4. We could eliminate 80% of crop protection products only by creating a variety that is resistant to Sigatoka. Black Sigatoka is 80% of everything we apply. We have a couple side problems like nematodes in the soil [...] But this one disease is a lot. [If] we were able to offer any variety that is truly resistant to this, that would be a tremendous advance.” (Mult_8, 2025)

The actor downplays the threat of TR4 by generalizing the disease and the entailing threats of eradication of plantations as exaggerations. Furthermore, they shift the focus away from TR4 to the other disease Sigatoka. This is either because the Sigatoka disease and the pesticide application against it are more present in the daily practices of the actor, or they actively try to deviate from the issues of TR4. The persuaded downplay of the disease repeatedly evokes the

ignorance of multinational companies and actors in the Global North towards issues on the farms in exporting countries. The reference to the research and the belief that it will manage to find solutions, however, addresses a certain responsibility of the company, as many companies fund research projects to study resistant varieties. Nevertheless, the claim of the threat of the disease being an exaggeration is relevant for analysis of how actors in the Global North perceive challenges, especially against the backdrop of current research.

An opposing view is represented by the interviewed researcher, who views the Panama disease as the most dangerous disease for banana plantations as there is no measures to be taken to eradicate it once it is present (Res_6, 2025). The impossibility of prevention was stressed three times during the interview. They compare it to the Black Sigatoka which is similarly harming, but it can be controlled with chemicals. Their work at a company in Europe includes the supervision of breeding new resistant banana varieties. This company is part of one multinational company and was created in 2021 with the aim to develop banana varieties that are resistant to TR4 and Black Sigatoka⁷. The research project, however, started earlier at a university when the researcher started their PhD in 2012. At that time, there was not much research on the biology of bananas as everything “*is super standard. It's a monoculture. [...] if you want to start a plantation, you already know how to do it because it's just copying what others are doing. Everything is standard. The boxes, the system. Everything. And for Black Sigatoka, there was a lot of research. It's one pathogen, one disease that caused problems in banana. But for Fusarium [TR4], there was not too much [research]. So the biggest change, at least from my perspective, is the expansion of this pathogen. Because when I started this [...], it was present only in five countries. Nowadays it's like, if I remember correctly, 26 countries. So in these years the disease has expanded to many countries. And this is a disease that can wipe out banana essentially*” (Res_6, 2025). Research on bananas was not needed by companies in the Global North (that have the financial resources to fund research), as the plantations operated well and the disease was only present in countries that did not affect companies. The actor remembers the development of the disease and the surrounding discourse around it:

“Now it's everywhere. When I came, there was not too much knowledge about the fungus because, you know, it was present only in few countries that were not important, let's say, for the industry. So nobody cared. [...] But when we started to discover the disease in many other countries then it was like okay, it's happening, it's moving, it can happen again that we lose our bananas” (Res_6, 2025).

As soon as TR4 was discovered in countries that are important for global trade, the industry started to react. The history of the eradication of the Gros Michel variety was remembered, and in the light of a possible destruction of ‘relevant’ banana plantations and thus possible loss of turnover, it appeared crucial to take measures. From a planetary approach by Chakrabarty (2021), this late reaction can be critically assessed. If players in the Global North only respond if their own nation or banana supply is under threat, they act from a ‘global’ perspective that

⁷ Many multinational companies and suppliers conduct and fund research on bananas, the researcher is a representant of one of these projects.

centers around humans and borders. A ‘planetary’ perspective would have entailed an earlier reaction, as the spread of the disease in any region of the world can be considered a threat to bananas on the planet. However, the spread of TR4 can also be regarded to act in a ‘planetary’ manner, as it does not stop at national borders but spreads around the planet and its nature, even reconquering the regions of banana cultivation that have been transformed by humankind in the Anthropocene. The actor remembers the first appearance in Colombia in 2019, where they were responsible for the identification and confirmation of the presence of TR4:

“And that was like the biggest boom because it was for the first time in a place where bananas can [...] cause a big effect in the industry. Yeah, well, you know, most bananas come from Latin America, so that that is like: Oh, okay. Now it's here. So now we have to start doing something.” (Res_6, 2025).

This presence in Latin America led to funding of research by many players within the global banana complex and implementation of measures. For a global coordination on the management of TR4 to be generated, it took four to five more years (considering that the report on global coordination by the IPPC was released in 2024⁸). The researcher explains that these reactions occurred too late, as once Fusarium wilt is detected or the plants show symptoms, the disease had been present in the soil for a longer time and within this time it could have already be spread to other farms unknowingly. They thus stress why current developments and downplaying of the occurrence of TR4 are alarming:

“[That is] one of my like more famous phrases: [W]hen you see Fusarium, it's already too late. So it's not that, for example, now that they find it in Ecuador, they announce it like, hey, no worries, it's in just one plant. That's very, very. How do you say that? Like irresponsible to say. It's not that you're sick and then you're isolated and that's it. No, the plant is sick is because the disease was there already for years.” (Res_6, 2025)

The delay of presence and detection and thus the invisible spread is one of the issues TR4 entails. The biological consequences for soils and farms are that once Fusarium wilt is present in the soil, it is contaminated. For banana cultivation, this means to either plant bananas on uninfected soil, or to renew the plants after one harvest, as the old ones are “full of fusarium” (Res_6, 2025), which is expensive and inefficient⁹. If more ground is used as either the soil is less productive or new areas are cultivated with bananas, other environmental issues like challenges of soil health, water management or biodiversity result. Thus, to address the issue of TR4 in Latin America, research is studying the breeding of new, resistant varieties also for the purpose of tackling environmental issues. This research remains challenging as it aims to produce varieties that are resistant to both TR4 and Black Sigatoka. A decrease of Black Sigatoka would entail less spraying of pesticides; a consequence which is both economically and ecologically desired. It would entail less costs for products and spraying and simultaneously reduce pollution of nature and the improve health of workers. Research is challenging due to the biological complexity of the disease: “Fusarium, let's say it's relatively easy because it's

⁸ See (IPPC, 2024a)

⁹ See examples of the Philippines in section 5.1.5

just one gene in the DNA [that] is responsible for that resistance. So when you make a resistant banana, you transfer that gene and then that's it. But for Black Sigatoka, it seems like it's several genes acting together” (Res_6, 2025). These reasons complicate the research on resistant varieties, but the company of the researcher is testing new varieties in secret. The aim is to have a new Cavendish-type variety by 2028: *“That's at least the objective. I don't know if we can manage to do it, but we are working hard on that. [...] But in the meantime, we are developing new potential varieties. [...] I think in potential varieties we have around 11 that we want to test next year. So we are not telling yet to anybody because we want to make sure that they look nice, that they are resistant. So for now, we are going to observe them in the greenhouse and send them to the Philippines or to Indonesia”* (Res_6, 2025). As they do not communicate their progress, it is possible that several other research projects are also working in confidentiality. According to the researcher, there is urgent need to develop new varieties, as the TR4 disease can cause serious damage. They illustrate a possibility that the same eradication that happened with the Gros Michel variety happens to the Cavendish. Simply creating one new variety that is resistant for the present is thus not the only solution, *“[b]ecause the same as we had before of TR4. TR1 that decimated the banana [...] that our grandpas used to eat. Then we create Cavendish that was resistant. Then came TR4, then we will create something and then will come TR5. So we need to think that we need more diversification, because when one fall we will have the other, you know, and then we or one will not fall because the other act as a barrier”* (Res_6, 2025). The urgency for diversification of the banana cultivation is declared by many other actors, which is part of the discussion in the section on adaptation strategies and solutions.

5.2 How are Challenges Addressed?

5.2.1 Adaptation Strategies and Solutions

In connection to environmental issues, the data suggests a variety of possible solutions or adaptation strategies to tackle the existing issues. These strategies and solutions address different aspects of the banana industry, some focusing more on technological changes, some on certifications and others on research. Although the solutions suggested by the actors address different areas where changes could be implemented, they share the requirement of financial resources and investment to be executed. This section will identify some of the most mentioned strategies and solutions proposed as well as how they are discussed, including the discussion about investments.

Necessity of Investment

As there are several issues acknowledged by the actors, calls for a transformation of the banana industry are common. Nevertheless, the actors remain vague when speaking about tangible solutions and strategies and frequently emphasize the high financial input required. Mult_8 (2025) stresses the importance as well as the costs of solutions: *“[W]e need groundbreaking innovation. We need faster. And it's difficult because you need a lot of capital to do this.”* After this statement, they address the difficulties for emission reduction from vessels and how research is targeting that, before focusing on the urgency of these solutions. Eventually, they

emphasize the importance of affordable and realistic solutions (Mult_8, 2025). This argumentation reflects the market-driven balance between remaining costs low, while being aware of needing solutions to secure a productive banana trade in the future. That measures require financial resources as well as knowledge is also stated by a researcher in an article on endangered banana production in Colombia due to TR4. They elaborate that measures like *“building cement paths between banana plots, fencing them, and installing disinfectant stations at farm entry points”* are effective and observed to be profitable although *“they require money and awareness”* (EURASIA REVIEW, 2024). Despite being expensive, investments are made by companies. In August 2025, the chairman and CEO of the multinational company Fresh Del Monte noted the combination of *“short-term tactical adjustments with long-term strategic investments”* to address *“the banana supply shortage while strengthening the resilience of its supply chain”* (STRAILEY, 2025). These include precise examples like the expansion of cultivation area as well as research support for growers to adjust production to make it more efficient. While this is a reaction to environmental changes that affect banana production, it does not address the causing of the changes and possible strategies to mitigate emissions or produce more sustainably in these regions. The focus on efficiency is mirrored in the explanation of the adaptation strategies, which “denaturalize” the plants and intensify a perception of bananas as a manufactured product:

“In the short term, we are implementing targeted programs to optimize production during periods when banana plants are naturally more productive. By leveraging our detailed research on banana growth cycles, we are able to shift production to these productive windows. This involves applying agronomic techniques to either accelerate or delay harvests, allowing us to better align fruit availability with market demand.” (STRAILEY, 2025)

Rather than referring to nature, these projects remind of manufacturing processes of commodities in factories. This perspective on cultivation of bananas for large-scale production without incorporating the vicious cycle and impacts these monocultural processes entail for the environment ignores the responsibility of companies and other actors in the Global North. It underlines the hyper focus on profit and staying competitive that organizations and research criticize (Cert_2, 2025; Org_7, 2025). Solutions that are viewed socio-economically and environmentally sustainable are primarily considered if they connote reduced costs, which can be communicated for promotion purpose.

Research

One example is the investment in research on resistant varieties against diseases. The Chief Sustainability Officer of Fresh Del Monte explains in a PR article from 2021 that they are addressing issues through a partnership with research at the Queensland University of Technology (PR NEWSWIRE, 2021). The research aims to create *“disease-resistant bananas”* that are *“less susceptible to Tropical Race 4 (TR4) [...] and are more sustainable to our food supply”* (ibid). While the focus on sustainability and improved livelihood of farmers is stated, it becomes clear within the article that the main aim is not environmental or social sustainability, but sustaining banana trade and thus sustaining trade and sales for the company, as the

researcher quoted focuses on high supply and efficiency rather than ecological or social sustainability:

“These new gene-editing technologies represent a new opportunity for addressing the global food supply in ways we never imagined,” said Dale. “Our partnership with Fresh Del Monte represents a great opportunity for our research to reach society in an efficient and commercially feasible manner”” (PR NEWSWIRE, 2021).

‘Efficient’ and ‘commercially feasible’ corresponding to value accumulation stand in contrast with environmental and social issues that arise within the global banana complex.

The importance of research to tackle environmental issues is repeatedly raised in the data by several actors, mostly in combination with resistance (Org_1, 2025; Ret_5, 2025; Mult_8, 2025; KIISHEWKO, 2013; PR NEWSWIRE, 2021; FAO, 2024b; CLERCX *et al.*, 2025). The issue of susceptibility of Cavendish bananas together with the faster spread of diseases due to weather extremes results in the reliance on research to develop resistant varieties. While some actors are considering and researching genetically modified (GM) bananas to tackle the susceptibility, the researcher I interviewed is working on varieties *“in what is known [as] the natural way”* (Res_6, 2025). This is due to GM plants being under restrictions in many countries, thus it would entail a long process of validation for them to be permitted for trade. Naturally sourced resistant varieties can be planted *“tomorrow in the field without any restriction”*, however, it is crucial that these new plants *“look like Cavendish [and] taste like Cavendish”* even if they are not genetically similar (Res_6, 2025). The motivation is again market-driven: *“So of course they still want the Cavendish because that’s the cash, the money. They can get money from the Cavendish”* (Res_6, 2026). ‘They’ in this argument refers to the multinational company that mostly funds the research. The focus is thus clear, although other strategies to address the susceptibility of the current Cavendish banana are proposed by the researcher. *“Our aim or our dream is to create something that looks like that Cavendish that we have now that is resistant, resilient to the climate change, but at the same time try to incorporate new types of bananas with the same characteristics [...]. We are trying to generate other plants with the diversity that we have, because we have currently more than 150 different types of banana[s]”* (Res_6, 2025).

Agreements and Certification

Although cost intensive, many solutions and strategies to combat the issues regarding climate and the environment within the global banana complex are emphasized in the interviews and the text corpus.

Although some critical remarks are made about certifications (increased efforts for farmers and not enough control), there is repeated focus on certifications as a possible solution to environmental challenges. The arguments include the ensuring of fair prices that promote sustainable practices and investments for climate change mitigation (SOUTHEY, 2023; SMITH, 2024; MURIGI, 2025; SPEARE-COLE, 2025). The increased transparency of supply chains due to certifications is elaborated on, as well as improved working conditions and control for farmers (Org_1, 2025). The large-scale introduction of certified farms and fruits requires

high administrative and financial input, and furthermore certain certifications are often voluntary and not mandatory by national regulations.

To increase the spread of certification but also to combat environmental issues on an international scale, solutions in the form of international agreements are discussed. Countries should act against climate change and its consequences by cooperating (VERMA, 2019). This includes the “*international collaboration and knowledge exchange in fostering effective TR4 management strategies*” as well as the “*need for establishing global standards in plant protection*” (FAO, 2024b). International financial support for banana producers and agricultural communities for adaptation to climate change as well as the reduction of emissions by countries in the Global North are discussed as adaptation strategies and solutions to tackle existing issues (LIMB, 2025; MURIGI, 2025; QUESADA WEBB, 2025; *CE NOTICIAS FINANCIERAS ENGLISH*, 2025a). While these arguments mostly do not contain tangible examples of strategies or solutions, they hint at the responsibility of tackling the environmental issues.

Diversification

Diversity is crucial, as otherwise the next eradication of plants through a fungus might appear and repeat the extinction of the Gros Michel (or the predicted one of Cavendish). The solution of diversification is promoted by other actors in the data, with different kinds of diversity being discussed. Agreeing with the researcher, many call for a diversification of banana varieties. These can either be created by introducing and developing new varieties, but also by exploring existing varieties that are cultivated mostly for local consumption (DODWELL, 2019; GRAY, 2022; FAO, 2024a, 2024b; MURIGI, 2025; WATSON, 2025). By creating genetic variety, the resilience against pests, diseases and also other issues following climate change can be tackled and having more varieties would “*better serve farmers and adapt to future climate conditions*” (MURIGI, 2025). The adaptation strategy of diversification additionally implies biodiversity on farms and plantations by evolving away from monocultures which increase the risk of disease spread (RATHS, 2015; MUKUL, 2024). If more varieties or different crops are planted, they work as a “*natural barrier for pests and for diseases*” (Res_6, 2025). Planting different crops like coffee, cacao or mango alongside bananas creates more sustainable and resilient production systems and the systems can furthermore improve soil health, water retention and natural pest control. These observations are highlighted by studies as well as interviewed retailers who report on small-scale projects of agroforestry (*Agence France Presse*, 2011; *NEWSRX*, 2024; Ret_4, 2025; Ret_5, 2025). While these projects promise to tackle environmental challenges, they are still only adapted in small regions and not for global trade.

To maintain (short-term) global trade, diversity is also addressed on an economic scale. For international companies and retailers, this entails diversifying the producer portfolios to have alternative supply options in case of production losses (Ret_3, 2025) or sourcing bananas from geographically diverse regions like Africa and Latin America to secure a more stable supply (DUNCAN, 2025; WATSON, 2025).

Technological Changes

In addition to investment, research and diversification, technological solutions are relied on to combat environmental issues within the global banana complex. They range from genetic modification and disease management to climate change mitigation and supply chain optimization. To tackle diseases and pests, a variety of technological options are proposed. Although the topic of genetically modified bananas arises in some discussions about solutions, it is accompanied by the notion of difficulty to introduce it globally due to regulations as well as public suspicion (GRAY, 2022). To support on-farm diagnosis of pests and diseases, apps using artificial intelligence are suggested (GHOSH, 2019; FAO, 2024b). Technological solutions to mitigate and adapt to climate change include methodologies to measure carbon and water footprint in the banana industry (Org_1, 2025; Cert_2, 2025), technologies to optimize irrigation (Org_1, 2025; CLERCX *et al.*, 2025) or “*water-saving irrigation methods like drip systems, and early-warning systems for extreme weather*” (KUMBHAR and MEMON, 2025). For the optimization of production and trade, drones can be implemented to surveil and monitor crops (FAO, 2024b; Org_1, 2025; Mult_8, 2025). An alternative to cardboard boxes for transport and thus reducing the emissions in trade is used for one label of bananas at Ret_4 (2025). They introduced hard plastic boxes for transport that are reused for transport of bananas. This project, however, was a huge investment for the retailer (Ret_4, 2025) and they do not address whether the costs were economically profitable.

This reliance on technology to resolve every environmental issue is misleading, as technological fixes are discussed to be crucial for “food security and sustainability”, however, by providing solutions for some issues, they produce further issues on social or environmental levels (*Nature Food*, 2021; Gugganig, 2025). Technological solutions thus indicate a multifaceted approach to addressing the diverse challenges in banana production and highlight attempts to more efficiency and resilient banana farming. They should, however, not be regarded as the one and only solution to environmental challenges. Most of these technological adaptation strategies or solutions, address only small-scale symptoms instead of the root of the cause and harm of climatic changes. They only have an impact if adopted wide-spread and in combination with other measures.

Internalization of external costs

Whether it is research, diversity or technological changes on farms, these strategies to combat environmental issues all require investments. To already include the costs for tackling these issues in the price of the commodity, another adaptation strategy is the internalization of costs. Collins (2013) suggests the internalization of external costs such as the polluting or destruction of nature to grasp supply complexes more extensively. Proposals of solutions that aim in this direction are scarce within the data, however some actors provide examples of what it would entail. The representant of a certification stresses their aim to reduce the external costs and that “*one of the biggest components of the external cost is low wages. So in this particular [...] external cost, part of that cost is already absorbed by the plantation owner*” (Cert_2, 2025). They furthermore refer to the investments in productivity, diversification and resilience to reduce the externalities that are not yet reflected in the price of bananas: “*It has to be*

Internalized in how much it costs. So they have to charge that. That part is a very difficult discussion that they have. No one is willing to do that. No one is willing to be perceived as more expensive to internalize that” (Cert_2, 2025). They refer to the actors with economic power within the supply chain, especially supermarkets that do not want to risk losing customers if they internalize external costs into the price of bananas, which would make the bananas more expensive than at other supermarkets where costs are not internalized. External costs span from low wages as well as environmental costs due to a chemical-heavy monoculture, all of which are not taken into account (GRAY, 2022). The representant of an organization lists the different types of externalities when describing what a sustainable banana entails for them (Org_7, 2025). They refer to workers and their livelihoods, diversified production systems and not only monocultures, the reduction of agrochemicals and carbon footprint, as well as using water sustainably. Sustainability can also be applied to gender and working conditions:

“So that's another big issue in the banana industry where, you know, the majority of work is done in the field by men and in the packhouse by women. And there's an issue with women tending to suffer poorer contractual conditions, more insecure work, less work, and in cases, lower pay for longer working hours as well [...]. And then [...] also ensuring that they're paid in a kind of fair and equal way for their work and have, you know, stable contracts and childcare if necessary. [...] these are incredibly complicated issues. [...] it just goes in so many directions when you start to really think about what sustainability means for banana production” (Org_7, 2025)

Internalizing external costs can thus be regarded as a solution strategy on a broader level, as it includes different spheres of where issues occur. Scholars suggest a reflection of external costs within prices as well through a reversal of the determination of value (Collins, 2013; Van Rietbergen and Koster, 2023; Voora *et al.*, 2023). Rather than the value (which does not consider all of the externalities in a commodity) determining the (low) price, the price ought to reflect the value of the product (Mazzucato, 2020; Van Rietbergen and Koster, 2023) and thus all the labor, nature and resources included. As most proposed solutions entail higher investment and costs, higher prices that reflect a share of the external costs appear to be inevitable. The actors, however, do not always agree on who is responsible to pay these internalized costs.

5.2.2 Responsibility

When speaking about environmental issues in the banana industry, preceding solutions were discussed as well as the responsibility to implement these solutions. If not asked directly in interviews, the actors scarcely addressed responsibility for tackling the issues we discussed. A similar tendency can be observed in the text corpus. While several issues are broadly discussed, only a minority of reports directly address the actors they find to be responsible; one of the only instances is the report by the charity Christian Aid addressing governments and wealthy nations to act, which is echoed in the articles (Kramer and Ware, 2025). Otherwise, reports remain rather problem-oriented and do not highlighting which actors are responsible for addressing the issue. A representant of the multinational company Del Monte predicts disruptions in the

banana supply chain, *“unless there is some solution to the diseases that are overtaking the plantation in many parts of the world”* (SHAH, 2025). By applying the broad term ‘there’, the representant does not address any actor to be responsible for finding a solution, they just address everyone and simultaneously no one, especially not themselves. Similarly, the interviewed actor working for a multinational company states that *“the monoculture needs to be kept in check”* (Mult_8, 2025), however does not explain by whom.

As there are many actors within the banana complex, responsibility can be attributed to many different stakeholders. As media reports do not provide much data on the addressing of responsibility, this section primarily focuses on how this subject was discussed in the interviews. As the actors themselves also rarely pointed towards other actors to be held accountable for issues, I asked one specific question about responsibility (*‘Who do you think is responsible to tackle these issues?’*). The responses helped to explore how the actors perceive challenges, respectively who they perceive as responsible to tackle them. This section explores different argumentations by the interviewed actors about responsibility, which is attributed to different actors, mostly legislation, retailers or consumers. However, a ‘shared’ responsibility is often discussed, as the whole ‘chain’ is said to be responsible to approach environmental and resulting issues. Furthermore, as retailers and multinational companies have the biggest economic power (Morazán, 2010; Maselkowski and Olenius, 2014; Voora *et al.*, 2023), the self-reflection of their own responsibility and power is analyzed.

5.2.2.1 Legislation and Shared Responsibility Along Supply Chain

The section on solutions introduced the idea of governments and international agreements to have an important agency. Legislation of countries in the Global South and the Global North are mentioned to have responsibility in tackling issues within the banana trade. A representative of a European retailer supports this argument, however, criticizes the pace of governments: *“[P]olitics have a tremendous responsibility, but currently do not do it justice”* (Ret_5, 2025). They discuss certain policies that the EU introduces, where *“one can really ask themselves whether they have ever spoken to a company [to see] if it is possible to implement it”* (Ret_5, 2025). Action by governments to *“reduce greenhouse gas emissions and ban the most toxic chemicals, while investing in transitions to fair, stable and healthy food systems”* are consistently requested (MURIGI, 2025). This is reflected in literature, where the role and action of governments to combat challenges in the banana trade is criticized as *“international aspirations so far have not met the expectations”* (Maselkowski and Olenius, 2014, p. 13).

Furthermore, there is demand for uniform solutions in the whole industry, for instance the due diligence legislation for transparent supply chain, which *“requires companies to be more socially and ecologically responsible”* (STOCKBURGER, 2022; SIGRIST, 2023; VALONA INTELLIGENCE, 2025). This law was passed in 2024 by the EU and will take effect in 2027, however, at the end of 2025, the EU parliament voted for an alleviated form, which erased rules of accountability and includes only corporations with a turnover over 1.5 billion Euros and 5000 employees (Paasch and Barisch, 2026). The attenuation was justified based on securing competitiveness of the European economy (*ibid.*), which furthermore highlights the dilemma

between sustainability and market-driven economics. As the vote was also a result of lobbying by corporations, the intertwining of government action and economic interests become apparent in this example. As legislative action by national or international governments is criticized to be inefficient, retailers have acted themselves and joined in collaborations for instance for living wage, as the employee at an international retailer declares:

“Many retailers are doing this because legislation is too slow and because they say, okay, we actually want to change something and nothing is coming from the legislators. So, okay, we'll join forces and do something together. And this level playing field is extremely important to us. Because if we are now in a worse position than other retailers, then we may have margins or cost losses. But if we do this in step with everyone else, then we can say, okay, it affects all of us equally. And I think these are very important measures that can be implemented” (Ret_5, 2025)

This action reflects the acceptance of responsibility for issues in the supply chain by retailers. Yet the actor stresses the collaboration and the equality of all the retailers, displaying that admitting responsibility and acting only works if all competitors commit to the same rules, as staying competitive is of highest importance. Another perspective on these proactive measures is stated by Org_7 (2025), as they observe the legislative discussions to have influenced retailers to act: *“I think the new kind of wave of human rights due diligence legislation in Europe [...] is like a really helpful background. I do think that states have a role to play. [...] I think all of this kind of movement towards implementing living wages by the retailers probably wouldn't have happened without that background to motivate them. I think that's also a really important role to recognize” (Org_7, 2025)*. Although legislation is perceived as acting slowly, it is attributed an important responsibility as their discussions and decisions have an impact on other actors in combating issues. Not only governments in the Global North are considered to be an important player when it comes to responsibility, but also governments of exporting countries in the Global South. Since the industry in exporting countries can be powerful and act independently, *“local governments should take action [and] should play a bigger role there [...] [by introducing] the right policies, control a little bit what happens there and try to think most [for the] small growers and not the industry” (Res_6, 2025)*. Repeatedly, the focus of all governments to shift away from market-driven concerns to social and environmental issues is stressed. The responsibility of governments and legislation to introduce mandatory standards and thus increase pressure on retailers is also raised by the representant of a certification (Cert_2, 2025). They acknowledge that changes regarding standards have occurred in the last years, while stressing the importance of uniform and compulsory rules: *“[It] first came as voluntary commitments. But now there is legislation, so it has to hurt. If it's voluntary, then there is no urgency to do the things. If it's mandatory, everyone has to run” (Cert_2, 2025)*. They furthermore mention incentives that ought to change, as they are currently only focusing on maximum margin and thus profit. In this context, the government also has a responsibility to educate consumers on the impact their purchasing decision has, resulting in other incentives for the retailers and importers (Cert_2, 2025). The consideration of consumption being a political act and the subsequent necessity of governments to transparently educate the consumers about the impacts is supported by scholars (Beh, 2022). The demand for the interference of governments in global trade and market, however, conflicts traditional

neoliberal demands for free markets and deregulation. Frundt (2005) explores a hegemonic resolution and differentiates between free and fair trade, the latter involving different aspects like the protection of smallholders, the recognition of historical context as well as the “support of environmentally-sustainable banana cultivation” (p. 216). At the intersection of fair and free trade, however, friction arises. Furthermore, standards often focus on the Global North and consumers, rather than establishing compatibility in the realities of farmers and plantations (Coral and Mithöfer, 2023). The concept of a shared responsibility was introduced by the World Economic Forum’s Global Agenda Council on Human Rights in 2015 as “a collective response [...] in which global and local businesses, governments, international organizations and philanthropic organizations devise collective solutions and share the financial cost of addressing the most entrenched human rights problems in global supply chains” (World Economic Forum, 2015, p. 3). While this approach recognizes that issues cannot be tackled by one actor alone, the distribution on several actors in the chain dilutes the responsibility. This might lead to challenges not being managed as the actors do not solely feel accountable. The narrative that ‘everyone’ is responsible to tackle environmental issues within the global banana complex was applied by actors in the interviews as well. They emphasize a collaboration of governments, industry, scientists, producers, retailers, importers and consumers. While some actors concisely answer “*everyone should do*” (Mult_8, 2025), “*eventually it is all the actors that have to collaborate*” (Ret_3, 2025), “*actually everyone*” (Ret_4, 2025), “*I think everybody has a role to play in all of that*” (Org_1, 2025), some elaborate more on the collaboration between whom: “*[...] It is politics, it is the purchaser. But it is also national unions that have to take action. [...] So from a political side, but also from a retailer side more has to be done*” (Ret_5, 2025). All stakeholders are addressed to collaborate, however tangible plans on how this shared responsibility can be implemented are often omitted. The researcher Res_6 (2025) decomposes the shared responsibility to a triangle that ought to develop solutions: “*So the government, the industry and scientists, because scientists can help to define the regulations, see to the future [...] and try to make the best programs to solve the main issues*”. They centralize the responsibility to the actor triangle in the middle of the commodity chain and the sphere of legislation, not referring to smallholder farmer, workers on plantations or the consumers. By connecting industry with science, the researcher highlights one issue that they encountered during their research on bananas. When they commenced research on disease resistant Cavendish varieties, none of the multinational companies or the industry were investing in research to tackle the issue of susceptibility. The researcher observed that after the transition from Gros Michel to Cavendish, the industry falsely relaxed:

“[I]ts’ like okay, we solved the problem, let’s not do any other research on that. [...] and of course you are not going to invest. And I understand from the point of view of the industry like okay, TR4 is not here so why are we going to invest? Let’s wait that the researchers do their work by themselves. And we were working more than ten years almost alone by public funding [...] but zero industry. But when the fusarium started to spread and then arrived to places [...] then they took action, but before there was nothing” (Res_6, 2025).

Only when it was technically “*too late*” from the researcher’s perspective, the industry started to react and invest in research to maintain banana cultivation (Res_6, 2025). Thus, they urge

the industry, together with governments to continuously invest and focus on research, so that ecological issues around monocultures and diseases can be identified and combatted earlier. It is, however, challenging to collaborate with other actors, as an employee of a multinational company explains (Mult_8, 2025). They stress how they collaborate, do research and partner with other actors. The pace of finding solutions, however, is dictated also by the pace of the other actors. By repeatedly addressing the other actors as well they shift responsibility away from themselves: *“And we are not the [only] one, right? We have to work with fuel company, shipping company, the shipbuilders, the manufacturer of the fertilizer [...] the list goes on”* (Mult_8, 2025). Right after this elaboration, the actor numerates investments and examples of actions the company has taken already. In the context, this evoked the sentiment of marketing strategy: wanting to change the topic from the many issues that exist to the small proportion of measures that the company had taken, while stressing that others are responsible too.

The representant of an organization imagines a scenario that can be interpreted through the perspective of the planetary approach by Chakrabarty (2021). As the source and impact of environmental issues cannot be traced by borders, they ought to be viewed from a planetary and not a global perspective, where humans are decentered and planetary processes included. The representant of an organization addresses the broad environmental issue of climate change being everyone’s responsibility, so the issues that climate change entails are to be tackled collectively (or: planetarily) without focusing on national borders, governments or economically driven competitiveness: *“The dream idea is to have a pre-competitive cooperation that [unites] forces to do that”* (Org_1, 2025). This idea erases the focus on profit and competition in a capitalist system and introduces a broader, more long-term perspective. However, within the current system, the path to this idealistic scenario ought to include measures that can be applied to incentivize economically oriented actors. If these are not connected to action and responsibility by certain actors and attributed to ‘everyone’, the risk that issues are not being tackled because no one feels responsible is high, as ‘everyone’ can equal ‘no one directly’.

5.2.2.2 Retailers, Multinational Corporations and Self-Reflection

As discussed in preceding sections, the economic power within the global banana complex has shifted to retailers, with multinational companies still playing an important role but less significant than in the mid 20th century. Especially representants of organizations and certifications perceive the market power and thus responsibility to tackle challenges within the industry to be with actors in the Global North. In contrast, the actors working at retailers and multinational companies assess their power and responsibility differently, also depending on size of the corporation.

The responsibility that is attributed to the supermarkets is often connected to the price, which in turn influences the financial resources to address environmental issues and changes in the banana supply. Retailers are addressed to not ignore the problems and focus on low prices to remain competitive, but to promote labels and standards that *“pay a premium when growers actually meet the requirement of this add-on”* as these requirements are often not compensated

for growers (HEIJBOER, 2019). The low prices do not address issues and lead to devaluation of bananas (BADSHAH, 2025), while *“just a few cent more per box could meet the costs of banana growers considerably [...] consumers wouldn’t even notice it in price per kilogram”* (HEIJBOER, 2019). Organizations and certifications that observe the whole banana complex and advocate for socio-economic and environmental improvements support this perspective. Org_7 (2025) clearly states that they *“think retailers are the ones that have the power to find a way to pay better prices”*, with which Cert_2 (2025) agrees and elaborates: *“I think that everything is done with the prices that have been decided at retail level. How much it costs consumers. So the pressure starts from there. But in both aspects, price always down and sustainability demands always up and quality perfect. So that combination, that equation doesn't fit together.”* The representant of another organization emphasizes the environmental problem of plastic use in banana trade along with other issues and addresses the actors with economic power to tackle these:

“The retailers should tackle when we talk about [...] the production, the farmers. But there are trading companies of bananas. When they are so big, they are not only producing and selling bananas, they produce plastics. They have plastic factories, the big ones, all of them have plastic factories to use in the banana production. Or they have a pesticide, [...] not pesticide companies, but aerial fumigation companies. So the same group now owns all these operations. So I think the big traders, they have a big role to play because [...] from the producer side, they are the strongest partner. And then the retailers, because they are the one that decide prices” (Org_1, 2025)

This elaboration not only clearly addresses the responsible actors and explains why, it furthermore illustrates the complex connections within the banana industry: trading or multinational companies that are involved in more than one process and thus have a lot of power over certain stages in the production and trade, as well as supermarkets whose pricing decisions influence the whole complex. Due to their interconnected relations and decision power, they are claimed to accept responsibility and address environmental issues.

Rarely, retailers communicate their awareness of environmental issues and acknowledge their responsibility. And if they do, there is always the risk of it being used for greenwashing purposes and thus green capital accumulation. Nonetheless, the discount retailer Lidl communicated in an interview in 2022 that they aim to trade fairly (STOCKBURGER, 2022). In the interview, the head of corporate social responsibility (CSR) and the head of purchase emphasize their responsibility: *“If you examine the ecological and social impacts of our business activities, the biggest leverage is within the value chains of our products [...]. Through the purchase of certified resources we have an effective leverage to contribute to a fairer distribution of value within our value chain”* (STOCKBURGER, 2022). They furthermore stress that a sustainable orientation will improve and secure their competitiveness.

The self-reflection of retailers and multinationals in the interviews when assessing their own responsibility differed in the interviews for this study. This might be due to the different sizes of the retailers; one operates in Switzerland and the other in several countries in Europe and on other continents. The multinational company operates internationally as well, yet the actor I

interviewed argued defensively when speaking about responsibility and power in the banana industry by asking “[b]ut more powerful than who? [...] multinational companies [...] our power is widely exaggerated in the media” (Mult_8, 2025). They subsequently explain that the time of monopolies has passed and reference the fragmented market today, where in some cases, producers directly trade with retailers: “The supermarket, for example, have become so concentrated that they are economically stronger than us, and they are way more powerful because they are way more concentrated than the offer of fruit” (Mult_8, 2025). Presenting other actors to be more powerful and thus more responsible is a discourse strategy to deviate and thus not reflect on one’s own position in the industry. Consequently, the focus is on ‘the others’ and what they ought to do: “No matter how big we are in our industry, we are small. If you compare us to the big Nestlé’s and other bigger [companies], we are relatively small in that wider context. But again, like everybody needs to do their share. We do our share, and support the cause” (Mult_8, 2025). While also indicating other, more powerful players, they nevertheless refer to their own action. By framing it as “our share”, however, the impact of this ‘share’ is relativized. As they suggest their power to be small, it can be understood that their responsibility and actions to tackle environmental issues can be small too.

A more complex self-reflection can be analyzed in the interview with the representants of a Swiss retailer. The purchaser of bananas and a member of the sustainability team reflected on the economic power and the entailing responsibility. When confronted with the idea of retailers having the most powerful position, the purchaser answered defensively as well by stating that “I think [...] we do not regard ourselves as the most powerful ones in the chain [...] I wouldn’t say we are more powerful than suppliers, concerning the price. We certainly have more pressure, because eventually the customer just wants very, very cheap prices” (Ret_4, 2025). While this statement furthermore reflects the fixation on the price and the ignorance of issues, it also displays the view of retailers. Although they objectively have economic power, they subjectively do not recognize it or focus on the pressure of low prices and staying competitive. When I elaborated on the power in relation to price dumping and thus the money not reaching the ‘end of the supply chain’, they acknowledged the problem and stated understanding, however argued that these issues also harm the retailer itself: “A lot of it is at our expense [...] just because the price falls does not mean we constantly had the same margin, but we also had losses” (Ret_4, 2025). From a purchasing perspective, this market-driven view is understandable, however it does not consider the whole global banana complex and the issues that arise in it. They do acknowledge that the ‘end of the supply chain’ suffers from low prices and that they are aware of it, yet they relativize their awareness in the same sentence by referring to Switzerland being a small market and “that is very different. We only buy for Switzerland while other retailers simultaneously buy for several countries and thus have very different prerequisites. [...] With them, your statement is true that they probably have more power.” (Ret_4, 2025). They elaborate on their issues in purchasing only for Switzerland, as they require other standards and less pesticides. Therefore, in that context they regard other retailers as having much more power than themselves, however “at the end we push down the prices too and at the end the farmer on the farm suffers. Exactly, it is also a chain” (Ret_4, 2025). The application of discourse of comparison to other players blurs the comprehension of their responsibility. While they comprehend the issues that low prices entail, they view themselves as victims of these low prices instead of actors holding power to tackle the issue of low prices.

And by comparing themselves to bigger, international retailers, they diminish the urgency for their own action. The sustainability team member present in the interview reflected ambivalently on the position of retailers. They perceive themselves to be less in the field of conflict of sustainability and price pressure, however, they think that *“retail does have a rather good position. I have the feeling it depends though. With which resources? I think with bananas, we are not the big player [...] And eventually I notice the price pressure. [We are] the last chain link that acts with it economically”* (Ret_4, 2025). Although they are not directly confronted with the pressure of maintaining low prices, they consequently feel it as they work for the same company. The comparison of bananas to other resources complicates the acceptance of being in a powerful position. Due to these observations, the sustainability team member states that they *“cannot overall say that retail has the strongest position”* (Ret_4, 2025). Both of the interviewed subjects impart responsibility to the consumer, which will be analyzed after the self-reflection of another subject working for a retailer.

The actor working for an international retailer applied fewer defensive arguments and acknowledged the retailer’s responsibility in environmental issues. When confronted with the big economic power of retailers in commodity chains, they consented: *“I would fully agree with that. It is even more than in other supply chains”* (Ret_5, 2025). They compare the fruit and vegetable supply chains to the ones of cacao or coffee, where suppliers in the middle have more economic power than retailers and interests often collide. With fruit and vegetables, however, they agree that the retailer has an enormous economic power *“next to the multinationals like Chiquita, Dol, Fyffes or Del Monte. And we centralize this power more and more”* (Ret_5, 2025). They acknowledge that the losers of the current development are smallholders, as in many countries also cultivation is concentrated which results in an economic power. Therefore, they state the importance of action of retailers and other powerful actors in the industry. According to Ret_5 (2025), these include suppliers and multinationals that have a lot of economic power, not only because they own huge farms or produce a high volume, but also since some multinationals own entire shipping ports. Regarding their own responsibility, the actor lists measures they have taken to sell more sustainable bananas and combat environmental issues. These include longer than annual contracts or minimum prices in collaboration with Fairtrade standards. As many other actors and discussions focus on the unprofitable consequences of such measures, I enquired how they remain competitive in a market driven environment despite these more expensive measures: *“Yes, that is achieved through quantity. So that’s why we have less suppliers in our pool and had to clearly examine that. There are these three layers of sustainability. You can always make social and environmental advances if you think about the economic aspect”* (Ret_5, 2025). In their case, the economic aspect is achieved through thin margins, as they aim to remain competitive in the market while also being sustainable. While these measures appear to function in their case, the actor indicates that making changes and evolving to more sustainable practices takes a lot of time. *“We are a cargo ship and not a speed boat. If you want to make changes in this direction, that takes some time”* (Ret_5, 2025). When regarding the intrinsic motivation of the retailer to sell sustainable products, the incentives are twofold and not only economically driven like with other retailers. Thus, environmental and social issues are addressed and responsibility is recognized. The actor regards the rethinking of banana trade as the responsibility of the retailer as well as the other

economically powerful actors, and not solely the consumers. Other actors discuss a responsibility to address environmental issues to also lie with consumers of bananas.

5.2.2.3 Consumers

As the consumers are an important actor regarding the determination of banana prices, a lot of responsibility in connection to environmental issues is attributed to them. Retail is said to be only focused on consumers and their price sensitivity. Thus, they transfer a certain share of the responsibility to the consumers, for instance by offering different labels of bananas with different prices: *“We have a broad range of products to tell the customer: we have different bananas with a different origin and especially a different classification with organic, fairtrade, [another label]. In principle, we give the consumer the possibility to also say: it is important to me and that’s why I choose this type”* (Ret_4, 2025). This range of products automatically shifts the responsibility to the consumer, as they have the possibility to either chose bananas that are produced with more attention to socio-economic and environmental issues or with less. The sustainability team member of this retailer furthermore assesses the consumer to be willing to pay more for bananas (Ret_4, 2025). However, the incentives for consumers are different, there is not one consumer, but they are reported to be fragmented, complex and only some of them are observed to be fixated on the price (Mult_8, 2025). But since there are customers who are price sensitive, supermarkets try to attract them with low prices for bananas so they perceive the supermarket as cheap (Org_1, 2025), although Cert_2 (2025) declares that *“it is demonstrated: no one will notice”* if the price of bananas would increase by one cent for instance. This observation is supported by Ret_5 (2025) who reported on internal studies they conducted to find that slightly higher prices do not influence the consumer choice as much as they had thought. Nevertheless, consumers are considered to play a role to tackle environmental challenges. Org_1 (2025) states that the water and carbon footprint can be reduced a lot if the consumers would be willing to do that. Even if customers were willing to tackle environmental issues, however, they are not all educated and informed about the impact their choice of banana purchase has. Therefore, actors also reflect on the power that can be allocated to consumers: *“You should not underestimate the power of consumers, but also not overestimate [...] I see it in our responsibility to nudge rethinking and comply it, and not only with the consumer”* (Ret_5, 2025). The actor elaborates on the different modes of living as well as different privileges. Consequently, not everyone can afford to think about whether bananas are from a sustainable cultivation or not, *“but a share must be steered”* by retailers (Ret_5, 2025). Costs of living besides groceries such as insurance, education and transportation is stated to pressurize consumers furthermore as the costs are rising (Mult_8, 2025), thus even if they support the tackling of environmental issues, they are forced to choose the cheapest bananas, which the retailer reads as indication as a need for low prices and little action to tackle issues. These arguments redirect the agency to the retailers, as they have economic power and knowledge to combat challenges. In an indirect aspect, retailers are requested to educate the consumers collaborating *“with government and with the universities to try to explain that [there] is nothing bad about the banana that is a little bit brown. So it's actually better education. Yes. Awareness campaigns, these kinds of things could help. And [...] the supermarkets are very responsible for that”* (Res_6, 2025). This would lead to appreciation of the work and input a banana contains by consumers, which also influences the purchasing decision (Ret_4, 2025). A certain

openness towards ‘imperfect’ fruits is required by consumers. They are attributed responsibility for environmental issues through their price sensitivity. If consumers remain price sensitive, however, retailers are predicted to not react or take more responsibility as they aim to stay competitive through low prices. The retailer’s position can thus be regarded as having a higher responsibility than the consumer due to economic power and the awareness of the complex issues that arise within banana cultivation and trade.

5.2.3 Othering of the Global South and other Discourse Rhetorics

To assess how actors in the Global North perceive challenges and how they react to them, I analyze the discourse around ‘the Global North’ which includes the regions all the actors work in. As discussed in the beginning of this thesis, the framework aims to display uneven development, yet it is also subject to criticism due to vagueness, simplification or the reinforcement of unequal power relations (Tavares, 2025). In assessing the perception of environmental issues that mostly occur in the Global South, I thus analyze how actors in the Global North refer to their own position in comparison to ‘the other’ actors and countries that participate in banana trade. Subsequently, I present reoccurring narratives around the role and positioning of the Global North.

Creation of otherness (‘*Othering*’) roots in colonial history where the discourse around ‘us’ (dominant group, norm) is opposed to ‘them’ (devalued group, defined by differences and marginalization) (Staszak, 2020). Space, borders and territorial construction can strengthen the process of *Othering*, as they “create and differentiate the groups they seem to separate” (ibid.). Eventually, the examination of the appliance of *Othering* in discourse reveals less about ‘the other’, but more about the perspective and attitude of the actor who perceives ‘the other’ as such (ibid.). As banana trade evolved with and reinforced colonial structures, *Othering* of actors in the Global South of the banana trade can still be observed. After elaborating on struggles in exporting countries and on farms, Cert_2 (2025) summarizes the issues of coordination with a generalization of the whole industry in the Global South: “*They are not very well organized as a sector*” (emphasis added). By referring to them as the unorganized group, they distance themselves from the issues. Similarly, the representant of an organization speaks about issues with certifications and audits on farms, stating that “*then they pretend, like ah certification is coming*” (Org_1, 2025, emphasis added). While this generalizes all the farms and workers on plantation, it also excludes the actor from any involvement in these issues, as they state that ‘they’ act wrongly. *Othering* of countries and actors in the Global South was also observed in the discourse of the actor working for an international retailer by clearly distancing the Global North (‘us’) from the Global South (‘them’ or ‘there’): “*This is not like with us, where maybe some nepotism exists or a closeness of economy in politics, but there that is acted out very openly*” (Ret_5, 2025, emphasis added). They furthermore refer to issues of power in countries of the Global South: “*There you have some people inside that clearly take advantage of their economic power*” (Ret_5, 2025, emphasis added). By the usage of the term ‘there’, they distance actors in the Global North (such as themselves) from these problems, ignoring that the abuse of market power is a global issue and not only happens in exporting countries.

The Global North was also positioned in contrast to the Global South through other narratives and rhetorics, for instance when discussing the spread of fungal diseases and its consequences. A researcher is quoted by explaining the global consequences, however differentiates between two parts of the world: *“This will have catastrophic effects for developing countries and will strongly affect the western world”* (SCHAAL, 2023). The emphasis on the different regions and their impacts accentuates the narratives that actors employ to position the Global North in contrast to the Global South. Examples of such narratives are discussed successively.

As the price and costs of banana are often discussed as issues, the position of the Global North as source of money and funding is applied. Cer_2 (2025) states that *“[w]ithout money, there is no solution”* and refers to a sustainability project that they run in Latin America with money that stems from a development donation in a country of the Global North. The funding of projects in the Global South through the Global North is also addressed by Org_7 (2025): *“Now it does seem as though the funding landscape is getting a little bit more optimistic as well, because I think it's getting onto the agenda of more funding organizations that, you know, monoculture production systems with heavy pesticide use is just really bad.”* The Global North as a funding region for projects of resilience against environmental issues is repeated, however the funding is never without self-interest. The increased attention to funding is happening at a time where actors in the Global North recognize that the issues in the Global South do not remain there but might affect trade and supply in all regions of the world. Given this development, multinational companies also report on the investments they make in the Global South. A chairman of Fresh Del Monte stated their efforts in an article: *“To bolster our supply chain resilience, we are proactively implementing stringent biosecurity measures and investing in climate-resilient farming practices within our farms”* (WATSON, 2025). Actors in the Global North (‘we’) are presented as investors for projects in the Global South, as they do not have the resources for it. This narrative is reproduced by an Mult_8 (2025): *“We created a foundation. [...] We collected our money and money from our growers. And in places like Ecuador, for example, where [...] the state is very poor [...]”* that foundation provides doctor appointments and healthcare for free. By stressing the need for these supports and their initiatives in the living wage process, the actor others the country in the Global South which is *“completely terrible at paying people”* (Mult_8, 2025). These narratives display companies in the Global North as financial donors and saviors, yet they veil the advantages the multinationals gain from supporting health care in communities, which is more availability of human resources: *“[P]eople didn't have to travel to the next village. And it was good for us because our workers do not have to take day off”* (Mult_8, 2025).

In combination to presenting the Global North as funder for projects in exporting countries, the actors are also presented as leaders and decision makers. By speaking about cultivation regions of bananas, possible shifts and who they source from, the actors depict ‘themselves’ as decision makers in contrast to ‘the others’. These statements can also be analyzed in connection to economic power the actors in the Global North have, and Ret_4 (2025) acknowledges that they are interested in maintaining or winning back the power in working with the suppliers and producers. They furthermore imagine future shifts of regions that grow bananas: *“For purchase; the question remains ‘which countries of origin exist? Will they remain the same?’ [...] That is very interesting and somewhen you will see that the countries change. There will*

probably be a shift and [bananas] will not be cultivated where they are now” (Ret_4, 2025). The consequences for local communities in the Global South if banana cultivation is not possible anymore is not considered, only the point of view of the purchaser who can decide. From the perspective of an actor in the Global North, the shift is simply a change of countries of origin and not something existential. They are aware that they possess the economic power to purchase bananas from other countries if they must. A similar example is given by Cert_2 (2025) when discussing the strike on Chiquita-owned plantations in Panama. Following the strike, the multinational company decided *“I am going out of Panama, I go to Ecuador”* (Cert_2, 2025), implying the position of the decision maker of actors in the Global North. Big companies and retailers are also portrayed to decide what small growers and plantations must plant and what standards they have to comply (Res_6, 2025). This decision power is mirrored in the use of the terminology ‘we want’ by Mult_8 (2025): *“We want a mix of what's sustainable to us is a mix of smart farming, which is going to be, very aware of resources, reduce water footprint, reduce carbon footprint when we can, so very oriented to the science.”* This implies that the actors in the Global South have to follow ‘the rules’ that the actors in the Global North make.

In addition to the preceding narratives, a paternalistic discourse can be observed. While this also entails the process of *Othering*, the actors of the Global North present themselves as authoritarian to the Global South. The narrative becomes visible in the discourse around knowledge, where Ret_4 (2025) addresses measures to tackle environmental issues on farms. These measures ought to be implemented on the instruction of the retailer, as *“often the whole knowledge is not there yet”* (Ret_4, 2025). Along with lack of knowledge, actors in exporting countries are also spoken about as not having their own agency, but that every decision (see section above) and control must be made by the actors in the Global North for trade to remain consistent. The actors with economic power are the only ones addressed to have agency: *“I think for retailers, they'll be they'll be looking at the risks, you know, for their own reputation and also with bearing in mind all of this kind of new legislation on mandatory human rights and environmental due diligence and thinking, which countries are the least risky, so be more likely that they're going to have, you know, greater, volumes”* (Org_7, 2025). Although the actor works in projects that target communities in exporting countries and is focused on improving socio-economic and environmental spheres, they do not refer to these communities as ‘active’ actors. Representatives of retailers and multinational enforce this impression of passivity by stating that *“[w]e have to empower them”* and following this statement initially acknowledging that *“we have a certain responsibility in certain geographies”* (Mult_8, 2025, emphasis added). The appliance of *Othering* within this narrative enforces the sense of self of the actor. The exporting countries (‘them’) are displayed as not being able to empower themselves, and thus the actors in the Global North present themselves as authoritarian supporters, which benefits themselves eventually. The employee at the multinational company articulates about their tasks with ‘them’, referring to the labor force on plantation: *“[If] you don't invest in your labor force, you don't treat your labor force well, someday you're going to have a strike. You're going to have an issue”* (Mult_8, 2025). The ‘taking care’ of the exporting countries in a paternalistic manner results in advantage for the company, an attitude that is observed in other statements by retailers as well. They discuss the processes on farms and the importance of maintaining standards, explaining that they observe, control and intervene on

farms in exporting countries. Ret_4 (2025) explains their audit system of the whole trade as they are used to things going wrong: *“We observe precisely, how does the commodity get to the port? How does the commodity get from the port to us? [...] is that traceable? [...] especially these kinds of things where they try to execute tricks, shows us [that we need to supervise]”*. These observations illustrate the economic power of the retailer which they execute in authoritarian manners. Ret_5 (2025) shares that they control their implementations and standards on farms and plantations as well as intervene on them: *“There are so many points we have to address on the farms”*. The constant control by actors in the Global North is enhanced by a statement of Mult_8 (2025): *“Our communities are progressing. But you need to keep in check all these different things.”* The paternalistic control results through or entails expectations the economically powerful actors have for actors in the Global South. These expectations pressurize the exporting countries, which can be interpreted that vice versa, the structures are perceived as paternalistic from actors in the Global South as well:

“Banana producing, associations [are] saying, you know, more and more recently, like, you know, you're expecting so much from us, these retailers are wanting like X, Y, Z quality of banana, all of these different certification schemes. Now they're wanting us to do research around living wages and all of these different things. And (...) having these increased production costs is just another pressure on them, which isn't necessarily being reflected by retailer buying prices. And in all cases, it's more difficult for smaller producers to manage.” (Org_7, 2025)

This perception is also reflected in a statement by Res_6 (2025) who speaks about the distress that the paternalistic pressures entail: *“And I see all the time these open letters that people from the associations of banana in Latin America sent to directly to the supermarket, like stop doing these kinds of things”*. The sources of this imbalance of power and thus authoritarian structures lie within the historical development of banana trade, which is still reflected in today's structures *“We are still in this postcolonial system, and the creation of value lies with us, not with the producers in the south”* (SIGRIST, 2023). These observed narratives applied by actors in the Global North do not reflect a planetary approach (Chakrabarty, 2021), nor do they address issue in the trade from a feminist perspective (Collins, 2013). Historical developments as well as social relations that led to the situations in exporting countries are widely ignored by the actors, while they indurate the power and agency imbalance between actors in the Global North and the Global South. Furthermore, issues, solutions and responsibility are only addressed in local contexts, ignoring the planetary dependence of environmental issues and their consequences.

5.3 Imaginations of the Future

To answer my research question concerning the perception of environmental challenges, I furthermore aim to analyze how the actors in the Global North imagine the future of banana trade. This analysis identifies what the actors regard as important when making predictions of the future, yet it also reflects how they perceive current challenges and how they imagine these challenges to be addressed (or not). Consequently, challenges and narratives that were

discussed in previous sections reappear in context of predictions. Through analyzing narratives around the envisioned future in the text corpus as well as in the interviews, this section will identify reoccurring arguments but also contradiction of visions. It will discuss different narratives around the future, firstly how actors imagine different scenarios, followed by which of these are realistic and which are reported to be idealistic. The last section elaborates on the temporal discussion of how far away the actors view ‘the future’.

Throughout the data, actors agree that banana trade will be affected by climate change. This entails environmental issues such as rising temperature, extreme weather events as well as the spread of fungal diseases. The predictions include warnings of supply shortage (GUTIERREZ, 2025; SHAH, 2025), the reduction of regions suitable for cultivating bananas (BADSHAH, 2025; CHEN, 2025; SPEARE-COLE, 2025) and disease threats, particularly TR4 and Black Sigatoka (WITHNALL, 2013; HARVEY, 2025; MURIGI, 2025). The consequences of the spread of TR4 are also stressed by Res_6 (2025). They warn that *“[a]t some point it will be present everywhere and it will be very difficult to grow bananas. Or it will be extremely expensive [due to] many factors”* (Res_6, 2025). In addition to addressing the costs, they also emphasize the need for resistant varieties. These two arguments are repeatedly stated in the data. The necessity for increased and fairer prices is stated by many actors, which would result in more financial resources for farmers and especially smallholders to increase their economic viability, cover their costs and allow them to invest in sustainable practices (DESSON, 2024; SMITH, 2024; SPEARE-COLE, 2025, Cert_2, 2025). Certifications and standards support this call for higher prices, as farms should be economically viable and *“the demands on sustainability that [are] put along the supply chain, the cost of those demands are shared along the supply chain”*, as currently, the costs and demands are passed along the supply chain and eventually burden the farmers and producers (Cert_2, 2025). Employees at a Swiss retailer agree with this necessity, as higher prices and distribution of costs along the supply chain *“would be profitable for all”* (Ret_4, 2025). The member of the sustainability team furthermore stresses the importance of environmental issues (compared to socio-economic issues), as tackling these are meaningful for the company and their consumers in the long term (Ret_4, 2025). This thought traces the direction of a planetary approach, where they consider the impacts that environmental issues have for the whole planet, yet it disregards the entanglement of socio-economic and environmental challenges. They furthermore stress the requirement of *“consumers wanting to pay more. That [they] start to think and ask themselves what it is and what this product contains, what did it need”* (Ret_4, 2025). They doubt that this motivation will evolve by itself in the future, thus they propose solutions. On the one hand, education and campaigns could inform consumers about the costs of the product. On the other hand, they propose regulations of the market or *“maybe also price agreements of supermarkets, but that is not allowed”* (Ret_4, 2025). These reflections imply that supermarkets are aware that the current price pressure and competition is not a long-term sustainable solution and that low prices entail issues for the whole system. It also underlines their focus on consumers and their price sensitivity; thus, they propose to only make changes if consumers are willing to pay more.

Another reoccurring argument when imagining the future of banana trade is diversification. Many actors see that farming one variety that is susceptible to diseases and cultivated on monocultures as a problem and suggest resistant and diverse varieties to ensure future trade

(GRAY, 2022; Ekugbe, 2024; FAO, 2024b; MURIGI, 2025). The employee of an international retailer poses this central question around the varieties: *“How do we continue with the Cavendish banana? There will always be bananas, but if they will exist in the same extent depends on how they develop or how quickly we might find alternatives”* (Ret_5, 2025). Knowing the history of the Gros Michel variety and its extinction, the future of the Cavendish variety seems uncertain. Thus, a researcher is also convinced that the *“current system has to change. We cannot grow just one banana”* (Res_6, 2026). They refer to the Cavendish variety as having been an easy fix for the industry, however, if it continues to grow just one variety, there will be future problems that repeat themselves. Hence, new varieties should be developed and grown and sold in supermarkets, similarly to the many varieties of apples there are: *“Next to the Cavendish at least five more. And that is not just because it’s nice. It’s also part of the sustainability. If you grow in the field different types of plants, that increases the biodiversity [...] and that also works as a natural barrier for pests and for diseases”* (Res_6, 2025). Diversification, according to the researcher, would tackle several environmental issues at once, as biodiversity also entails healthier soils which need less irrigation and pesticides. They do acknowledge, however, that within the current capitalist trade system, these other or new varieties of bananas would have to firstly be resistant to certain diseases and secondly produced and transported as efficiently as the Cavendish bananas. These requirements are not easily feasible. The ‘dream scenario’ of a diversified banana trade is shared by other actors, thus the following section analyzes imaginations of the future of different actors and finds commonalities as well as contradictions in these scenarios.

5.3.1 Commonalities and Differences in Imagined Scenarios

As discussed above, the representant of a certification explains that their *“dream [...] is a real shared responsibility on the cost of those [sustainability] demands”* (Cert_1, 2025). While this imagination of the future involves higher prices and thus cover of costs for all actors within the global banana complex, they also imply that higher costs would tackle environmental or sustainability demands. When envisioning the future, Ret_3 (2025) stresses their aim to sell high-quality and sustainability certified bananas as the fruit is very popular among their consumers. They also mention challenges such as shifts in regions where bananas cannot be cultivated due to drought and rising production costs that might lead to higher prices (Ret_3, 2025). Higher prices of bananas are also predicted by Org_7 (2025) *“as the climate gets more unpredictable, producing food will become more difficult and therefore more expensive. I think that’s just an unfortunate, high probability”*, however they think that these prices will only increase in the long term. In the short term, they imagine the banana prices to remain low, as an increase of for instance 10% would not make a huge impact as the prices are so low already (Org_7, 2025). Another representant of an organization committed to fair trade bananas predicts increasing production costs to result in the *“banana [to] become a luxury item, and it would definitely not be for sale for one euro per kilogram in supermarkets anymore”* (HEIJBOER, 2019). This could be due to the introduction of new varieties which is cost-intensive, as well as increased use of expensive technology.

Not every actor is convinced that prices of bananas will rise in the future. Although banana production is predicted to be threatened, the chairman of the multinational company Fresh Del Monte is quoted to be optimistic about the future (HEILMAN, 2025; SHAH, 2025). He predicts that *“even over the next decade or so, the banana will still be the cheapest fruit on the shelf”* (HEILMAN, 2025). By not explaining how these low prices will be maintained, an ignorance or downplaying of environmental issues that impact long-term production can be analyzed in this statement. A similar attitude is observed in the interview with the actor at a multinational company. Although they admit that there are *“still areas of improvement that we could do to the ultimate, you say sustainable banana. I mean, again, I don’t know exactly what that is, but right”*, they are confident that there will be solutions in the current system: *“We have still some way to go, but it’s an industry that is on pretty solid ground to achieve this”* (Mult_8, 2025). They praise the nutritious advantages of the banana and the industry’s fundamentals, which is why in their perception, *“[the industry] has a pretty bright future”* (Mult_8, 2025). However, they stay vague on the visions of how exactly they imagine this bright future. When I posed the question whether they think the Cavendish variety is going to remain for the next 20 years or not, their response can be interpreted as indifferent to which variety of banana it is going to be, as long as trade still occurs: *“Possibly. [...] Maybe some new varieties are going to come up. I mean, we are researching actively in that field. Is it going to be Cavendish only? [...] But maybe in 5 to 10 years it’ll change and we’ll grow a different one.”* (Mult_8, 2025). Although conducting and funding research for new varieties can be regarded as trying to tackle environmental issues within the banana trade, the surrounding narratives imply that this research is solely for the purpose of staying competitive. The representant of an organization additionally stresses the reliance on the market system: *“I think people are going to continue wanting to eat bananas. And I think people are going to continue wanting to make money from selling bananas. But what exactly that looks like is really hard to know”* (Org_7, 2025). They maintain an economic perspective by imagining that smallholders might have to give way to production sites that become larger in the future, which ignores the involvement of socio-economic or environmental issues, as large-scale monocultures only enhance these. Additionally, however, they believe that the market-driven incentives for retailers leads to addressing socio-economic and environmental issues simultaneously, as they state it likely to happen that retailers will source from countries where they have a guarantee of labor rights for instance. If the market-driven incentives remain in the future, the representant of a certification envisions a possible shift of countries where bananas are exported to:

“Maybe everyone will sell to China or to Russia or to Arab countries which are countries that don’t care about sustainability. And I see that already in Russia. In Ecuador, people moving away from exporting to Europe, even to export to USA because there is less complex, less demand in their regulation, even in organic. Why should I pay so much to comply with legislation of the European Union if I am not paid sufficiently?” (Cert_2, 2025)

This prediction repeatedly combines the interconnectedness of environmental issues with the pricing of bananas. Measures to improve sustainability in the global banana complex are often more cost intensive for producers, thus they ought to be compensated for these increased costs by the actors with economic power and demands, such as retailers and multinationals. If these

compensations are not met, producers might choose other countries to export their fruit to different countries with other demands¹⁰.

5.3.2 Realistic and Idealistic Scenarios of the Future

Imagined scenarios of the future by other actors consider a broader perspective regarding environmental issues. They address several challenges that occur currently which they imagine to be addressed in the future, yet they often speak about their “dream” or “idealist” scenario, implying that they are not convinced that there will be solutions to all issues within the present capitalist system. By presenting their future scenario, the representant of an organization addresses many different current challenges regarding the environment and its entanglements:

“I think more diverse, with lots of types of bananas in a more integrated system. And, yeah, that we will continue to eat lots of bananas without plastic. I hope maybe [for] a maritime transport that is more efficient [...] Maybe we will have a mechanization revolution in the future. I think already you have with drones. So I think using bio compost with resistant varieties or using more bio control, using more technology to optimize irrigation, to optimize pest management” (Org_1, 2025, emphasis added)

To the inquiry whether these changes are going to happen or are just an ideal vision, they refer to examples of other crops like sugar cane, cotton or grapes where mechanization entailed progress. However, they also focus on the importance of financial resources that are needed to introduce these measures: *“With the low price [...] nobody can invest in nothing. So with low price is very difficult to do innovations or investing in better things”* (Org_1, 2025). Imaginations of higher prices and willingness by consumers to pay these (because they are aware of what it takes for production) are expressed by the purchaser of a Swiss retailer (Ret_4, 2025). They elaborate on their dream scenario: *“On one side, the development of a new variety. I think that would be great. One that is resistant against the fungus, where you can go around and maybe more varieties, so that one is more broadly positioned”* (Ret_4, 2025). Diversification entails solutions to environmental problems, yet from a retailer perspective it is also beneficial for competition. More varieties would decrease the dependency on one susceptible variety and the risk of shortages due to diseases for instance. With this entanglement in mind, the representant of an international retailer dissects their future scenarios into ‘desirable’ and ‘realistic’:

“So idealistic: We have agroforestry systems, we have good soils that provide a lot, that actually store more CO2 than they emit [...] good water management [and] established a system, where ten products come from one farm and we have turned logistics around so that works well. [...] It would be a completely different approach to agriculture, and I think it will take long for us to reach that. I hope we will reach it, before it’s too late. To

¹⁰ While the statement on whole countries to not demand standards is generalizing, it furthermore shows the vagueness of the framework of Global North and Global South, as with current geopolitical developments, the border of this framework will shift and adapt. This discussion would go beyond the scope of this thesis, nevertheless I did not want the reflection on these thoughts to be unnoted.

be honest, my realistic approach is that we will continue like we did so far for a long time. [...] We will rely on this system of monocultures for a long time” (Ret_5, 2025).

The actor works in the sustainability team of the retailer and is thus confronted with contradicting motivations daily. Although many companies are driven by economic incentives, the representant recognizes a change of thinking concerning environmental topics such as soil health, where they now also observe multinationals to address these issues. They furthermore address the importance of the banana industry for the livelihoods of many people, *“but it always depends on how good are the farms managed, how are the people treated? In general, we must of course not forget that if the industry dies, this would have consequences for extremely many people”* (Ret_5, 2025). A breakdown of the banana production and trade would not be beneficial for any actor, yet the narrative of a possible collapse was expressed by other actors as well. The purchaser of a Swiss retailer refers to the fruit and vegetable industry in general and criticizes *“that it has to snap first for something to change”* and explains an example of water issues in Spain where a tipping point was almost reached. They conceive the banana industry not to be *“as bad”*, however, they still imagine *“that it takes a lot for anything to change, that they will watch for a long time before they implement a change”* (Ret_4, 2025). This reaction only when the tipping point is reached is predicted by scholars, as *“the commodity boom represents the signal crisis of neoliberalism. A signal crisis announces the tipping point in the regime’s capacity to appropriate unpaid work/energy”* (Moore, 2015, p. 243). Within the banana trade, actors fear that environmental and further issues will be seriously addressed when it is too late or a crisis appears. This pessimist prediction is reflected by the member of a certification when envisioning the future:

“[Cert_2] If we have a serious shortage of bananas in the next years, then people will be scared and then they will change [...]

[Interviewer] So do you think that is going to have to happen first; the shortage?

[Cert_2] Yeah of course. This has to hurt [...] But at production level. No bananas this week in the shelves or less bananas. More expensive. So there has to be happening something that is really shocking, the industry, you know, especially at this level, but also consumers [...]

They imagine a shock like that to be possible in the future, if weather extremes or diseases weaken farms. When asked about the temporal aspect of possible shortage and thus change, they estimate the shortage to appear in the next years and a change in the next decades. The temporality of other actors when addressing the future of banana trade differed in interpretation and is discussed in the next section.

5.3.3 Temporal Discussions - How Far Away is the Future?

The discussion of ‘the future’ as a construct is very insightful to analyze how actors reflect on current challenges in relation to the future and vice versa. However, ‘the future’ is a very broad term and interpreted very differently in a temporal aspect. I thus aim to analyze the different narratives of ‘how far away’ that ‘future’ is temporally placed. There are reports that support

the narrative of ‘the future is now’, as negative impacts of climate change are already being felt and have an impact (KUMBHAR and MEMON, 2025; *INDIAN AGRICULTURE NEWS*, 2025). The report of the charity Christian Aid quotes a farmer in Guatemala who addresses the urgency:

„The crops have been dying. In the past there was a prediction that this would happen in the future, but it has come earlier, and this is because we are not taking care of our motherland, our ecosystems, and this is very worrying for our kids and especially for our grandkids. What is uncertain, is perhaps this situation is going to worsen in the future and we lose this whole plantation. This is going to be a huge issue for me.“ (Kramer and Ware, 2025, p. 15)

This statement evaluates the future as entailing dangers for the crops and their livelihoods, as the impacts have happened sooner than expected. Thus, future developments are feared to disimprove. Other actors place the future further away from ‘the now’. When speaking about the temporal distance, however, most narratives focus on negative impacts that the future entails. Positive predictions evolve around the development of a resistant variety. There are hopes that this will emerge in the next decade (GRAY, 2022), and the interviewed researcher refers to the aim of a having developed a new Cavendish variety by 2028 (Res_6, 2025). The representant of a multinational company also mentions the emergence of a new variety to happen in the next decade: *“But maybe in 5 or 10 years it'll change and we'll grow a different one”* (Mult_8, 2025). The introduction of a new variety is predicted to be crucial, as supply chains might be disrupted within the next decades due to diseases and impacts of climate change (HEILMAN, 2025). In connection to the current challenges and future developments, the sustainability team member at a Swiss retailer elaborates on Switzerland’s net zero goal 2050 *“which is actually really soon, considering where we are at the moment. I think, a lot will happen. Or I hope that a lot will happen in the next 5 to 10 years, I think. If you go towards 2040 and realize that the impacts have become bigger. [...] I think this phase will be critical. From my perspective also how much the population combined with politics is ready to define – nicely expressed - regulations”* (Ret_4, 2025). They refer to climate and emission goals that their company and other corporations aim to meet in context of the net zero goal. By not clearly stating what will change, they remain vague about the future changes and thus critical to whether the goal will be met. Environmental issues would have to be tackled more precisely by corporations and retailers, where banana trade does not account for the biggest emissions (compared to the emissions of other food) (Ret_4, 2025). Thus, changes might occur in other departments and not within the global banana complex. The actor Org_7 (2025) is also critical to whether buying departments at retailers have a long-term perspective and are sensible enough to their responsibility in the future, however they observe changes that are happening already, where some retailers acknowledge their responsibility and tackle environmental and socio-economic issues in the supply chain.

As studies predict severe impacts to happen in the middle and second half of the century, ‘the future’ is often connected to the year 2050 or 2080. Countries like India and Brazil as well as Colombia and Costa Rica are *“expected to see declining yield due to climate change”* by 2050 (DUNCAN, 2025). Simultaneously, other regions are predicted to benefit from the shift in

climate and might see yield increase (ibid.). The study by (Varma *et al.*, 2025) is often cited when addressing the future of banana trade, as they found that by 2080, up to 60% of the regions that cultivate bananas currently will not be suitable anymore due to environmental challenges and socio-economic constraints (BADSHAH, 2025; CHEN, 2025; LIMB, 2025; TANDON, 2025; *FOOD AND BEVERAGE: UKRAINE AND THE WORLD*, 2025; *THE TICO TIMES*, 2025). This precise year is the furthest outlook and prediction of future changes and impacts of the banana trade if current challenges and developments remain. Some actors address possible changes that are happening now and could combat current environmental issues. The retailer Ret_5 (2025) speaks about pilot projects that some of their producers report on, where a small part of land in their plantations is used for tests in diversification. They are reported to grow bananas and coffee intercropped with cacao and mangoes. These decisions to try out currently stem from an intrinsic motivation, as *“I think it depends very much on individuals. [...] It depends on who is leading. The question ‘who is responsible in the end’? Is it young people that want to change something?”* (Ret_5, 2025). As these future changes and tests depend on the decisions of individuals, an impact for the whole banana trade and possible changes might be rare. Nevertheless, precedent cases and pioneers are said to be important to drive changes in the future. Considering and supporting these pilot projects in countries in the Global South acknowledges that these are spaces of conflicts of challenges, yet also places “of the imagination and practice of alternative futures” (Verne, Marquardt and Ouma, 2025, p. 7). The actor at an organization stresses the importance of collaboration when tackling issues by giving an example in Germany, where a retailer implemented changes by cooperating with producers but also legislation:

“I mean, they've just had some kind of modest success [...]. They've had [a retailer] speaking with the producers and the workers in negotiating payments and continuing to negotiate on occupational health and safety issues, I think in Costa Rica. So I think that's a really important example of how, with an enabling kind of legislative background and a retailer that's taking responsibility that some of these issues can be tackled. And hopefully that's just the beginning. You know, hopefully that sets a precedent [...]" (Org_7, 2025)

Regarding long-term sustainability outlook, there are projects which “have the potential to be scaled up in collaboration with a larger number of stakeholders or on the global level” (Kessler and Hermann, 2019, p. 477). However, within a market-driven system where short-term competitiveness is given higher weight than long-term stability, such projects are likely to not be supported and succeed if there are no obligated regulations or profit for corporations. DOWARD's (2009) prediction that *“in a globalized world, it will be the invisible hand of the market that is likely to dominate and as a result the supermarkets may one day end up reaping what they have sown”* (p. 2) reflects current attitudes of stakeholders with economic power, however the consequences of short-term thinking in the banana industry are not felt. The future of banana trade thus depends on the decisions of actors with economic power. If they acknowledge their responsibility, environmental challenges can be tackled and impact of climate change reduced, which could then change the negative impacts as well as the temporal scope that are predicted when discussing the future of banana trade.

6 The Consumption – Conclusion

Through providing an overview of the state of research on banana trade, the theoretical frameworks applied as well as the analysis and discussion of the subquestions in the preceding chapters, this thesis aimed to answer the overarching research question of *How do actors of the Global North within the global banana complex perceive environmental challenges?*

The findings show that while environmental challenges such as the unpredictability of climate change, entailing weather extremes as well as the spread of pests and diseases are widely acknowledged, their perception varies depending on the actors' position within the global banana complex. While researchers and organizations contextualize the issues as alarming regarding the future developments of current banana trade, actors with economic power acknowledge the issues, yet their evaluation and urgency of the challenges depend on the impact it has on their position and competitiveness. Furthermore, the complexity of the global banana trade and the interplay of environmental, social and economic challenges are omnipresent and can thus not be assessed as separate issues.

This is illustrated through the connection of the price and costs when speaking about environmental challenges. The prices of bananas are a reoccurring issue in the global banana complex. Although market prices for many other products have risen in the last years, retail prices for bananas in the Global North remained the same. These low prices are criticized as they do not reflect the external cost of the commodity and thus devalue the banana. Findings of this study show that the price and cost of bananas can be regarded as one of the most pressuring environmental challenges since financial resources and the combating of issues on farms and in trade intertwine. Although retailers with economic power possess the means and power to approach this intersection of issues, their competitive market orientation often stands in opposition to independent action.

Environmental challenges in the global banana complex are twofold, with either the banana industry contributing to climate change or being affected by it. Several challenges are focused on in the data; and while weather extremes such as droughts, floods or hurricanes are examples of issues impacting farm and trade, issues such as monocultures which require much chemical input and emissions of greenhouse gases in cultivation and transport are cases where the banana industry contributes to climate change. These challenges are acknowledged and discussed in the data, as well as the threats of only having one banana variety for global trade. The susceptibility of the Cavendish variety on monocultures entails risks as the plantations are prone to diseases such as the fungal disease TR4 which is reported to have a devastating impact on the global banana trade by many actors and spreads more quickly with climatic changes. As the disease does not yet directly affect global trade and actors with economic power, however, many actors in the Global North perceive TR4 as manageable or not as the most pressuring environmental challenge.

The actors address these environmental and interconnected challenges differently. While adaptation strategies and solutions are proposed on different levels, responsibility often shifted along the supply chain or to other actors. Depending on the position of the actor, tackling environmental issues through higher prices, investments and other solutions is often considered the responsibility of ‘the other’ and not entirely oneself. Scholars, researchers and organizations call for a collaboration of governments and actors with economic power to drive change. Actors with economic power, however, often underestimate their own power and shift responsibility to the consumers and their price sensitivity, or they call for governmental regulations regarding prices. Thereby the actors acknowledge the restrictions that a market-driven competition entails for addressing challenges in banana trade, which shows contribution of this study to existing literature on analyses of commodity chains.

The current banana trade is dictated by uneven power distribution. These power imbalances in the global banana complex can be regarded as results of uneven development that roots in colonial histories of the countries participating in the trade (Christophers, 2009; Beh, 2022; Didi, Diawara and Acevedo, 2025). This has been observed in the rhetorics that the actors use when speaking about the Global South. They apply *Othering* and rarely attribute agency to countries of exports and their producers, which reinforces the imbalanced dynamics. The request for tackling environmental issues through sustainability demands in cultivation and trade by actors in the Global North furthermore shifts the responsibility. Solutions to environmental challenges like diversification or technical innovations must be implemented on farms and plantations, thus the actors in the Global North can transfer this responsibility to the producers in the Global South. By applying this responsibility mostly to ‘the others’ and not oneself, the actors ignore a planetary perspective (Chakrabarty, 2021) on the global banana complex, where actors are all considered equally responsible for the sustainability of the whole planet. Within a capitalist system, a planetary approach thus appears idealistic, as it considers the planet as a whole and reconnects the actors in the supply complex to each other as environmental issues and climate change eventually affect the whole planet. Since actors rely on borders, legislation and price, the perspective of a planetary view or a rethink of the system appears out of reach. Actors reflect on the banana industry to only react if a tipping point is reached. The alarming narratives around the disease TR4 portray the image of a possible tipping point, as the fungal disease is said to be capable of destroying banana plantations around the world.

When imagining the future of banana trade, the data shows concern in maintaining the current condition. Climate change is predicted to entail an increase of weather extremes and a faster spread of diseases, especially the fatal TR4. These challenges are already causing disruption in supply of bananas and could impact the global trade further. Measures taken by actors in the Global North often appear as ‘quick technological fixes’ to challenges that affect them, which reflects the short-termism in a competitive system. Research on new varieties is claimed to have started “too late” and can thus be regarded as providing a short-term solution instead of planning far ahead. Long-term prospects about the future of banana trade are mostly made by scholars and researchers, and not by retailers or multinationals, reinforcing the short-term thinking in a capitalist environment. Imaginations of a possible detachment of monocultures and more diverse trade are framed as an idealistic scenario which is not conceivable in the current system.

While some actors predict a possible collapse of the banana trade due to the interplay of environmental issues, many envision the continuation of the current trade and power imbalance. These imaginations and attitudes towards the future mirror the perception of current challenges as only urgent if they affect the efficiency and profitability of the system. Since the extinction of the Gros Michel variety proved the ability of adaption if market-driven incentives were given, a repetition of history and short-term solution in the case of an extinction of the Cavendish variety is imaginable. These analyses show that actors in the Global North perceive environmental issues as potentially menacing, but as long as cultivation, trade and supply can take place and is profitable, they are not considered urgent.

The entanglement of actors, spheres and their reciprocal relationships within the global banana complex becomes apparent with the analysis of environmental issues and their perception. As a planetary approach was applied for the analysis in this thesis, the critical reflection on globalization and trade within a capitalist society is central, as is the interplay of environmental and socio-economic issues. Within this, a broad number of spheres, actors and reciprocal relationships as well as their entanglement are to be considered. The analysis of the data has illustrated these complex relationships within the global banana complex and traced the connections of environmental issues to actors and spheres. A central aspect which links many issues that were addressed in the data is the financial distribution and the low retail prices of bananas.

Through the lens of a feminist commodity chain analysis, the exploitation of nature and the impact that banana cultivation and trade have on the climate ought not to be ignored in the final price of a commodity (Collins, 2013). As this perspective provides a broader and more uneconomic view on the global banana complex, actors who depend on profit and competitiveness in a market system do not reflect on internalizing costs, only one representant of an organization suggests the solution of a pre-competitive cooperation that includes all spheres and actors within the system. A pre- or non-competitive approach would entail the consideration of a broader distribution of costs, where not the price sensitivity of the consumer is a determining factor. By shifting the attention to the consumer, the interviewed actors in the Global North excuse their decisions without reflecting on their own power and ability to combat challenges within the supply complex. The internalization of external costs and a reflection of the true value is discussed by scholars as well as actors within the banana complex. This would entail not taking the price sensitivity of the consumers as a determination factor, but the value and external costs of e.g. biodiversity loss, emissions and the value of work to define the final price. A possible price increase is often only imagined if legislation is involved. By advocating for state intervention, the actors implicitly acknowledge the limitation of a market-driven system in securing an environmentally and socio-economically sustainable future of the banana trade.

In summary, the results indicate that actors in the Global North acknowledge environmental challenges within the banana complex. They show awareness for potentially fatal impacts of climate change, spread of diseases and emissions of the banana industry. Nevertheless, the perception of these challenges differs depending on the position of the actors. The further the

actors are distanced from the regions where impacts are visible and alarming and the more market-oriented they are, the less urgent the environmental challenges seem to be perceived. While some efforts are reported to tackle issues within the global banana complex, not many concrete measures are indicated. With the actors in the Global North not or not yet being directly affected by environmental issues, they do not perceive these as a tipping point to act. This observation of perception is supported by many actors predicting little changes in the future of the banana trade, as long as market-driven competition is present and thus prices remain low.

The results of this study entail potential transferability to qualitative research on other crops which are primarily cultivated on monocultures and thus susceptible to diseases. The findings are embedded specifically in the global banana complex and reflect perspectives of actors in the Global North. However, the identified narratives, problem framings and perceived environmental challenges may be applicable to other commodity complexes that go beyond the banana sector. Especially if these are also characterized by asymmetric North-South relations and power imbalance, similar results might be found. The limitations of the results and discussions lie primarily in the selection and number of interview partners. Different actors or more interviews with retailers or multinational companies would have provided further opinions and thus findings. Additionally, the discourse analysis focused specifically on answering the research questions, but there would have been many more statements and narratives to be analyzed in the context of environmental challenges and banana trade in general. Finally, the analysis was conducted through a capitalist-critical perspective based on the frameworks of uneven development, feminist and planetary approaches. This socio-scientific angle which aimed to center reciprocal relationships of human and nature on a planetary scale influenced the findings, as someone with a solely economic perspective would have interpreted the data of the text corpus and the interviews differently.

Furthermore, the subject of environmental issues is very broad and while many connections between issues were analyzed in this thesis, details of specific matters such as TR4, chemicals or diversification and their perception of actors provide ground for further research. It would be interesting for subsequent studies to focus on perception of challenges of actors in the Global South, as the scope of this thesis only allowed an analysis of actors in the Global North. This would also expand a feminist lens on commodity chains through redirecting narratives and uncovering social relations. Moreover, concentrating on examples where environmental issues are tackled by collaboration and addressing responsibility, as well as the adaptation of these strategies, offer substance for further academic studies.

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9 Annex

9.1 Excerpt from transcript

Excerpt from Interview with Actor 6_Research (2025, Pos 7-22)

[Interviewer, S2]: I'm really excited to hear more about these ideas and also about the research you've been working on, bananas, as I saw on LinkedIn for a long time and research on them. I think you started in [country] around like 2016 already, or maybe even earlier. What changes have you experienced over that time when it comes to global banana trade and research in your field?

[Res_6, S1]: Well, when I started in 2012, banana in the [country] when I came to for a PhD, study. But then I stayed here working on research. Many things changed for many years. There was not too much research on banana because, you know, in banana everything is super standard. It's a monoculture. So everything is if you want to start a plantation, you already know how to do it because it's just copying what others are doing. Everything is standard. The boxes, the system. Everything. And for Black Sigatoka, there was a lot of research. It's one pathogen, one disease that caused problems in banana. But for Fusarium, there was not too much [research]. So the biggest change, at least from my perspective, is that, the expansion of this pathogen. Because when I started this, when I don't know if you understand pathogen. Right. So the disease, when I started, it was present only in five countries. Nowadays it's like, if I remember correctly, 26 countries. So in these years the disease has expanded to many countries. And this is a disease that can wipe out banana essentially. That already happened. Probably you already read about the Gros Michel story, and that's happening again. It's a new race of the same disease, but in a different variety. Before we have the Gros Michel, now we have the Cavendish, and it's happening again. Of course, we are now more prepared. We have more technology, but at some point the disease will just completely spread and cause serious problems. Because in theory, you cannot grow bananas where this disease is present. And recently arrived to Ecuador which is the main exporter. So that's a big call of attention.

S2: So within these 13 years that you've been working on at the beginning you were like new to the, to research on, on TR4 and now it's, it's everywhere and it's really urgent.

S1: Now it's everywhere. When I came, there was not too much knowledge about the fungus because, you know, it was present only in few countries that were not important, let's say, for the industry. So nobody cared. Like, okay, it's in let's say in Jordan, it's in Indonesia. So those are places where bananas are not produced for the trade. So nobody cares. So it's like okay, it's there, but. Well, but when we started to discover the disease in many other countries then it was like okay, it's happening, it's moving, it can happen again that we lose our bananas. And I think the first big impact was when the disease appeared in Colombia in 2019. So I was responsible actually for the identification of that disease there to confirm that was present. And that was like the biggest boom because it was for the first time in a place where bananas can be really, can cause a big effect in the industry. Yeah, well, you know, most bananas come from Latin America, so that that is like. Oh, okay. Now it's here. So now we have to start doing something. So I remember from that moment, that's why we started this project because the companies were like, okay, we need to do something. So [multinational company] started to work with us. [Other multinational company] worked with other researchers, though, with other researchers trying to find the solution because now it's touching their pockets, let's say. It's like, okay, now it's it's serious. It's not like in a country that we don't grow bananas.

S2: As soon as it affects global trade. And yeah.

S1: So that's been that at least ten, more than ten years that have been like the biggest change. Like at the beginning there was not much interest of the industry on doing something. It was all everything paid by funding of research. But now that it's serious, then everyone wants to do something.

S2: And one of the slogans if I read that correctly is that you're working on creating sustainable, bananas or working on sustainability.

S1: Exactly.

S2: What do you exactly understand under the term sustainable banana?

S1: So I will give you a very big there are many examples, but one that is always very like important is that we create or we develop a resistant banana for black sigatoka for example, which is the other disease. One just to make it clear for you, the tropical race, in my opinion, is the most important because the moment arrives, it doesn't move. So it's there and you cannot eradicate it with anything. The black in the other hand, is also very dangerous, but you can control it with chemicals. This is very alarming for you probably, but in countries like Costa Rica. Colombia. Philippines. There are in average 62 applications per year with claims of these chemicals to maintain the nice bananas. That's a lot. It's almost a 1 or 2 times per week. That's ridiculous. So if we create if we are able to develop bananas that are resistant to that disease, those applications are not needed anymore. So even if we make a health resistant banana for black sigatoka, we can reduce the application. And in terms of sustainability, that's a big step because we are reducing the application of poison in in the lands. So that's number one. Making bananas resilient more strong the same. So we need less, fertilization, less care of the plants because the plants are stronger. So in my opinion, in terms of controlling diseases, what we call the genetic control. That means developing new varieties is the most sustainable because in any of the other ways to control diseases, you have to incorporate measurements that are not sustainable, like chemicals or inundations. Changing the ecology of the soil these kind of things is difficult. So I think that's the point from sustainability reducing the amount of applications.

S2: Which then has an impact on several, well on soil health as well and on, I mean social sustainability within the country. And did I understand that correctly. So with black sigatoka you can actually like react, but with TR4 you sort of have to watch out to prevent it before it even enters?

S1: Exactly, exactly. There are two scenarios, and there are these 26 countries that already have the disease. They cannot do anything in terms of prevention. They have it. So they have to now contain. Prevent that [it] escapes. So if there is in certain farm they have to close that farm. Not let anybody enter. Try to keep it there. Eventually it will spread. Because the moment you see the disease with your eyes, it's too late. Because the Fusarium lives in the soil and needs time to produce symptoms in the plant. That means that when the plant shows the symptoms, it's already too late because it's already passing probably being very optimistic: One two years and you can spread Fusarium very easily by just working in that. So just imagine the amount of people that could bring the disease to other places. So I always say that it's one of my like more famous phrases. That is like when you see Fusarium, it's already too late. So it's not that that, for example, now that they find it in Ecuador, they announce it like, hey, no worries, it's in just one plant. That's very, very. How do you say that? Like an irresponsible to say it's not that you're sick and then you're isolated and that's it. No, the plant is sick is because the disease was there already for years. So for black sigatoka we can add a lot of chemicals. That's in some places they do it to control. But for Fusarium you cannot apply anything. It's just like you have to quarantine the farm or destroy the plants. That's what did happen.

S2: And did that understanding of sustainability within banana trade - with reducing the application of fertilizers change during the time that you've been working on - like some years ago, was the understanding of a sustainable banana different than it is today?

S1: No, because there are not yet resistant varieties. So is everything continues as it is. So we are trying to accelerate our efforts to get these varieties quick. But this is a very difficult and complex disease. So just to not make it too complex for Fusarium, let's say it's relatively easy because it's just one gene in the DNA is responsible for that resistance. So when you make a resistant banana, you transfer that gene and then that's it. But for black sigatoka, it seems like it's several genes acting together. So you cannot transfer all those genes in just one cross, let's say using the pollen as we do it. So it's more complex even if you use transgenics or something

like that, it's difficult. So black sigatoka is more complex to develop varieties. So that's why it's taking more time.

S2: So but ever since you started with the project, the goal of a sustainable banana was always to reduce the chemicals?

S1: Yes, exactly. So everything that happened in the last years is trying to reduce the applications, change to products that are less dangerous. Some products in some countries, this is the type of sustainability that the people are talking about now in banana.

9.2 Codebook

Code System
Global Banana Complex
Rhetoric
Positionality of Global North
Funding / Money
Othering of Global South
Decision Maker
Paternalistic Discourse
Leadership Discourse
Knowledge Hub
Perception of Challenge
Severity
downplayed
manageable
existential/crisis
First Mentioned Challenge
Reaction to Challenge
Offering Solutions
Addressing Responsibility
shifted towards legislation
shifted towards corporations
shifted towards consumers
shifted towards retailer
Shared responsibility along supply chain
shifted towards producers
Future of Banana Trade
Actors

State
Consumers
Importers
Retailer
Trading Companies
Cooperatives
Producers
Plantations
Multinational Companies
Producers/Smallholders
Adaptation Strategies / Solutions
Switch to other Crops
Resistance
National Regulations
International agreements
Internalize external costs
Research/Genetic Modification (GM)
Efficiency
Investment/Innovation
Technology
Diversification
Certifications
Biosecurity/Organic Farming/Intercropping
Geographic Regions
Historical/Recent Changes
Price
Living Wage
Other Challenges
Environmental Challenges
Pesticides / Fertilizer
Food Waste
Emissions / Carbon Footprint
Biodiversity
Plastic Use
Diseases / Pests
Susceptibility of Cavendish

(Black) Sigatoka
Fusarium Wilt TR4
Soil Health
Water / Irrigation
Weather Extremes
Drought
Flood
Heat
Climate Change

10 AI Declaration

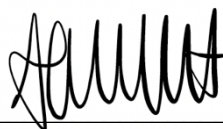
While it has been used more to troubleshoot technical problems, artificial intelligence programs (ChatGPT, DeepL) were used for structuring the thesis and re-formulation or grammatical correction of certain sentences. Furthermore, the AI Assist tool provided by MAXQDA was applied for support with the data analysis.

11 Statutory Declaration

I hereby declare that the submitted thesis is the result of my own, independent work. All external sources are explicitly acknowledged.

Zürich, 15. April 2026

Date, Place



Signature