Farming is toxic in every chemical way.

This thesis elaborates on why small-scale farmers in Guatemala choose to 'unnotice' and use humor to make life with health risks from the forced use of chemicals more pleasurable.

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Abstract

This research elaborates on how small-scale farmers in the Valle – a small village in Guatemala cope with health risks caused by the agro-industry and increased by climate change. Chemical use is an important aspect of the agro-industry but is not without risks. Small-scale farmers are captured and dependent on (big) transnational agricultural corporations who create the boundaries in which small-scale farmers can move. In addition, small-scale farmers face (consequences of) several crises. The most important one, the climate crisis, which can be seen as a chronical crisis, an ongoing crisis. In the meantime, small-scale farmers face poverty due to (among other things) the economic instabilities since the entrance of the agro-industry. Responding towards the climate crisis therefore not feasible. Small-scale farmers are aware of the changing environment, but changing towards a more sustainable agriculture is due to the agro-industry and living in several crises not feasible. Changing would bring especially economic risks, which are considered more dangerous than health risks. This leaves farmers no other option than accepting health risks. Small-scale farmers do this in two ways. The first is 'unnoticing' the short-term health risks. The short-term health risks are part of everyday life, small-scale farmers can not do anything about it, so they normalized them. On the other hand, long-term health risks are considered more dangerous and at the same time small-scale farmers cannot change them. The use of humor releases the stress of health risks for a short period of time, it illuminates life.

Introduction

There is a lot of agricultural land close to the city of Quetzaltenango, located in the western highlands of Guatemala. Set against the mountains and volcanoes, the *Valle* - my research location - consists of small agricultural land divided among various small-scale farmers.

It was the dry season and, therefore, quiet around the agricultural lands, high in the mountains, where I did my fieldwork. The soil was covered with light-brown sand that flew around with every bit of wind. The sun shone sharply on my skin. I could not avoid the sun because only a few shaded areas existed, at least a 10-minute walk from the lands. The trees looked dry, and only a few trees had green leaves. The others were bare. Due to the lack of (minimal) rainfall, which usually falls toward the end of the dry season, and no reach to groundwater, the growth of crops was obstructed. Preparing the soil with a shovel for the next (vegetable) production was the primary, time-consuming, and exhausting activity. Next to this were several pieces of land full of growing onion. The onions did not need much water because the soil they were standing in was as dry as a cork.

Still, local crops could be bought at the local markets. Farmers who had farms close to the centers of their villages had access to water, which made it possible for them to grow crops. Every time I visited the market, I was surprised by the enormous sizes of the vegetables and fruits—especially the carrots and onions. Most of the carrots were as wide and long as zucchini, and the onions resembled the ball used in handball. I decided to ask Jose - a 45-year-old farmer, how this was possible and why these sizes seemed important. Jose answered clearly: ‘Chemicals’ (Jose, participant observation, 20 March 2024). Chemicals are essential aspects of current farming (McKay, Alonso-Fradejas, and Ezquerro-Cañete et al. 2021, 4; McMichael 2009, 161).

Since the beginning of the 20th century, farming methods worldwide have changed towards a more homogenous farming style: monoculture. Monoculture has been breathed into life because of (worldwide) food insecurities after the Second World War (McKay, Alonso-Fradejas, and Ezquerro-Cañete et al. 2021, 3). One of the crucial aspects of monoculture is the use of chemicals. In addition, small-scale farmers changed their production from selling locally to selling internationally due to the entrance of the free

market and free trade (International Trade Organization - ITO, 2023). In 2004, Guatemala signed the CAFTA-DR agreement with the United States (US) and other Central American countries. In the years after, Guatemala also established free trade agreements with South American countries, the European Union (EU), and Taiwan (ITO, 2023). The free market and free trade caused an increase in competition, and food had to be produced and sold for the lowest price possible. For example, imported food from the US and EU is subsidized and sold below the cost of production (Geurts 2013, 74). The competition threatens small-scale farmers due to inequity (McMichael 2009, 152). Large agricultures can more easily farm for a lower price. The possibility of a lower price involves reduced labor costs through efficient labor practices. Next to this, extensive agriculture benefits from better access to financing, allowing for investment in advanced mechanization that increases productivity and lowers overall costs (McKay, Alonso-Fradejas, and Ezquerro-Cañete et al. 2021, 4). To stay in selling competition, small-scale farmers use chemical fertilizers and pesticides to control pests and accelerate growth. Farmers sell vegetables by the kilo. By making the weight of one piece of vegetable as heavy as possible, fewer seeds, soil, labor activities, and chemicals are needed per kilogram, resulting in economic savings (Jose, participant observation, 20 March 2024). In addition, Guatemala is affected by severe climate change, making it the fourth most vulnerable country (Steffens 2021). One of the leading climate problems in Guatemala is the dry corridor. As a result, drought times increase every year (Lakhani 2021). Next to this, pest and fungus plagues were increasing, threatening to ruin small-scale farmers' total harvest (McKay, Alonso-Fradejas, and Ezquerro-Cañete et al. 2021, 4). Current farming is a result of the industrialization of agriculture (Kedia and Van Willigen 2005, 63) and the increased intensity of climate change, causing risks for nature (soil depletion and decrease of biodiversity) and humans (health) (Dowdall and Klotz 2016).

This thesis focuses on small-scale farmers in the *Valle* who must participate in the modern agricultural system. The requirement is based on the lack of economic and political power to change toward more sustainable farming (Geurts 2013). At the same time, due to this stuckness in industrialized agriculture, health risks became part of the current farming culture (Dowdall and Klotz 2016). They are leaving farmers no other choice than normalizing. Normalization does not implicate that small-scale farmers are unaware of short- and long-term health risks. However, small-scale farmers need coping strategies to make health risks situation bearable. This research aims to answer the following question: *how do small-scale farmers in the Valle cope with short-term and long-term health risks*? To answer

the research question, firstly, attention is paid to the agricultural changes since the 1950s. Small-scale farmers were forced to change from traditional *Milpas* to industrial farming, where monoculture, the use of chemicals, and interconnectedness with the world were the norm. A *Milpa* is a traditional Mesoamerican farming system. It works via the three-sisters method – maize, beans, and squash. This method was to enhance soil fertility, control weeds, and provide a balanced diet (Maya Forest Gardeners 2016). In addition, chemical use has increased over the last few years due to an increase in the number of pesticides and soil stimulation, which has increased the speed of crop growth. However, looking at the climate crisis separately is not possible. Small-scale farmers live in a web of crises that are all related to one another. Small-scale farmers need, therefore, to categorize risks from high to low. Because small-scale farmers are more afraid of economic risks, they choose to accept health risks. Leaving small-scale farmers up to coping strategies to deal with the health risks, which they are partly afraid of. In the following section, an elaboration follows on the debates in which this research interferes.

Debates

Crisis

The study of crisis shifted from temporal events, which are primarily placed in the past (Kosselleck, see Vogh 2008, 8), to events that take place in the present (Vigh 2008, 10). Following Bryant (2016), the present is not one form. The present is a time between the past and the future (2016, 8), but it is not an actual time; it is based on how people perceive the present (2016, 3). Besides, a crisis does not need to be ‘an intermediary moment of chaos’ as Kosselleck (see Vigh 2008, 8) argues (Vigh 2008, 10). For many people worldwide, life without a crisis is more an exception than usual, making living in a crisis chronic. Seeing the crisis as a chronic one opens the door to looking at the meanings people give to their lives in crisis, but at the same time, crisis becomes a ‘terrain of action’ (Vigh 2008, 5). For people living in an ongoing crisis, the crisis becomes a ‘state of being’ (Roitman, see Khasnabish 2014, 570), which they cannot escape. Within these crises, people continue making a life. Social processes continue instead of being on hold (Vigh 2008, 10). By constantly living in a crisis, the crisis will be embedded in people's lives and could be observed as normalized (Das 2006, 80). From another perspective, taking the present as uncanny (Bryant 2016, 7) helps to understand how expectations for the unknown future are experienced. The experiences make

inconveniences and changes due to crisis stand out, but people do not know how to act. I will follow Vigh (2008, 10) in this research by arguing that the climate crisis is chronic. In addition, I argue that people are aware of the problematic future, but because they cannot do anything about it, people normalize it as a conscious choice to make life bearable so that they can move on. A conscious choice of normalizing differs from Das's (2006, 80) argument. She argues that normalization happens when people live in constant crisis.

Risks

Douglas and Wildavsky (1983) argue in the book *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers* that people become conscious of the risks they live with due to social and cultural selection (1983, 8). When there is a socially accepted risk, society does everything in its power to protect itself from the possible loss (1983, 8). To place risks in context, an assessment of the causer and victim takes place. The judgment of the potential harm to the victim indicates if people judge the risk as high or low (Boholm 2003, 175). Boholm (2003) examines how the identification of a causer and victim influences the perceived seriousness of risk.

In contrast, Beck (1992) provides a broader framework by linking risks to industrial overproduction and modernization. Beck argues that there is a "systematic way of dealing with hazards and insecurities induced and introduced by modernization itself" (Beck 1992, 21). In other words, industrialization provided modernization. Modernization brought many goods, such as wealth, but simultaneously bringing goods has side effects. These side effects come from industrial overproduction, which causes risks. This calls Beck the ‘distribution of bads’ that threatens everyday life. In coherence, Beck (1992), Boholm (2003), and Douglas and Wildavsky (1983) recognize the social dimensions of risks but from different viewpoints. Beck (1992) focuses on the structural production of risks by modernity, Boholm looks at the relational dynamics of a causer and a victim, and Douglas and Wildavsky focus on the social selection of risks. Still, what they all have in common is that they look at risks from the perspective that risks are something negative. From another perspective, risk could be a part of productivity (Jovanović 2016, 497-498; Zaloom 2004, 383-384). As Jovanović (2016, 498) in her article about toxic pollution in Serbia shows, pollution brings health risks, job opportunities, and income. People can make a life due to the risks they are living with. My research aligns with Jovanović and Zaloom, arguing that pollution can be part of life-giving in a productive sense.

Coping strategies

Literature on coping strategies is limited in Anthropology. Mostly, coping strategies are related to adaptation (Oliver-Smith 2016, 60-61) or as part of each other (Rosinger 2023, 94). Rosinger argues a coping strategy is "[the] behavioral (...) adaptation or response to (...) when facing (...) insecurity" (2023, 94). Rosinger describes how individuals change their behavior in response to uncertainty. People use coping strategies when they feel unsafe or at risk. Anthropological scholars disagree on whether behavioral change is culturally made or not. According to Oliver-Smith (2016, 60-62) and Mazzeo (2011, 406), people use coping strategies when a culturally given solution to an emerging problem is unavailable. A coping strategy, in their eyes, is a short-term solution to problems that arise. From another perspective, as Roncoli, Crane, and Orlove (2009, 87) show, coping strategies are culturally based. This is because culture frames how people perceive the world and, therefore, influences how people cope with the problems they face. In this research, coping strategies are related to the short- and long-term health risks people face. Small-scale farmers chose to use unnoticed risks they have noticed (Lou 2022) and humor to make their lives bearable (Douglas 1975) instead of using their observations of health risks to fight for justice, as people in Cancer Alley - a polluted town in the United States did (Davies 2018, 1537). In line with Roncoli, Crane, and Orlove, I argue that coping strategies are culturally based. It is a cultural choice of how people respond to the problems they face. This research expands on the anthropological knowledge of coping strategies.

Location

The location of this research, which I call the *Valle*, is close to the city of Quetzaltenango in the western highlands of Guatemala. At least at 2000 meters altitude, close to several (active) vulcanos. The *Valle* has two seasons: the rainy season from May to October and the dry season from November to April. In addition, it lies in the dry corridor, causing drought times to increase (Lakhani 2021). During my fieldwork, which was from February to May 2024, it was dry season. The temperatures varied from minus 3 at night to 25 degrees Celcius during the day. In the morning, everyone wore (winter)gloves, hats, and winter jackets, which changed to t-shirts during the day. It was light between 7 AM and 7 PM. Only the centers of the *Valle* had streetlights. Still, the inhabitants did not recommend, especially for women, to leave the house alone.

The *Valle* is known as one of the most important agricultural areas in the area. It

consists of several districts, each with a center and outlying area. The centers consisted of colorful houses and stores; every house or store on the same street was a different color. In the center were (street)markets and small stores for basic and agricultural needs. Besides, each center had its own (Evangelical) church. A general practitioner was in one center, and the *Valle* had two elementary schools. With few exceptions, every street in the centers of the *Valle* was asphalted. The centers and outlying areas had no access to a sewer system. Toilets were, therefore, not placed in the houses but outside in a small shack with a corrugated iron roof. The outlying areas (high) in the mountains were mainly agricultural lands. These areas were difficult to reach since there were no asphalted road surfaces. In addition, it was difficult to know the directions because of the lack of street designations.

The agricultural lands in the outlying areas where I conducted my fieldwork did not have access to (ground)water. Farmers bought water in cubic meters as a result. Around each agricultural land, hedges defined the boundaries. There was also no storage space on the land, so farmers took their work tools home daily. The agricultural areas did not go to the top of the mountain; the last part of the mountain was a protected area of the municipality, and because of this, it was sheltered by trees, which prevented erosion. Little was grown because of the dry season; only onions could survive the drought.

Population

My primary interlocutors were small-scale farmers in the *Valle*. Specifically, I volunteered at two family farms at the beginning of my fieldwork. Still, I continued due to practical reasons, such as planning and the possibility of contact, to only one (family) farm. During the whole fieldwork period, I worked with the family of Jesus. Most of the days, I worked alone with Jesus. Sometimes, one of his brothers, Ignacio, Jorge, or nephew Jose, came to help. Next to this, Jesus had employees from the *Valle* for two days during my fieldwork. One day, Jesus had one worker, and the other day three workers. In addition, Jesus and I also worked some days at one of the farms of his brothers or nephew. Jesus produced mainly non-traditional crops for export, such as onions, carrots, cauliflower, and cabbage. Besides, he produces a small amount of maize for his family's consumption. The other family - the one of Fransisco, worked with five family members on their land: father, mother, and three children between 12 and 18 years old. Fransisco only produced non-traditional crops (comparable to Jesus's) for export. Next to my volunteering job, I visited farms of other small-scale farmers: Tomas, Mario, and Pedro in the *Valle*. Here, I hold informal interviews to increase my background

information.

Next to the farmers, my research population consisted of a few governmental actors: Luis from the Ministry of Agriculture, Cattle, and Alimentation (MAGA) in Quetzaltenango. He increased my understanding of the macro-level of agriculture in Guatemala. Secondly, Maria and Pablo from the municipality of the *Valle* provided local knowledge of biodiversity, nature, and agriculture. Thirdly, Juan from the water supplier company (EMAX) in Quetzaltenango to get an impression of the water regulations in the *Valle*.

Another part of my population was with Javer, a teacher, and Carlos, the boss of an agricultural school committed to connecting traditional knowledge with science. In addition, the forest workers Reno, Jose (also a farmer), Miguel, and Roberto always brought me to the field.

Research methods

For this research, I used multiple ethnographic methods. Ethnography helped me to gain a local understanding of practices, problems, and lifestyles of small-scale farmers in the *Valle*. By being in their natural habitat, people feel more comfortable, so if there is a good relationship of trust with the researcher, people dare to show more of themselves (Bernard 2011). Being in a natural habitat gives insights into the holistic form of how people behave and react to everyday situations. Especially the observations of behavior, is in questionnaires or interviews not to catch (Hammersley and Atkinson 2019, 2-4). Being in the field gives me the opportunity to adapt to the culture of interlocutors and become one of them, allowing me to collect and elaborate on data from their point of view. One of my limitations is being in the field for a short period (3 months). This may have caused me not to see all the cultural aspects of small-scale farmers' lives in the *Valle*. Still, by trying to become ‘one of them,’ I gained a deeper understanding of their livelihoods. Ethnography also gave me the flexibility to change research topics because the natural setting showed other things than expected before. The goal of ethnography is to conduct thick descriptions and/or explanations instead of testing hypotheses as a result (2019, 2-4).

I used the snowball method to get in touch with my interlocutors. I did this by asking around at local markets and by going to the municipality. After many conversations, I found Maria - the office manager of protected areas at the municipality, who said she knew farmers in the *Valle*. She asked the forest workers to take me to the agricultural lands. Supported by the forest workers, I started to ask around at farms if there was a possibility to work with

them. By asking around, I found Fransisco. During a conversation with another farmer, I got in contact with one of his friends, Jesus, who wanted to participate in my research. Visiting the school was possible due to a friend who had a family member studying there. Lastly, I arranged interviews with governmental organizations by passing by and asking for an interview. These could often take place immediately or the day after.

Firstly, and most importantly, I used participant observations. I did this by working with two small-scale farmers in the *Valle* and, later, one (due to agenda-technical difficulties). By working with them and asking questions about several themes (such as culture, risks, and climate change), I increased my understanding of their everyday practices. The power of participant observation relies on how people act instead of how they say they act (Bernard 2011). My activities were planting seeds, pulling weeds, covering plants with needles from conifers and removing them again, watering plants, harvesting crops, cutting vegetables, and preparing the soil. To build a report (2011), I was honest about my presence. I spent, especially in the beginning, many days in the field, due to which people were getting used to me. This also lowered reactivity to my presence (2011). In addition, I had conversations about the farmers and my life. Each week, my interlocutors opened up more and treated me the same way they treated others. For example, farmers were making jokes about me, and I could join them in the exhausting (men's)work, such as preparing the soil with a shovel.

Secondly, I used semi-structured interviews and informal interviews. By using these interviews, I increased my understanding of topics (O'Reilly 2011, 116-117) such as climate change, agricultural reforms, and health risks. Interviews allowed me to understand how my interlocutors interpreted their own actions and situations and how they thought about the topics mentioned above. If possible, I used open-ended questions to let my interlocutors speak more freely (2011, 122). Sometimes, it was necessary, in case of a confirmation, for example, to ask closed-ended questions. I used 8 semi-structured interviews in total with the MAGA, EMAX, Municipality, Agricultural school, and small-scale farmers. I discovered that the farmers spoke more freely during informal conversations; therefore, I limited the semi-structured interviews to 3. Semi-structured interviews gave me control of the direction of the interview. In addition, I had to learn Spanish in Guatemala, and semi-structured interviews helped me to have handholds when I ran out of words. A limitation of this was that the respondents were more limited to the questions I had prepared. This made it more challenging to let them speak freely and guide the interview by what topics my respondents liked to discuss (O'Reilly 2011, 120).

Informal interviews were used while working on agricultural land or when I visited (farming) families at home, the natural setting of my interlocutors. I discovered that my interlocutors were more relaxed (relaxed attitude and joking) when we were working at the farm instead of planning a time for an interview. I did not record informal interviews since they mainly happened spontaneously. Sometimes, after analyzing the data I had gathered, questions arose. I wrote the questions I gathered while analyzing my data in my notebook and asked these questions to my interlocutors the next time I saw them. I did not want to make extensive use of prepared questions because, during work or spending time, I wanted my interlocutor to guide the conversation on the topics he wanted to discuss. Still, there is a difference between informal interviews and conversations. During informal conversations, I wrote (extensive) notes during and after the conversation. While with everyday conversations, I only wrote (sometimes) notes afterward (DeWalt and DeWalt 2010, 137).

Lastly, I was following the news since climate change problems and agriculture were topics that I passed by at least every other day. This gave an insight into what was happening in Guatemala and not only specifically in the *Valle*. This information helped me with informal and semi-structured interviews because it increased my background information. Besides, I used it as a control factor. For example, when the news said that the government released a couple million for agriculture, I could ask the farmers and governmental organizations how this proceeded. As Boucher (2018, 9-10) shows, this method of questioning had a different starting point and was further conducted in an unstructured way, leading to the interpretation of others.

Ethics

In general, I was following the American Anthropology Association (AAA, 2023). By observing the culture, I created a sense of the rules of conduct. I adapted to this to not harm. For example, when a farmer told me I could not do soil preparation because this was for men, I accepted this. Next to this, I used my sensitivity by looking at how people reacted to me. Once, I went to an agricultural village on my own. By walking around, I saw that residents were looking at me with tense attitudes. I also tried to have small talk conversations, but the answers to open questions were only yes or no. The closed answers made me realize that people did not trust me. An explanation for this can be found in the civil war from 1960 to 1996, which was a result of the revolt against the American CIA's forced election of president (Schlesinger and Kinzer 2005). This may have lowered confidence in Western people, which

explained that I was causing unrest in the village. Because of this, I left.

Secondly, I was honest about my presence to my interlocutors. I shared my information letter with all potential interlocutors to make clear what I was doing and why. I shared the information letter orally with the farmers. Illiteracy rates are high in rural areas in Guatemala (Orozco and Valdivia 2017), so to ensure farmers understood my research goals, I used the oral method to explain.

Thirdly, I asked my interlocutors for informed consent. I did this orally with farmers (for the same reasons as explained above), and for governmental organizations, I gave the option between oral and written. I gave the organizations the option to prevent them from not taking me seriously. I asked for consent mainly before I started gathering data. It happened twice I asked my interlocutors afterwards. The advantage of oral informed consent was that my interlocutors did not have to sign a paper, which kept them more anonymous. A paper could also make them feel at risk because, due to this, they could not deny they had spoken to me (O'Reilly 2011, 69).

Fourthly, I kept my data protected and safe. I made use of small notebooks during my days at fieldwork. In these notebooks, I did not write the names of people or places. After I arrived home, I elaborated on my notes in a big notebook, which I had always hidden. After copying and elaborating further on my notes, I deleted the paper in my small notebook and tore it. In my big notebook, I used pseudonyms to protect the identity of my interlocutors. In a Word document protected by Utrecht University with a password and a second authentication, I created a list of the actual names of my interlocutors to keep my data organized, and every interlocutor only had one pseudonym.

Next to the AAA (2023), I took other ethical considerations in mind. One important ethical consideration was based on my living place. During my stay in Guatemala, I lived with a host family, for which I paid weekly. Staying with the same family - they did not live in the *Valle* - for the whole fieldwork period gave me security. The sense of security was because of the natural connection we had. In addition, the house was clean and well-secured, with a large gate. The house was in the city of Quetzaltenango, so there were more activities to do at night than in a remote village such as the *Valle*. Living with the host family helped me to entirely focus on my research and feel mentally and physically healthy.

Positionality

My position as a Western, white, and young woman has been contested in Guatemala. It was contradictory to find out that I found easy access to governmental organizations, while access to farmers was more difficult. In the Netherlands, I have experienced the opposite. As mentioned in the section on ethics, this could be a result of the civil war (Schlesinger and Kinzer 2005). Thereby, I found connections with farmers through the municipality. I found out that several farmers did not trust the municipality. Taking this together could, therefore, have led to mistrust in me. What I wanted to show is that my presence had led to several interpretations, as Bernard (2011) argued. To gain trust, I decided during the first conversation with a farmer that I had to be immediately honest about my presence instead of starting with small talk. I did this to prevent the idea of why I am asking questions and what I am going to do with the answers.

I positioned myself in a learning attitude toward farmers and stayed curious about how they farm. By doing this, I expanded my knowledge about farming and the culture of small-scale farmers. Even though my ideas of how the agricultural system should look (more locally, without chemicals, working with ecosystems – which is in line with agrarian activists such as the food sovereignty movement of Nyéléni (2007) are not in line with how the farmers farmed, I took their knowledge seriously. By doing this, I followed the belief that every knowledge is of the same value. It, therefore, does not matter if you followed a study or not. In short, it means there is not one group superior that has all the correct answers to problems (Sillitoe 1998, 227). In my opinion, essential knowledge can come from both school and life experiences.

The language barrier had positive and negative consequences. The positive repercussions were that my interlocutors wanted to help me with everything because they found me sweet. Next to this, due to the barrier, I was more focused on physical reactions. Thereby, it ensured more conversations because I asked questions about what things are called in Spanish, which, in my opinion helped to build trust. On the other hand, not always understanding what someone says limits my study because this means some data gets lost. For the formal interviews, this was not a (big) problem. Due to recording these, I could listen back to them. It sometimes happened that when I listened back, I did not understand a word. If that happened, I could ask (native Spanish-speaking) friends what was said. I am aware that my friends could also hear it wrong. I always placed the word in context to see if it made sense to reduce the risks of wrong interpretations (Hammersley and Atkinson 2019, 115-116). When I doubted, I did not

include it in my research. To limit the change of unknown words, I prepared interview questions. By organizing the interviews, I increased my vocabulary, and the list of questions helped me as well by making new/following-up questions.

Structure of thesis

This thesis explores the coping strategies related to short—and long-term health risks caused by agricultural changes but increased by the climate crisis. I divided it into three chapters.

In the first chapter, I start by limiting the scoop of actors that played a role in the industrialization of agriculture. In addition, I gave a brief history of how the agricultural reforms proved possible in Guatemala. Afterward, I will focus on several actors related to small-scale farmers in *Valle*. I do this to demonstrate how several powerful actors forced small-scale farmers to change in industrial agriculture, in which the use of chemicals became important. The industrialization made small-scale farmers dependent on external companies (such as Bejo - a seed corporation) and therefore limited their autonomy.

The following chapter focuses on how the climate crisis can be seen as a social crisis. The ongoing weather changes make the climate crisis chronic. The unpredictable weather makes farming and, therefore, farmers more vulnerable. Besides, the climate crisis is not the only crisis small-scale farmers face. The intertwining of the climate crisis with other crises leaves farmers with a choice as to which crisis they handle. Taking the crises together influences the ability of small-scale farmers to react to the climate crisis with the associated risks.

In Chapter 3, I discuss how risks are socially constructed and how this influences the perception of risks. Small-scale farmers see health risks as lower risks than economic risks. Still, small-scale farmers are aware of the health risks, but due to the coping strategies of unnoting and the use of humor. In finding ways to navigate these challenges, small-scale farmers have utilized coping strategies such as unnoticing and humor to address these issues effectively.

I conclude by answering the research question and summarizing the three chapters. I also addressed this research's limitations and provided some suggestions for potential areas of future research.

Chapter 1 - Bye, bye *Milpas*. Hello Monoculture

On a sunny day, Jesus a 60-year-old farmer, and I worked on one of his small agricultural lands in the *Valle*. We were cutting onions that we had harvested the day before. These onions need to dry till the rainy season starts, then they will go back into the soil again to grow bigger. To dry, we must remove the green stems from the onion. We were both sitting on the ground, Jesus with a manchette in his hand and me with a small, blunt knife. It was a relaxing day. We sat in silence. I have been working at Jesus's farm for a while now, which is why being silent around each other was comfortable. We were enjoying the singing of the birds, the wind, and, of course, the calmness of nature. As usual, at some point, we started to talk about 'life,' this time about our families. Jesus told me he began working as a very young boy at his grandparent's *Milpa* to help sustain his family. "Back in the day, we [Jesus and his grandparents] had animals on our *Milpa*: sheep and chickens. They rotated from place to place at the farm to spade the ground. At the other parts of the *Milpa,* we rotated [traditional] crops, such as maize, beans, squash, potatoes, and chipilín. The animal feces were used as compost. No chemicals Kike, no chemicals!" Jesus said this with a smile. After a couple of seconds, he changed his smiling face to a severe look and thought of how agriculture has changed quickly over time. The change of crops and the increased use of chemicals were the main effects he experienced. Jesus also mentioned that he could not do much about the change himself. Jesus smiled again. He remembered valuable moments in the past, such as how he ran after the chickens when they had to move from field to field along with his grandfather. (participant observation, 16 April 2024).

The work activity in the vignette is one of the activities of a regular day in the field. The conversation about the changes from the past to the current situation makes several things clear. Firstly, the shift from *Milpas* with traditional crops to industrialized agriculture with mainly non-traditional crops such as onions, carrots and cabbage. At *Milpas,* farmers produced crops they consumed themselves, with which they provided themselves with food. In addition, the surplus was sold on the local markets (Jesus, participant observation, 16 April 2024). The influence of culture is vital in defining what can be seen as food security. Goldstein (2010, 131) shows that culture is an essential factor in determining what food security means to people. "Production techniques, food preferences, gender norms, and other cultural factors" (Goldstein 2010, 131) are essential aspects of how people understand food

security. The industrialization of agriculture changed self-sufficiency in providing food for others (mainly international). It changed cultural food security (corn, beans, and squash) to the feeling that food was no longer secure by growing non-traditional crops that farmers did not consume themselves (Geurts 2013, 74).

International institutions forced the increase of cultivating non-traditional crops on the demand of free markets and free trade agreements, such as the CAFTA-DR (the Dominican Republic-Central America Free Trade Agreement). The World Bank (WB), the World Trade Organization (WTO, established in 1995), which is the successor of the General Agreement on Tariffs and Trade (GATT), the United Nations (UN), and the Food and Agricultural Organization (FAO) are institutions who were among others involved (Philips 2006, 40). Agricultural products are grown where there is a purchasing power demand (from the global North) (Geurts 2013). In addition, farmers are also dependent on other actors. Farmers rent agricultural lands from the municipality with temporary contracts of 2 to 4 years, causing them to live in uncertainties. Thereby, farmers rely on hybrid seeds from Bejo – one of the most powerful seed suppliers (Access to Seeds, 2019). In this chapter, I argue that the multiple actors involved in the current industrial agriculture hinder small-scale farmers' autonomy in the *Valle*. The actors, as mentioned earlier, put frameworks around being a farmer from which farmers cannot escape. Before I focus on the actors involved, I want to make clear that for other small-scale farmers around the world, the actors can be different. In addition, I demonstrate how industrial farming became possible in Guatemala. Secondly, I pay attention to the international and national actors involved and how the agro-industry made the farmers in the *Valle* dependent on them. I elaborate further on what this dependency means and how, paradoxically, farmers still experience a sense of autonomy. I conclude this chapter with a conclusion.

Limit the scoop and a bit of history

Not one particular factor or actor created the way farmers in the *Valle* are currently farming. In this paragraph, I outline how I limit the scope of involved actors and pay close attention to Guatemala's history, clarifying when the agricultural reforms began. In the following paragraphs, I outline factors and actors that played an essential role in the development of farming for my interlocutors. I am aware that factors and actors could be partly different within Guatemala and internationally. For example:

> On April 20, while harvesting onions with Jesus, Ignacio, Jose, and Manuel, I asked the men if non-governmental organizations provided them with assistance. Jesus, the eldest brother of the four, spoke, and he pointed his finger at his brothers one by one. Jesus said, "This is our organization, we as a family" (translated quote, participant observation, 20 April 2024)

Jesus suggested he and his brothers did not need support from local non-governmental organizations (NGOs). Because the help of NGOs did not emerge during my fieldwork, it is not addressed in this section. Next to this, I do focus on the time since the 1950s. I look at changes from the *Milpas* to current industrial agriculture, which have accelerated since 1950 (McMichael 2009, 141). Still, it is essential to mention that before the 1950s, inhabitants of Guatemala faced a complex colonial period in which farmers faced, among other things, dispossession and inequalities (see also Smith 1990). In 1951, there was hope of change for small-scale farmers. Agricultural reforms were presented, which promised more equal land distributions, a better and fairer price for farmers, and more rights to less fortunate residents, where small-scale farmers were among them.

In 1954, under pressure from the American-based giant banana exporter United Fruit Company (which owned many agricultural lands in Guatemala) and the American CIA, a coup ensued. The agrarian reforms were reversed (Schlesinger and Kinzer 2005). Six years later, farmers (and related corporations) began to stand up for their rights, causing a civil war (Schlesinger and Kinzer 2005), which lasted till 1996 (Gibbings and Vrana 2020, 4). Guatemala began to industrialize their agriculture (Carey 2009, 292-293). As a result, land ownership problems arose, which caused small-scale farmers to leave their properties. Besides, small-scale farmers faced human rights violations and increased inequalities (Gauster and Isakson 2007, 1533–1535).

The industrialization of agricultural practices

The industrialization of agriculture includes several actors, both international and national. First, I focus on the agro-industry, and then, in the next section, I look at the development of the free market and free trade agreements. In other literature, the industrialization of agriculture, further referred to as agro-industry, is also described as the 'Green Revolution' (McMichael 2009, 141) or "corporate-led, external-input plantation agriculture" (McKay, Alonso-Fradejas, and Ezquerro-Cañete 2021, 1). The agro-industry aimed to ensure a consistent food supply and reduce the disparities between small and large agricultural producers (Miller 1977, 192). The agro-industry caused agrarian practices to become

market-oriented, and existing power relations were not considered (McKay, Alonso-Fradejas, and Ezquerro-Cañete 2021, 4; Medeiros 2015). As a result, foreign companies started to invest in Guatemala's agricultural properties. Small-scale farmers were dispossessed (Gauster and Isakson 2007, 1533-1535) or were integrated into the global food chain by contract farming (McKay, Alonso-Fradejas, and Ezquerro-Cañete 2021, 4).

In one way or another, the agro-industry favored extensive agriculture; extensive agriculture gained control over what small-scale farmers had to produce and at what price (McMichael 2009, 141). To achieve a consistent food system, changes had to be made in the production methods of small-scale farmers in Guatemala. To increase production, farmers transitioned from high-yielding propagation seeds to genetically modified seeds to hybrid seeds (Norton Grubb 2013; Nyéléni 2007, 6). Hybrid seeds are one-year high-yielding seeds that are more disease-resistant and have shorter growing cycles (McKay, Alonso-Fradejas, and Ezquerro-Cañete 2021, 3; McMichael 2009, 141). In addition, as part of the agro-industry, farmers increased the use of pesticides and chemical fertilizers to accelerate crop growth and control pests (McMichael 2009, 141). Furthermore, implementing technology and mechanization allowed for more efficient farming and reduced the number of required employees (McKay, Alonso-Fradejas, and Ezquerro-Cañete 2021, 3; Miller 1977, 192–193).

Translating to small-scale farmers in the *Valle* they faced disadvantages. Small-scale farmers could not keep up with the mechanization. Farming goes by hand, making the process slow compared to mechanical agriculture. Selling prices are the same, but production costs (due to working by hand) are higher for small-scale farmers (Jesus, participant observation, 5 April 2024). The main reason farmers in the *Valle* cannot use mechanization is machine costs. The high machinery prices can affect farmers in the *Valle* and, more broadly, in developing countries (Ajah 2014, 123) because they cannot be paid. Most farmers in the *Valle* start each year with a loan from the bank. Farmers need this to purchase seeds, fertilizers, pesticides, and employees and possibly acquire farm tools such as shovels. In addition, they also need this loan to sustain themselves. Jesus told me that he has income twice a year, which is when large crop production is sold. He has to distribute this money over the months, but there are always unexpected costs. In addition, farmers' income is unstable; it is ideal to have between 40,000 and 60,000 Quetzals as income per six months, but it can also be less. From this, they must deduct the fixed expenses, which average 30,000 Quetzal per six months. What remains is what Jesus earns (participant observation, 5 April 2024). This situation highlights how farmers´ mobility and decision-making capacity are

limited. The dependency on loans and the inability to invest in modern machinery keep small-scale farmers in a cycle of limited productivity and economic vulnerability, restricting their ability to compete with larger, more technologically advanced agricultural enterprises. The competition is a bridge towards the systems that made the competition possible: the free market and free trade agreements.

The not-so-free markets and trade agreements

"The great advances of civilization, whether in architecture or painting, in science or literature, in industry or agriculture, have never come from centralized government" (Friedman 1962, 49). In other words, significant progress in every field has (historically) not originated from centralized government authorities. Instead, Friedman argues, these advancements have typically emerged from independent, decentralized efforts. Innovation, development, and progress are more likely to occur in environments where (private) corporations or individuals have the freedom to explore and create without control or direction from a central governing body. A shift had to be made from collective thought towards individual thought and from governmental organizations to private corporations. By doing this, freedom of personal choices would increase, and profit and development would be more equally distributed, creating a better democracy (Ganti 2014, 95; Harvey 2005, 2). This is the core of neoliberalism, which rose from the 80s onwards by Reagan and Thatcher and was the basis of the liberalization of agriculture within the Agreement of Agriculture in the WTO in 1995. Liberalization is also the base for free trade agreements like CAFTA-DR. Klein (2009) shows in the documentary *the Shockdoctorine* that the privatization of common goods (like water) did not lead to freedom but to unequal competition in which cheapness became an important aspect. The privatization and liberalization of trade allowed for competition in agriculture between farmers within a country or between farmers internationally. This section focuses on how the free market and trade agreements influenced the small-scale farmers in the *Valle.*

The free market impacts small-scale farmers in the *Valle* in various ways, starting with the need for multiple jobs. Being a farmer in contemporary times is not enough for economic sustainability. Jesus told me that many small-scale farmers in the *Valle* during the dry season have other jobs in construction, for example. Jesus does not have other part-time jobs during the dry season because he owns a home store, and his wife resales vegetables from another small village in the city of Quetzaltenango. De La Piscina (2022, 8) shows in comparable

studies in viticulture in Spain that small-scale farmers cannot sustain themselves only through farming since the state interferes as little as possible with market prices. Big agricultural companies can produce food quickly and with high production at low prices. Small-scale farmers must compete with this by extending their properties and increasing production levels to survive in the competitive markets (Homs 2022, 8). Farmers in the *Valle* have multiple pieces of land, mostly rented from the municipality. Jesus will increase his properties this year with one extra (rental) piece of land. Increasing work days is not an option since Jesus works seven days weekly. The additional land will extend his daily work time, which is already ten hours. Still, Jesus was happy to expand his farm because it would help him to provide his family with a better income (participant observation, 12 April 2024). The expansion shows how the free market creates market fluctuations, making farmers' income unstable. Hence, farmers continue to expand their operations to secure themselves more of an income. The farmer himself does not do the pricing but by the market. Small-scale farmers are forced to adapt to external forces over which they have little control, which can significantly limit their economic and personal room to develop or structural savings.

The market fluctuations influence, as mentioned above, the income of farmers. Farmers do not have a fixed minimum price to gain. Jesus: “Today I can earn 3 Quetzals for this bunch of onions, and next week it can be 7 Quetzals. This depends on the availability of onions, as well as the size of the onions” (participant observation, 5 April 2024). The price differences, as the effect of the free market, show how variable and unpredictable the prices are each time farmers want to sell their production (Philips 2006, 40). The price depends on the availability and size of the product. No account has then been taken of purchasing prices or the duration of growth. When growth takes longer, it delays the time to plant new seeds. It slows down the process, reducing the income coming in. Together, this creates the risk of a lower income than the expense for farmers.

The dominance of neoliberal policy made it possible to create free trade agreements between countries, simplifying the exchange of goods. This impacted local agricultural practices (Philips 2006, 40). Several international institutions, such as the WB, the WTO, which is the successor of the GATT, the UN, and the FAO, which is part of the UN, provided homogenization of agricultural production worldwide (2006, 40). This homogenization, or, differently said, standardization of food systems, reduced food production via local farming styles. The abovementioned corporations, together named the Transnational Corporations (TNCs), created power over the food industry due to investments. This gave them control of the total food process, from production to distribution (Heffernan and Constance 1994,

47-48). It became more popular to produce non-traditional crops, which meant that my interlocutors faced a change from *Milpas* to crops they did not consume from origine. In addition, the TNCs created obstacles for small-scale farmers in developing countries, including the *Valle*. Old farming traditions and products became unprofitable because of the pressure of these influential organizations.

Small-scale farmers in the *Valle* produce mainly for surrounding countries, partly due to the CAFTA-DR agreement. Jesus explained that 90% of the crops he produces are sold to a distribution center in a village close to the *Valle*. His wife sells the other 10% of Jesus' production at a local market.

> Jesus: "We [farmers in the *Valle*] produce onions, carrots, cauliflower, and other vegetables for El Salvador, Ecuador, and other surrounding countries. (...) but we [the government] import onions from Mexico because they are cheaper. The Peso [Mexican currency] is less valuable than the Quetzal [Guatemalan currency]" (transcribed quote, 16 April 2024).

The international market decides which crops are profitable (Rosa 2001, 583-584), limiting farmers' choice of what to produce. Small-scale farmers focus on compatible crops in the export market instead of crops more suitable for their own consumption or climate conditions. Besides, despite local production, the government's choice to import cheaper crops suggests a lack of support for local farmers (Lyon 2012, 286). However, these governments must also do so after signing these free trade agreements (ITO, 2023).

The promised freedom of Friedman (1962) by decentralizing governments and centralizing markets and trades on themselves created unequal competition worldwide (Klein 2009). Competitiveness became important, restricting the autonomy of small-scale farmers in the *Valle*. Competitiveness became visible through attention to the free market and free-trade agreements. The free market caused farmers to work multiple jobs to earn sustainable income for themselves and their families. Similar trends were observed in Spain, where minimal state intervention in market prices forced farmers to expand their properties and production to maintain their business. Besides, the need to compete with large agricultural companies means small-scale farmers must continuously increase production and working hours without a fixed minimum income. Market fluctuations destabilize small-scale farmers' earnings, leading to economic insecurity and restricting their ability to save money or invest in sustainable farming. Consequently, it is crucial to delve deeper into the loss of autonomy among small-scale farmers in the *Valle* in the following section.

But I am living the good life, no?

The historical international and national changes have restricted the autonomy of small-scale farmers in the *Valle*. As mentioned in the previous sections, various factors and actors have shaped this process, framing the limitations within which small-scale farmers in the *Valle* must operate. Small-scale farmers are constrained by economic pressures, technological disparities, and market demands, which collectively reduce their ability to make independent decisions. In this section, I elaborate on how small-scale farmers experience autonomy. Afterward, I compare the experiences with how the international and national changes delimit small-scale farmers' leeway.

"I have my own business. I can decide which hours I want to work. I can rest for a couple of hours during the day. I have no boss who tells me what to do. To me, this is freedom. I am having a good life" (Jesus, participant observation, 3 April 2024). Jesus is not the only farmer I spoke to who argued for having a good life due to the above conditions. Ignacio adds: "The payment for working for a boss is low, and then you must follow his rules. I want to decide on my own" (participant observation, 20 April 2024). What Jesus and Ignacio understood by having autonomy is based on a micro-level: their own life. Pellow (2009, 770) shows in her research among women in West Africa that the sense of autonomy, as Jesus and Ignacio experience, is when an individual has "control over her own self, activities, and decision making and the power to conceptualize alternatives and act upon them" (2009, 770). Jesus's ability to set his own work hours and take breaks whenever he wants illustrates his control over his activities and decision-making. Similarly, Ignacio's preference for self-employment over working for a boss reflects his desire to retain power and make independent decisions. This sense of autonomy is about the freedom to govern one's life.

On the contrary, implementing agro-industry, which resulted in monocultures, increased the number of pests and weed plagues. In addition, monoculture increased plant diseases. To counteract this, farmers must use more chemicals to combat pests, plagues, and diseases (McKay, Alonso-Fradejas, and Ezquerro-Cañete 2021, 4). Farmers depend on commercialized (agricultural) production resources, such as seeds, pesticides, and fertilizers (Smit and Kloppenburg 2004, 34). These resources must be procured from external corporations (McKay, Alonso-Fradejas, and Ezquerro-Cañete 2021, 5). Not producing seeds (or other resources) by farmers self alienates them from the means of production and makes them dependent on outside suppliers, which limits farmers' independence (Smith and

Kloppenburg 2004, 34). Besides, as an earlier example of Jesus showed, 90% of the crop sales are to a distribution center (Jesus, participant observation, 16 April 2024), which makes farmers dependent on these centers because distribution centers determine the price of crops (Smit and Kloppenburg 2004, 34). The result of being dependent on external corporations is that essential production functions (such as reproducing seeds, like what happened at *Milpas*) moved to industrial settings (outside the farms). This movement has led to increased profits in industrial settings, while farmers face rising costs and decreasing returns (Bernstein 1979, 427). In addition, the soil and labor are depleted due to monoculture techniques, which makes expenses even higher than revenues. The increased profits in industrial settings and the depletion of soil and labor calls Bernstein (1979, 427) the 'squeeze' of small-scale farmers.

Even though the MAGA wants to change farming from monoculture to agroecological, the systems that have been established since the agro-industry must be changed. Luis, a MAGA employee, describes the reason why the MAGA intends to change:

> "Monoculture (...). A fast-growing crop that needs many chemicals. These chemicals are bad for nature and humans. Guatemala faces decreased biodiversity, an important aspect of keeping the ecosystem resistant to plagues and extreme weather events. (...) Especially in times of climate change, we need to work with nature to sustain ourselves because monoculture will kill everything" (translated interview, 12 April 2024).

Luis has concerns about an unsustainable future if farmers continue to farm as they do. His concerns are not unjustified. The agro-industry stimulates soil erosion. In 2021, one-third of the agricultural land was parched by monoculture (FAO and UNEP 2021), and arid soils cannot be cultivated. In addition, pests increase resistance against pesticides. As a result, more pesticides have to be used each year. These pose health risks to both nature and humans (Slavikova 2019). Thirdly, fertilizers are used to increase the speed of crop growth, causing nutrient depletion (2019). Fourthly, monoculture contributes to climate change (IPCC 2022, 503). It was discovered that agriculture is among the significant users of fossil fuels. Together, these are problematic concerns for the future of agriculture. With an eye on climate change, causing more extreme weather conditions, agriculture will be made more difficult. The risks for small-scale farmers, therefore, increase if international changes will not be made.

Conclusion

In the previous sections, I paid attention to how small-scale farmers depend on several actors from which they themselves cannot detach. The free trade agreements, to which countries are also bound. The free market causes economic instability. Lastly, the municipality with flexible contracts is a reason why farmers do not dare to invest. Together, they have significantly restricted the autonomy of small-scale farmers in the *Valle*. Despite individual farmers like Jesus and Ignacio expressing a sense of freedom and autonomy on a micro-level, their overall ability to make independent decisions is severely limited by larger structural forces. The perception of small-scale farmers in the *Valle* on autonomy, rooted in their control over 'being their own boss,' contrasts with the macro-level constraints of the agro-industry. As briefly mentioned in the last section, climate change will increase the vulnerabilities of small-scale farmers in the *Valle* if there are no changes made toward a sustainable agricultural method.

Chapter 2: A crisis with crisis and another crisis

At one of his dusty agricultural lands, located on a mountain, Jesus stands waving at me. From the other side of the land, Jesus screams with a smile and flapping hands up and down: “I am waiting for the rain, Kike. Waiting for the rain. The wind is coming from the North, which means there is a chance of a small amount of rain.” Jesus was hoping for a small quantity of luck. His cabbages had just hatched but were dry, waiting for the rainfall.

Jesus remembers how the rains used to come at predictable times. “Normally, during this month [April], we have a couple of days of rainfall. This year it did not rain once”. Jesus relies on the harvest for his income. Without the rain, the cabbages will not grow. The lack of rain negatively influences Jesus's income. He can harvest later with luck, but with lousy luck, he loses his entire production.

The crops, hybrid seeds from the Netherlands, Jesus is using are less water-intensive, which increases their chances of survival. The chemical fertilizers, a mix of fungicides, growth accelerators, root protectors, and seed protectors, Jesus uses are cheap and promote quick growth. Still, Jesus knows they negatively affect the soil and his health. However, he has no choice; he must sustain his family.

The situation has been exacerbated since the COVID-19 pandemic. Prices for food and other basic necessities doubled, while their income remained the same: flexible and with good luck, as Jesus describes it. Flexible income because Jesus’s income depends on the production volume. The more production, the higher the revenue. Good luck is based on weather conditions; his plants will grow in good weather. The little money they earn goes directly to purchasing essential supplies, employees, or investments for the farms. Investing in sustainable farming is not an option; Jesus and his family need to survive. Jesus thinks a lot about his working children in the United States, who currently have, in his perspective, more economically free lives. He dreams of going back one day. “I did not have to worry about money there [in the United States], and I could sustain my family.” Jesus knows the future is uncertain but remains hopeful, even though he does not influence it (participant observation, 6 April 2024).

The above situation entails simultaneously living in a climate crisis and recovering or dealing with consequences from other crises, like the economic consequences of COVID-19. The changing climate on which Jesus relies for production makes farming increasingly insecure (Orlove et al. 2007, 261). The weather's unpredictability brings extra risks to forecasting. The risks are based on income security, which relies on planting seeds at the right time with no problems with extreme temperatures or temperature variations. Jesus was forced to continue farming to reduce economic risks as the agricultural changes made it. In this chapter, I argue that the climate crisis is a chronic crisis, which goes along with other crises. This makes the climate crisis social because the people who suffer the most are the least fortunate. The lack of sufficient economic needs makes investing in adaptation or mitigation strategies difficult. Still, small-scale farmers must choose which dangers they respond to and are concerned with survival.

In this chapter's first part, I look at the ecological side of climate change. Looking at the environmental side is needed to show how the weather impacts farming in the Valle. In addition, I focus on small-scale farmers' perception of climate change. Secondly, I dive more deeply into the concept of climate crisis. I argue that the climate crisis is chronic by following Vigh's (2008) argument of chronic crises. In the same chapter, I show that the climate crisis is interwoven with other crises and cannot be observed in isolation. Afterward, I focused on the non-availability of resources, limiting farmers' adaptation and mitigation strategies. Lastly, I show by an example of agroecological farming that the romantic thought of the government has the opposite effect in practice, creating more inequalities.

The weather and farming, once a golden combination

Since human involvement in the increased use of fossil fuels, which led to increased emissions of greenhouse gasses, the climate changed more rapidly (O'Reilly et al. 2020, 14). The increased need for fossil fuels has significant adverse effects on the living conditions of humans and more-than-humans in the global South. This is contradictory, given that the global north mainly emits greenhouse gasses (Sayre, Stenner, and Argumedo 2017, 103). The rapid changes make it challenging to forecast when extreme weather events will occur (NPR 2016). In Guatemala, year-to-year weather changes are established (Gun, Matheny, and Folan 2002, 80; Lakhani 2021). The weather changes go from extreme heat- and cold waves (Waddick 2017, 109) to longer drought seasons and rain in overflow (Gun, Matheny, and Folan 2002, 80; Lakhani 2021). Luis, a Ministry of Agriculture, Livestock, and Alimentation

employee (MAGA), demonstrates how these changes are experienced around Quetzaltenango:

> "Guatemala has two seasons: the rainy and dry seasons. Currently, these are changing and are getting more intertwined. That is a problem. In recent years, the rainy season has lasted longer and longer. Last year, even till the middle of December [normally it ends in October]. In the middle of the rainy season, we had drought periods of 45-60 days. Thereby, the number of hurricanes increases during the rainy season. And we do face huge temperature differences. Look, today, this morning, it was 2 degrees [Celcius], and now [around 3 PM], it is 28 degrees. This is ridiculous! This year, we even had days minus zero degrees, which caused plants to die. At the same time, due to high temperatures, the soil is drying. This makes it difficult for water absorption. Close to Quetzaltenango, there are many weak nature points, and due to high temperatures, forest fires increase, too. During the rainy season, we have a lot of floods, which destroy plants" (transcribed interview, 12 March 2024, 05:43).

Luis wanted to show how the seasons are fading in Guatemala. When he specified the region around the city of Quetzaltenango, he described how extreme weather events impacted farmers' production. The rapid weather changes do not fit the model of natural scientists' findings about natural climate change cycles over the past 600,000 years, as revealed by ice core records from Antarctica (Crate 2011, 178). Small-scale farmers who rely on their agricultural planning on the weather must correct their planning; what and when to sow and harvest changes (Orlove et al. 2007, 261). Rapid weather changes complicate reliable agricultural planning. Forecasting weather became more unpredictable for local weather knowledge and scientists (Roncoli 2006, 83-84). In line with previous research, climate change negatively impacts small-scale farmers (Fernandez 2021; Vermeulen et al. 2013, 8384). Jesus describes in the following situation how the weather not only impacted the planning but also indirectly affected his (future) income:

> New onion seeds were allowed to be planted in Jesus's garden. Nevertheless, before planting, Jesus and I walked around in his garden. The seeds planted earlier had sprouted. "Normally [the years before], the green stems would have been larger by this time. Every year, the growth rate slows down. I [Jesus] could have harvested the onions and let them dry for the second planting time. And I could have planted new onion seeds here." (participant observation, 10 April 2024).

Small-scale farmers need constant anticipation of how the weather changes, not only every year but also during the seasons. Planning became more uncertain because crops needed more

extended time to grow. The constant uncertainty of crop growing asks for continual anticipation of the situation. Jesus was not the only one who experienced changes:

> Fransisco: "It [the land] is super dry. I need to know when the rain is coming" (participant observation, 8 March 2024).
> Pedro: "The soil absorbs the water worse and worse" (participant observation, 20 March 2024)
> Jose: "I am waiting for the rain. Normally, I would have planted maize three weeks ago" (participant observation, 20 March 2024).
> Reno: "A lot of old trees have died. We [forest workers] planted new ones, but these trees are less resistant than the old big ones (...). The forest along the agricultural land is getting smaller every year. Also, some trees, such as the laurel, are dying out. This is bad for biodiversity" (participant observation, (informal conversation, 21 March 2024).
> Ignacio: "I do not have money to buy water boxes to water my plants" (participant observation, 20 April 2024).

As Bryant (2016, 7) shows in her article, it is when people do not know what to expect in the future, which means they can only guess; it brings the uncanny present into people's consciousness. The future feels out of control (2016, 21-24), which aligns with what I observed; farmers are worried about how the weather will change in the coming years and how this will affect their crops. At the same time, they feel powerless (Jesus, Jose, and Ignacio, participant observation, 20 March, 3 and 20 April 2024). This feeling of powerlessness creates coping strategies to take back agency and handle the situation, which I will elaborate on further in the next chapter of risks and coping strategies. Given the above observations about the substantial impact of climate variability on agriculture, it is essential to explore the concept of the climate crisis in more depth. The current situation goes beyond only natural/ecological changes.

The climate crisis is not the only crisis to be handled

Only some interlocutors in the *Valle* were aware of living in a climate crisis. The partly awareness of small-scale farmers in the *Valle* may have to do with the fact that the climate crisis is not "an intermediary moment of chaos where social and societal processes collapse upon themselves only to come to life after the crisis is overcome" (Kosseleck, see Vigh 2008, 8). In other words, the climate crisis did not appear as an interruption. It did not create a phase of disorder within society like COVID-19 did. Following Vigh (2008, 10), within a

chronic crisis, people cannot stop making life and continue their pre-crisis lives when the crisis is over. Importantly, Vigh (2008) focuses in his article *Crisis and Chronicity: Anthropological Perspectives on Continuous Conflict and Decline* on people for which crises are constant rather than occasional events. Vigh (2008, 8) gives poverty as one example. Poverty can become part of the social system so that people no longer notice that they live in a crisis. People learn to cope and live with poverty. It is often not a single period after which everything returns to normal. The coping strategies people use to learn to live in their crisis make a crisis a state of being (Roitman, see Khasnabish 2014, 570). In addition, understanding which coping strategies people use to learn to live with crisis makes crisis a 'terrain of action and meaning' (Vigh 2008, 5). The crisis becomes the context in which social interactions and decisions take place. A crisis shapes the daily lives of individuals and communities, influencing their choices, behaviors, and opportunities. This makes explicit how deeply embedded a crisis, with its effects on all aspects of life, is within the social fabric.

I take Vigh's (2008) observations about the elements of a chronic crisis as a viewpoint for the climate crisis. The climate crisis slowly breaks down established social processes and norms. During the climate crisis, there has been no return to climates similar to those in the past, and rapid changes will continue (O'Reilly et al. 2020, 14), in which constant anticipation is necessary. Jesus: "Do you see these insects Kike [Jesus was holding two larvae in his hand]? Those are my enemies. They eat everything [seeds and plants]. Every year, I have to increase the number of pesticides for the plagues" (participant observation, 12 April 2024). The quote illustrates how climate change impacts daily activities. The increased number of plagues and the need to use more pesticides yearly highlights the constant anticipations farmers like Jesus have to make. The ongoing need to anticipate climate change's effects makes the climate crisis chronicle. In line with Vigh's (2008) argument of chronic crisis, there is no end point in sight; instability is becoming the new norm, with people constantly having to anticipate and adapt to survive.

Vigh (2008) shows that chronic crises mainly occur for 'structurally violated, socially marginalized and poor' (2008, 5) people. This is different from the climate crisis, which is a global phenomenon. Weather changes are taking place in both the global North and South, and the intensity of the changes may vary (IPCC 2022, 12). As mentioned earlier, people in the global South suffer more from climate change. In addition, socioeconomic status influences the ability to react to the climate crisis. The poorest people suffer the most from climate change and face, therefore, problems with the ability to adapt or mitigate towards the climate change problems (IPCC 2022, 12). The climate crisis as a chronic crisis is

particularly evident among the less privileged people, who often live through multiple, overlapping crises. Vigh's (2008) concept of chronic crises becomes crucial in understanding the compounded vulnerabilities of these populations in Guatemala, where 62% of the inhabitants live in poverty (2022, 1698), which small-scale farmers are part of (Luis, translated interview, 12 March 2024) are affected. Small-scale farmers dealing with the socioeconomic challenges of poverty are further burdened by the impacts of climate change, which exacerbate their existing vulnerabilities and limit their ability to adapt or mitigate these problems. The climate crisis does not exist in isolation but is deeply intertwined with other struggles.

Poverty is not the only crisis or after-effects of crises small-scale farmers face in Guatemala. In conversations with my interlocutors, two consequences of different crises were highlighted. The first is due to migration outside Guatemala (Barrios 2024; Fernandez 2021). Migration influences farmers in the *Valle*; fewer employees are available, which slows down food production and decreases income. In addition, the price for employees increases due to reduced availability, making spending higher (Jesus, participant observation, 3 April 2024). The reason people migrate is due to an increase in food insecurities among small-scale farmers who depend on their own food production, which is related to climate change, is one of these reasons (Barrios 2024; Fernandez 2021) - secondly, increased natural hazards obligate inhabitants to move (Barrios 2024). Another reason concerns economic reasons (Taylor, Moran-Taylor, and Rodman Ruiz 2006, 58-59). Guatemalans migrate to mainly the United States and Canada to increase their income and help sustain their families who still live in Guatemala (2006, 42). Another crisis was the COVID-19 pandemic. The pandemic weakened the economy, which farmers are still struggling with. Even though the COVID-19 pandemic is not a crisis anymore, it still has consequences. Reno, a friend who always brought me to the field, told me that the living prices have doubled since the pandemic. Therefore, he had to take another (extra) job to sustain himself (Reno, participant observation, 5 April 2024).

The intertwining of multiple crises with the climate crisis, in which inequalities already exist, demonstrates the differences in social impact and the extent to which people can react. Small-scale farmers must navigate various urgent issues like economic instability and climate change. The accumulated crises have significantly impacted their economies. Looking closer at access to resources is essential.

Where is the water?

Around the beginning of April, it became busier on the farms in the *Valle*. The rainy season became closer, due to which farmers dared to take the risk of planting seeds. I planted kale seeds with Jesus and five others as one of the first farmers in the *Valle* kale. These seeds need more water than onions, which we planted earlier in the season. After seeding, we had to water them directly. Jesus bought water boxes that were running on diesel for this. He explained that each can cost 50 Quetzals - equivalent to 6 euros. He needed four boxes, which together cost 200 Quetzals or 24 euros. Jesus' daily income is between 120 and 150 Quetzals (14,40 - 18,00 euros). The water is more expensive than his daily income. Of course, he did not water the plants daily. Still, he had other expenses as well, like employees who earned 100 Quetzals (12 euros), the seeds, the rent price of the land, chemicals, and work equipment (like his car and shovel) (participant observation, 3 April 2024).

We returned to the agricultural land two weeks later, where we seeded the kale. The soil was dry, and Jesus was worried because it could be too late to water the crops. I asked Jesus why he had not watered the crops earlier. He replied that the forecast predicted rain, so he did not dare to water the plants. Watering the plants could have led to excessive watering, which would undoubtedly kill the crops. Next to this, watering from boxes would be expensive, which would mean higher expenses (participant observation, 16 April 2024). “Maybe I am too late” (Jesus, participant observation, 16 April 2024). This means Jesus would have high expenses for water and employees, without income to pay employees and himself. An option could be new seeding, with the risk it would be too late in the season. A late seeding would bring the possibility of crop failure (again), which means even higher expenses that Jesus could not afford.

Jesus's situation illustrates the risk of financial insecurity due to climate insecurities. The weather forecasts were different than they turned out to be. Because of this, it could be that a failure of Jesus’s harvest. Living with constant insecurities and instability is part of a chronic crisis (Vigh 2008, 13). For Jesus, the continual concern about the climate and financial pressures of agricultural costs makes it an ongoing crisis. His daily struggles and anticipation with balancing income and expenses illustrate the impact of economic risks. Secondly, the unknown future makes it difficult for Jesus to make the right choice. With anticipation, as Bryant (2016, 3) describes, the future can be predicted so that choices can be based on it. This is in contrast to expectations, which highlights the uncanny present. Whether or not to water

the crops takes both risks. That makes the present uncanny because the outcomes are not known. Lastly, the need for water boxes illustrates that access to a common good, such as water, is inaccessible. The agricultural lands in the outlying areas do not have access to groundwater. Small-scale farmers are thus obligated to buy expensive water due to this. With the future expectations of water scarcity (IPCC 2022, 10), the price of water will also rise (Muehlebach 2018, 348). The role of financial sustainability comes into play. A farmer's income is variable and, therefore, unpredictable. The risk of overwatering the plants and having more costs for small-scale farmers is higher than not watering the plants. The unavailability of water as a resource is a social problem. In the centers of the *Valle*, the municipality allowed the connection to groundwater. Farmers who have their farms in or very close to the centers have a more stable income. These farmers can grow crops all year round and do not have to pay for the water. By doing this, they decrease economic risks. An interesting side note: the groundwater in the *Valle* has a high value of sulfites, and an increased amount of methane, and the water in boxes does not, said Juan - an EMAX employee (the municipal water company). Contaminated water may cause farmers' crops in the centers to be more dangerous or bring more health risks (translated interview, 11 March 2024). As Pablo explained, the construction of groundwater in higher areas is expensive and is not done because of this (translated interview, 8 April 2024**)**.

Simultaneously, farmers have to pay rent for the land, Maria, an office worker of the municipality, told me. From her perspective, with an eye on more drought periods, the municipality should save money to build water points. Still, Maria does not think the municipality will do it. Farmers not paying their taxes may have to do with this (Maria, translated interview, 3 April 2024). One of the reasons small-scale farmers in the *Valle* do not pay their taxes, Jesus told me, is because they disagree with the monthly fixed price. So it makes no difference whether farmers sold crops or not. Because of this, monthly expenses can be high (Jesus, participant observation, 12 April 2024).

The situation of farmers illustrates the complex web of financial and climate insecurities. The unpredictability of weather patterns and the high costs of essential resources like water create an ongoing, chronic state of instability. This aligns with Vigh's (2008) concept of a chronic crisis, where there is no time limit, and with Bryant's (2016) notion of the uncanny present, where farmers must continually cope with changing conditions. However, these agricultural challenges are not merely technical or economic but also social. The reliance on expensive water boxes and the lack of access to groundwater reflect social

inequalities. In the next section, I discuss how social factors impact and influence farmers' decisions and their capacity to respond to climate (and economic) pressures.

Yes, it is social

In this section, I use an example to show the contradictions between the ministry's wishes to change the current agricultural practices of monoculture into agroecological farming to be more resilient to climate change and plagues and the farmers who do not have the resources to change.

> On the 12th of March 2024, I had a spontaneous interview with Luis. In a crowded room with books, papers, and posters everywhere, there was a large table where we could sit after some paperwork shuffling. After a few minutes of talking, "We have to farm differently" came loudly out of his mouth. I nodded yes in the hope he would continue with his argument. "We have to change to agroecological farming." Meanwhile, Luis gave me a report with detailed information on what the 'new' farming style should look like. "Farmers must produce multiple crops simultaneously, work with nature, stop with chemicals, and produce their own compost. In addition, farmers need water barrels to store water." According to Luis, it is a simple change every farmer, even small-scale farmers, could make. "All they need is only a little education on how to compost and work with nature." In a village nearby is one of the schools, classes are two days a week for one semester. The government partly subsidizes the education. The other part [100 Quetzals per month (Rsapalu 2019)] farmers need to pay themselves (translated interview).

The above situation outlines the Ministry's perception of how farming should be done, especially when climate change is more intense (IPCC 2022). The situation makes several tensions clear. The first one is that agroecological farming is a manageable and necessary change in the eyes of the Ministry. Luis thinks farmers need a little education about a few topics. Afterward, farmers can farm agroecological. As previously mentioned, small-scale farmers have a whole working week. Due to this, they do not have the time to attend school. Their working days are long, and given the financial constraints they face, such as the lack of money for essential items like water boxes, it is unreasonable to expect them to spend money on education. In addition, farmers would have less time to spend on their own farms, which would cause production levels to decrease. The decrease in production levels would mean a lower income. In sum, it is not only the school payment but also a decrease in revenue.

Secondly, a difference can be discovered between the ideological agroecological

farming thought of the Ministry and the on-the-ground practices. Jesus: “For me, it is okay to change to another system without chemicals, but the soil is used to chemicals. The soil will take many years to get used to producing without chemicals. A new ecosystem must develop because there is not one now” (participant observation, 5 April 2024). I want to show that the changing tasks are probably not that difficult for farmers, but the time it will take and the associated costs. For small-scale farmers, it is a time in which they cannot produce identical amounts, an economic risk. A risk small-scale farmers do not want to take. Lastly, small-scale farmers in the *Valle* mainly farm on rented lands of the municipality. The temporal contracts are between two and four years (Maria, translated interview, 3 April 2024), and changing farming style with the risk of no renewal costs many investments of small-scale farmers.

Previous research, mainly in the discipline of agriculture, such as Francis et al. (2008, 101-102) and Hinrichs (2014, 144), shows the importance of a change towards at least organic farming. In the eye of climate change, biological farms will be more resistant to pests, extreme rainfall, and warmth. The few abilities of small-scale farmers to adapt towards more sustainable agricultural practices make the climate crisis a social crisis. Their dependency on weather, compounded by poverty, lack of resources, and insecure land tenure, makes it challenging to implement the necessary changes. The transition to agroecological farming is not just about changing agricultural practices but requires addressing the socio-economic context in which small-scale farmers in the *Valle* operate. The socio-economic context of small-scale farmers did not allow them to take risks independently. It limits the ability to change and increases the problems if farmers continue farming as they do. This indirectly increases inequalities.

Conclusion

In the previous sections, I focused on the changing climate in the *Valle* and how this impacts small-scale farmers. I also argued that the climate crisis is a chronic crisis in which it is difficult to make correct weather predictions. The unreliable weather makes farming difficult. Together with the industrialization of agriculture, farmers suffer more from drought and soil depletion. I argued that the ongoing process makes the climate crisis a chronic crisis in which it is difficult for small-scale farmers to predict the weather and how to adjust their schedules. In addition, the climate crisis is related to other crises, such as poverty, which many of my interlocutors had to deal with. The responses small-scale farmers have to climate change are

limited due to this. This became clear in the last section about the wish of agroecological farming of the ministry.

Chapter 3 - Do you smell health risks?

On the last day of my fieldwork, I woke up with my throat hurting, I had to cough more, and I had a stuffy nose filled with dust. This morning, I even had a nosebleed. I also felt pain in my body. To harvest onions, we had to do long bend-down standings, so my upper legs and lower back started to hurt. It felt like I had become one of the farmers because I observed they all had the same health issues as I experienced.

A friend of mine brought me to the farm of Jesus' brother, Ignacio. After chatting, Jesus started preparing chemicals to spray on the agricultural land. He opened the bottle with chemicals, searched for a piece of wood to mix the substance, and threw the substance in a sprayer. Jesus did all of this while talking and laughing with his colleagues (a part of his family as well). I noticed that he did not use any protection. His hands, arms, and face were all uncovered. Thereby, he was standing close to his colleagues and me. The smell of the chemicals passed by us. It was a penetrating smell, a smell I had never experienced before. It was a sour smell, but at the same time, it smelled like rotting vegetables. I had the idea I could get a spontaneous nosebleed. I decided to take some distance, but I was the only one. His colleagues did not move, and they continued eating and working. Jesus took the sprayer in his hand and started to walk, or better said, hopping around. Jesus hopped from the right to the left, from forward to backward. In my view, it seemed like Jesus did not have a clear route or structured way to spray the chemicals around. Even though I took some distance, I could still sniff the intense smell of the chemicals the same way as when I stood closer. The wind could cause this. The wind, which provided a lot of refreshment because of the extreme heat, also blew the chemicals around in the air, mainly in the direction of Jesus' colleagues and me. They laughed when I asked my interlocutors what they thought of the smell. They answered: "Which smell do you mean Kike? The onions?" (Jesus, translated quote, 20 April 2024).

As I observed, my interlocutors seemed lighthearted about how the chemical pollution they use in agriculture causes health risks. The above situation, which is objective rather than subjective, shows the lightheartedness of Jesus not wearing protection when he uses chemicals. In contrast, the chemical bottles have images of a mouth mask, gloves, and a skull. In addition, Jesus's colleagues did not move, so they were also close to the chemical

expansion. Because the chemicals were flying around, the colleagues' food could also get contaminated. Through this, the colleagues could quickly ingest a lot of chemicals. Lastly, the laughing of the colleagues and the joke Jesus made gave observational, not the impression that they cared about the health impacts of chemicals because why would that be funny? Taking these three examples together, it seemed like I was the only one who was concerned with the health risks of chemical use.

I decided to discuss my observations (as described above) with my interlocutors. I asked why the farmers did not step away when Jesus was preparing chemicals and why they made jokes about serious topics. Ignacio answered that he did not step away because it would not make any difference after all those (35) years. He was still worried about the adverse health effects in the future but also felt he could not do anything about it. “If I have to step away each time someone uses chemicals, I cannot enter the land anymore, hahaha” (Manuel, farmer, translated quote - participant observation 20 April 2024). With this, Manuel showed that the work would fall behind if he had to take a step away to put himself in more safety. In the end, this would decrease the production levels and, therefore, the income small-scale farmers generate. This observation aligns with Lou’s (2022) observation of ‘unnoticing.’ By this, Lou means that people are aware of the health risks they face from pollution, but these do not outweigh the benefits of, in her case, living in the (polluted) area. The health risks are accepted, and people choose, consciously or unconsciously, not to notice them anymore (2022, 583).

On the other hand, Jesus gave a reaction to the use of jokes: “Otherwise life is just boring. With making jokes about each other, and with each other, we have a lot of fun. We work here good and happy together” (Jesus, translated quote - participant observation, 20 April 2024). The reaction of Jesus suggested that jokes, or the use of humor, help to handle the everyday problems small-scale farmers face (Goldstein 2013, 6). Humor can be seen as a survival strategy ‘to the vicissitudes of life’ (Oring 1984). Douglas (1975) studied the relationship between comedy and social order. She argued that “comic serves to stand things on their head for a laugh and one laughs at what is believed to be dangerous in order to deal with the fear and to diminish feelings of peril and inferiority.” In other words, comedy can be seen as a mechanism for dealing with difficult or frightening situations by placing them in a ‘new,’ less threatening light. I take this further and show that it is not only a comic (with prepared jokes) that can cause the feeling of a more bearable situation but that these types of jokes can also happen spontaneously.

In the following sections, I demonstrate how the perception of risk can be seen as a socially constructed phenomenon. Afterward, I pay attention to how small-scale farmers in the *Valle* cope with short-term health risks by unnoticing them. In the third section, I demonstrate that farmers use humor to cope with long-term health risks. Finally, I conclude this chapter.

To me, this is not dangerous

Risk is related to knowledge and consent (Douglas and Wildavsky 1983, 5). It is a "cognitive frame that produces contexts which link an object of risk (a source of potential harm), an object at risk (a potential target of harm), and an evaluation (implicit or explicit) of human consequences" (Boholm 2003, 175). In other words, risk is a concept that connects a causer, a victim, and the judgment people give to this. An example I heard a couple of times from my interlocutors was based on people consciously setting fires in the forest close to their agricultural lands. The cause was, in this case, people who set fire. The victim is the forest, and my interlocutors' judgment was based on the risks for loss of flora, fauna, and biodiversity. These risks influence the healthiness of the environment in which they farm (Jesus, Reno, and Jose, participant observations, 20 and 21 March, and 5 April 2024). At the same time, several farmers, including Jesus and Jose, set fires on their own properties to burn the (vegetable)waste from the previous harvest. The difference in judgment Jesus and Jose make is based on the fact that their own fire is controlled and only impacts the soil where the fire is located, while the forest fire is uncontrolled, leading to more plants dying. By giving this example, I want to show how risk is a socially constructed concept. Risk perceptions shift from global risk calculations to personalized or culturalized stories in different communities. It is human to "understand and judge risks in terms of emic, locally defined, values and concerns (Stoffle et al. 1991, 612). In other words, how people understand and assess risks depends on their values and concerns, as they are experienced and defined by themselves. In addition, values and fears can differ between societies and will influence the calculations of risks. Each society will rank its risks in higher and lower dangers (Douglas and Wildavasky 1983, 8). Risk is a calculation of the danger people pose to situations (Jovanović 2016, 496-498; Zaloom 2004, 367). In addition, not every society faces the same risks, and risks may be valued differently in different societies (Boholm 2003, 175).

A clear distinction can be seen in the reaction towards using chemicals between me and my interlocutors. Working with my interlocutors on the land was my first exposure to

working with chemicals. This is in contrast to my interlocutors, who have been exposed to chemicals for many years already. Where I always distanced myself from Jesus when he prepared or sprayed the chemicals around, his colleagues stayed near him. The economic risks of work delay or not using chemicals weigh heavier than the personal health risks, as I show in the following examples. Ignacio said the following sentence while waving with a bottle with chemicals, “I know I can get cancer from working with this [chemicals]. But if I do not work with chemicals, I cannot pay for the medicines I already need or for food” (translated quote participant observation, 20 April 2024). Or: “Working with gloves is safer, but those make my work imprecise. As a result, more seeds and/or plants will be lost” (Jesus, translated quote participant observation, 12 April 2024). The risk perception of my interlocutors is in line with the findings of Jovanović (2016, 498-499). She shows that people would rather accept the health risks of pollution than move away from their comfortable living areas and social lives.

Another example of subjective risk calculation (Boholm 2003, 161) was when my interlocutors argued that their bodies are used to chemicals. Quitting the use does not only have economic risks but, according to my interlocutors, does not affect their health positively either. The same goes for changing one's work style (participant observation, 20 April 2024). Auyero and Swistun (2009) studied how living in a flammable village impacted the lives of inhabitants in Argentina. One of the findings was that inhabitants viewed pollution as something that existed both in the environment and within their bodies. This was also reflected in my interlocutors, who seemed to have accepted the additional health risks as part of their lives. The job - farming - with which they are also at health risk, also ensures an income. But more importantly, it is the job that the farmers love. ‘Farming is my passion’ is a phrase I heard multiple times from my interlocutors. My interlocutors were, therefore, reluctant to exchange their jobs for another job (Jesus and Ignacio, participant observation, 20 April 2024). People would rather take health risks for granted than have to give up their passion (Boholm 2003, 161).

Still, my interlocutors are aware of the health risks chemicals have. Examining how my interlocutors cope with the inherent health risks is crucial, as economic considerations influence their risk perception. My interlocutors like Ignacio and Jesus accept health risks due to the necessity of gaining an income despite being aware of the potential dangers of chemicals. They view the risk of losing their livelihood as more significant than health risks, highlighting how locally defined values and concerns shape their risk assessments.

Do I have a cough?

Now it is clear that reducing economic risk takes precedence over health risks, it is necessary to examine how farmers deal with the nevertheless essential health risks. As I observed during my time with the farmers, two coping strategies were discovered. The first is unnoticing (Lou 2022), and the second is the use of humor (Douglas 1975; Oring 1984) to deal with health risks. In this section, I focus on the short-term/chronic health risks (further referenced as short-term). Short-term health risks, which include cough, nosebleeds, headaches, and rashes, are not seen as very impactful by the farmers.

> "Aghammm, Aghammm, Aghammm" was the sound I suddenly heard next to me. The sound was Fransisco's cough. I asked if he needed some water or anything else. "No, thank you Kike. In a couple of minutes, I will have to cough again. It is normal when you prepare the soil. A lot of dust will be released". "Why do you not wear something over your nose and mouth?" was my question. "That is too hot, and dust will still come through, so it does not make any sense. Tonight it [the cough] is over" (Fransisco, participant observation, 13 March 2024).
>
> One day later, we saw each other again, and I heard "Aghammm, aghammm, aghammm" again while Fransisco was harvesting onions. I doubted to ask if he was sure that his cough was over, but I did not. It did not seem it was bothering him. A couple of minutes later, Fransisco looked at me and started to laugh while pointing his finger at his throat. Without saying anything, we both started to laugh, and no more words were needed. We did not need to say anything. Fransisco noticed his cough was not over. (Fransisco, participant observation, 14 March 2024).

On the 14th of March 2024, Fransisco noticed his cough. He came to me and said that if I had not said anything about his cough before, he would not have noticed it. This made his cough, which he had unnoticed, part of his everyday life. In addition, Fransisco feels that a nose and mouth covering would make no difference; they are not 100% guaranteed to reduce health risks, which is his reasoning. Because he is in the field every day, this does not eliminate the risks he feels. The nose and face mask are mainly in the way due to the heat. 'It is not that bad, Kike' (Jesus, participant observation, 17 April 2024) was an answer I repeatedly received when I asked my interlocutors about the short-term health risks I discovered they were having. With 'bad,' my interlocutors meant they did not feel affected by a nosebleed or a constant cough. The short-term health risks seemed like part of the normal status. Therefore, a recovery time was unnecessary. In addition, it looked like my interlocutors

convinced themselves that short-term health risks are not bad.

I discovered a difference between me and my interlocutors: I was trying to notice every bodily change I experienced since working on the farm, while my interlocutors only seemed to notice the physical challenges of short-term health risks when I had conversations with my interlocutors about these challenges. As an (aspiring) anthropologist, I learned that everything I notice, even the most minor details, can be essential data (Bernard 2011). Because my body began to have the same health issues as my interlocutors in a short time, I noticed how my own body changed in a short period. I could quickly 'notice' this because it was taking place inside me. On the other hand, my interlocutors were just living their lives in their natural habitat when I 'interrupted' for doing fieldwork (2011). The short-term health risks seemed accepted as part of everyday life: "I always have a cough, Kike" (Jesus, translated interview, 17 April 2024). My interlocutors made me aware that noticing every physical change would not be tangible in everyday life. How many dangers would then begin to strike? I started to understand why my interlocutors saw the short-term health risks as standard as part of the deal of being a farmer because they will not change or disappear.

In *'The Art of Unnoticing*' describes Lou (2022) the tactics of inhabitants of a village with a petrochemical plant. Lou's interlocutors continued their lives consciously or unconsciously, convincing themselves that they did not know of the toxic environment they were living in (Lou 2022, 590). By using unnoticing, people made their situation more bearable, but at the same time, they felt a sense of having control over their lives. An essential aspect of unnoticing is that people know what they choose to 'unnotice.' Like Jesus, his example in the previous paragraph is knowing he always has a cough. Some of my interlocutors were unaware of the short-term health risks of pesticides (participant observation, 8 March 2024). A possible explanation is that attending school was not yet familiar when my interlocutors were young.

To unnotice, my interlocutors looked at local emic perspectives to calculate the chance of health risks. When I was talking with my interlocutors about health implications, they mentioned family members or acquaintances who have grown old with health implications such as COPD (Chronic Obstructive Pulmonary Disease). Positive stories like the COPD made my interlocutors make their risk calculation based on 'slow observation' (Davies 2018, 1537), by which I mean basing stories on (elderly) people who grew old with specific health issues. By focusing on the positive stories of others, people can convince themselves that scientifically proven findings do not apply to them (Lou 2022, 590-591).

Laugh, it is a joke

‘Time to seed the onions, Kike!’ Jesus had already grabbed some seeds, leaving his hands coated in white. Jesus showed me the package of the seeds and told me that these were the best seeds, coming from my country [the Netherlands]. I looked at the package and saw that the seeds were covered by fungicide, which explained his white hands. Seeds without chemicals do not have a white powdery substance. On the back of the package, I found three images. The first was a picture of someone putting (protective) gloves on, the second a mouth mask, and the third a skull. I showed it to Jesus. He started laughing, shrugged his shoulders, and said something in the sense that he already had a chemical-filled body. If you die from using chemicals, he would have been dead already, was the reasoning of Jesus. With a smile, he continued scattering the seeds across the field. Afterward, he patted his hands, opened his water bottle, and drank from it (participant observation, 5 April 2024).

Jesus’ reaction to the fungicide warnings shows how humor can serve as an “escape-valve” (Goldstein 2013, 6) for dealing with discomfort. According to Douglas (1968, 364), a joke provides pleasure and relief by temporarily ‘a holiday’ of the control we have over our conscious thoughts. In the context of Jesus, he used humor to momentarily release the idea of the risk of potentially harmful pesticides, allowing him to cope with a situation he cannot change. In addition, humor can act as a ‘homeostatic mechanism,’ helping individuals express social tensions and strains while knowing that the status quo is not going to be changed (Mulkay 1988). Jesus his expression of a ‘chemical-filled body,’ reflects an acceptance of his reality. His humor does not challenge the underlying problematic issue of fungicide exposure but reinforces his normalized view of the situation. According to Mulkay (1988), it reveals contradictions, but it does not bring change. Jesus’ joke highlights, at the same time, his awareness of the danger of pesticides and his acceptance of it.

Farmers do fear long-term health risks such as cancer or lung diseases. Like Ignacio noticed: “I know I can get cancer from working with this [chemicals] (...) I am afraid of that disease. How am I going to pay for a treatment if I get it? (...) But hahaha, who says I will get it? I think Jesus will get it sooner” (translated quote participant observation, 20 April 2024). A double bind can be found in Ignacio's reasoning. First, Ignacio fears health risks and how these would influence his life. He thinks about the economic consequences and what kind of impact a disease would have on his body. Secondly, he uses a joke to illuminate our conversation. Humor makes the everyday life more bearable (Goldstein 2013, 6). The double

bind of emotions shows the complexity of emotions Ignacio must deal with daily. According to Oring (1984), who was inspired by Freud's theory of the self-critical humor of Jewish people, people do use humor to alleviate difficult situations. I extend this argument to the situation of small-scale farmers in the *Valle*. Small-scale farmers are obligated to continue industrialized farming, including the persistent use of chemicals. In addition, they navigate themselves through several crises. These partly ongoing crises outweigh reducing economic risks over health risks. Consequently, small-scale farmers are forced to accept the health risks associated with agricultural practices. Although small-scale farmers are aware of the long-term health risks, they find themselves trapped in their current situation. Humor provides, therefore, temporary relief and strengthens relations with people in the same situation (Goldstein 2013, 10). People find enlightenment and kinship in shared jokes. Having shared jokes makes people feel heard and creates a community (Davis 1995, 331).

Conclusion

In this chapter, I explored the perception of health risks among small-scale farmers, focusing on unnoticing (Lou 2022) and the use of humor (Douglas 1975; Oring 1984) as coping strategies. I demonstrated how risk can be seen as a socially constructed phenomenon due to the locally defined values and concerns. For short-term health risks, I discovered that small-scale farmers used to unnotice the thing they noticed. This coping strategy provided farmers with a sense of control over their lives despite the ongoing exposure to chemicals. The last section demonstrates how small-scale farmers in the *Valle* use humor as a survival strategy in dealing with long-term health risks. Humor helps farmers to release the stress of their work and strengthens the social bonds within their community.

General conclusion

This research aimed to demonstrate how small-scale farmers in the *Valle* (Guatemala) cope with short-term and long-term health risks. Based on the personal stories of my interlocutors, small-scale farmers, employees of governmental organizations, and a practical agricultural school, I was able to dive deeper into the lives of small-scale farmers in Guatemala. Small-scale farmers used coping strategies to manage the health risks they face from their agricultural work.

To understand why farmers need to cope with the health risks they are facing, I went back to the origins of today's agriculture. In the first chapter, I elaborated on the agricultural changes. From the origin, local culture plays an essential role in what farmers are growing on their agricultural land (Goldstein 2010, 131), and this was based on their consumption. This changed since the middle of the 20th century. The industrialization of agriculture has traveled the world and homogenized the way of farming worldwide (Philips 2006, 40). Farmers all over the world were starting to produce the same type of crops on monocultural lands, creating a competitive market (Lyon 2012, 286). In addition, the growth speeds had to increase. Together, this made farmers dependent on seed corporations and chemicals. Due to monoculture, biodiversity decreased, and the ecosystem became unbalanced (McKay, Alonso-Fradejas, and Ezquerro-Cañete et al. 2021, 4). The agro-industry not only became a significant CO2 emitter, accelerating climate change (IPCC 2022, 503) but also forced small-scale farmers into the given framework of the powerful TNOs, such as the WTO and FAO (Philips 2006, 40). This changed the culturally produced food into food production for others. In addition,

The climate crisis is driven primarily by industrialization in wealthy countries (Sayre, Stenner, and Argumedo 2017, 103)), causing problems with weather predictions for small-scale farmers who depend on the weather. The ongoing weather changes care for a future beyond our control. This makes the climate crisis both chronic (Vigh 2008, 8-10) and a place where constant expectations should be adjusted (Bryant 2016, 7). However, the climate crisis cannot be seen in isolation; it is connected to other crises or after-affects of crises, such as COVID-19. The accumulation of crises makes it difficult, resources-wise, for small-scale farmers to react to them. Together with the agricultural reforms, small-scale farmers face an increase in drought periods and crop growth uncertainty. In addition, farmers can not change

their current way of farming because “the soil is used to chemicals” (Jesus, participant observation, 5 April 2024), implying high economic risks and potential loss of livelihood.

Remain these challenges, small-scale farmers remain passionate about their jobs and lives in the *Valle*. Aligning with Jovanović (2016, 497-498) and Zaloom (2004, 383-384), risks do not only know opposing sides. People can make a living with a risk. For small-scale farmers, there is no other option but to farm with chemicals due to the agricultural changes and the increased plagues due to climate change. As a result, farmers had the choice of quitting their passion, which has also been handed down from family, or continuing farming and accepting the health risks. Still, it was a paradoxical finding that small-scale farmers are afraid of certain health risks, mainly in the long term, but did nothing to protect themselves. An explanation was, “My body is filled with chemicals,” suggesting that after many years of exposure to chemicals, protection would also not have been sufficient to reduce the risks. Protection, such as mouth masks and gloves, create even more heat, is what I heard multiple times. In addition, the use of gloves also limits production levels, which causes farmers to face economic difficulties in this time of economic instability (Orlove et al. 2007, 261).

It leaves farmers no other choice than to accept health risks and use coping strategies to continue their lives with pleasure. In this thesis, I found two main coping strategies. The first one is ‘unnoticing’—where people choose not to see something, in this case, certain health risks anymore (Lou 2022, 590-591). I take this concept from Lou onward to the situation of small-scale farmers. Small-scale farmers focused on emic perspectives (2022, 590-591). Due to positive ‘slow observation’ (Davies 2018, 1537) of related people in the *Valle*, farmers concluded that the short-term health risks would not be ‘so bad.’ “Other farmers are also turning old, so I think it is not that bad” (Jesus, participant observation, 17 April 2024). Knowing that others in the same sector had turned old gave farmers a comfortable and secure feeling. The stress that it would have taken to notice each health issue and question it would give the opposite feelings.

On the other hand, long-term risks that farmers were more afraid of led to another strategy. Instead of unnoticing, farmers made a lot of jokes about chemicals and (chemical)illnesses. The use of humor could be seen as a moment of release while knowing that the situation would not change. Humor makes the situation people are in more bearable (Goldstein 2013, 10). For small-scale farmers, it also worked as bonding. They all had the same type of jokes with which they not only fooled health risks but also each other Davis 1995, 331). According to small-scale farmers, making fun of life is the best way to survive (Jesus, Ignacio, Jose, and Manuel, participant observation, 20 April 2024).

In sum, people make tradeoffs regarding risk perception, and even in the face of fear, they continue to make a living. This paradox is evident as I observed farmers who, despite the health and environmental risks, remained cheerful and resilient. The agro-industry and climate challenges have limited their options, yet they accepted their circumstances with a sense of humor. As Jesus said during our last goodbye, "Keep laughing and chatting, Kike, that keeps life fun" (20 April 2024). With this research, I contribute to the understanding of the relationship between forced health risks and how people deal with them and to the anthropological knowledge of coping strategies.

Lastly, I want to focus on future research and its limitations. Future research can be done by focusing on the health implications for consumers, including the contaminated water, since this research was only focused on production. Another suggestion is to explore the needs of small-scale farmers to change their farms into more sustainable farms that are more resistant to climate change. This research also has some limitations. The first one is the language barrier I and my interlocutors had since I did not speak Spanish fluently. This could mean that I have misinterpreted some sentences. Secondly, due to the short time to write my thesis, I was not able to thoroughly analyze every fieldwork day. I made notes of moments that seemed necessary for this research. However, it could mean that some exciting data is missing.

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