

“Before there were no diseases”
Perceiving the Coffee Rust Epidemic in the Intersection
of Knowledge Systems



Isabelle Hugøy

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Pura vida

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List of Abbreviations

CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (The Tropical Agricultural Research and Higher Education Center)
CICAFFE	Centro de Investigaciones en Café (Research Center for Coffee)
FEDECOOP	Instituto de Fomento Cooperativo (Federation of Cooperatives of Coffee Producers)
ICAFFE	Instituto del Café de Costa Rica (The Coffee Institute of Costa Rica)
ICE	Instituto Costarricense de Electricidad (The Costa Rican Electricity Institute)
ICO	The International Coffee Organization
MAG	Ministerio de Agricultura y Ganadería (Ministry of Agriculture and Livestock)
PROMECAFE	Programa Cooperativo Regional para el Desarrollo Tecnológico y la Modernización de la Caficultura de Centroamérica, República Dominicana y Jamaica (Regional Cooperative Program for Technological Development and Modernizing of the Coffee Culture in Central America, the Dominican Republic and Jamaica)
SFE	Servicio Fitosanitario del Estado (State Phytosanitary Service)

Glossary

<i>Beneficios</i>	- Coffee processing factories
<i>Beneficiadores</i>	- Coffee processors
<i>Brava</i>	- Wild
<i>Broca</i>	- Coffee Berry Borer
<i>Brotes</i>	- Spots
<i>Calma</i>	- Calm
<i>Casona, La</i>	- House where ICAFE <i>charlas</i> are held
<i>Caturra</i>	- A coffee variety in the category of <i>Coffea Arabica</i>
<i>Chapea</i>	- A technique for cutting and gathering weed using a knife
<i>Charla</i>	- Informal talk
<i>Cogollo</i>	- The upper part of the coffee-plant
<i>Coleroga</i>	- A fungal disease
<i>Fanega</i>	- A measuring tool that equals 400 liters of coffee berries. Farmers get paid for each <i>fanega</i> they deliver to the <i>beneficio</i>
<i>Finca</i>	- Coffee plantation
<i>Herrumbre</i>	- Orange powder – the infectious part of <i>roya</i>
<i>Medio ambiente</i>	- Environment
<i>Obatá</i>	- A newly introduced coffee variety that is rust-resistant
<i>Ojo de gallo</i>	- The Rooster’s Eye (a fungal disease)
<i>Palea</i>	- A technique for cutting and gathering weed using a knife
<i>Peón</i>	- Non-skilled worker
<i>Roya</i>	- Coffee rust (<i>Hemileia Vastatrix</i>)
<i>Rumbre</i>	- Orange powder (from <i>roya</i>)
<i>Tamaño poco</i>	- A large amount (Costa Rican meaning of the phrase)
<i>Tico</i>	- Costa Rican
<i>Turrialbeño</i>	- A person from Turrialba
<i>Veneno</i>	- Poison. Farmers referred to both herbicides and fungicides as poison.

Introduction

On January 22, 2013, Costa Rica declared a state of emergency to battle the spread of a fungus manifesting itself on coffee plants¹ (Cressey, 2013). The fungus (*Hemileia vastatrix*) is called *roya* in Spanish (rust). It was first discovered in Sri Lanka (previously Ceylon) in 1869, where it was causing severe damages and yield losses. In Sri Lanka, this resulted in uprooting of coffee plants, and the plants were replaced with tea cultivars that better fit the humid climate (Clarence-Smith, 2003). However, from 1869 and onwards, the fungus continued spreading to Asia, Africa, and finally to Central America in the 1970's. Costa Rica's first encounter with coffee rust was in 1983. The presence of coffee rust in Central America created distress, especially because susceptible cultivars were planted throughout the region. Consequently, several coffee institutions of the regions' countries gathered themselves in the creation of PROMECAFE (Programa Cooperativo Regional para el Desarrollo Tecnológico y la Modernización de la Caficultura de Centroamérica, República Dominicana y Jamaica) in 1978.² This project's goal was to confront threats such as *roya*, through developing and improving "modern" technology for cultivating coffee in the Central-American region (Avelino and Rivas, 2013). By adopting methods that increased productivity, such as applying fungicides and planting rust-resistant coffee varieties, the region managed to coexist with the disease with the exception of a few epidemics on national level. However, the epidemic of 2012-2013 was probably the most severe the region had ever experienced (Avelino et al. 2015).

Research questions

This thesis is about how the rust-epidemic of 2012-2013 and its repercussions were experienced and conceptualised by small-scale coffee farmers in Turrialba, Costa Rica. The perceptions and experiences of agronomists too, have been an interest of mine, as they interacted with coffee producers in trying to combat *roya*. I will refer to them as agronomists and scientists

¹ Most literature on coffee refer to the coffee *tree*. I prefer the term coffee *plant* because it is a more suitable translation for the Spanish phrase "*la mata de café*", expressed by my informants.

² http://promecafe.org/site/index.php?option=com_content&view=article&id=19&Itemid=60

interchangeably. Through interviews and observations of them communicating with coffee farmers, I have attempted to grasp scientific discourses related to coffee rust. In the following, I will refer to small-scale coffee farmers as farmers, producers and smallholders interchangeably. Smallholders, with less than 5 hectares of cultivated coffee, constitute 92% of the country's coffee producers.³ Altogether, they represent 44% of the area cultivated with coffee in Costa Rica. The epidemic affected about 64% of the country's coffee plantations, that is, more than 60.000 hectares of the total 94.000 hectares planted in the country. Subsequently, this led to economic losses of 14 million US dollars in 2012-2013 (ICO, 2013).

My farmer-informants estimated that they had lost between 30 to 80 % yield compared to what they had expected to produce during and after the epidemic. The damages and production losses caused by the disease has had direct socioeconomic impacts on thousands of coffee farmers in the country. Hence, coffee producers⁴ who are the ones receiving the least profit in the coffee industry, are forced to adapt themselves to the challenges presented by the disease. Attempts to distribute scientific knowledge about the disease and how to combat it has been the prime agenda of the country's coffee institute, namely ICAFE (Instituto del Café de Costa Rica). Agronomists working at ICAFE's regional offices throughout the country have had central roles in providing such knowledge for local coffee farmers. Therefore, I think it will be fruitful to analyse agronomists' knowledges and conceptions of coffee rust and compare them to the knowledges, experiences and perceptions of farmers.

Despite ICAFE's significant influence in coffee issues, I do not contend that coffee farmers receive or pursue information from agronomists at ICAFE alone. On the contrary, many also seek advice from agronomists working in institutes related to agriculture issues, such as MAG (Ministerio de Agricultura y Ganadería), CATIE (Centro Agronómico Tropical de Investigación y Enseñanza), or at coffee processing factories to which they deliver their coffee. However, I have chosen to focus on gatherings arranged by ICAFE for coffee producers in Turrialba as an intake to observe the distribution of scientific knowledge, the appropriation of this by farmers, and the social interaction between agronomists and farmers. Focusing on this interaction might facilitate an analysis of how various social actors are central in the *making* of *roya* as a social phenomenon. Now, what does it mean to understand the fungus as a social

³ <http://www.icafe.cr/nuestro-cafe/estructura-del-sector/>

⁴ Both small, medium and large coffee producers.

phenomenon? To me, this suggests not studying *roya* as an isolated entity. On the contrary, throughout the thesis, I will analyse the emergence of *roya* in relation to historical, economic, political and social dimensions. Moreover, I will explore the different agents, social relations, knowledge systems and various practices that are set into motion by the fungus. Based on this, I have formulated the following research questions:

- How did *roya* emerge as a social phenomenon after the 2012-2013 rust-epidemic? How was it given new meanings in the process?
- What are agronomists' and small-scale coffee farmers' perceptions of what is causing *roya*? How do farmers relate to agronomists' conveyance of scientific knowledge in combating the disease?
- How have various measures of controlling *roya* affected farmers' coffee management practices and the manner in which they approach coffee rust?
- How has *roya* evoked temporality in different ways? How might this be related to farmers' notions of time?

To discuss these questions, I will draw upon various theoretical frameworks and analytical terms. However, before presenting these, I find it necessary to provide a brief description of Turrialba.

Turrialba

Turrialba is the city of the canton by the same name, located in the Cartago province in Costa Rica. As one of the largest cantons in the country, it covers approximately 1.758 square kilometres and has 69.616 inhabitants (INEC, 2012). The canton consists of twelve districts, and due to practical reasons, I mainly focused on three of these, namely La Suiza, Tuis, and Santa Rosa. The topography of the region is quite diverse. Although most of the districts are located between 600 and 800 meters above sea level, the altitudes range from 390 to 1.475 meters above sea level in Santa Cruz where the Volcano of Turrialba is situated (Araya, 2003:88). The region has multiple microclimates, with temperatures and amount of rainfall varying according to altitude. Moreover, Turrialba has a tropical climate, meaning that

significant amount of rainfall is distributed throughout the year. There are two periods with heavy rainfall, namely in June-July and November-December (Araya, 2003:88). However, as I will explain in chapter two and three, climate change further complicates rust issues due to alterations in what, according to farmers, once were more defined seasons. For now, it might be interesting to explore the history of the crop that Costa Rica thrived upon to develop their nation.

El grano de oro

Coffee has occupied a major role in the history of several Central American countries since it first was introduced in the region in the mid-18th century. Being the first country in Central America to establish the coffee industry at the beginning of the 19th century,⁵ the crop would link Costa Rica to world markets, develop social and production relations that would create a relatively small elite class of agrarian-capitalists compared to a larger class of smallholder farmers (Paige, 1997).⁶ I refer to the former as elite because of their dominance and control of not only the coffee industry, but also political, social, and economic positions and sectors within the Costa Rican society.

El grano de oro (the golden bean) became the axis for accumulating capital during the 19th and a large part of the 20th century. After independence in 1821, laws were enacted that offered land titles to settlers who occupied national lands to plant coffee among other crops (Roseberry et al., 1995:16). Thus, family-operated smallholdings expanded from the Central Mesa to peripheral regions, such as the Turrialba Valley, where coffee farming became more frequent at the end of the 19th century. The coup d'état in 1870, marked the initiation of a continuous political rule of the coffee elite which would dominate this arena until their decline after the Civil War of 1948 (Paige, 1997).

The elite's interest in expanding the coffee industry was accompanied by structural changes that facilitated the exportation of coffee to their prime market at the time, namely Europe. The construction of the railroad route from the Central Mesa to the Caribbean port of Limón -

⁵ <http://www.icafe.cr/nuestro-cafe/historia/>

⁶ I do not claim that there did not exist some sort of class formation prior to this. In the colonial period there existed exploitative tax, tribute and labour relations (Paige, 1997:41).

completed in 1890 – made transportation more efficient to their foreign markets. Additionally, it connected and integrated Turrialba to the national market and contributed to its agricultural development by introducing and expanding commercial cultivars like banana, sugar cane and coffee (Araya, 2003:64-76). Due to various factors, banana cultivation rapidly declined and was by large replaced by coffee, sugar cane and kettle, which to this day are recognized as the traditional agricultural activities in Turrialba.

Turrialba developed a wide coffee market during the mid-20th century which was reflected in the twelve *beneficios* (coffee processing factories) located in the region in that period (Araya, 2003:121). However, on a national level, the coffee export economy had created strained class relations between a large class of smallholders who sold their coffee to a privileged elite who in turn processed coffee, acted as exporters, and functioned as principal creditors to the former (Roseberry et al., 1995:22). This control facilitated exploitation by setting high interest rates for loans while simultaneously paying farmers inferior prices than the market price. Thus, their power over the coffee sector had created increased tension that became critical with the severe drop of prices in the international market during the 1930s Great Depression.

The effects of international conditions of low coffee prices strengthened antagonistic class relations. The conflict revolved around smallholders' demand for a legislation that would regulate the price of coffee purchased by the *beneficiadores* (processors). The dispute was resolved quite peacefully, by the state's founding of the Defence of Coffee in 1933 (today ICAFE). This semi-autonomous organ sought to mediate in conflicts between producers and *beneficiadores*, while regulating relations between the two parties through fixing prices and regulating payments (Roseberry et al., 1995:23). However, the coffee elite remained in control of this organ until the successful political revolution of José Figueres Ferrer and his Liberation Army's opened the path to democracy in 1948, by excluding the coffee elite from the direct political power they had exercised since 1870 (Paige, 1997:323).

The beginning of a new era

Ferrer was democratically elected as president in 1952. Following this was a thirty-year period of Liberación rule, in which political, social and economic changes ensued. In this political agenda, projects of improving infrastructure, agriculture and industrialization intended to

“modernize” the coffee industry, increase yields, and thus national economic growth (Paige, 1997). However, tensions still existed between *beneficiadores* and coffee farmers as the traditional structure of the industry and power of the former remained intact until approximately the 1960s. Consequently, the state subsidized FEDECOOP (Federation of Cooperatives of Coffee Producers) was founded in 1962 to export the coffee of its coffee cooperative members (Araya, 2003:150). Furthermore, state control over the distribution of credit - before in the hands of the coffee elite - through the nationalization of banks enabled small and medium producers to expand their coffee production. Hence, the expansion of cooperatives and the democratization of credit meant that farmers could reduce their economic and commercial dependence of *beneficiadores*. Furthermore, farmers’ complaints that the Defence of Coffee defended the interests of *beneficiadores*, ultimately led to the nationalization of the coffee institute. Subsequently, due to Liberación policies that strengthened the agro-industry, the total national coffee production expanded more than a sixfold, and yields more than tripled between 1950 and 1980 (Paige, 1997:258).

Prioritizing agro-export meant that the country was increasingly vulnerable to fluctuations in world markets as they depended on importing raw materials (Araya, 2003). Despite agricultural diversification⁷, expansion of the agro-industry and profits from coffee, Costa Rica’s habit of reliance on foreign financing for national development led to an economic collapse in the 1980s. Prior to this, in the late 1970s, international oil prices increased whereas prices of traditional export crops - like coffee, sugar and banana - crashed. Hence, wages dropped and agro-production and exportation decreased. In Turrialba, the socio-economic situation altered drastically from 1985 onwards as consequence of an exogenous process of globalization. Endogenous political processes in turn, marked a direction towards neo-liberalism by promoting non-traditional production, privatized services and a free market. These processes led to an increased investment of foreign capital in national agricultural and industrial sectors. This, together with the rise of cooperatives, diversion of credit, and growing numbers of manufacturing plants, and labour-shortage (to name some), led to intense pressure on smaller marginal firms processing coffee. Additionally, low international coffee prices led to reduced use of agricultural inputs, decreased harvest, and closure of various *beneficios* in the Turrialba region.

⁷ Among such projects were cultivation of macadamia, wood, forestry, and apiculture (beekeeping). However, these proved unsuccessful in Turrialba (Araya, 2003:247-252).

The economic crisis meant that exporters of these crops did not have sufficient means to pay for the harvests they had received, leaving coffee farmers in an economic disaster. The situation exacerbated upon the failure to reach a new agreement with the ICO (International Coffee Organization) in 1989, which subsequently led to a collapse in coffee prices from 140 US dollars per *fanega*⁸ to 70 US dollars before recuperating to only 80 US dollars (Paige, 1997:261). Consequently, when international prices continued remaining low between 1990 and 2000, *turrialbeño*⁹ coffee farmers found themselves in an extremely vulnerable situation. Intents¹⁰ have been done to implement alternative income to face such crises on local levels. However to this day, no viable alternatives to coffee and sugar cane have emerged, which make *turrialbeño* coffee farmers particularly vulnerable upon encountering epidemics such as that of 2012-2013.

Literature review

Literature about coffee rust tends to explore biological themes (Vandermeer et al., 2009; Avelino and Rivas, 2013; Avelino et al., 2015). However, with the recent epidemic, I believe that social scientists are taking an increased interest in how coffee rust is affecting farmers and other actors in the industry. For instance, I found that anthropologist Sarah Lyon is currently writing an article based on fieldwork in Mexico, where she explored the coffee supply chain resiliency and the impacts of coffee leaf rust.¹¹ Furthermore, I came in touch with a Finnish M.A. student in Development Studies, Janica Anderzén, who conducted fieldwork in Mexico from March to May in 2014. I found that we initially had similar research interests, namely farmers' perceptions of coffee rust and their adaption responses to the rust-epidemic. However, upon writing the thesis, my empirical findings suggested that I should move away from adaptations, to the benefit of knowledge systems. Fortunately, I got the opportunity to read her thesis before finishing mine. I found some similarities regarding farmers' comprehensions of what was causing coffee rust, which I will mention briefly in chapter three. Moreover, she dedicated significant attention to livelihood responses compared to farmers' perceptions.

⁸ A *fanega* is equal to 400 liters of ripe coffee berries. Coffee producers are paid for each *fanega*.

⁹ A *turrialbeño* is a person from Turrialba.

¹⁰ For instance, projects such as "selling oxygen" to conserve forest zones, cultivation of yucca, bananas, raising chickens, pigs, and tilapia for familial consume (Araya, 2003:254).

¹¹ <https://anthropology.as.uky.edu/users/smlyon3>

Hence, although we initially had similar research questions, our studies are both unique by focusing of different themes.

None of the mentioned studies have analysed coffee rust within the context of different knowledge systems, or in the intersection between agronomists and coffee producers. The aim of my thesis is to do so by arguing for a more symmetrical study of knowledges. I therefore believe that my study is a significant contribution to anthropological studies of coffee rust. Due to the few social studies that have been and currently is being conducted on coffee rust, I think it might be just as fruitful to consider how other types of “diseases” have been approached. In chapter three, I will adopt Mol’s (2002) approach of *doing* of disease to emphasize central points. For now, I will present analytical terms and theoretical framework I will adopt throughout the thesis.

Analytical terms and theoretical framework

This thesis aims to contribute to a more symmetrical study of knowledges. Knudsen (2009) argues that there is a lack of symmetry in studies of knowledge systems, by contending that most of these have approached knowledge as either “indigenous knowledge” (IK)/“traditional ecological knowledge” (TEK) or as “studies of technology and science” (STS). He criticizes such approaches for being too simplistic, as they treat IK/TEK as the counterpart to scientific knowledge (Knudsen, 2009:6). Moreover, they enforce dichotomies between the West and the rest, and “Us” and “Them”. Building on Knudsen’s argument, chapter four aims to exemplify that farmers are continuously shifting between knowledge systems.

I approach the knowledges of farmers and agronomists by discussing ways of perceiving the world. Ingold argues that *local* and *globe* perspectives of the environment are not hierarchical, but they embrace different means of apprehension (Ingold, 1993a:210-216). The former is based on being-in-the-world, practical and lived experience, where a hierarchy of *spheres*¹² embraces man. The latter is based on a distant observation of the world that is detached from life (Ingold, 1993a:216). In short, this distinction may be one of views of the world from within (*being-in*), versus a worldview from the outside (*seeing as* - the world perceived as a globe). Moreover, this might be a differentiation between perceiving something as a subject and

¹² Spheres are layers of surfaces that overlap each other and the world.

perceiving something as an object. However, using solely these analytical concepts might be criticised for approaching the issue in a dichotomous manner, due to their contrasting nature. I will return to how I will solve this, for now, it might be interesting to connect ways of perceiving to conceptions of the landscape.

Perceiving the landscape

In his discussion of people's engagement with land and ecology, Ingold (1992) offers a theory of perception that illustrates how people acquire direct knowledge of their environments through engaging in practical activities within it. This theory of perception is closely connected to the way persons perceive the temporality of the landscape. Through engaging with the landscape, people participate in an act of remembrance of the past wherein generations of their ancestors have engaged in activities, which in turn have taken part in the formation of the landscape (Ingold, 1993b:152). His "dwelling" perspective considers landscape as "[...] an enduring record of – and testimony to – the lives and works of past generations who have dwelt within it, and in doing so, have left there something of themselves." (Ingold, 1993b:152).

From this perspective, he rejects Western tendencies to prioritize form over process, and seeks to surpass this bias by introducing the concept "taskscape" to explain how landscape does not exist a priori, but rather is an embodied¹³ form of the former. Taskscape is a vast array of interlinked tasks, defined as "[...] any practical operation, carried out by a skilled agent in an environment, as a part of his or her normal business of life." (Ingold, 1993b:158). By introducing this analytical concept, Ingold seeks to understand the emerging forms of landscape. As essential acts of dwelling, the taskscape is continuous and unending, meaning that landscape too is always under process of construction, it is never complete. In this sense, the temporality of the taskscape is essentially social.

Ingold argues for the temporality of the landscape, by contending that temporality inheres in the process of dwelling, or in the process of tasks. For him, temporality is not chronology nor history. Rather, he understands temporality and historicity as merging in the experiences of those whose activities are performed in social life (Ingold, 1993b:157). In other words, Ingold

¹³ Ingold understands embodiment as a movement of *incorporation*, in which forms are generated, rather than ascribing form onto material.

argues that taskscape gathers the past and future into itself, thus, implying that past, present, future are not isolated entities, but must be understood in relation to how they are continuously incorporated into the moment. Similarly, the temporality of the landscape is not segmented; rather it is interrelated, as we might “[...] move from one present to another without having to break through any chronological barrier that might be supposed to separate each present from the next in line.” (Ingold, 1993b:159). Thus, the temporality of the taskscape is in turn the temporality of the landscape in the embodied form of the former.

Ways of *seeing*

In the following, I will introduce several ways of *seeing*. The concepts might be somewhat confusing, but I will do my best to show their resemblances and dissimilarities. In the succeeding chapters, these will be very useful in highlighting my arguments in different subjects, which is why I have chosen not to exclude any of them. Upon using these concepts, I will try to be as clear as possible with respect to their distinctive usages and the scholars who introduced them. The first aspect of vision I will introduce, is one that I believe might solve the issue I slightly touched above: the differentiation between perceiving something as a subject and perceiving something as an object. Indeed, Ingold (1993a) claims that the two manners of perceiving do not exclude one another, and that they both have the potential of the other within them. Although he tries to moderate their differences, I believe his distinction is problematic due to its artificial character. In my opinion, it might reproduce the dichotomies that he tries to exceed. To overcome this problem, I find Okely’s (2001) notions of vision extremely useful. Okely distinguishes between *seeing* and *looking*. *Seeing* is a way of understanding through an embodied experience that engages all the senses with the body as a memory (Okely, 2001:103-104). *Looking* on the other hand, is detached, distant commanding overview and surveillance. By applying her concepts, chapter four aims to exceed presupposing notions that contrast the knowledges of farmers and agronomists (or scientists) by treating them as isolated entities. This distinction will be useful in discussing how perspectives of the world (Ingold’s *being-in vs seeing as*) cannot solely be ascribed to either farmers or agronomists.

As one of her central points, Okely suggests that the omniscient gaze (to *look*) may not necessarily be one of control and chosen distance. Rather, to *look* at a landscape might also be to receive it, to be open to that which it offers (Okely, 2001:111). This point is highlighted by

her discussion of how rural aged farmers who were relocated from their rural locations to urban homes perceive the landscape where they once spent substantial time working. By *looking* at the views of the distant Normandy landscape through the glass in their urban homes, memories of the past in which they worked these were evoked. Although their bodies were physically detached from that landscape, their perspective was not grounded in detachment, as their body functioned as a memory wherein movements in that landscape were familiar to them. In other words, by *looking* at the distant landscape in which they once resided, they could *see* their past, which was spent engaging within it.

Okely's (2001) notion of *seeing* carries resemblances to Ingold's (1993a) *local* perspective of *being-in*. Through dwelling within the world, people perceive it from within the many layers of spheres and out (Ingold, 1993a). These spheres cannot be seen, but may be heard, he contends, thus suggesting that both body and senses engage in conceiving the environment. Similarly, Okely suggest that *seeing* is a manner of understanding that engages the entire body and its senses. On the other hand, she also suggest that you might *look* to *see*, that is, you do not have to be inside the immediate environment to see it (i.e. you may look at it from distance). This is because the memories of having "dwelt" within it (to use Ingold's term), have been embodied, which thus enables people to *see*. In this sense, she differs from Ingold by contending that one might somehow be "detached", but still be able to perceive from within. Furthermore, Okely's notion of *looking* is dissimilar to Ingold's *globe* perspective. For her, *looking* is reserved to a synoptic gaze of control (although she suggests it might not necessarily be limited to control), whereas Ingold implicitly suggests such control and surveillance when explaining the *globe* perspective as perceived from without, separated from life. In fact, Okely's usage of *looking* might carry similarities to Scott's usage of vision.

Seeing like – a synoptic view

Scott (1998) also uses a concept of vision, namely *seeing like*, which carries similarities to Okely's (2001) notion of *looking*. Their resemblances lie in the synoptic, controlling view of surveillance. Unlike Scott, Okely takes this "gaze" a step further, thus arguably approaching vision in a more dynamic manner compared to that of Scott who limits it to that of control. As mentioned, Okely suggests that the gaze may not necessarily be one of control and chosen distance. Conversely, to *look* at a landscape might also be to receive it (to *see* in Okely's

terminology), to be open to that which it offers. Scott uses *seeing like* when discussing a state-initiated large-scale social engineering in the ujamaa village campaign in Tanzania from 1973 to 1976. This campaign was an attempt to permanently settle millions of the country's rural inhabitants in villages, which were planned to a large degree by officials of the government (Scott, 1998: 223). The reasoning behind this resettlement was to deliver development and welfare services such as schools, clinics and clean water to the population, simultaneously as gathering scattered farmers to educate them about techniques of "modern" agriculture, as a part of the larger scheme of the high-modernist ideology of that time.

It was also a manner to achieve surveillance and control through attaining a synoptic view of its subjects, through *seeing like* a state. A large number of the rural population practiced pastoralism or subsistence farming, and mobile populations such as the former is often regarded as problematic to the state according to Scott, due to the challenges they pose for its surveillance of these groups. Indeed, the state was partially blind because it lacked a "map" of its people, their wealth, landholding and yields, trading activities and their location (Scott, 1998:2). In short, through ordering its subjects in permanent villages, the state would expand its vision by supervising their activities while simultaneously promoting forms of agriculture intended to increase yields and provide a larger marketable surplus, in particular for export. In chapter four, I will argue that the donation of fungicides not only was an attempt to control coffee rust, but it was also one of several measures in a greater agenda of "modernizing" smallholders' management practices. Now, what does "modernity" entail?

Modernity

Latour (1993) argues that our quest for modernity rests on an attempt to distinguish between natural and social worlds, i.e. a nature-culture dualism of what he labels the "modern constitution". Essential to the modern constitution is a dual process of "purification" and "hybridization" (or "work of translation"). He contends that "modern" thinkers praise their ability to categorize natural and social phenomena into domains of "humans" (subject) and "non-humans" (object). He conceptualizes this as a process of purification. From the so-called modern worlds' perspective then, those who are "unable" to do this work of purification are labelled as "premoderns". In practice though, the "modern" world increasingly engage in the work of translation; that is, by creating hybrids (i.e. mixtures) of the phenomena they constantly

seek to keep separate. He exemplifies this by addressing an increased concern with issues such as global warming, in which separated disciplines such as science and politics are intertwined in the same discussion. Consequently, natural and social phenomena are interwoven as they are in “premodern” *thinking*. Therefore, Latour argues, we have never been modern. Despite that hybrids are continuously created in practice, he contends that the nature-culture dichotomy has maintained “Great Divide” distinctions between the West (as “modern”) and the rest (all other cultures, as “premodern”) and/or, between science and the common people (Latour 1993 in Knudsen, 2009:11). In seeking to transcend such Euro-American dichotomies, Latour argues for generalized symmetry. That is, he is interested in how realities come in to being by investigating a horizontal network in which statements, objects, “facts”, devices, institutions and agents find themselves at the same level. He argues that descriptions should start with the phenomenon, that is, how a phenomenon comes into being. I draw on Latour’s approach in chapter two and three, by exploring how *roya* became a social phenomenon. As part of this process, scientific discourses were integral, which is why the notion needs a suitable definition.

Discourse

Foucault defines discourse as “[...] practices that systematically form the objects of which they speak” (Foucault, 1972:49). Discourse depends on more than the act of speech. Discourse consist of numerous oral and textual statements. Such statements however, are not only representations of things, society or subjects, but they also connect networks of agents, actions, tools and institutions together (Schaanning, 1997:207). These statements produce the foundation of what is, and what is not, possible to express, because they have already attained a certain degree of truth. Upon expressing a statement, it enters a network of pre-existing statements, which are set in motion together with several practices, tools and institutions (Schaanning, 1997). Together, these constitute the “conditions of possibility”. Thus, discourse must be seen not as isolated entities, but in relation to, and as embedded within practices, tools and institutions. As such, discourse has materiality.

Foucault focuses on history in arguing that the present conditions of possibility were established at the end of the eighteenth century. Conversely, Latour is interested in how sets of inscription devices (see below) provide limits to scientific knowledge and reality (Law, 2004:35). Although Latour has not constructed a theory of discourse, there are several similarities between his and

Foucault's approaches. Law (2004) introduces the concept "hinterland" as comparison to Foucault's "condition of possibility". According to Law, statements that are considered as true, together with inscription devices (which enable a statement) constitute the hinterland. An inscription device is "any item of apparatus or particular configuration of such items, which can transform a material substance into a figure, or diagram which is directly usable by one of the members of the office space" (Latour and Woolgar, 1986:51). In the process of producing scientific knowledge and "facts", a network of institutions, practices, statements from scientific authorities, and inscription devices among other things, are drawn upon to provide a statement with "weight" (credibility) and persuasive power in the fight to "get" right (Schaanning, 1997:211). Both Foucault and Latour are concerned with the conveyance of discourse in a manner that present them as convincing, and the status of those who convey it is central in this task.

For Latour as for Foucault then, a discourse is not a representation that is detached from nature and society. Rather, it is part of a larger network of statements that are considered as true (or "facts") – as well as objects, institutions and practices. Moreover, Latour shows how the social world cannot exist detached from the scientific world, because the latter is the finished result of numerous activities that engage networks of social relations, inscription devices and statements. It only appears as if the social and scientific realms are distinct, he claims, because the social relations and inscription devices that are involved in producing "facts" are hidden once it, that is, a fact is established (Latour and Woolgar, 1986:23). This might explain the general belief in the "hard" facts of science, and ideas that "natural" and social phenomena should undergo work of "purification" by treating them as two distinct disciplines in the so-called modern society. Having presented analytical and theoretical framework and concepts, I will now proceed to the methodological approach that I adopted during fieldwork.

Methodological approach

Locating informants

I spent the first week in the capital, San José, to meet with agronomist Miguel Barquero Miranda at CICAPE¹⁴ (Centro de Investigaciones en Café). After talking with him, I decided to conduct

¹⁴ A research centre for coffee, affiliated with ICAFE.

my fieldwork in Turrialba due to the area's high incidences of coffee rust. In San José, I was fortunate to acquaint someone who put me in contact with a *tico* family living in Turrialba. I lived with this family throughout the fieldwork due to practical reasons of transport. Prior to my arrival in Costa Rica, I had planned to find coffee cooperatives as a starting point to create a network of informants. However, the absence of such cooperatives in the area made the initial phase of finding informants a very slow and challenging process. Smallholders lived somewhat dispersed in villages or neighbourhoods. Some lived next to their plantations, whereas others did not. Common for the *fincas* (coffee plantations), was their location in higher altitudes, which made me depend upon transport to reach the sites.

Shortly after my arrival in Turrialba, I accompanied an uncle of my *tico* family, who introduced me to some of his acquaintances in the coffee industry. I spent a significant time locating potential informants in this manner during the first weeks. Having selected some of these as my key informants, I then relied mainly on the snowballing method to expand my network of informants. Fortunately, I soon got the opportunity to meet with plant pathologist Jacques Avelino and a PhD-student, Rolando Cerda at CATIE, who was investigating yield losses caused by coffee rust. They invited me to join Rolando on visits to *fincas*. During the visits, I was introduced to several farmers. Of these, I returned to four on more than one occasion for interviews and conversations. In the selection of my key informants, I chose five farmers in different age groups with plantations located in various altitudes. Age was important to grasp potential generational differences in management techniques, knowledges of coffee production, history and related issues that I will return to on several occasions. Later, I will explain why altitude too was an important aspect.

Despite the lack of a uniting organ for farmers, I attended *charlas* (informal talks) and activities arranged by ICAFE for coffee farmers, which seemed to represent an attempt to unite the producers of Turrialba. Although these gatherings did not occur as often as I would prefer, they gave me the opportunity to observe social interaction between agronomists of ICAFE and CATIE and coffee farmers. Attending these further allowed me to locate potential informants. Eventually, I had interviewed altogether 20 (both male and female) farmer-informants, excluding my five key informants. It was evident that coffee cultivation was male-dominated. Moreover, four of the 20 farmer-informants were in the process of leaving, or had recently left coffee cultivation due to *roya* and low coffee prices.

Method

The main research methodology applied throughout my fieldwork was participant observation, focusing particularly on daily practice in coffee fields. In the initial phase, I acquired a more observant approach. The reasons for doing this were mainly two. First, such an approach allowed me to learn about the environment in which I found myself, namely coffee plantations and activities associated with cultivating coffee. I would visit each of my five key informants once a week. During visits, I participated in daily management tasks, such as pruning coffee plants, shadow trees, fertilizing soils, removing weed, uprooting coffee plants, planting new coffee varieties and other agriculture related issues. By participating in these activities, I acquired extensive knowledge about cultivating coffee. Beginning with a relatively “clean slate” or *tabula rasa* in terms of cultivating coffee had its advantages and disadvantages. On the one hand, the possibility of not being taken seriously was present. Limited knowledge could be understood as ignorance, thus hindering informants to open themselves up and not bothering to talk. On the other hand, knowing too much would pose a risk of taking practices for granted.

This leads me to the second reason as to why I initially adopted a more observant approach. Following Briggs (1995), I felt this subsequently enabled me to ask sensible questions and adjusting interview techniques according to the persons with whom I spoke. On several occasions, I experienced farmers telling me that they felt I understood their situation, and that the questions I asked made sense to them. This is not to imply that *all* my questions were sensible. Especially in the beginning, I sometimes experienced that farmers misunderstood certain questions, which made it particularly important for me to continuously reflect upon the questions I asked, rephrase them and see which of them provided more insight. In fact, I believe such misunderstandings led to phrasing questions that were more sensible.

Upon having acquired basic knowledge of coffee production, I started conducting interviews with agronomists and farmers in addition to participant observation. Participant observation and interviews were complementary: sometimes I would learn about an issue in the former, which assisted me in phrasing sensible questions during interviews. Other times, it was vice versa. Altogether, I interviewed six agronomists and one plant pathologist. When interviewing them, I applied semi-structured and structured interviews (Bernard, 1994). This was mainly to ensure I got answers to issues in which I was interested. Most of the relevant persons were often busy,

and had other tasks to attend besides talking with me. I also voice-recorded the interviews, in case they would use scientific words I might not immediately understand.

Conversely, I applied informal and unstructured interviews with farmers, at times semi-structured (Bernard, 1994). Such interviews took place in informal settings, usually at their home over a cup of coffee or in their *fincas*. I chose not to voice-record these interviews, because I wanted farmers to be comfortable when voicing their opinions, without having to worry that their thoughts were stored for others to listen. My thoughts were somewhat confirmed when I got the opportunity to join a foreign non-Spanish speaking student on visits to farmers, who intended to interview the latter. Accompanying the student was a local interpreter. Before starting the interview, he asked, or rather told farmers that they would voice-record the interview if the person in question did not mind. Some seemed not to really mind, others however paused for a second with a rigid body posture, agreeing reluctantly it seemed. The student had several A4-pages filled with questions, following them somewhat systematically although the person answering them sometimes started talking about things going in another direction. Conversely, I relied on taking notes and using my memory to write field notes. It is therefore important to clarify that the majority of quotes by farmers in the following chapters are reconstructed and not direct citations. Evidently, this provides room for some error. However, I feel this was the best approach, as I wanted them to feel as relaxed and comfortable as possible when talking with me.

Personal positioning

Personal features and positioning have implications for information gained in the field (O'Reilly, 2012). As a young unmarried non-Costa Rican woman, I did not face any major challenges. However, at times, when starting interviews, I got the impression that some farmers thought it was rather entertaining that a young white foreign girl was going to question them about issues of which I seemingly had limited knowledge. Evidently, I expected such reactions. During several interviews, however, I noticed that many were surprised of my level of knowledge. It seemed as if my knowledge made them inclined to elaborate more than they might have initially planned. Furthermore, before my arrival, I assumed that people of higher social status (e.g. agronomists) would not take me seriously due to my personal positioning. I was wrong. They welcomed me warmly and offered help whenever I needed. This was the case

especially with Jacques Avelino and agronomist and social anthropologist Nicole Sibelet working at CATIE. My positioning as a master student and the relevance of my theme might explain such a curious interest in my research project.

Language

For the past years, I have been in various Latin-American countries on several occasions, where I have alternately studied, worked and lived for several months. This has not only improved my Spanish language skills, but it has also given me insights and knowledge about Latin American cultures and society. I believe this has been an enormous advantage, as I could communicate directly with my informants. On several occasions during the interviews when the previously mentioned foreign student was using an interpreter, I would observe misunderstandings and flawed translations. By speaking Spanish, I believe I gained acceptance and respect more easily. Furthermore, living with a *tico* family for an extensive period, I became prone to live and experience cultural meanings of words I initially took for granted. Among these was *tamaño poco*. Directly translated it means small amount/size, which I first thought was its significance. Upon my arrival in Turrialba, I inquired about the amount of coffee plantations in the area. The family told me that there was *tamaño poco*. Immediately, I went into stress-mode, thinking that I had chosen the wrong site for my fieldwork. Still, I observed several plantations, which left me confused. Soon, however, I had a good laugh with an informant as I learnt that through participant observation that the phrase actually signified “great amount”.

Chapter outline

Before chapter two, I will present my key informants. Chapter two discusses the emergence of *roya* as a social phenomenon within the context of the 2012-2013 rust-epidemic. It will explore the different agents, social relations, knowledge systems, and various practices that are set into motion by the fungus. Furthermore, it will exemplify how *roya* was given new meanings from “calm” to “wild”. Chapter three initially builds on this alteration in meanings to discuss how the emergence of *roya* as a social phenomenon not only was a top-down process, but also a bottom-up process. The chapter focuses on farmers’ perceptions and first-hand experiences with coffee rust. Furthermore, I draw parallels between their conceptions and their principal manner of acquiring knowledge, while comparing it to that of agronomists. I adopt Ingold’s (1993c)

concepts of technique and technology to show how farmers and agronomists *might* be associated with technique and technology respectively. Ingold defines the former as context-dependent, tacit, subjective and practical “knowledge how”, whereas technology is defined as context-independent, explicit, objective and discursive “knowledge that” (Ingold, 1993c:434-435). Simultaneously, however, I exemplify how farmers’ knowledges are not solely technique-based. In chapter four, I elaborate this argument. I illustrate how the technique/technology distinction is problematic as the *tico* farmer is increasingly relying on technological devices developed by science. Hence, I aim towards a more symmetrical study of knowledges, by arguing that farmers continuously shift between perspectives, knowledge systems and manners of relating to the coffee plant in their daily management practices. Chapter five explores how *roya* has evoked temporality in different manners, by creating imaginaries of the future as uncertain compared to what is perceived as a more secure past. Finally, the conclusion will summarize the most central points and themes in the thesis.

Introducing key informants

Alejandro

52-year-old Alejandro is married and has three children. One is a pre-school teacher, another works in constructions, and the latter works for the Costa Rican Electricity Institute (ICE). Alejandro learnt how to produce coffee from his father. However, he worked with carpentry for some years before settling down with cultivating coffee again as he preferred that type of labour. Now, he works as a driver next to this activity, due to the low profitability that his plantation of two hectares provide.

Andrés and Martín

84-year-old Andrés has cultivated coffee and some sugar cane his entire life. He has a coffee plantation of three hectares, and rents another plot with sugar cane to a neighbour. Andrés is married and has six children. Everyone but his youngest child, Martín (age 24), works in non-agricultural labours such as retail or grocery stores, in banks, or as drivers. In the initial phase of my fieldwork, Martín assisted his father only a couple of times a week in his coffee plantation. However, as Andrés got ill, Martín quit his job as a taxi driver to fill in for his father. Hence, I worked more alongside Martín than Andrés, whom I visited on several occasions.

Daniel

68-year-old Daniel has a wife and four children. Two of them work outside Turrialba; one in construction projects and the other as a truck driver. Another two live in Turrialba; one is a homemaker and the other is a pre-school teacher. Daniel owns a coffee plantation of two hectares, which he inherited from his father, along with the practical knowledges of cultivating coffee.

Luis

76-year-old Luis has four children. One works at a restaurant, another is a police officer, another is a homemaker, and the fourth studies to be an agronomists, while helping his father in heavier types of works on the plantation. Luis has always cultivated coffee, and owns a plantation of two hectares that he inherited from his father.

Sergio

56-year-old Sergio is married to 53-year-old Juliana who often assist him in coffee-related tasks. Sergio worked with his father in his plantation as a youngster. However, he contends that much of his knowledge derives from studying agronomy despite not finishing the career due to personal issues. The couple has two children; one works in ICE and the other studies accounting. Sergio has a plantation of 2 hectares, but works on other farms whenever the opportunity presents itself.

Scientific Discourses:

The Emergence of *Roya* as a Social Phenomenon

This chapter will discuss the following question: How did *roya* emerge as a social phenomenon after the 2012-2013 rust-epidemic? As noted, understanding something as a social phenomenon is, in my opinion, to analyse a phenomena in relation to historical, economic, political and social dimensions. I do not intend to understand the fungus *Hemileia Vastatrix* primarily as a biological phenomenon. Rather, I will explore the different agents, social relations, knowledge systems, and various practices that are set into motion by the fungus. To do so, I will adopt Latour (1986) and Foucault's (1972) approaches to the construction of scientific knowledge, "facts" and discourses, and explore the social actors involved in producing such knowledge. First, however, I find it necessary to explore scientific discourses about *roya*, in order to grasp scientists' perceptions regarding the causes of the recent epidemic. This exploration is based on statements gathered from *tico*¹⁵ newspaper articles and from booklets written, published and distributed by CICAPE with advice for coffee cultivation and for combating *roya*. Additionally, I will include empirical findings based on interviews conducted with plant pathologist Jacques Avelino, and various agronomists. I argue that scientific discourses and measures to combat coffee rust on a national level, have contributed in creating a framework in which *roya* has emerged as a social phenomenon. I will also explore how coffee rust was given new meanings in the process. What these new meanings are will be discussed later and more thoroughly in chapter three.

Scientific discourses of *roya*

What is *roya* and why is it causing such damage?

Roya refers to *Hemileia Vastatrix*, a fungal disease that manifests itself on coffee leaves, also known as coffee leaf rust. I will refer to this disease as *roya* and coffee rust interchangeably. The disease causes defoliation that in severe attacks leads to the demise and fall of a great

¹⁵ Costa Ricans refer to themselves as *ticos*.

amount of leaves. This consequently weakens the plant, and may cause death of branches, an abnormal irregular ripening of coffee berries, and heavy crop losses (CICAFE, 2013:51). According to plant pathologist Avelino, the first symptoms are small yellowish lesions that appear on the inferior side of the leaves. These continue growing while producing urediniospores, the infectious form of *Hemileia Vastatrix*, appearing as orange powder (Avelino et al., 2015:304). On the superior surface of the leaf, there are yellowish lesions, which, during the last stage of the disease develop into a dark-brown colour, illustrating that they have become necrotic (dead tissue).



Figure 2.1.



Figure 2.2.

Figure 2.1. Infected leaf. Yellowish spots on the superior surface of an infected leaf.

Figure 2.2. Infected leaf. The inferior side of another leaf show urediniospires distinguished by an orange colour and a number of lesions. On the right side of the leaf, there is a dark-brown colour, illustrating necrosis.

In an interview with Jacques, he explained how under normal circumstances, as have been the case with epidemics previous of 2012, the effects on production are first visible in the years following an outbreak. Under such circumstances, coffee rust starts to grow strong right before harvest, and reaches its maximum infection at the peak of, or towards the end of harvest, meaning that *roya* will have slight repercussions on the yield of that year. At the end of the rust-epidemic, death of branches might occur, hindering flowering and hence production of new coffee berries. He concluded that such epidemics produce secondary losses. The epidemic of 2012-2013 on the other hand, produced primary losses, he said, assuming that there was probably an early development of the epidemic, reaching its peak before harvest instead of

during or towards the end of harvest. This resulted in death of branches before harvest, and thus heavy production loss.



Figure 2.3. Rust-infected plants

Plants that have been severely damaged by *roya*. By comparison, there is a newly planted rust-resistant variety in the front.

ICO estimates that the rust-epidemic affected over 50% of the total coffee cultivating area in Central America, experiencing an immense production loss of 20% in 2013 alone (ICO 2013:2-4). The countries suffering the greatest production losses in 2012-2013, were Honduras (31%), El Salvador (23%) and Guatemala (15%) (Avelino and Rivas, 2013:5). Although Costa Rica was one of the least affected countries, it still experienced high incidences of coffee leaf rust, leading to a loss of 5 % in 2012-2013. These production losses have had direct socioeconomic impacts on thousands of smallholders and

harvesters. For many, the rust-epidemics in Central-America has raised food security concerns, as many smallholders rely on the income from coffee to purchase food (Avelino et al., 2015). In Turrialba, most smallholders do not produce food for their personal consume,¹⁶ they must purchase it. In circumstances of epidemics and low coffee prices, farmers are faced with a difficult dilemma, as one farmer put it:

¹⁶ Most cultivated bananas, plantains, and yucca. Only some cultivated other types of vegetables besides this.

“You have to choose whether to provide your family with food, and let the coffee suffer the consequences, but then you may risk getting more diseases and perhaps lose yield. How can you feed your family with no coffee? Or, you may invest in coffee which may or may not give you something in return, and let your family starve! It’s a vicious circle.”

For most of my farmer-informants, their main income derived from coffee production, which made them particularly vulnerable to fluctuations in coffee prices on the international market, as well as epidemics such as *roya*. Hence, many seized short-period job opportunities in various sites as *peónes* (non-skilled labourers). As I will return to in chapter five, farmers complained that coffee cultivation was no longer *rentalbe* (profitable), it did not *da* (give) anymore in terms of price and yield. However, unlike coffee prices that might rise one year and decline the upcoming year, coffee rust had severe impacts that lingered for years in the aftermath of the worst outbreak. Due to the epidemic’s repercussions, farmers (in many cases) did not have another choice but to stump such coffee plants (cutting at the lower end of it) to renew life and simulate production again, or to renovate parts of their plantations.

The extensive area that required stumping or renovation as result of the epidemic left an unproductive area of 21.000 hectares in 2013-2014 (Avelino and Rivas, 2013:5). When stumping, or renovating, farmers put themselves in an extremely vulnerable situation, especially if they do not have other means of income. Stumping implies three years of investing into coffee plants that do not produce normally again until after this period. Furthermore, if the plants do not receive the necessary management during this period, they might risk being exposed to a new rust attack. In an interview with an agronomist working at CATIE, Carlos Cordero Vargas, he told me that in Costa Rica most coffee farmers have planted a type named *Caturra*.¹⁷ For decades, ICAFE recommended *Caturra* because of its high productivity, its adaptability to various types of management and heights. The issue however, is that *Caturra* is highly susceptible to coffee rust, which is partly why thousands experienced great challenges with the epidemic. Nevertheless, there are several other factors contributing to the maintenance of coffee leaf rust in Costa Rica, and especially in Turrialba, which will be my focus. In the following, I will highlight scientific discourses on what is considered to cause coffee rust.

¹⁷ *Caturra* is a coffee variety, in the category of *Coffea Arabica*.

What is causing *roya*?

Notions of climate change from a *globe* perspective

Foucault defines discourse as “practices that systematically form the objects of which they speak” (Foucault, 1972:49). In the following, I find it necessary to explore scientific statements by scientists to emphasise my point that discourses were integral in the process that allowed for the emergence of *roya* as a social phenomenon. On several occasions during my stay in Costa Rica, I came across mentions of climate in newspapers or on the television news. Among these, the dominant statement was how greater intensities of the phenomenon *El Niño*, was causing significant impact in the agricultural sector. Simply put, *El Niño* is an interplay between the ocean and the atmosphere in the Pacific Ocean that creates global effects on weather patterns.¹⁸ Its effects revealed themselves in Costa Rica by decreasing rainfall and increasing temperatures on the Pacific side and Central Valley, whereas the Caribbean side experienced increased rainfall. Consequently, farmers on the Pacific Coast in particular, were experiencing high incidences of draught, affecting cattle and cultivation of vegetables and rice among other products.

An article in the country’s largest daily newspaper, *La Nación*, illustrated the meteorological impact of an intensified *El Niño* in 2015 (Miranda, 2015, p. 18A). It contrasted the rain pattern in the period January to April 2015, from what has been the historical average pattern. The comparison illustrated that, among other regions, the North Caribbean experienced an increased amount of rainfall by 393 millimetres in 2015. Notions of *roya* and climate change also appeared in the digital newspaper CRhoy.com and *La Nación*. Among these were “Due to climate change, plagues reach areas where they were not installed, coffee rust and dengue are proofs in the country” (Rojas, 2013). “Climate change brings coffee rust to higher altitudes in Central America.”¹⁹ Hence, for the first time, many *turrialbeño* farmers with plantations in higher altitudes were experiencing *roya* on their *fincas* for the first time.²⁰ As I will return to in chapter three, farmers in Turrialba often complained about how the weather had changed during the last decades. A great majority of them agreed that such changes have affected and still is affecting the agriculture of the region, coffee being among the crops. Indeed,

¹⁸ <http://academic.eb.com/EBchecked/topic/181759/El-Nino>

¹⁹ http://www.nacion.com/mundo/centroamerica/Cambio-climatico-lleva-zonas-Centroamerica_0_1417858321.html

²⁰ This was the reason why I chose my key informants with plantations in varying altitudes.

meteorological factors are considered one of the main factors contributing to the emergence of the rust-epidemic in 2012-2013 (Avelino et al., 2015).

The sudden outbreak of coffee rust in 2012 in the entire Central-American region, may suggest that anomalies in climate conditions were of great significance. Avelino et al. (2015) remark that abnormalities in rainfall, temperature and sunshine duration have been vital for the emergence and magnitude of the disease. They argue that an earlier rainy season in the region in 2012, combined with bright periods of sunshine, have possibly led to the initiation of an early coffee rust-epidemic. During rainfall, splashing raindrops can cause dispersal onto other adjacent plants. Raindrops also transport infectious urediniospores towards the underside of the leaves, which is where they first manifest themselves by penetrating the leaf. Coffee regions with tropical climate, like Turrialba, experience additional challenges with high cases of leaf wetness during night and early morning, producing a very favourable and humid environment for the fungus' development. Nonetheless, the decreased daily thermal temperature might be one of the main factors contributing to the epidemic, providing ideal range of temperatures for the fungus to develop itself (between 21-28°C, although infection might ensue in temperatures ranging from 15°C to 28°C) (Avelino et al., 2015:310). These temperatures supposedly permitted the fungus to reproduce its cycle more quickly due to a shortened latency period.²¹ An equally important element is wind speed, which was allegedly higher than normal at the beginning of the harvest in 2012. This allowed for liberation and dispersal of dry spores. Another vital element that facilitated this process was human activity in coffee plantations (i.e. harvesters). Their movement and contact with coffee plants permitted the spores to spread in not only one, but all the plantations in which they harvest.

In claims about climate change, scientists rely on various inscription devices in order to “register” the “signals” that “nature” transmits (Schaanning, 1997:209-210). Upon gathering information, signals are turned into numbers, figures and graphs, which are then analysed and discussed in order to tell something about climate conditions. By using such instruments, scientist arguably embrace a more disconnected relationship to the environment than do farmers, who actively engage *within* the environment (*being-in*). Moreover, the social relations embedded within the process of gathering these “signals” are eventually “hidden” and rendered invisible, as they become established “facts” (Latour and Woolgar, 1986:23). Following Ingold,

²¹ The incubation period, before symptoms appear.

agronomists might thus be said to hold a *globe* perspective based on a distant observation of the world that is detached from life by using such inscriptions (Ingold, 1993a:216). Furthermore, the scientific concepts they apply in conveying scientific knowledge are also “detached” compared to that of farmers. For instance, whenever climatic conditions are not corresponding with what they perceive as the fixed seasons of the year (e.g. dry- and rainy seasons), scientists convey statements about anomalies or irregular meteorological patterns. From this perspective, scientists are *seeing as* – perceiving the world as a globe. In chapter three, I will compare farmers’ and agronomists’ manners of perceiving the world, connecting them to particular knowledges and ways of talking about *roya*. For now, I will explore statements about economic factors.

Economic factors

Although meteorological conditions are perceived as being among the main drivers in the expansion of the fungus, economic factors were equally important in explaining its magnitude according to scientists. Avelino et al. (2015) argue that all of the epidemics that have occurred in Central America coincided with declines in coffee prices, which produced low coffee profitability. Reduced profitability made investing in coffee management difficult for coffee farmers, who are those receiving the least profit in the coffee industry. Inputs such as fungicides and fertilizers are highly important in order to control the expansion of *roya*. However, with limited sources of income, purchasing inputs were complicated by low coffee prices. “[...] the international price of other mild Arabicas fell sharply by 55 % between September 2011 and December 2013, from 274 to 126 USD per 46 kg (100 lb) of green coffee, while production costs reached their highest level in the last decade, for instance: 139 USD per 46 kg of green coffee in 2012-13 in Costa Rica [...]” (Avelino et al., 2015:307). Moreover, Costa Rica’s uneven topography makes mechanisation of harvesting impossible. Their dependency on manual labour means that production costs cannot be reduced, making them highly vulnerable to decreases in coffee prices (Avelino et al., 2015:308).

Despite being a central factor, I experienced that statements about economic factors received less attention than those of climate change. In ICAFE’s gatherings, I found that economic related issues were not commonly discussed. One reason might be the topic’s sensitive character: it is common knowledge that *turrialbeño* farmers receive the lowest price for the

coffee they produce compared to farmers in other regions of the country. In turn, this makes it sometimes challenging for them to invest in necessary products that ICAFE is recommending to combat *roya* and other diseases. Now, why do *turrialbeño* coffee farmers receive an inferior price for their coffee?

Several interconnected issues might explain the low coffee prices of the region. Based on interviews with both agronomists and farmers, I found climate, elevation, marketing, conceptions of quality and absence of local competition between coffee processing factories to be the principal factors. “It’s not that the coffee from Turrialba is bad. We’re just located in a difficult zone from every perspective,” said agronomist Oscar Ortíz in an interview at his office in *beneficio* Juan Viñas. Compared to other regions, the coffee from Turrialba has not been differentiated and promoted to the same extent. “If you ask where the best coffee comes from, people will likely say Tres Ríos, Naranjo, San Ramón or Tarrazú,” he claimed. Unlike Turrialba, coffee from these regions have managed to create themselves a name based on the origin of the coffee, through marketing. Another issue, he continued, is that *turrialbeño* coffee lacks a niche market. Likewise, agronomist Carlos explained that the absence of a niche market in lower zones like Turrialba is connected to a standard of quality that traditionally has been adopted in the coffee industry.

Carlos: “This standard is an American standard, which favours coffee with acidity and aroma among other characteristics. Acidity and altitude are related; high levels of acidity are to be found in higher elevations. Thus, in lower zones such as Turrialba, the coffee is more balanced, indicating an inferior quality than coffees from higher altitudes from the American standard point of view. The *turrialbeño* coffee is used to produce coffee blends, and to balance and improve the acidic coffees of higher zones. Trading the latter is easier in the international market, than is trading coffee with characteristics from lower zones. This is why there exists differences in price according to the altitude of the zone, which are divided into low, mid- and high zones.”²²

However, due to the varying topography in Turrialba, farmers with *fincas* located in higher altitudes receive a higher bonus in price for their coffee, according to my key informants. On

²² Low zones are located below 1.000 meters above sea level. High zones are situated above 1.200 meters above sea level, while mid-zones are located between these (<http://www.icafe.cr/nuestro-cafe/regiones-cafetaderas/>).

the other hand, the general recognition of Turrialba as a low zone is reflected in the pricing of its coffee. Carlos thought that it was therefore necessary to identify a niche market, which prefers a more balanced coffee profile in order to enhance coffee prices in lower zones.

Carlos: “A possible market that is emerging and expanding is Asia, where such taste profiles are preferred over acid ones. However, if it continues like today, using coffee from lower zones to balance their adversary, the coffee farmers of Turrialba will not receive superior prices like in higher zones.”

One aspect of perceived quality is acidity. Another is the ripeness of the coffee berry. An issue that was voiced by agronomists and farmers alike was that the climate in Turrialba did not allow a concentration of flowering and ripening of berries. *Turrialbeños* generally agreed that flowering occurs from May to December.²³ One of my key informants, 76-year old Luis, complained that on one branch you might find *pitillo* (small flower bud) white coffee flowers, *garapatilla* (signs of small berries that emerge after the flower falls off) and *granos* (coffee berries) of different ripeness. Due to the scattered ripening, farmers and harvesters have to do up to 13 to 15 rounds when harvesting coffee, compared to for instance Tarrazú where they only require approximately four rounds. This movement not only weakens the plants, but it also facilitates premature fall of *pitillos*, flowers, *garapatillas* or coffee berries, which means yield- and thus economic losses. The continuous human movement and contact with coffee plants leave the plants weakened at the end of the harvest. More importantly, the human activity in and between plantations of the region not only enables the dispersion of *roya*, but also make plants more vulnerable to rust attacks due to their limited strength.

²³ There are minor flowerings in the months before May. However, May is recognized (by farmers and agronomists alike) as the month when the flowers set, developing into coffee berries that will be collected during the years harvest.



Figure 2.4. Irregular ripening

By my finger, you may observe *pitillos*, and further up are a few *garapatillas* and berries of different sizes.

Rainfall, especially heavy rainfall may also cause yield losses, meaning that *turrialbeño* farmers are quite exposed to crop losses compared to other coffee regions with more clearly defined dry- and wet seasons, such as Tarrazú. These “defined” seasons permit concentration of the ripening process. Consequently, *turrialbeño* farmers often have to harvest the berries while they are *pintón* (not fully ripe berries), to prevent them from dropping during rainfall. During the interview with Oscar, he pointed at a picture of a red and ripe coffee berry, saying; “That’s why you rarely

find such berries in the processing factories here. And that’s where the quality lies.” Thus, the irregular ripening does not allow farmers to deliver coffee of what is perceived as good quality (in this context, ripe berries). Moreover, this perceived quality is reflected in the payment received for red berries, which is significantly more than green or semi-ripe berries. Adding to the several dimensions of the economic issue is the lack of local competition between the regions’ *beneficios*, which means that prices are kept relatively low. Farmers complained that there are only two *beneficios* where they might deliver their coffee, namely Santa Rosa and Juan Viñas, compared the many that once existed. In chapter five, I will explore the decline of the coffee industry in Turrialba and imaginaries of the future as uncertain.

Coffee management

Variation in local effects of *roya* suggests that coffee management is another important factor. In *charlas* by ICAFE, application of fertilizers and fungicides were said to be of central importance in controlling coffee rust. Both farmers and agronomists informed me that

fertilizing would contribute to enhance growth, avoid death of branches and increase productive abilities by renewing leaves. Well-fertilized plants improve their natural defence. They therefore pose greater chances to survive fungal attacks. However, I found that statements conveying chemical control always had an emphasis on fungicides. This emphasis might be grounded in a national agenda of “modernizing” the *tico* coffee farmer in terms of promoting technological practices to better control the disease, which I will discuss in chapter four.

Closely related to statements about fumigating and incidences of *roya*, were notions about the age and the variety of coffee plants. This was mentioned on several occasions during ICAFE’s *charlas*. In an interview with agronomist Adolfo Martínez Guillén from ICAFE, he explained that the coffee plants in Costa Rica are possibly about 30 to 40 years of age. In total, he estimated that 70 to 80 % of the coffee plants are older than the age of 25. According to a study ICAFE conducted, the productivity of a coffee plant endures for a maximum of 20 to 25 years. Subsequently, after this age, the plant is no longer profitable because of its limited production. However, fumigating practices and the age and variety of plants were not the only issue frequently talked about.

Another statement intimately connected to that of controlling *roya* with fungicides was “Two new species of *roya* have been found in Costa Rica”. Agronomist Adolfo explained to me that samples of rust were extracted from each coffee region in the country when the magnitude of rust was recognized in Costa Rica. These were sent to an investigation centre in Portugal that specializes in coffee rust, Centro de Investigaciones de Roya, for analysis. Following this was a discovery of two new *razas* (species) of coffee rust, which were more pathogen²⁴ than those already known in Costa Rica. The discovery was somehow done detached from context, in laboratories rather than within the context of coffee plantations. Again, this is an example of how scientists were *seeing as* from a *globe* perspective by using inscription devices in order to explain the recent “aggressiveness” of coffee rust. In fact, ever since *roya* entered the country in 1983, these species had not been discovered. In the Teletica news, a national news channel, Jorge Ramírez, technical manager of ICAFE, said that the new species had the ability to affect other coffee varieties in addition to those varieties that *roya* already affected when first entering the country (Teletica, 2013). Having in mind that the country has never experienced an epidemic on this scale may have led farmers to believe that *roya* had changed in characteristics.

²⁴ Pathogen means that these species are more aggressive. The two new *razas* are 24 and 36.

Indeed, both agronomists and farmers alike made a distinction between *roya* as *calma* (calm) before, and portraying it as *brava* (wild) in the recent years since the epidemic.

The emergence of *Roya* as a social phenomenon - from *calma* to *brava*

The diverse answers given to questions about the arrival and characteristics of *roya* in Turrialba (chapter three) suggest that there are social and cultural processes embedded within the emergence of it as a social phenomenon. In this section, I will discuss how *roya* emerged as a social phenomenon by addressing various measures by the state and scientists to assist coffee producers in combating coffee rust. By structuring the discussion in Barth's (1994) analytical levels; macro and median, I find it easier to observe their inter-connections and their links to the micro level. The latter will be the focus of chapter three due to its extensive character.

Macro level

Barth (1994) defines this level as a state-centred level in which politics affect agents on the micro level. He claims that the rhetoric on the macro level is closely related to that of the median level. I will adopt this level to discuss measures to combat coffee rust taken on national level in Costa Rica, and in what way they altogether might have contributed in creating a framework, in which *roya* emerged as a social phenomenon. In the process, *roya* was also given new meanings. I will analyse the rust-epidemic of 2012-2013 as an *event* in Kapferer's terms (2005). I argue that the measures taken on macro level - such as the declaration of emergency, economic relief, donation of fungicides and early warning control - created a sense of acuteness, a perception conveyed to the median and micro levels.

State initiatives to combat *roya*

In the aftermath of the initiation of PROMECAFE, chemical controls showed its effectiveness in Central America, perhaps due to relatively low incidences of damage caused by *roya*. Hence, the fear of coffee rust started declining, and coffee farmers as well as authorities and agronomists started considering the disease as manageable (Avelino et al., 2015:304). Despite experiencing a rust-epidemic in 1989-1990 in Costa Rica, the general perception of *roya* as

manageable prevailed until the 2012-2013 epidemic. Nonetheless, writings on coffee rust continued in ICAFE's newsletter updates, especially during the two main epidemics. Agronomist Adolfo explained that even before the epidemic, ICAFE arranged a series of activities aimed towards how to manage a farm in a preventive manner, with coffee rust in mind among other diseases. Despite such efforts, the recent epidemic created massive destructions, which eventually led to a declaration of state of emergency.

I believe that the declaration of emergency marked the beginning of a sense of acuteness in which farmers, agronomists, and ICAFE among other institutions, were urged to take action. Following the declaration, the Costa Rican government launched the idea of *fideicomiso cafetalero*, a programme that aimed to support coffee farmers that harvest less than 100 *fanegas* of coffee berries or *quintales*²⁵ a year. Finally, in 2014, an agreement to donate 20.000 million *colones* from the national budget to finance social assistance was signed between the Ministry of Finance, Ministry of Agriculture and Livestock, the Costa Rican Bank, the Institute of Joint Social Assistance, and ICAFE (Arias, 2014). As a result, farmers were provided with economic relief of altogether 300.000 *colones* (approximately 559 US dollars), which aimed at covering the basic needs of their respective families who were facing hardships. All of my farmer-informants had received this support, except two, due to reasons I will not elaborate here.

As a part of the *fideicomiso*, another 15.000 million *colones* were distributed to four credit programs to assist smallholders in getting back on their feet. Among them were loans tailored for pruning and renovation of coffee plantations, which both had low interest rates between 4% and 6% (Barquero, 2014). The advantage of these loans is that the two to three first years only require payment of interests. When a farmer prunes or renovates parts of his/her plantation, he/she will have to wait up to two to three years before they start producing normally again and generating income to start repaying the loan. However, the "wild" characteristics of *roya* and low coffee prices have created imaginaries of the future as uncertain, which might explain the low numbers of smallholders who relied on such loans during renovation. I will return to this issue in chapter five.

Adding to the measures already mentioned was a donation of products to combat coffee rust. ICAFE and other national institutions such as SFE (Servicio Fitosanitario del Estado) united

²⁵ A *quintal* equals 46 kilos of processed coffee.

themselves to offer help to coffee farmers. SFE is an institution that regulates products that are imported and exported in Costa Rica, according to pests and diseases. Both ICAFE and SFE contributed with altogether 2 million *colones*, which they used to purchase fungicides. These were given free of charge to all coffee farmers around the 2012-2013 harvest according to Adolfo. Every coffee farmer I spoke with in Turrialba had received a couple of bottles of fungicides during the worst outbreak of coffee rust, regardless if they attended ICAFE's gatherings or not. I return to this in chapter four where I explore how the donation might have marked the presentation of, and emphasis on, a particular type of knowledge.

Roya portrayed as an acute challenge

According to farmers with whom I spoke, they had never before received such aid from national institutions. Quite often, I would hear smallholders complain about the lack of economic support in order to afford the most vital inputs, such as fertilizers and fungicides, to prevent diseases from developing in their plantations and to optimize their yields. Displeasures of being among those who receive least profit and little economic support were often revealed as small comments on several occasions.

“They gave us 300.000 *colones* and a couple of bottles of pesticides to fight *roya*. But how will that help us in the future? We're constantly facing challenges; either low coffee prices, increased prices in inputs, or diseases. What we really need is continuous economic support!” complained an exhausted farmer.

In chapter four, I discuss how such displeasures were veiled in joking comments during ICAFE gatherings. In fact, the economic relief and donation of fungicides might have triggered the social tension or displeasure that farmers described, of not receiving continuous economic support, but rather getting recommendations of which products to purchase and apply.

When economic support finally was provided during the epidemic in 2012-2013, it marked, in my opinion, an abnormal situation for coffee farmers. Together with the declaration of emergency, the various measures taken on national level marked a situation of acuteness. It might be analysed as an *event* in Kapferer's terms (2005). He defines an *event* as an unexpected situation, or a state of crisis with several potential outcomes, in which social structures are

rendered visible for analysis. In this exact case, the aid provided to coffee farmers highlighted the asymmetrical relationship in the coffee industry. Coffee farmers are those at the bottom of the hierarchy in the coffee industry, thus receiving least profit from the coffee, in which they invest great amounts of time and effort.

In my opinion, this context of acuteness allowed for the emergence of *roya* as a social phenomenon, perceived as more threatening and destructive than before, according to both agronomists and farmers. Their descriptions of the recent *roya* that suddenly developed into being *brava* (wild) differed from a *roya* that previously was considered *calma* (calm). This sudden change in the characteristics of *roya* might further exemplify that greater processes on national level (i.e. declaration of emergency and measures) contributed to such perceptions. Having explored how the declaration of emergency and various measures provided a framework; a sense of acuteness related to the rust-epidemic, I will now proceed to the median level.

Median level

Barth defines the median level as group-oriented, as revolving around the mobilization of groups, common experiences (“erfaringsfellesskap”) (Barth, 1994:184). In this section, I will address the regional office of ICAFE in Turrialba, by focusing on activities and gatherings arranged by them. Initially, I will describe the general setting of these gatherings to provide context. Through such gatherings, I will discuss how the conveyance of scientific discourses about *roya*, together with what Latour (1986) defines as inscription devices, allowed for the emergence of *roya* as a social phenomenon that was ascribed new meanings.

Social setting in ICAFE gatherings

During my stay, I attended three gatherings in Turrialba. In chapter four, I will describe the first activity I attended in detail, while also drawing some important aspects of the third activity to highlight my points. The second gathering was a *charla* about *roya* and *broca* (coffee berry borer).²⁶ All gatherings were held in a large white house, *La Casona*, in the botanical garden of

²⁶ Coffee berry borer (*Hypothenemus hampei*) is a small beetle that causes yield losses, affects physical quality and the taste of the coffee (Barrantes, 2013).

CATIE, close to ICAFE's regional office. Two of the gatherings I attended both started with a presentation here, held by agronomists from ICAFE and/or CICAPE. Inside the room were numerous chairs lined up for attendees. In front, there was a long table on which a projector and a laptop were positioned in order to display power point slides on the white screen. Agronomists utilized this in explaining aspects of coffee rust or other diseases. The slides generally contained key words, graphs, numbers, lists of various recommendations in combating various diseases, but always with a central focus on *roya*. Carlos and Adolfo were present at all gatherings. As farmers would visit or call ICAFE regarding various issues, Adolfo knew several of the local farmers. Carlos had also previously worked at ICAFE. However, he was now working at CATIE. By working at these institutions, he had acquainted many farmers of the region, some of which had become friends. Farmers regarded persons working at these institutions of a higher-social status than themselves, especially due to the acknowledged position CATIE had, which worked closely with ICAFE.

Early on, I learnt that CATIE had several ongoing projects related to diseases such as *roya* and yield losses among other issues. CATIE is an internationally acknowledged institution with scientists working in areas of biology, economy, and sociology to name some. All of them are connected to agricultural issues. Moreover, CATIE receives numerous exchange students, who also reside on its large campus. I came to know some of these who did shorter fieldworks. Several of my farmer-informants had been in touch with CATIE students on one or more occasions throughout the years. Having clarified aspects of the social landscape, I will now discuss how the conveyance of scientific discourse by agronomists in ICAFE's gatherings contributed to the emergence of *roya* as a social phenomenon, and how it was given new meanings in the process.

Material aspects of discourse

In general, a commonly repeated concept in *charlas* was *cambios climáticos* (climate change). However, I noticed that this concept entailed two meanings when agronomists and farmers were speaking about *roya*. First, it could refer to common changes in weather, whereas one day it might rain, and the following day it might be sunny. In Turrialba, as stated, there are frequent changes in weather, due to its tropical climate. Such changes were accentuated as rather favourable to the progression of coffee rust, providing a nearly continuous wet and humid

climate for the fungus. Secondly, *cambios climáticos* could also refer to climate change as consequence of global warming. In talks about climate change in the second meaning of the concept, an agronomist mentioned the *El Niño* phenomena during a *charla*. As I had read in the newspaper *La Nación* the first week of my arrival, he said that an intensified *El Niño* had caused severe draught in Costa Rica. Turrialba on the other hand, had experienced an increased amount of rainfall this year, by 16% more than average, thus producing more challenges in controlling *roya*. As noted, agronomists often used graphs, tables, numbers and, or, percentages to present such irregularities in rainfall. Meteorological anomalies were said to be due to climate change, and these were portrayed as forceful factors in the 2012-2013 epidemic. Following Foucault (1972) and Latour (1986), I argue that the usage of graphs, tables, curves, and references to studies, together with the status of the speakers, conveyed a statement about the rust-epidemic as a consequence of climate change.

As I accompanied a PhD-student, Rolando and his two assistants on visits to various *fincas*, I observed some of the methods they applied. On each farm, they had marked eight coffee plants, and the condition of these were revised on more or less every visit. On two of these plants, there was a white plastic cup hanging upside down by a steel thread, with a sensor inside. These were used to measure humidity and temperature in order to gain more detailed knowledge about the microclimate in the specific area. Rolando used a devise to measure the percentage of shadow on the plantation. This devise reminded me of a compass, however, it had small mirrors with cubic inside. While holding the devise, he told me that he used this to calculate percentage of shadow according to the amount of cubic that is covered. Such methods were applied in order to gain information about the differences of coffee rust according to microclimates. I suppose that similar procedures, or in Latour's (1986) terms, inscription devises are used by ICAFE in their investigations on coffee rust. My point is, following Latour, that materiality is converted into statements through inscription devises. In this case, the various devices and equipment used by researchers and agronomists at ICAFE and CATIE, produced results in the form of figures, curves, statistics, which were referred to in *charlas*. These in turn produced statements about coffee rust being intensified by climate change. This is not to say that agronomists considered this the only factor in causing the recent epidemic. However, I experienced that notions of coffee rust as consequence of climate change was given more weight than for instance economic statements.

Another statement that was given equal, if not more attention, was that; “*Roya* is best controlled with chemical inputs”. In all the gatherings, agronomists continuously emphasized the importance of fumigating, explaining that a lack of chemical control was one of the main reasons as to why coffee rust had grown out of proportion. To illustrate this lack of control, agronomists displayed a graph with different curves, showing how coffee rust developed during the epidemic with and without the application of fungicides. The curve demonstrating no chemical control showed high incidences of rust, whereas the curve with chemical control showed a less aggressive development. A parallel between the aggressiveness of the fungus, referring to the two new species, and lack of fumigating was frequently drawn to stress the importance of fumigating. Moreover, the “discovery” of this aggressiveness through inscription devices in Portugal contributed in producing persuasive statements about *roya* as more destructive than before.

Following Latour (1986), I believe references to graphs and conducted studies produced convincing statements together with the status of the speakers. Latour and Foucault are both concerned with the conveyance of statements in a manner that present them as convincing and true. The status of those who convey statements is central in this task. Agronomists maintain a higher social status than farmers, who are generally perceived to hold a lower social status. The former have higher education, whereas the latter have primary education, with some exceptions. Indeed, one of my key informants, Sergio, had educated himself in agronomy, and much of his knowledge from cultivating coffee derived from there. Other farmers had also attended minor courses related to coffee management. Nonetheless, agronomists are agents in a large network of other agents linked to institutions on regional, national and international levels (e.g. CATIE, ICAFE, CICAPE, PROMECAFE, and Centro de Investigaciones de *Roya* in Portugal). In talks about the new species, agronomists mentioned the investigation centre in Portugal. Not only did such a reference provide more “weight” to notions about the aggressiveness of *roya*, but the numbers presented in *charlas* that illustrated the magnitude of coffee rust in Costa Rica, also supported such a statement. Hence, ICAFE’s access to a vast array of resources put them in a “higher” position, where the credibility of their words are given more “weight” due to their association to this entire network, and their references to studies conducted by agents of it.

Concluding remarks

This chapter discussed how *roya* emerged as a social phenomenon with altered characteristics from “calm” to “wild”. I adopted Barth’s (1994) macro- and median levels in order to highlight how measures taken on macro level to combat coffee rust, created a sense of acuteness. Within this sense of “acuteness” *roya* emerged as “wild”. On the median level, I disclosed how this “wildness” became observable by applying Latour (1986) and Foucault’s (1972) approaches to the construction of scientific knowledge, “facts” and discourses, and the social actors in producing such knowledge. I discussed how inscription devices, references to conducted studies and analysis together with the status of the agronomists at ICAFE gatherings, created persuasive statements about a) *roya* as “wild”, b) coffee rust as a consequence of climate changes and c) *roya* is best controlled with chemical inputs. Moreover, I exemplified how agronomists were *seeing as*, that is, embracing a rather disconnected relationship to the environment by observing changes in climate and *roya* from distance by means of inscription devices. Having explored agronomists’ perceptions of what was causing the rust-epidemic, and their statements about *roya* as “wild”, the following chapter will proceed to the micro level. It will discuss how the altered characteristics of *roya* were perceived and experienced by farmers in particular. Moreover, it will also highlight how notions of climate change on macro and median levels were incorporated into the micro level.

Experiences, Knowledges and Perceptions of *Roya*.

In the previous chapter, I discussed how measures to combat coffee rust on national level, combined with scientific statements about climate change, together contributed in creating a framework in which *roya* emerged as a social phenomenon with altered meanings, namely *roya* as wild. Before exploring farmers' ideas of what is causing coffee rust, it might be fruitful to first discuss how the emergence of *roya* as "wild" not only was a top-down process, but also a bottom-up (i.e. of experiencing coffee rust). In doing so, I explore agronomists' and farmers' different conceptions regarding the arrival of coffee rust in Turrialba. I argue that the two-way processes (top-down of *enacting roya* and bottom-up of experiencing *roya*) were both integral for farmers' conception of the disease as *brava*. Second, I will draw on Ingold (1993a) in arguing that farmers' practical experience and their *local* perspectives based on *being-in* made them experience and perceive *roya* in different and multiple ways than that of agronomists. In doing so, I will refer to the most central themes repeated by all farmers. Having already elaborated about the economic issue (chapter two), I here only emphasize that low prices meant that many farmers could not afford to invest in the necessary inputs to manage their coffee optimally. Finally, I will explore religious understandings of *roya*.

Becoming disease – from calma to brava

Coffee rust has existed in Turrialba for approximately 40 years according to local agronomists I interviewed. The majority of my farmer-informants on the other hand said that it had been present in the region up to 15 years, but describing this *roya* as *calma*. Hence, they contended that; "One could easily live with it, because it didn't do much damage". Peculiarly, several of my other farmer-informants claimed that *roya* did not exist until two to three years ago, when the epidemic ravaged their *fincas*. How may such different time perspectives persist not only between agronomists and farmers, but also between farmers themselves? To answer this, I will first explore farmers' accounts regarding diseases.

Julio: “It’s a very curious disease. It started about ten to fifteen years ago with small yellow spots beneath the leaves, which throughout the years have grown continuously larger. The last three years have been fatal, because that’s when it became *brava*. At the worst, I was left with hardly any coffee. Many coffee plants were naked with barely any leaves, and I had to cut those plants that could not be saved. It makes me sad to see the plant without leaves.”

Similar accounts about the recent *roya* were expressed in various interviews. “Before we could live with *roya*”, “The other one did not fuck up that much”, “It might as well be another type of *roya*, a more serious one.” Common for these was a distinction between *roya* before as *calma* (calm), *débil* (weak), and *normal* (normal), whereas the recent *roya* was depicted as *brava* (wild), *fatal* (fatal), and *catastrófica* (catastrophic). Another important characteristic was its developing speed and coverage, the former being *lerda* (slow), infecting only parts of the *finca*, whereas the latter was *rápida* (fast) and contaminating the entire plantation. Moreover, the listed adjectives that farmers used to differentiate between *roya* “before” and “now”, illustrate that the former was ascribed static characteristics compared to the latter’s association with dynamic features. Contrary to “Western thought” then, which scholars have criticized for its tendency to contrast nature and culture, thus treating nature and landscape as passive (Ingold, 1993b; Humphrey, 1995), *turrialbeño* farmers talked about the recent *roya* as if having its own “will” or agency. More importantly, they commonly referred to *Doña Roy*a (Miss Roy) or *ella* (her). Several adjectives used to describe *roya* end with an *-a* (*brava*, *calma*, *catastrófica*), implying feminine connotations in Spanish. Repetitive accounts of “She’s [*roya*] very wild” might be related to thoughts about Mother Earth. That is, associating the feminine with nature and its wild and uncontrollable powers (Ortner, 1974). As I will return to later in this chapter, farmers also ascribe human-like needs, feelings and behaviour when talking about coffee plants.

A phrase that was frequently repeated by the majority of farmers in all ages was; “*Antes no había enfermedades*” (“Before there were no diseases”). Defining “before” in amount of years proved to be a difficult task. However, as I will return to in chapter five, people generally referred with nostalgia²⁷ to a time when yields and prices were high, and their ancestors were still using knife to maintain the fields, and little or no chemical products. Notions of “*Antes no*

²⁷ I use nostalgia as a concept that is not limited to the past and the present, but also suggests a particular orientation to the future (see chapter five).

había enfermedades” contradicted agronomists’ statements about *roya* among other diseases as existing for many decades. After reflecting upon this, while keeping in mind that *ticos* are great with understatement²⁸, I understood that the phrase might have conveyed another meaning.

When a key informant, Daniel, expressed this phrase, it opposed some of his earlier statements about there being few diseases. By further asking him, I found that he was actually talking about diseases that had been around for as long as he could remember. Among them were *coleroga*²⁹, and in particular *ojo de gallo*. He mentioned that he experienced *roya* on his plantation about 15 years ago; however, this was *calma* and did not really affect the coffee plants much. “There were just some small yellow spots, but they didn’t grow big like they do now,” he claimed. He then explained how he did not categorize these as “bad” diseases because one might easily live with them, without them destroying significant yield or doing significant damage. According to Avelino et al. (2015:304), coffee rust had caused significant losses before the 2012-2013 epidemic. However, most of these went unnoticed due to coffee plants’ biennial production rhythm. This means that high yielding plants usually produce low yields the following year and reverse, regardless of coffee rust being present or not. Farmers alike explained me such rhythms. Hence, previous experiences of the fungus as *calma* might be explained by such fluctuations. In the same manner, these fluctuations might also explain how several farmers claimed that it did not come to Turrialba until two to three years ago, when thousands lived severe yield losses. This suggests that something does not become a (“bad”) disease until it is experienced as doing significant damage.

Mol (2002) suggests that the beginning of the disease atherosclerosis is the experience of diffuse pain. By comparison, coffee farmers experienced pain by living the indirect economic (and emotional) effects through damaged plants and massive yield losses. They experienced it as *brava* because of its destructive powers that were threatening the continuity of the agricultural activity. In this sense, *roya* might be analysed as the “experience of yield losses”. However, according to Mol, the enactment of disease does not occur *alone*, rather “*To be is to be related*” (Mol, 2002:54). She argues that diseases are enacted through medical practices, suggesting that diseases are brought into being. Mol exemplifies her point by portraying a picture of a patient

²⁸ For instance, *tamaño poco* (chapter one).

²⁹ A fungal disease.

who complains about pain in a consulting room, followed by an interview and a physical examination by a doctor. These procedures, together with the desk, chair, documents et cetera *make* or *enact* the disease that only existed as diffuse pain before entering the consultation room (Mol, 2002:22-25).

Parallels may be drawn between the clinic and gatherings held by ICAFE; the chairs, the power point, the table, references to conducted studies and prestigious institutions both nationally and internationally all participated in the *making* of *roya* as a social phenomenon. In this process, the agronomists (or doctors) were “confirming” the losses (or pain by analogy) that farmers (or patients) were experiencing due to coffee rust. More to the point, they had the power to define reality by “diagnosing” *roya* as “wild” through “discovering” two new pathogen species of coffee rust that had to be reckoned with. Hence, in line with Mol, *roya* was more than one; it was both “yield losses” and “two new pathogen species”. Furthermore, these practices were interconnected to the declaration of emergency, the *fideicomiso cafetalero*, and the donations of fungicides. The fungicides might be analysed as “medical” treatment to the “diagnose” affecting coffee farmers in the country. In this sense, *roya* as *brava* was enacted through a series of practices, which affected both farmers who attended gatherings, and those who did not.

The measures taken on national level were central in creating ideas of *roya* as a more “acute” challenge than before when it was *calma*. By analogy then, the “wildness” and “calmness” of *roya* might be analysed according to the amount of attention it has been given on national and regional levels through relieves, media and in *charlas*. Farmers’ repetitive notions of “*Antes no había enfermedades*” might thus be more easily grasped from this perspective. The lack of agronomists’ involvement in and “talk” about coffee rust issues might explain why farmers’ believed that it did not exist until two to three years ago, when it started receiving massive attention. Alongside, farmers’ experiences of *roya* as a “bad” disease (i.e. causing severe damage) were also integral in perceiving it as *brava*. In sum, the sudden shift of *roya* from *calma* to *brava* suggests that both top down and bottom-up processes were integral in the “diagnosis” and conception of *roya* as a disease to be reckoned with. In the following, I will focus on farmers’ experiences with, knowledges, and perceptions of *roya* on the micro level.

Notions about what is causing *roya*

All the farmers with whom I spoke had parents and/or grandparents who worked coffee fields. The knowledge embedded in coffee cultivation had been transferred from one generation to the next, normally from father to son, but also to daughter. The way that Daniel himself commented that his relationship to the *medio ambiente* (environment) made him especially aware of climate change, exemplifies how practical experience might make farmers prone to observing alterations in the environment. Following Ingold (1993a), I argue that farmers' practical experience and their *local* perspective based on being-in-the-world in cultivating coffee makes them experience and categorize *roya* in different ways than that of agronomists. In the following, I will address some of the main themes repeated by many informants, namely climate, humidity, shadow and chemical products, and discuss how these are seen to have produced or strengthened the prevalence of coffee rust in the region.

Climate, humidity and shadow

Ever since my arrival in Turrialba, I quickly started noticing how the weather was a common conversational topic. Agriculturalists³⁰, my host family and people on the bus were among those I observed having conversations about how one day it might be summer and then winter the following day. In the initial phase of my fieldwork, the use of *verano/invierno* (summer/winter) confused me. For instance, when inquiring about when Sergio normally would fumigate his plantation, he told me that he would have to wait for the summer. Being a novice in the coffee-production scenario, I understood his notion of summer literally – that he would have to wait for the summer *season*. However, when I visited him the following week, he told me that the weather finally had allowed him to fumigate. I on the other hand was left bewildered. After discussing my misunderstanding, I realized that his reference to *verano* signified sun (i.e. no rain) and *invierno* indicated rain.

I found it interesting that agriculturalists spoke about the weather according to the seasons associated with it, as opposed to referring to the weather itself. Such references might be more easily comprehended if connected to farmers' *local* perspectives of *being-in*, and their practical manner of acquiring knowledge through engaging directly with the environment. They might

³⁰ People dedicating themselves to any type of crop and/or livestock.

refer to a rainy day as winter, because that is how they experience it. A *globe* perspective from scientists' point of view on the other hand, approach weather in a detached manner compared to that of farmers. In the official understanding, seasons are rigid categories that are associated with a certain weather pattern. Whenever such patterns do not correspond to the season, they are considered anomalies. By using inscription devices, scientists measure weather anomalies, and do calculations in order to estimate irregular patterns, which then is used to explain climate change. Manners of acquiring knowledge is an issue I will elaborate later with empirical examples.

When talking about weather, I became aware that elderly coffee farmers in particular would complain about how the weather had changed over the last decades. In general, they claimed that the seasons *verano* (dry season) and *inverno* (rainy season) are not as clearly defined as they once were.³¹ “Nowadays, there might be four days of summer followed by four days of winter”, Luis complained. These changes especially affect coffee growers who are somewhat dependent on *verano* (i.e. no rain) to do most activities on their plantations. Experiences of changes in weather, and the positioning of farmers of *being-in* the environment on a daily basis might explain these *local* perspectives on weather. I will now demonstrate how an informant explained some effects of climate change, and how these were connected to *roya*.

Daniel had been working with coffee production ever since he was seven years old. Like the majority of my informants, he acquired most of his practical knowledge in the coffee fields by observing and participating in various activities on his father's and grandparents' farms. Besides this, he also worked as *peón* (a non-skilled labourer) on other coffee- and sugarcane farms. Daniel believed that his close relationship with agriculture made him especially aware of *cambios climáticos*,³² (climate change), which, according to him, started about forty years ago.

Daniel: “Before, the seasons were more clearly defined by a summer that lasted for about three months, with an abundance of sun, and very little rainfall. Now however, the weather is constantly changing, and the sun is stronger than it ever was.”³³

³¹ Without necessarily saying *cambios climáticos* (climate change).

³² His own words.

³³ Anderzén's (2015) informants also connected increased rainfall and climate changes to the sudden epidemic.

Isabelle: “How do you think this might affect agriculture in this region?”

Daniel: “Well, [scratching his head while glancing at the view from his plantation] changes in weather force us to adjust ourselves. For instance, my father cultivated rice, beans, corn and coffee among other crops. However, when the weather started changing frequently and the summers got shorter, he had to adjust. After a while, he had to leave the production of beans because of their delicacy to rainfall. Later, he also stopped cultivating rice and corn due to more frequent changes in weather. You can also see the effects on the *cogollo*³⁴ of the coffee plants, especially during the *canícula* in June. That’s when the sun is at its strongest, and it’s rainy and sunny interchangeably several times in one day. During rainfall, water is collected on the *cogollo*, which is then heated up by sunbeams. The hot water burns the *cogollo*, leaving it without *brillo* (shine/foilage). *Canícula* has always existed, but the problem now is that the sun is stronger, thus burning the skin of the plant, just as it burns our skin. [He pauses]. I guess I’m just afraid that cultivation of coffee might suffer the same fate as other agricultural products in the future.”

Isabelle: “Do you see any correlation between the climatic changes and the development of *roya*?” I asked, fully conscious that this might be a leading question.

Daniel: “You see *roya* feeds on humidity. One day it might rain, the next day might be sunny and then it might rain again, or both the same day. What these regular changes do is creating a very humid environment in the plantation, making it difficult to fight *roya*.”

When asked how he adapted to increased humidity, Daniel emphasized the importance of managing shadow. “If you don’t know how to manage shadow you may risk losing yield, partly due to *roya*, but also because the coffee plants need sunlight in order to flower and produce coffee beans. As important is having good shadow on your plantation.” When talking about shadow, coffee farmers seemed to distinguish between good and bad shadow. Everyone agreed that the tree *poró* (*Erythrina poeppigiana*) provided the best shadow for cultivating coffee, saying that coffee and *poró* coexist. *Poró* is easy to manage, it acquires humidity from the soil

³⁴ *Cogollo* is the upper part, or tip of the coffee-plant.

and its leaves provide the soil and the coffee plants with nitrogen. Farmers disagreed to some extent whether or not shadow from plantain and banana trees was good. Some thought *poró* was the only good shadow, while others believed shadow from banana/plantain trees was good because they absorbed water from humid soils. Furthermore, they provided the farmers and their families with plantains and bananas for their personal consume.

Conversely, all coffee farmers categorized the tree, *laurel* (*Cordia alliodora*) as bad shadow. This was because of its great altitude, its extended roots, which they thought stole nutrition from coffee plants, giving the coffee's roots less space to develop (or as some said, making it uncomfortable for the coffee plants). However, its height was the uttermost problem. During rainfall, raindrops would fall from the trees and onto the coffee leaves. Not only did this damage the leaves causing them to fall, but could also contribute to spreading coffee rust. Coffee farmers believed that when raindrops fell down on a rust-infected plant, the *herrumbre* (yellow dust) might be scattered onto other nearby plants. For this reason, several of my informants had decided to cut down *laurel* trees on their plantation. For scientists, effects of shadow on coffee rust remain controversial (Avelino and Rivas, 2013).

Upon arrival to the plantation to one of my key informants, Andrés, I witnessed a pile of trunks of trees. He told me that he and his son Martín had started cutting *laurel* about two years ago, because of its undesirable qualities, but more importantly because of high incidences of *roya* on his farm. One day, his neighbour walked by, and Andrés commented on how he had lost his plantation to *roya* due to excessive and bad shadow. When I got the opportunity to talk to Andrés' neighbour myself, he explained that he was aware that excessive *laurel* shadow had led to the demise of his plantation. However, he had planted *laurel* trees decades ago to eventually sell the wood. Another key informant, Sergio, also took the opportunity to rid himself of *laurel* and in favour of *poró* while renovating half of his plantation. Although several farmers told me that this tree provided bad shadow, they did not plan to cut them down. Rather, they were planning to sell them for their wood. *Laurel* is considered a good type of wood, and a person might earn a fair amount by selling it. Others however, decided that the trees were too big, and by cutting them, they would risk damaging a great deal of surrounding coffee plants.

“Tacit” knowledge

Despite the discovery of the stratospheric “ozone hole” in 1987, it was not until the 1990’s that climate change emerged as a political issue (Bodansky 2001:23-24). Since that time, statements about climate change have become more widespread among dominant global accounts. Although such statements previously were not common, that does not imply that farmers did not experience climate change and its effects. As noted, Daniel contended that climate change started 40 years ago, when his father had to start adapting and eventually leave the production of certain agricultural crops. As issues of climate change were not on the prime political agenda at the time, according to Bodansky, one might suggest that perceiving is closely related to engaging *within* the environment (Ingold, 1993a). As illustrated, experiences of *roya* as destructive were one of the two-way processes in producing conceptions about *roya* as *brava*. Farmers’ *local* perspectives from *within* then, might be said to make them particularly prone to observe and experience changes in the environment they surround themselves in on a daily basis. Most of my farmer-informants had acquired knowledge by observing, imitating and participating in daily maintenance practices with their fathers. This knowledge has continuously been passed on as a type of heritage, for multiple generations. Sitting on such valuable and ancient knowledge, Daniel told me “A farmer is a great agronomist,” referring to an incidence when he “outsmarted” a couple of them.

About five years ago, Daniel experienced an unusually low coffee production in one area of his farm, and he noticed how many of the coffee leaves were yellow. Unsure of what the cause might be, he contacted some agronomists to come visit his plantation, to give some advice. During the visit, they took samples of the soil for an analysis. Upon receiving the results, the agronomists concluded that the soil was lacking in certain nutrients. As to solve this, they gave him a list of recommended chemical products. Daniel, however, did not believe that chemicals were necessarily the solution. Neither was he particularly interested in spending a great deal of money on them. Subsequently, he decided that the problem could be very humid soils. By looking at the type of weed growing in different areas of the plantation, he could tell whether a certain area was humid. A certain type of weed only grew in humid places, he claimed, thus providing him an indicator of what might be the issue. He started digging holes in the soil, making channels. This was a practice his father had taught him, who himself did it to control *ojo de gallo*. Despite being more time consuming than that of scientific practice, which “located” the problem through inscription devices by running soil analysis, Daniel chose to rely

on his fathers' technique to save money. Upon digging, great amounts of water came pouring out, as he suspected. After some time, the coffee plant composed itself. When he told the agronomists that he managed to solve the problem without using chemical products, they were surprised. He was laughing and smiling while telling the story.

Daniel: “Although they’re *ingenieros* (agronomists), they don’t always know best. This is because they read and study books, take classes and so on. They don’t learn by experience like we have. I picked up much knowledge from my grandparents and my father, but more importantly from experimenting with the plants and different varieties of coffee during decades. The plant itself teaches you a great deal, which is why agronomists sometimes make mistakes.”

By observing and imitating his father and grandparents' management techniques in cultivating coffee, the knowledge and manner of relating to the environment has become embodied as *habitus* (Bourdieu, 2007). Moreover, Daniel's account illustrates a personal awareness that practical knowledge or what Ingold (1993c) refers to as “knowledge how”, or technique can only be learnt by doing: Not only did his ancestors teach him such knowledge, but also the coffee plants that respond differently to various management practices. Likewise, Müller (1996) denotes this knowledge as context-dependent and “tacit”, in that it cannot be materialized through language. By “reading” signs in the environment (yellow leaves and type of weed), Daniel understood that he was dealing with humidity. Hence, farmers might find other solutions rather than relying on chemicals, i.e. by “reading” signs in the environment in a manner different to that of agronomists. This might also explain why some farmers believe certain chemical products to harm the environment and coffee plants.

The ambivalence towards chemical products

Chemical products was a controversial theme among smallholders. By chemical products, I mainly refer to fungicides, herbicides and fertilizers. Not every coffee farmer used all the mentioned chemical products, except fertilizers, which in general most believed to not harm the environment. Overall, coffee farmers viewed herbicides as one of the products that might have negative effects if used incorrect or in abundance. When talking about fungicides, I found that several held ambivalent opinions, whereas others held a more positive attitude. Yet everyone,

in all ages, kept referring to what I will argue (chapter five) to be a nostalgic past, in which farmers used little or no chemical products. Since that time until now,³⁵ coffee farmers are experiencing a continuous decline in yield and increasingly more coffee diseases. Several farmers believe chemical products to be an important factor.³⁶ This is paradoxical, since certain chemicals are supposed to combat diseases. Why do farmers hold such an ambivalent attitude towards these products? In the following, I will try to answer this, by referring to farmers' experiences with chemicals.

Among other informants, Andrés thought that the increased use of chemical products might have contributed to an increased amount of diseases, and most importantly the catastrophic *roya*.

Andrés: “Look, I’ve seen plants get as old as a hundred years old. [He reached out to grab a coffee plant with few leaves and dry branches] This plant right here is about 40 years old. Nowadays coffee-plants don’t get as old as they did before. They’re worn out more easily and lose their strength. Just like humans. Before people grew older, but now they die younger. I think this is because of all the chemical products we consume. Tomatoes, corn and all types of vegetables are full of these and food additives. I believe people get diabetes and cancer because of this. When it comes to coffee, it is exactly the same issue. Before people didn’t use chemical products, and they didn’t have *roya*. Now, people are accustomed them, and we have serious problems with *roya*. *Roya* is like a cancer for the coffee-plant, just as cancer is for the human body.”

Farmers referred to chemicals as not natural, and therefore they might produce negative effects on the environment. Such ideas might be linked to what Latour (1993) labels the work of purification of nature and culture. By treating “natural” and social phenomena as separate, we consider chemicals to be antagonistic to nature, i.e. they do not emerge from nature itself. Moreover, chemicals might be analysed as what Douglas (1979) refers to as “matter out of place”. Chemicals do not “belong” in the category of nature, and thus they might be perceived as “dirt” and potentially dangerous. Despite this, farmers are now dependent on chemical products to enhance coffee yield and keep diseases at bay, as Mario explained.

³⁵ When asked about an approximate year, coffee farmers and non-farmers were very vague.

³⁶ Anderzén (2015) found that farmers in Chiapas, Mexico, considered agrochemicals to be related to the sudden rust-epidemic.

Mario: “Before we only used a knife to maintain an entire *finca*. If it still were like that, it’d be wonderful, but unfortunately it’s not. Nowadays we use a great deal of chemical products. All chemicals are harming the environment and one’s personal health. But what’s a person to do? Sadly, we’re dependent on them to continue cultivating coffee. The soil is far from as productive as it once was.”

I observed that several farmers still attempted to keep a balance between chemical and ancient practices to maintain their plantations, especially regarding the removal of weed. The purpose of removing weed is to allow air circulation and preventing a humid environment in the plantation. To do this, farmers used both herbicides and traditional techniques using a knife, as their ancestors did. In the process, farmers were applying both *globe* and *local* perspectives. Most farmers agreed that excessive use of herbicides would burn the plant’s small, thin and white roots on the surface of the soil. They referred to these roots as the “future” and “life” of the plant, indicating that this life would be negatively affected if it were to be exposed to *veneno* (poison).³⁷ Some claimed that excessive use of *veneno* would sterilize the earth and “steal” its nutrients.

Alejandro claimed that herbicides not only removed *malezas* (bad things, i.e. weeds), but also *buenezas* (good things). To avoid losing *buenezas*, Alejandro used a small amount of herbicides in the middle of the *calles* (“streets”) between the coffee plants. In this manner, he would not come too close to the roots on the surface, located in the proximity of the coffee plants. Additionally, he would apply an ancient technique called *chapea* or *palea*, which are different techniques for cutting and gathering weed using only a knife. Afterwards, he would use this weed as organic fertilizers, by allocating it over the small roots, thus providing “food” and indirectly life to the plant. However, *chapea* and *palea* are very time-consuming and it only takes weeks before the weed grows back again, compared to herbicides, which can last for up to two to three months farmers claimed. For this reason, farmers are increasingly relying on herbicides, which is more efficient and requires less time investment. Another important point is that many complained that herbicides produced a specific type of weed that could only be removed by rooting it up manually. The fact that the product that was supposed to remove weed,

³⁷ Farmers referred to herbicides and fungicides as *veneno*.

rather produced another type of weed in the process, might explain farmers ambivalent attitudes towards chemicals.

The ambivalence towards chemical products among farmers might be compared to the controversy over the sonar among fishers and local marine scientists in Turkey that Knudsen (2009) discusses. In short, fishers believe that the sonar harms the fish, while the latter and some fishers believe that the sonar does not harm fish, referring to a diving experiment, which allegedly proved this. On the other hand, most fishers disagreed with how the experiment was set up, criticising that the divers wore wetsuits, which did not allow sonar pulses to pass through (Knudsen 2009:184). My point is, just as fishers believe that the human body's reaction to the sonar pulses is an indicator of how fish bodies are affected, so might farmers' previous experiences with certain fungicides and their bodies' reactions to it provide a good indicator of how these might influence the coffee plant. On several occasions, I heard stories of how fungicides in the past were very poisonous for humans. Apparently, people got yellow stains on their skin and many people died from using them. Consequently, these were prohibited due to their venomous character and their environmental hazard according to Sergio. Still, the products used to date are not free of toxins. When fumigating, the person in question is required (by the instructions on the bottle) to use protective gloves, a mask and goggles to prevent contamination. Thus, farmers' ambivalent thoughts about chemical products, in particular fungicides and herbicides, might be based on human-plant analogy. If humans should shield themselves from such products, it might be reasonable to think that coffee plants should too. "*La mata es como uno* (The plant is like oneself)", farmers frequently said. If it receives excessive amounts of food or medicine, the plant will die, just like any human, they claimed. Scientists on the other hand, talk about plants using scientific terms, which arguably are more detached from the body (compared to what I will illustrate below). References to the human body was quite common among farmers, which is why this theme requires a closer examination.

The coffee plant as human body

When farmers explained processes in coffee cultivation, and talked about diseases such as *roya*, I noticed how they all commonly referred to the human body, both in its physical and emotional aspects. Occasionally, it seemed easier for them to explain *roya* by using the human body as a referential framework, thus connecting it to the realm of plants. For Jackson (1983) the human

body is our first and primary world of meaning. He emphasizes that our key metaphors of social life are bodily metaphors. When speaking about *roya* and the coffee plant, common metaphors included feeding, medicine, fever, headache, happy, and bored. Like *roya*, the plant too is ascribed an active agency of their own, by having human-like needs and feelings. After having fumigated some parts of his plantation, Alejandro complained that it seemed as if the strong chemicals were damaging the coffee plants. “It’s especially visible straight after spraying.” He grabbed the *cogollo* and said, “They look like they’re bored.” When asked what he meant by bored, he illustrated how the leaves on the *cogollo* were withered and had not opened themselves properly as they should. He then brought me to another plot on his farm, which still had not received chemical treatment. Presenting me another coffee-plant, he exclaimed; “Look here, this plant is happy!” Its leaves on the *cogollo* were more open, and looked generally healthier than those that had received chemical treatment. What is peculiar, he told me, is that the plants sprayed with fungicides, return to their “normal” (open and happy) condition some days later. Nonetheless, the coffee plants’ reaction to the chemicals strengthened his belief that



fungicides might not be healthy for the plants.

Figure 3.1. Cogollo

The *cogollo* of a rust-resistant plant (*Catimor*). The “cinnamon-coloured” leaves in the middle/top of the plant here characterizes the *cogollo*. In a “happy” condition.

Asking coffee farmers what *roya* is, proved not to be very fruitful. Their answers normally referred to *roya* as a fungus without elaborating any further. To grasp their underlying comprehensions, I was continuously rephrasing my questions. After some time, I was surprised to find how inquiring about management practices generated exciting insights to a complex set of beliefs about coffee leaf rust. During an interview, I asked about management practices when the conversation

took an unexpected, but intriguing turn. 58-year-old farmer Diego told me that he normally would invest in both fungicides and fertilizers. However, he still experienced great yield losses the last couple of years because of *roya*, especially in the 2013-14 harvest. He estimated that he lost about 30 to 40% of his total yield to *roya*. For now, he did not intend to invest in fertilizers.

Diego: “If there’s no harvest, then it’s just stupid. Why invest in an activity that doesn’t give anything in return? A neighbour of mine did exactly this, and he still has just as little harvest as he did before he started fertilizing his plantation [He paused]. You know, an ill person doesn’t eat.”

Isabelle: “Could you explain?” I asked curiously.

Diego: [He paused] “*Roya* is like a strong flu. You see, the plant has a fever inside that it needs to get rid of by taking medicines to regain its strength. Only then can it start to eat normally again, just like us when we are ill. That’s why I plan to fumigate this year, to get rid of the fever, and then start feeding the plants again next year, if God will.”

Diego was one of numerous coffee farmers who spoke of *roya* as a fever or a flu. The pauses he (and other farmers) took before explaining *roya* using the human body as analogy, might indicate that he was searching for words to describe a phenomenon to which he daily relates. Unlike farmers, agronomists have a vast array of scientific concepts available formulated in language when explaining *roya*. This again might be related to the *globe* perspective of *seeing as*³⁸, that is, a distant observation of *roya* detached from socio-cultural life. Although agronomists engaged with the fungus in coffee plantations that were used to monitor diseases such as *roya*, their manner of relating to the fungus was usually through various instruments used to measure diverse units. Thus, agronomists might be said to approach *roya* in an objective manner.

Farmers on the other hand experience and engage with coffee rust through everyday practices of *being-in* the world. Many of these practises are “tacit knowledge”. As Müller (1996) argues, such knowledge is difficult to convey or acquire verbally. With this in mind, there exists an issue of what is convertible into language. For farmers the language spectre for talking about a

³⁸ Ingold (1993a).

fungus that for many is a relatively new phenomenon might be limited. This leads to a search for words and concepts in a more familiar domain, connected to experiencing through the body, or “embodiment”. Johnson introduces the concept “embodied reason” in his argument that “[...] our conceptualization and reasoning are grounded in our embodiment, that is, in our bodily orientations, manipulations, and movements as we act in our world.” (Johnson, 1999:81). Thus, by “embodied reason” Johnson seeks to connect the body to the mind in order to explain how we make sense of and conceptualize things. By focusing on the cognitive unconscious level as one of the three levels of embodiment, he shows how cognitive mechanisms and structures are grounded in patterns of bodily experience (Johnson, 1999:82). Metaphors, mental images and concepts are all connected to bodily experience and practice. Hence, because of farmers’ experiences in acquiring knowledge with the body, and using their body actively in everyday management practices, the body functions as a familiar domain, which they draw upon to make sense of what is a relatively unfamiliar phenomenon.

Another important point in talks of, and dealing with *roya* was the continuous shift in relating to the coffee plant as a subject and an object. Diego used a human analogy when talking about *feeding* and giving *medicine* to the coffee plant. The language he acquired suggests that he was talking about the plant as a subject. His actions on the other hand, using technological products to take care of the plant might be said to approach it as an object. Somehow, he was distancing himself from the plant by not engaging directly with it, but rather through products developed by science. Thus, he might be said to shift between *being-in* (through talking about the plant as a subject) and *seeing as* (by adopting technologies developed by science). Similarly, as already noted, farmers try to combine both technique and technology in their daily management practices, to save time, but also to create a balance between chemical and traditional practices to maintain their plantations, especially during weed removal. From this point of view, categories of technique and technology, *being-in* and *seeing as*, subject and object are blurred in farmers’ management practices. I will return to this issue in chapter four. For now, I will continue to religious perceptions of coffee rust.

Religious perceptions

On various occasions, I experienced that farmers referred to God when speaking about agriculture and *roya*. One hot sunny day, I was assisting Sergio and Juliana in cleaning weed,

when I mentioned that another farmer told me that he saw a connection between *roya* and the Bible. They giggled, and told me they were uncertain, but that perhaps those who read and practiced the Bible knew better. “If someone were to think like that they would turn crazy!” Sergio claimed. Knowing that Sergio never went to church with Juliana, I seized the opportunity to ask her alone, while we were sitting conversing outside their house. When asked again if God might influence agriculture, and coffee in particular, her response was quite different.

Juliana: “Oh yes! The Bible says that humans themselves are going to destroy the earth. We cut down more trees, we have problems with draught on the Pacific side of the country and we cultivate the soil until it is exhausted. We’ve had problems with *ojo de gallo*, *broca* and *roya*. A disease of some kind always appears. This is *his* way of testing us, to see how we handle hardship. God controls everything. I just try not to think too much about it.”

What I found to be common for everyone I talked with (independent of their religious affiliation), was that they frequently started or ended a sentence saying “*Si Dios quiere*” or “*Si Dios lo permite*” when referring to, or speaking about the future.³⁹ However, only four of my farmer-informants shared religious understandings of *roya*, that is, ideas that the recent epidemic was God’s way of “testing” or “punishing” them.⁴⁰ Such comprehensions coexisted with others, such as coffee rust as consequence of climate change, and/or of chemical products, among other explanations. During an interview with Mario, he was talking about chemical products and their plausible effects on the environment. Then he continued talking about global warming, referring to a gathering held by ICAFE, which we both attended. Suddenly, the conversation suddenly shifted to religion.

Mario: “Humans themselves have produced this phenomenon, also *El Niño*. We’re the reason why we’re having a thinning ozone layer and stronger sunbeams. But you know what? [Pausing] Everything the Bible says is going to be fulfilled.” [He continued by referring to Revelation 16, saying that some of this prophecy had already been fulfilled.] “The Bible says that the sun got so hot that men were burned by its great heat. You see!

³⁹ Future meaning everything from tomorrow, to months or years.

⁴⁰ Some of Anderzén’s (2015) informants expressed similar perceptions.

In Costa Rica, many people suffer and die from skin-cancer. And just like cancer, I believe that *roya* and war are among the many signs of the world's end.”

When asked to explain why we (humans) were to blame for a thinning ozone layer, he listed cars, chemicals, litter and similar things that he believed to pollute the environment. Andrés and his son Martín shared similar accounts. They were both convinced that coffee rust was a sign of the world's end. Simultaneously, they did not reject explanations of *roya* as consequence of climate change and increased use of chemicals, which they believed had great influence. However, such explanations were considered as God's will. Hence, this suggests that farmers might embrace multi-layered comprehensions of *roya*. In fact, one might speculate whether religious perceptions of *roya* have emerged within a more uncertain context that coffee producers currently find themselves in (chapter five). In moments of uncertainties, it is often believed that people turn to higher powers, hoping for better times to come.

Concluding remarks

This chapter showed the utility of adopting Barth's (1994) analytical levels. Initially, I built on chapter two in order to disclose how *roya* emerged as a social phenomenon, and was given new meanings in the process (from *calma* to *brava*). Building on Mol (2002), I presented how this was a two-way development. First, it was a top-down process; various measures to combat coffee rust and the increased attention in media on macro level, together with the involvement of agronomists and conveyance of scientific knowledge in rust issues in ICAFE gatherings on median level were integral in *enacting roya* as “wild”. Second, it was a bottom-up process, meaning that farmers' experiences with coffee rust too were integral in perceiving it as “wild”. In doing so, I uncovered more than one disease. From farmers' perspective, *roya* was “yield losses” and from agronomists' standpoint, *roya* was “two new pathogen species”. Simultaneously, this approach made farmers' notions of “*Antes no habia enfermedades*” comprehensible in light of their different experiences with various diseases, and the amount of attention, “talk” and involvement of agronomists in such issues. For several farmers, their statements about “no diseases” in fact meant that they could easily live with them, without them doing significant harm. In turn, “bad” diseases, like *roya* became in the recent years, were experienced as destructive, which was reflected in massive yield losses.

Furthermore, the application of Barth's (1994) levels unveiled how scientific statements about climate change from a *globe* perspective were transferred to the micro level. However, as I have argued throughout the chapter, farmers' *local* perspectives of *being-in-the-world*, that is, of experiencing changes in weather and environment over decades, might mediate and supplement the statements of scientists. The argument was further strengthened by farmers' ambivalent attitudes towards chemical products, which they perceived to affect the coffee plant in both negative and positive manners, revealed by the plants' appearance of being "happy" or "bored" to name an example. Conversely, such statements were non-existent on macro and median levels. I exemplified how farmers and agronomists categorized *roya* differently due to their different manners of acquiring knowledge: whereas farmers spoke of *roya* by using human-plant analogy, agronomists spoke of it in more "detached" and scientific terms (e.g. anomalies, species). Finally, I briefly exemplified how farmers are shifting between *being-in* and *seeing as* (Ingold, 1993a). The following chapter will further discuss how the contemporary farmer is constantly shifting between categories of *local/globe*, *technique/technology*, and approaching the plant as a subject/an object.

“Modernizing” the *Tico* Coffee Farmer: Knowledges and Power Effects

As people arrive to the gathering, I wonder how many will attend. It is my first time participating in such an event, and I am excited to observe local farmers gathered in one function, interacting not only among themselves, but also with agronomists. The lack of coffee cooperatives in Turrialba practically make such happenings the only means to unite local coffee farmers. I am sipping a cup of coffee as I talk with Alejandro about how this function will evolve, since we both are first-timers. I notice how Alejandro is freshly shaved and that he and other farmers are wearing clean t-shirts or shirts, jeans and shoes rather than boots, which they normally use when working coffee fields. I get the impression that they have dressed up for the occasion. Usually, I observe farmers in the fields with several spots on their clothes, which often is a result of working with chemical substances. This was not the case today.

After a while, agronomists Adolfo and Carlos welcome everyone and invite us inside *La Casona* for a *charla*. As people enter the room, Adolfo, Carlos and several farmers greet each other by first name, shaking hands, as if they are somehow good acquaintances. Everyone finds a seat, before Adolfo and Carlos present an agronomist named Kevyn.⁴¹ He is here to organize an activity in the coffee fields. They tell us that one learns best by doing, which is why they are organizing a *Día de Campo* (day in the field). By using power point slides, Adolfo and Carlos present the agenda before briefly talking about optimal conditions for fumigating, contending that knowing when to spray is challenging in a tropical zone such as Turrialba. Climate changes, they say, provide an additional challenge to this, due to increased rainfall.

Following the brief *charla*, they present a short film about how to spray, and how to achieve optimal coverage of a plant. After the film, we all grab a copy of the booklets⁴² stacked on a table next to the exit. Next, we jump into ICAFE’s pick-up trucks that transport us to CATIE’s

⁴¹ Kevyn is a pseudonym.

⁴² The booklets were “*Recomendaciones para el Combate de la Roya del Cafeto*” (Recommendations to Combat Coffee Rust) and “*Guía Técnica para el Cultivo del Café*” (Technical Guide for Cultivating Coffee).

coffee plantation only a couple of minutes later. The activity itself takes place at the very entrance of the plantation, on a road consisting of pebbles, which divides the plantation into sections. The continuously burning sun is bringing out the beautiful green colour covering the lush plants. By the instant look of it, it does not appear as if coffee rust has been ravaging here, unlike the plantations of my key informants, which have several plants with less leaves, many of them with yellow spots. I observe how several farmers walk straight to some of the nearby plants, to study the inferior side of the leaves. Some pick them off to observe them closer, while others continue revising several adjoining plants. Suddenly, one of the farmers studying the leaves speaks out loudly, “Here they spray every third day!” Everyone around join him in laughter.

While people are seeking shadow by the plants, agronomists and some farmers assist in lowering blue plastic barrels filled with water from the pick-up trucks. Kevyn sets up a whiteboard on the pebble road separating, facing the people who have gathered themselves by the plants. Meanwhile, I introduce myself to some of the farmers. Several faces seem somewhat familiar to me, and I spot Anthony whom I recently interviewed. People are quite eager to talk to me, to uncover the purpose of me being there. I find that a couple of farmers are actually working as *peones*, unskilled labourers in this exact coffee field. Others are predominantly smallholders in various localities in Turrialba. Many of them know each other, either as neighbours or through such gatherings.

Kevyn starts handing out a staple of sheets of three pages to each participant. The first page of the staple has a small note attached to it, with a table on. After a closer look, this table is supposed to be used to gather a sample of coffee rust in the coffee field. To do so, one has to count and register the total amount of leaves on altogether twenty plants, and record the number of leaves with coffee rust on them. The first page emphasizes the necessity to regulate amount of products and water used to spray an area, and steps in procedures of how to regulate this. The next page shows an empty table which we are supposed to fill in during the activity. Finally, the last page contains various examples of how to calculate the ratio of chemical product and water used per hectare, per pump or per barrel.

Kevyn starts explaining the sheets, saying that the goal of the activity is to calculate amount of liquid used when spraying with manual pumps and motor pumps. He divides about twelve persons into two teams. Alejandro volunteers to participate, and is very eager to show everyone

how he goes about spraying. One team will use the traditional manual pump, a type used by most, if not all smallholders who use chemical substances in liquid form. The other team will use a motor pump, which allegedly is more efficient. Both teams are each allocated a row of 25 plants, and each person on both teams is asked to spray both sides of their respective rows in turn. Every time a person has sprayed the row, Kevyn measures how much liquid is wasted on both teams. Then, he registers the numbers on a table on the whiteboard, similar to that of the table on the staple of sheets we received. During the entire activity, the atmosphere is lively as people are making small joking comments to each other about their spraying skills.

Only a couple of farmers and I are taking notes on the papers we were given. At the end of the activity, Kevyn concludes through calculations on the whiteboard that the motor pump wastes less liquid than did the manual pump. However, he claims that the differing results to some degree might be due to uneven topography in the two areas of the rows, and differing individual techniques for spraying. He continues explaining that many farmers have a tendency to blame ineffective products. However, he says that this is not true, and that the farmer is responsible, often mistaking in amount of chemical products and water, application techniques, time of application and such. At the end of the activity, Kevyn mentions that he has attached some sort of paper on top of some plants on each row, which will turn from yellow to blue if they come in contact with water. Apparently, the paper on the side where farmers used a manual pump is still yellow, whereas the paper on the opposing side where a motor pump was acquired has turned blue. This is one of the problems when using manual pumps, he claims. Quite often, only two-thirds of the plant is covered, allowing *roya* to develop and disperse.

It is finally time for lunch, and everyone is transported back to the outer area of *La Casona*. Agronomists sit on a table together with some farmers, whereas others are spreading themselves in groups on several tables, chatting and joking with each other. I sit conversing with Anthony and his wife, Alejandro and some other farmers. At the end of the meeting Adolfo and Carlos summarize by thanking everyone for coming, while emphasizing the importance of standing together to fight and control *roya*; “We must unite ourselves,” says Carlos. He continues reminding us how the climate has changed throughout the years, and still is changing, that diseases are continuously emerging and that *we* have to change accordingly, adapting to such alterations. He mentions that farmers previously cultivated coffee varieties such as *Hibrio*, *Villalos*, *Arabiga*, then changing to *Caturra* subsequently. Nowadays farmers are getting rid of

Caturra because of its delicacy to coffee rust. “Times are changing and we have to change accordingly” he summarizes, leaving me in deep thought.

After the gathering, I accompany Anthony and a small group of farmers to the roadside to wait for the bus. Meanwhile, they talk about plans for renovating parts of their respective plantations, and debating whether the new coffee variety, *Obatá*, which ICAFE is promoting, is the best to replant. As they talk about previous experiences with different coffee cultivars, Anthony mentions that an acquaintance of him said that *Obatá* does not produce as good as certain other cultivars do. Despite this, Anthony tells us that he has decided to replant with this type, due to its alleged resistance to coffee rust. One of the other farmers is rather sceptical to the new variety, and will rather wait and discuss with other acquaintances about their experiences before planting it himself. As the overly crowded bus arrive, I quickly register a couple of their phone numbers, to proceed talking with them on another occasion.

Aspects of vision

This chapter will discuss the following question: How have various measures of controlling *roya* affected farmers’ coffee management practices more generally and the manner in which they approach coffee rust? In doing so, I will adopt Okely’s (2001) and Scott’s (1998) notions of vision respectively, to highlight my argument that it is erroneous to contrast farmers’ and agronomists’ knowledges, by contrasting them and treating them as absolute oppositions. Conversely, what prevails in farmers’ management practices is a continuous shift between technique/technology, approaching the coffee plant as a subject and an object, local-/global perspectives. These continuous shifts might be partly due to the rust-epidemic, as increasingly more farmers started fumigating, whereas others started doing this more regularly than before 2012-2013.

After the activity, I wondered if farmers would actually appropriate the method of measuring incidences of coffee rust in their respective plantations. I talked both with farmers who participated in the gathering, and with those who did not. Everyone agreed that they did not appropriate the method. When asked when they would know that it is time to apply fungicides,⁴³ Luis and my other key informants would laugh at the agronomists’ time-consuming method,

⁴³ They would always answer that they would have to wait for *verano* (no rain).

saying that they would rather *see*, but often having difficulties in explaining exactly *how* they see without showing me some coffee plants. This might be linked to the non-verbal manner they acquire knowledge, and the lack of linguistic concepts to describe an activity which is intrinsically “tacit” (chapter three). In the following, I draw upon Okely’s (2001) distinction between *looking* and *seeing*, the former being linked to the distant gaze similar to that of Scott.⁴⁴ *Seeing* on the other hand is a way of understanding through an embodied experience that engages all the senses with the body as a memory (Okely, 2001:103-104). I will now elaborate this point by describing how Luis engaged his body and senses to *see*.

We sat outside Luis’ small yellow wooden house, waiting for the heavy rainfall to cease, as he tried to answer my question about when he would know that it was time to apply fungicides. Suddenly, he rushed up of his seat, putting on his muddy boots and tying a large black plastic bag around his neck, while asking me to join him to his plantation. We passed some lemon and guava trees before he finally stopped next to a coffee plant slightly taller than him. Luis grabbed the upper part of the plant, and bent it over to observe the underside of the leaves. He picked off a leaf, let go of the plant and showed that it was covered by multiple yellow spots in various sizes. “You can’t see that many *brotos* (spots) on top of the leaves”, he said. Then, he swooped his rough thumb across the *brotos* using his nail to rub one of the yellow spots. “Look”, he said, showing me his finger and the orange dust that had collected itself below his nail, “We call this *herrumbre*”. He explained that this orange powder was what spread the disease, infecting nearby plants. He brushed the powder on his brown worn-out pants, while asking me to hold on to the leaf as he guided me through the wet coffee plants to another part where he had applied fungicides. Luis stopped by another plant, doing the same procedure. Now however, no powder collected itself underneath his nail. “When you spray you stop *roya* from spreading. The *veneno*,⁴⁵ poison removes *herrumbre*”, he said comparing the underside of the two infected leaves.

As other farmers, Luis had to engage with the coffee plants to explain how they *see*; using his body and his senses to explain the condition of coffee rust. He had to approach the plant, *look* at its leaves to *see*, use his fingers to touch and feel if any powder was covering the *brotos*, small spots underneath the leaf, as a sign of *roya*. As noted, most farming practices are “tacit

⁴⁴ See chapter one for comparison of their different meanings.

⁴⁵ Referring to fungicides.

knowledge” learnt through engaging the body and senses. Moreover, there exists a limitation as to what is convertible into language. This might disclose why farmers had difficulties in explaining how they know when to spray, without approaching the plants. When farmers investigated the leaves on CATIE’s coffee plantation, they did so to estimate the amount of rust by *seeing*. Similarly, as explained in detail in chapter three, Daniel was *seeing* that the soil was very humid by engaging his body and his senses to resonate with the familiar environment: seeing the particular type of weed growing in the area and touching and feeling the soil with his hands. The agronomists who came to visit his plantation on the other hand, concluded through soil samples that the soil was lacking in certain nutrients, giving him a list of recommended chemical products as to fix the problem. This might explain why farmers like Daniel sometimes doubt agronomists’ scientific methods of *looking* as opposed to farmers’ more practical, engaging and embodied methods of *seeing*.

On one occasion, I commented to Carlos that it seemed like the number of participants differed significantly from when they only held a *charla*. He agreed, saying it might be more interesting for farmers to participate in activities, rather than listening to other people talk. Generally, there exists a conception that farming is not a type of knowledge that is conveyed verbally. Rather, the body is the prime medium for understanding the environment and for acquiring such knowledge. Indeed, this is because most farmers have acquired their knowledges in cultivating coffee through observing and imitating their parents’ movements and manner of relating to the environment. This might explain why Daniel was rather sceptical of agronomists’ methods of *looking*, which are linked to a type of knowledge that is predominantly conveyed and acquired verbally. Furthermore, Carlos’ comment that “One learns best by doing,” indicates an awareness about farmers’ practical ways of acquiring knowledge, which might explain why they chose to present particular technological practices in what is perceived a familiar setting for farmers. Nonetheless, the activity itself however poses a paradox. It is set up to be practical, aiming towards how smallholders best acquire knowledge in order to attract more participants. On the other hand, they are presenting another type of knowledge, namely a technological one, in that farmers are explained how to count and calculate, rather than *seeing*, which a significant number of smallholders do in order to know when it is time to not only apply chemical products, but also to do other maintenance tasks.

In functions organized by ICAFE, farmers encounter knowledge based on technology, which is arguably more detached and unfamiliar (*globe* perspective), compared to practices learnt

through technique by doing and observing (*local* perspective), which subsequently has become part of farmers' *habitus* (Bourdieu, 2007). According to agronomists, it is necessary to apply fungicides prior to seeing yellow spots, which is why they are interested in attracting more farmers to join gatherings. Many farmers on the other hand complained that the donated products they received to fumigate did not work properly or did not suffice. According to them, everybody received only a couple of bottles from ICAFE regardless of the size of their plantation. Thus, producers with larger plantations would not be able to cover their entire *finca*. Furthermore, agronomists explained that farmers often waited too long before applying fungicides, which according to them, might explain several smallholders' belief that the products did not work or were of substandard quality. Thus, from agronomists' perspective, *seeing* poses a problem when referring to the technical development of the fungus' cycle. Due to this, they were arranging activities in order for farmers to learn how to measure incidences of *roya*, and when and how to apply fungicides, which is integral in controlling the disease.

“Times are changing and we have to change accordingly”

The above example is but one of several gatherings focusing on how to combat *roya*. An emphasis on knowledge of fungicide practices is considered an increasingly important issue in controlling the disease. This is especially since a significant amount of smallholders did not have the habit of fumigating, or had limited knowledge of this prior to the 2012-2013 epidemic, according to agronomists and local coffee farmers. As explained in chapter three, some simply did not have faith in such products, whereas others did not find these necessary prior to the epidemic. The economic aspect also played an integral part, due to the products' high costs. Through interviews, I learned that ten of my farmer-informants did not use fungicides prior to the epidemic. They only started fumigating after receiving the donation of fungicides from ICAFE, when the epidemic was at its peak. Another five applied fungicides once or twice a year before the epidemic. The remaining seven applied these irregularly: some sprayed one year, and not the next, whereas others sprayed periodically (i.e. when they had the money to do so). In the following, I argue that the donation not only was an attempt to control *roya*, but it was also one of several measures in a greater agenda of “modernizing” smallholders' management practices, by promoting technologies or practices that would minimize diseases, the foremost currently being coffee rust. Such technologies and practices were further promoted in *charlas* and activities organized by ICAFE. By modernizing, I refer to technological

alterations in management practices, with its focus on efficiency and knowledge based on science.

Seeing like a state – a globe perspective

In interviews with agronomists, they often mentioned that one of the challenges in fighting coffee rust was lack of knowledge on smallholders' behalf. When speaking with Miguel Barquero Miranda at CICAPE, he told me that incidences of coffee rust have decreased in the years following the epidemic. When asked why this might be, he believed that the meteorological conditions had been less favourable for the fungus than the previous years. He was not convinced that farmers had changed their practices in such a short period, saying that it might be difficult for them to understand the technical development of the fungus, and the optimal time for applying chemical products. "Some farmers just spray whenever they see fit, but what they might not know is that there are times when they should and should not spray," he contended. Likewise, agronomist Adolfo stated that; "The culture of *tico* coffee farmers is very traditionalist and it takes great effort for changes to occur in *their*⁴⁶ culture".

By using the word *traditionalist*, the *tico* farmer is associated with a time connected to the past. Stereotypes of the *tico* farmer as "backwards", "left behind by time" and "ignorant" are also conveyed in television shows such as the comedy show "*Juan Vainas*" and more recently the comedy movie "*Maikol Yordan de viaje perdido*" (Maikol Yordan Travelling Lost), which has been criticised for ridiculing the Costa Rican farmer (Venegas, 2014). Thus, Adolfo's statement indicates a general belief among several agronomists, namely that farmers are associated with another time-sphere, perceived as having a traditional and hence indirectly an underdeveloped non-modern culture by referring to their management practices, which are described as somewhat lacking in technological terms. This might be connected to Latour's (1993) notion about work of purification, i.e. the pursuit to separate nature and culture in our quest for modernity. He argues that this has created a "Great Divide" between not only the West ("modern") and the rest ("premodern"), but also between science and the common people, as it has been assumed that only "we" who have science can make "correct" distinctions between nature and culture, and therefore know it "as it is". In "their" world, nature and culture are

⁴⁶ My own emphasis.

intertwined (Latour 1993 in Knudsen, 2009:10-11). Furthermore, Nustad (2003) argues that the “West” and “the rest” distinction is generated in aid practices.

Nustad argues that aid as a gift has generated a series of homogenous images of the receivers as “[...] underdeveloped subjects recognized by traits such as powerlessness, passivity, poverty, ignorance, [...]” (My translation) (Nustad, 2003:38). Like development aid, the donation of fungicides produced power effects such as temporal segregation⁴⁷ in Nustad’s terms. “Temporal segregation occurs when differences in standard of living is explained by ascribing the poor to another stage of development than the rich, and thus also in another time.” (My translation) (Nustad, 2003:21). I however, believe temporal differentiation is a more suitable term. By temporal differentiation, I mean locating people differently in “past, present and future”-categories. Temporal differentiation separates the receivers from the givers (or the West from the rest), where the former is fixed in another time-sphere, perceived as left behind in time.

The donation of fungicides reinforced or more accurately reproduced such an image of the *tico* farmer as left behind by time, thus entailing a particular power similar to that of development aid (Nustad 2003). Gift exchange revolve around three obligations: to give, to receive, and, most importantly, to reciprocate (Mauss, 1995). Upon receiving fungicides, farmers could not give something in return to the giver *directly*, as the giver was an institution and not a person. By not being able to reciprocate, farmers remain in an inferior position as receivers. However, as a manner to reciprocate *indirectly*, farmers could apply the products and contribute to a national project of better control of the fungus. Hence, by giving a gift that farmers could not return *directly*, ICAFE and SFE could somehow “steer” farmers’ actions towards a project aiming at applying fungicides more regularly to control the disease. As an important factor in the spreading of the disease, all my agronomist-informants voiced concerns about the lack of cohesiveness in management practices among smallholders. In retrospective, by donating fungicides, ICAFE and SFE were *seeing like* a state in Scott’s (1998) usage of the term, by “ordering” farmers in one singular action to support a larger scheme of “modernizing” the farmer, while simultaneously controlling the disease and minimizing yield losses, which

⁴⁷ In my opinion, segregation is a word that has historically negative connotations. Furthermore, the word might imply that people do not coexist and interact with each other within the same society, contrary to what Otto (2013) describes when speaking about several “timescapes” coexisting in one same society. Segregation thus denies some kind of relation between the “segregated”, by treating them as isolated entities.

eventually would benefit the nation economically by means of coffee export. This leads me to another power effect produced by gifts aiming to develop, namely governability.

According to Nustad (2003), the issue of “underdevelopment” was sought made “governable” by providing universal solutions to what was perceived as a homogenous problem. These intended to bring poor receivers up to *our* level.⁴⁸ According to theories of modernization that were developed post Second World War, solutions were thought to be technology and increased production, thus projecting Western ideals to underdeveloped countries: democracy, education, capital to name some (Nustad, 2003:38). Again, these ideals may be connected to *seeing like a state* (Scott, 1998); by ordering its subjects through methods of increasing production, systematic elections and building education centres, enabling the state to control its subjects through a synoptic view. Likewise, the solution to the epidemic was explained in technological terms to some extent. By donating fungicides, ICAFE and SFE would control farmers’ behaviour, and eventually minimize incidences of rust and yield losses, which would benefit the state economically in terms of exportation of coffee.

Intents to control their behaviour might also be visible during *charlas* and activities by ICAFE. As pointed out on several occasions, ICAFE constantly promoted and focused on fumigating practices. Additionally, they stressed the importance of renovating coffee fields, replacing elder cultivars with new resistant varieties that would better resist rust-attacks. Various agronomists mentioned that a great amount of farmers did not have the habit of fumigating prior to the epidemic, which could also explain its magnitude and the aggressive reproduction of the fungus. I experienced that control of plagues and diseases often was connected to ideas of “modernizing” the traditionalist *tico* smallholder in talks with agronomists. By modernizing, they referred to technological practices, especially fumigating.

Although chemical products have always existed in the coffee industry, it has not been as widespread as nowadays, according to agronomist Carlos. In an interview, he told that the entry of coffee rust in Costa Rica in 1983 was followed by an increased use of chemical substances to fight the disease. However, this was also a period of good coffee prices, meaning that coffee producers could invest money in such products. ICAFE also started promoting fungicide practices, and technological investigations to prevent *roya* from dispersing. These

⁴⁸ Such approaches made a clear distinction between the West and the rest.

investigations would assist in improving the productivity of the coffee industry. During the recent epidemic on the other hand, coffee prices were low, thus posing an additional challenge for farmers who otherwise would invest in fungicides (Avelino et al., 2015:307).

Promotions of fungicides and technological practices might be analysed as the beginning of a greater scheme of standardizing the coffee industry. I believe that the donation and gatherings arranged by ICAFE might be analysed as acts of organizing scattered smallholders in similar practices deriving from technological knowledge. Through *seeing like* a state, ICAFE acted as a mediating organ in the country's coffee regions, promoting somewhat standardized technologies based on scientific research (*globe* perspective). The management practices they promoted aimed at controlling diseases and enhancing production, which in turn would benefit both the smallholder and the nation's economy. By donating fungicides, ICAFE and SFE not only tried to achieve a better control of the epidemic by seemingly uniting smallholders in fumigating their plantations, but they also imposed more "modern" technologies in what is considered as a traditionalist arena. From a development perspective, the epidemic provided suitable circumstances for altering numerous smallholders' traditional practices, which are primarily based on technique in Ingold's (1993c) terms. Hence, the epidemic was made governable, and the solution was thought to be technology, a hallmark of "modernity". In the context of an increasingly "modernized" coffee industry, I will now discuss how "modern" the *tico* farmer has become, by revising various management practices that might blur the categorical associations of *local* and *globe* perspectives, *looking* and *seeing*, technique and technology, and approaching the coffee plant as a subject and an object.

How "modern" is the *tico* farmer?

Throughout the thesis, I have to a large degree demonstrated how agronomists (or scientists) and farmers respectively might be associated with two particular knowledges. Following Knudsen such an approach might be criticised for essentializing and romanticizing knowledges by implicitly or explicitly contrasting them with each other (Knudsen, 2009:6). Moreover, he argues that most studies of knowledge focus on either indigenous knowledge/traditional ecological knowledge or studies of technology and science, thus criticising the lack of symmetry in these. Similarly, my aim is to show how knowledges based on technique and technology are not binary, rather farmers and agronomists alike draw upon both in the process

of acquiring knowledge.⁴⁹ I do not wish to create a sharp contrast between the technique-based knowledge of farmers, and the technological one of agronomists by treating them as two absolutes. On the contrary, by drawing on Knudsen's (2009) approach, I seek to acknowledge that agronomists and farmers in particular are shifting between technique and technology, *local* and *globe* perspectives, and *looking* and *seeing*.⁵⁰ More precisely, the *tico* farmer is increasingly acquiring chemical products and methods produced by, and associated with technological knowledge. In the following, I will highlight my argument by referring to specific examples, which will show how both farmers and agronomists are somewhat familiar with a knowledge that is not immediately associated with them.

In chapter three, I described how Daniel contacted agronomists to get advice about why he was experiencing unusually low coffee production in an area of his plantation. Eventually however, Daniel rather relied on his practical skills and *seeing* to understand the underlying issue. Similarly, on other occasions, he explained that he would *know* when the soil was lacking nutrients, and which it was lacking, by investigating the coffee plants' leaves. "Yellow leaves are a sign that the plant is tired and needs food", he said, referring to fertilizers. However, like most of my other informants, he would still occasionally contact ICAFE for soil analysis.

This is an example of how farmers are drawing on both methods of technology, by *looking* through soil analysis, while still managing their coffee with technique-based practices of *seeing*. Among other gratuity services, ICAFE promotes soil analysis to investigate levels of nutrients, and recommend products to balance levels accordingly. Soil became an increasingly important issue from the 1990's according to agronomist Carlos. Regarding the use of chemicals, there was no preoccupation of neither the health of people nor the soil before this. The fact that significant numbers of farmers are using soil analysis might indicate that the contemporary *tico* farmer is increasingly relying on technological practices. Likewise, I believe that the fungicides donated by SFE and ICAFE during the epidemic marked a further alteration in management practices for smallholders, meaning that they are increasingly applying technological methods.

⁴⁹ This suggests that there might exist multiple types of knowledges in between technique and technology. However, my focus primarily lies on how farmers were increasingly adopting methods and practices associated with scientific knowledge.

⁵⁰ Okely (2001).

Among my farmer-informants, everyone who had recently started applying fungicides (or doing so more regularly) upon receiving the donation, continued investing in such products in the years following the epidemic. This illustrates how the *tico* coffee farmer is increasingly adopting new technologies which intermingle with techniques such as *seeing*, engaging their body and senses directly with the environment. By using fungicides, a product developed by experts through technology, farmers are increasingly relying on technological instruments in their daily practices. As discussed in chapter three, Diego used a human analogy when talking about *feeding* and giving *medicine* to the coffee plant. The language he used suggests that he was talking about the plant as a subject. Likewise, many farmers described the coffee plant as “A human being.” Diego’s actions on the other hand, using technological products to take care of it might be said to approach the plant as an object. Somehow, he was distancing himself from the plant by not engaging directly with it. In my opinion, the daily maintenance practices involve continuous shifts in relating to the coffee plant as both a subject and an object.

Just as farmers are relating to coffee plants in continuous shifts between subject and object, so are they taking on two aspects of vision. Smallholders acquire both technique and technology to *look* and *see*, meaning that they are somewhat in between *being-in* and *seeing as* in Ingold’s (1993a) terminology. By adopting technological practices, or inscription devices such as soil analysis, farmers are shifting between *looking* at the coffee plant as an object, and *seeing* it through their body and senses. Subsequently, in line with Knudsen’s (2009) argument, it would be erroneous to categorize *tico* coffee farmers’ knowledges as technique, thus contrasting them with technology. Likewise, just as farmers are quite familiar with technological practices, so might agronomists be acquainted with the more practical and technique-based knowledge. Indeed, practice is also important in acquiring technological knowledge.

In chapter two, I described some of the procedures and inscription devices used by the PhD student’s assistants when revising the conditions of a selection of coffee plants. However, they did not exclusively rely on these devices. I also observed his assistants touching several of the plants’ branches, bending them to check their state. Some of them cracked, whereas others remained in place. They also observed and touched leaves to say something about which nutrients might be lacking in the soil. These practices are similar to those farmers did in their plantations. The sound and feeling of the crack of a branch was a sign that a plant was affected by *roya*, they contended. Subsequently, in this sense, one might argue that scientists/agronomists might not only *look* but also *see* to some extent (Okely, 2001). Like

farmers, they are engaging their senses (looking and touching leaves, feeling and hearing dry branches crack) and using their bodies and senses to some degree, to estimate the condition of a coffee plant.

This leads me to my main point, namely that it is erroneous to contrast technique and technology by treating them as two absolute knowledges. Rather, knowledges of agronomists and of farmers must be analysed according to the continuous shifts between technique and technology, thus aiming towards a more symmetrical study of knowledges. The *tico* farmer is increasingly “modernized” in technological terms, meaning that they are arguably relying on technological methods and practices to a larger degree than before. The fact that a significant number of my informants started fumigating after the donation is an example of this. Moreover, there are continuous moves between *looking* at the plant as an object, through soil analysis and chemical products, and talking and relating to the plant as a subject by *seeing* through embodied practices (Okely, 2001). Thus, the contemporary farmer symbolizes the encounter of technique and technology, drawing on both to face challenges such as *roya*, to manage their coffee plantations. Now, I think it will be interesting to discuss what occurs when agronomists and farmers encounter each other in activities arranged by ICAFE.

Defining reality

My previous description of the *Día de Campo* is but one of several gatherings arranged by ICAFE for local coffee producers. As explained, the donation of fungicides produced power effects such as temporal differentiation and governability, in that the problem of underdevelopment in traditional management of coffee farms was made governable through technology. In fact, I would go even further by arguing that also *charlas* and activities arranged by ICAFE produce similar power effects. In this section, I will explore how farmers related to agronomists’ conveyance of scientific knowledge in combating the disease. In doing so, I will discuss how power effects emerged by looking at the encounter between farmers, agronomists and knowledge systems in ICAFE gatherings. In my opinion, I believe that the general setting of these is of great importance in producing such power effects. To highlight my argument, I will first briefly describe another activity arranged by ICAFE, which I think shows important features.

The goal of the activity was to recognize plagues and diseases by *looking* at the plants' leaves and coffee berries. Prior to the activity, Adolfo and Carlos handed out a sheet with a list of plagues and diseases affecting coffee plants, with a description of what characterizes each of them. Some twenty attendees were divided into teams of six, with one agronomist on each team. Every team set out in the coffee collection of CATIE to gather diseased coffee leaves and berries. In the end, we all gathered around in a circle, where members of each team would show a leaf and explain the plague or disease and the suitable treatment for it. What is peculiar however is that the agronomist gave an occasional nod, as if approving with what was said, or sometimes interrupting to give supplementary information. Although the intentions might have been good, the nod and extra information might suggest that the agronomists approved or disproved of what farmers were saying, thus having the power to define the "truth". While I got the impression that the intention was to let farmers speak and educate everyone around, it seemed as if the agronomist had the last word in defining the plague or disease affecting the leaves or berries.

Foucault (1976) argues that power is exercised through the production of truth. Likewise, Latour (1986) argues that an important aspect of power is the power to define "reality". Having one agronomist per team suggests that they have the final word, and thus the power to define "truth" and "reality". As discussed in chapter two, agronomists are linked to a larger national and international social network of numerous agents and institutions. Additionally, as persons with higher education, agronomists' access to a vast array of resources put them in a "higher" position, where the credibility of their words are given more "weight" due to their association to this entire network. Farmers on the other hand do not have the same "weight" and credibility behind their words, despite their daily practices revolving around coffee management. Moreover, the sheet they received further strengthened the agronomists' definition of truth and reality, in that the dominant statement of what designates diseases and plagues respectively is materialized in black and white. Thus, in such a setting, a smallholder do not have the same power to define the reality although he might have extensive knowledge of plagues and diseases.

Similarly, in *charlas*, the setting itself might be similar to that of a classroom, in which the agronomists might be interpreted as teachers and the attendees (mostly farmers, but also sometimes representatives of larger coffee *haciendas*, farms) as students. The teacher speaks and educates the students, who hold an inferior position due to their presuming limited

knowledge compared to the former. In such a setting, the teacher has the power to define reality, based on his or hers education which again is linked to an extensive social network of professors at various Universities. Likewise, the whiteboard used in the first activity to note amount of water used when spraying, also produces an image of teacher and student relation. In the last activity I described however, such physical manifestations of status were not immediately visible. However, the occasional nod and supplementary information produced might have produced an image that reaffirmed the already existing knowledge hierarchies between agronomists and farmers. Thus, such settings produce power effects by creating an image of the farmer as less knowledgeable than agronomists, and that this lack of knowledge is made governable by educating them further in such gatherings.

Paradoxically, although the goal might be to educate and try to enhance farmers to another *level* of knowledge, the setting in which the education takes place reproduces a relation of teacher-student, or more specifically degrees of knowledge. In this, farmers might be perceived as having less knowledge, due to their assumed unfamiliarity with technological knowledge, which is the officially accepted knowledge. Moreover, this knowledge indirectly poses a greater power than that of the technical one, due to its general acceptance in Universities and in jobs with higher statuses. In short, the gatherings and activities produce power effects similar to that of development aid, in that their goal is to “develop” attendees through educating them, and presenting them to technological knowledge, which arguably is the officially “accepted” knowledge. Now, I will return to the question; why is it that low numbers of coffee farmers participate in gatherings arranged by ICAFE compared to the number of farmers existing in Turrialba?

Veiled displeasures

None of my key informants except one attended the functions arranged by ICAFE. By seeking out informants through the “snowballing” method, I managed to get in touch with persons who both attend and do not attend such functions, which I believe has been a great advantage to open up for different views of ICAFE’s gatherings. Sergio expressed reluctance when asked if he would attend a *charla* with me; “Why go to a *charla* when they only tell us what we already know? They tell us to invest in chemical products that we might not even afford!” he uttered with displeasure in his voice, while cutting old *Caturra* coffee plants. Other farmers who did

not attend expressed similar opinions. Sometimes I wondered whether this was how they actually perceived such gatherings, or if they told me this as a defence mechanism. As men, they might not allow themselves to show signs of vulnerability to a young foreign woman by admitting that they perhaps might not fully comprehend scientific words or graphs used by agronomists. In my opinion, however, the power effects that are produced and reproduced in such gatherings might better explain their disinclination to attend.

Numerous farmers' unwillingness to participate might be more easily comprehensible by contextualizing it in relation to the power effects that the general setting of such gatherings produce. Farmers who chose not to attend might indeed do so in fear of being perceived as ignorant or as having limited knowledge. This might explain why those who actually attend dress up, or wear clothes and shoes that they normally would not wear when doing daily maintenance tasks. Although *ticos* in general are concerned with how they present themselves in physical appearance (like the choice of clothes), I believe that farmers "dressed up" as an attempt to take on a role as knowledgeable "front stage" (Goffman, 1971). Having in mind the stereotype of farmers as "ignorant", the choice of clothes that are not immediately associated with farmers might be analysed as an effort to blur the differences in status (both socio-economic and regarding knowledge) between themselves and agronomists. The choice of clothes might support the words that farmers' express with more "weight" compared to what the more practical choice of clothes in working with coffee would do. Thus, by presenting themselves in a manner similar to that of agronomists, the clothes might be a manner to strive against the power effects that are (re)produced by attending such gatherings.

On the other hand, I think the low numbers of attendees might also be explained by farmers' pride. Farmers take great pride in having extensive knowledge in managing coffee. When farmers explained what type of disease was manifesting itself on the coffee leaves, they cleared their throat, speaking loudly while keeping eye contact with everyone around. Likewise, some men pushed their chest forward, as if taking pride in the message they conveyed. This general body language might be interpreted in the same manner as the clothes. By pushing their chest forward, they might attempt to rise above their immediate social-status, or knowledge status, by appearing confident in the messages they convey. However, in such gatherings they are faced with technological knowledge, which, generally speaking, is less familiar to them than practical knowledge. Furthermore, the power relation is reinforced in that agronomists are mediators of, and have access to scientific knowledge. They read and explain the graphs, tables

and curves in power point slides, and perform calculations as described in the first activity. Farmers, on the other hand, do not have immediate access to this knowledge, without going through an agronomist.⁵¹ Thus, by attending they might be faced with not having sufficient knowledge in technological terms, of an activity to which most of them have dedicated their entire life. I will now turn to a deeper analysis of joking comments expressed during such gatherings to uncover other underlying reasons that might explain why farmers like Sergio was not interested in attending.

Sergio was not interested in being told what he needed to do in order to control coffee rust. Even Anthony, who occasionally would attend, explained that it is easy for agronomists to tell farmers what they need to do, without having to consider the issue of economic resources. Indeed, having the economic capital to do so or not, was a theme not particularly discussed in *charlas*. Although agronomists explained to me on several occasions that the economic aspect plays an integral part in managing coffee, the activities and *charlas* mainly focused on educating farmers on fumigating practices. Hence, what by farmers and agronomists is considered as one of the root issues in the rust-epidemic, namely smallholders' limited economic capital to combat coffee rust, is, in such gatherings, transferred to being about a lack of knowledge in technological terms. Hence, ICAFE gatherings somehow ignore this aspect by focusing on educating farmers, which again reproduces an image of the smallholder as less knowledgeable.

One can only imagine how frustrating it must be for farmers who are continuously being advised what to do, when they already are aware of it, but not having sufficient economic means to do so. When attending activities, I noticed how farmers in particular were making small jokingly comments throughout the events. Some of these comments made me reflect upon their veiled meaning, as I quickly scribbled them down in my black notebook. The remark "Here they spray every third day!" makes it obvious that CATIE, as a very prestigious and resourceful institution, has significantly larger economic capital than do smallholders who barely can afford the yearly recommended two to three applications of fungicides. Such jokes might be analysed as a part of what Scott (1989) denotes as "everyday resistance". These are informal and veiled forms of resistance conducted by subordinate groups within a given society in which they

⁵¹ This is not to assume that farmers cannot calculate themselves. However, as discussed, they acquire other methods rather than calculating.

experience dominance by other groups. Such resistance is a secure manner to convey political opinion and interests, often expressed individually and not collectively as is commonly associated with political activity. Furthermore, Scott introduces the concept “hidden transcripts” when speaking about resistance. Hidden transcript is a site for non-hegemonic discourse that is not directly observable by powerholders (Scott, 1990:4). Everyday resistance is an indirect manner of contesting “public transcripts”, which are open and public interactions between the dominating and the oppressed (Scott, 1990:2). To name some, gossip, linguistic tricks, metaphors are ways to contest public transcripts, which is why humour might be analysed as resistance.

As noted, several farmers’ unwillingness to participate in gatherings might be because of the reproduction of differences in social and knowledge statuses and the power associated with them. Moreover, having in mind that ICAFE is a nationally recognized institution, ICAFE’s agronomists might be associated with the governments political interests, which farmers complain disfavour them in many aspects. During the last activity, a middle-aged farmer held up a diseased leaf saying with a rather serious tone, “This disease is called heartache, because we *turrialbeños* have a heartache due to everything that is happening to the coffee!” before laughing hysterically with everyone around him. By referring to their own body, this joking comment as a hidden transcript might be a manner of “politicizing” not only the problems farmers were experiencing with *roya*, but also the uncertain future of Turrialba’s coffee culture. Coffee farmers are increasingly faced with challenges such as diseases, low coffee prices, elevated prices in chemical inputs, and inferior productivity compared to previous years. In general, smallholders complain that they do not receive a regular economic support, which in the long term would have helped them maintaining their coffee and controlling diseases more easily. Thus, such jokes might be analysed as “weapons of the weak”, that is, secure manners of expressing displeasures, political opinion and interests (Scott 1989). Finding themselves in uncertain times, farmers were frequently referring to more secure times of the past.

Concluding remarks

Throughout the chapter, I explored how measures of controlling *roya*, (e.g. conveyance of scientific knowledge through ICAFE gatherings and donation of fungicides) affected farmers’ coffee management practices more generally. By adopting Okely’s (2001) analytical concepts of *looking* and *seeing*, I aimed at contributing to a more symmetrical study of knowledges by

exemplifying how the *tico* smallholder is increasingly relying on *looking* through technological devices (e.g. fungicides and soil analysis), combined with traditional technique-based practices and manners of *seeing* (or “reading”) the landscape. Hence, this approach allowed grasping farmers’ continuous shifts between approaching coffee plants as subject/object using technique/technology, *local/globe* perspectives, and *looking* and *seeing*. I also highlighted how scientists too might *look* to *see* when checking the condition of a plant.

Furthermore, I focused on the donation of fungicides in order to explain how ICAFE and SFE were *seeing like* a state (Scott 1998). By giving a gift that farmers could not return *directly*, these institutions were somehow “steering” farmers’ actions towards a larger scheme if “modernizing” the *tico* smallholder, by introducing them to technological devices which aimed at controlling *roya*. However, this gift produced power effects of temporal differentiation and governability – effects that were further reproduced in ICAFE’s gatherings. In ICAFE’s functions, there was an emphasis on educating the smallholder, at the expense of discussing economic aspects and how to afford the products that farmers were advised to purchase. Displeasures of not having sufficient economic resources to invest in products that farmers knew they needed, were revealed in joking comments, analysed as hidden transcripts, or veiled manners of expressing political opinion. By analysing the epidemic as an “event” (Kapferer, 2005) in which social structures are revealed, one might argue that such displeasures are becoming more evident in the aftermath of the epidemic, especially since farmers are now facing an increasingly uncertain present and future. In the following chapter, I will explore how uncertain times have allowed for notions of loss and hope by connecting them to notions of temporality and landscape.

Notions of Loss and Hope in Uncertain Times – Temporality and Landscape

This chapter will argue that as *roya* emerged as a social phenomenon with altered characteristics (chapter two and three), so were notions of temporality set into motion in different manners. By adopting temporality as a framework, this chapter discusses how notions of past and future were triggered on two levels. On the first level, I will present some of the most central events that have contributed in generating an uncertain situation for coffee producers. By focusing on farmers' accounts, I argue that statements of loss, particularly collective anxieties of losing Turrialba's traditional coffee culture, together with notions of hope have emerged within this context, suggesting that these (i.e. statements of loss and hope) constitute ideas of nostalgia. Predominant in these notions are continuous references to the past as more secure, comparing it to the present conditions, which in turn has created imaginaries of the future of the coffee culture as uncertain. On the second level, I discuss how notions of past and future are materialized in the present through acts of renovating coffee plantations due to the destructive effects of *roya*. I analyse how the social relation between the farmer and the plant has altered due to the rust-epidemic, while simultaneously setting in motion temporalities of the landscape through memories of ancestors and thoughts about future generations.

On the second level in particular, I aim to understand the relations between temporality, materiality and sociality. In doing so, I follow Ingold's (1993b) argument that past, present and future are not isolated entities. Rather, these must be understood as coexisting according to how they are continuously incorporated into the moment. Thus, I aim to approach time as a dimension that is experienced through engaging in the "taskscape" (Ingold, 1993b) similar to that of the farmers' ancestors. Moreover, I find theories of landscape useful as I experienced that the landscape's social aspects were often tightly connected to notions of time in acts of renovation. In sum, this chapter aims to connect the preceding chapters together by discussing the following questions: How has *roya* evoked temporality in different ways? How might this be related to farmers' notions of time? In fact, time was a concept I started reflecting upon after going for a walk with Luis.

Luis and I were walking up the hills of La Suiza, as we finally reached the graveyard where we would put flowers on the grave of his sister who had departed a year earlier. From the view of the graveyard, I glimpsed multiple green landscapes with some coffee farms in between. The Turrialba city centre was located further in the back, in the valley of surrounding mountains where white smoke was slowly escaping the Turrialba volcano. Luis pointed at several of these green patches, telling me a story for each of them.

“That one over there was once a large coffee farm, but it was left about ten years ago because of low coffee prices. Many of the abandoned coffee fields you see here were left many years ago when prices were low, and people couldn’t afford to assist them anymore. Others were left recently, after *roya* came. Some people just didn’t have the will or means to keep on fighting,”

he said with his head bent down, while holding his hat between his hands, as if he was mourning the demise of an activity that his ancestors and thousands of *turrialbeños* had once thrived upon as means to support their families and their future well-being. Indeed, both farmers and agronomists portrayed an image of Turrialba as a city in which the coffee industry was in decline.

The decline of *el grano de oro*

After the construction of the railway (chapter one), coffee cultivation became more frequent in Turrialba. As coffee prices elevated, “the golden bean” was believed to bring prosperity and a bright future as farmers could support large families on its sole income in the years to come. Luis, like other farmers, portrayed a picture of the past in these terms; “Coffee plants would bend over due to the large amount of coffee they produced. We had to set up wooden sticks to support them so they wouldn’t break. The berries were red and big as grapes!” *Turrialbeños* also agreed that the competition between *beneficios* was good due to the prevalence of several coffee processing factories and cooperatives. Most commonly, they referred to *CooperSuiza* as the longest standing and arguably the most known cooperative in Turrialba. *Turrialbeños* described La Suiza⁵² as vibrant and packed with people during the cooperative’s existence.

⁵² *CooperSuiza* was situated in the district of La Suiza, Turrialba.

However, this bubble of prosperity and progress was soon about to burst, and farmers were about to face more uncertain times.

Tsing (2015) suggests that precarity *is* the condition of our time, that is, the insecurity that increasingly defines the world's neoliberal capitalist economies. In Costa Rica, socio-economic insecurities might be said to have begun in the 1980s, when their habit of reliance on foreign financing led to a collapse. As prices crashed in the late 1970s, *turrialbeño* coffee farmers would feel the repercussions in the years to come as several cooperatives and *beneficios* had to close. In Turrialba, the socio-economic situation altered dramatically from 1985 onwards due to exogenous processes of globalization. Endogenous political processes in turn, marked a direction towards neo-liberalism by promoting non-traditional production, privatized services and a free market (Araya, 2003:237-244). As coffee was recognized as a traditional crop, coffee farmers found themselves particularly exposed in the neoliberal context. The situation exacerbated upon the failure of a new agreement with the ICO in 1989, as prices continued to remain low for the next decade. Although diversification projects were implemented, many proved unsuccessful, meaning that no viable alternative incomes to coffee have emerged. As Sergio said, "Here it is coffee, sugar cane, and some livestock," implying that those are essentially the occupational possibilities agriculturalists have in the region.

Within this context, coffee rust entered the country in 1983. My informants experienced this *roya* as "calm", whereas others did not experience it altogether or did not categorize it as a "bad" disease (chapter three). Although methods for increasing productivity and information of fumigating were adopted through PROMECAFE, some farmers commented that the fungicides entailed heavy metals, which affected the soil negatively. After the 1990s, an increasing preoccupation with soil fertility emerged according to agronomist Carlos. Both farmers and agronomists complained about exhausted soils, leading to less productive coffee plants. Many also complained about the prevalence of diseases, connecting them to the increased use of chemical inputs and climate change (chapter three). Statements about climate change also become an increasing issue, as it is affecting agriculture and livestock in the entire country. The "uncontrollable" forces revealed by climate change is threatening the continuity of these activities. Moreover, the anxiety that meteorological conditions might provide suitable environment for the fungus *Hemileia Vastatrix* to suddenly grow "wild" at any moment, is a constant reminder of the losses thousands of farmers experienced in during the epidemic. "It's [coffee rust] there although you can't see. It might pop out at any moment," said farmers.

As *CooperSuiza* eventually had to close, Turrialba was left with no coffee cooperatives. Consequently, upon facing the worst epidemic to date, farmers no longer had a uniting organ as the only exception in the country's coffee regions. For several coffee farmers who persisted through low coffee prices, the epidemic was what eventually pushed them out of the coffee activity altogether. When driving or walking around in various districts of Turrialba as initially described, I observed several plantations wherein coffee plants were covered with lianas and weed growing uncontrollably. Informants told me that these were abandoned due to *roya*. In short, since the expansion of the coffee industry, these central events have eventually led to a declining coffee industry in Turrialba that was exacerbated by the rust-epidemic in 2012-2013. For coffee producers, the golden bean no longer shines a bright future. Finding themselves in such a precarious situation, farmers frequently referred back to a past in which times were more secure, and the future was looking more optimistic. In the following, I argue that notions of loss, particularly collective anxieties of losing Turrialba's traditional coffee culture, together with ideas of hope have emerged within this uncertain context. Despite the controversy about the notion of nostalgia, I believe it might be suitable to describe this continuous mental time travelling.

Nostalgia - notions of loss and hope

The concept "nostalgia" has been criticized for being a catch-all notion that simplifies and often conceals rather than reveals the complexities of memorial practices in social life (Lankauskas, 2015:40-41). Berliner approaches such criticism by proposing a distinction between two fundamental nostalgic postures. First, endo-nostalgia is a type of nostalgia from the past that one has personally lived. Second, exo-nostalgia is one that has not been experienced personally (Berliner, 2015:21). I will adopt the first type primarily, as an attempt to use the concept as an analytical tool rather than a catch-all notion. Moreover, Berliner claims that hope is never far away from nostalgia, suggesting that it entails some sort of engagements with the future. In my opinion, however, his concepts are rather restricted to studying nostalgia in terms of the past and the present. To overcome this challenge, I find it necessary to draw on Nadkarni and Shevchenko's approach (2015), whom I believe better cover nostalgia's several temporal orientations. They argue that a sense of rupture from the past is necessary for nostalgia to exist.

Furthermore, they contend that “[...] the perception of loss is the precondition for discourses of return and recovery” (Nadkarni and Shevchenko, 2015:66).

In line with Nadkarni and Shevchenko (2015), I argue that notions of loss and hope have emerged due to the precarious situation that farmers find themselves in, beginning with the drop of coffee prices, which was exacerbated by the rust-epidemic in 2012-2013. In my opinion, ideas of hope might be considered as statements of recovery, that is, hope that prices will recover to what they once were and hope that plant would provide a certain quantity of yield. Hope however, was only expressed in relation to these two aspects, as farmers were convinced that other circumstances listed below would never recuperate to what they were. Nevertheless, I treat references to hope as statements about return and recovery. In short, I adopt nostalgia as a window that connects perceptions of a secure past, with present and future orientations as uncertain and rather low-spirited. In the following, I will explore how farmers’ temporal orientations were entailed in statements of loss and hope in talks about the gradual loss of the *turrialbeño* coffee culture.

“Antes no había enfermedades”

As noted, farmers repetitive accounts of “Before there were no diseases” was linked to ideas of a past in which coffee was in abundance. Although I have not, and will not have room for discussing the social aspects around *broca*, I believe this too might be analysed in similar terms as I have with *roya*. In fact, *broca* is a quite recent plague in Costa Rica. It was first reported infecting coffee plantations in the year 2000 (Arrieta et al., 2014). This might be why ICAFE’s *charlas* also sometimes focused on *broca* next to *roya*, although to a lesser degree. The increased “talk” about *broca* and *roya* as being among the most destructive diseases, together with the experiences of yield losses by these, have produced imaginaries of the future as uncertain. Comparisons of “then” and “now” according to diseases may be interpreted as loss; i.e. of times when diseases were not prevalent, or when they did not pose great harm to their plantations. Such loss was indirectly expressed by Andrés, who referred to other diseases to say something about the durability of *roya*.

Andrés: “First there was *ojo de gallo*, then came *broca*, which everyone was terrified of, but eventually *roya* came as the worst of them all! All of these diseases reached a

peak, and after some time, they started declining, and didn't do that much harm anymore. I think the same is going to happen to *roya*, because it's calmer now than it was a couple of years ago. But you never know, *roya* is different from the other diseases because it's very *jugadora* (playful). Although you can't see it, it's still there inside the plant, waiting to burst out. Suddenly, it might grow strong again when you least expect it.”

What is central in Andrés' account is the interchangeable reference to past, present and future regarding *roya* and other coffee diseases. Analysing not only the rust-epidemic as an “event” (Kapferer, 2005), but also treating the prevalence of other diseases like *ojo de gallo* and *broca* as such allows, among other things, opening up for discussing temporalities. I draw on Jackson (2005), who argues that events might connect previous experiences of them in the past, with how they are experienced in the present and how these might disclose something about what people think might occur in the future. When asked about how coffee rust would continue in the years to follow, farmers would refer to previous experiences with *ojo de gallo* and *broca* in the past, while simultaneously taking into consideration how *roya* was *behaving* in the present, to predict its endurance in the future. Nevertheless, the unique “wild” and “playful” characteristics of *roya* compared to the other diseases made this disease an exception. Hence, although farmers believed that the worst part was over, the destructive damages and yield losses it had caused created fear that it might suddenly grow strong again in the future, creating additional uncertainties.

Loss of yield, superior prices, *beneficios* and coffee cooperatives

Berliner argues that nostalgia is closely connected to conceptions of crisis, that is, problems of continuity and uncertainties about the viability of cultural transmission. He contends that concerns about “losing culture” are part of general accounts about “a crisis that never ends” (Berliner, 2015:18). In the same manner, I *turrialbeño* coffee producers might be said to be experiencing such a crisis, beginning with the international drop of coffee prices and its repercussions, which later was exacerbated by the rust-epidemic. As agronomist Carlos said,

“Prices have decreased altogether. They have increased slightly at times, but generally, they have remained quite low compared to what they have been in the past. Now, we

have a generalized economic crisis on every level: coffee producers, the industry, and the government find themselves underfinanced.”

Because of the prices, 53-year-old producer Felipe believed that Turrialba’s coffee culture was at the verge of annihilation. Like several of my farmer-informants, he was convinced that coffee prices would never recuperate to the level they once were. He, like many, described the past as a time in which coffee was in abundance, in contrast to now as farmers were abandoning the activity.

Felipe: “Before, there were many *beneficios* fighting between themselves to offer the best price to producers, so that we would deliver our coffee to them. Turrialba was packed with coffee plantations! We also had several cooperatives. Now, there are only two *beneficios* left, so competition is practically non-existent. They just agree about a price between themselves, so we don’t really benefit like we did before. With the way things are now, we have to fight with our nails to maintain the coffee we have left after *roya!*” he exclaimed, while continuing to portray an image of the past of which he talked about enthusiastically.

Felipe: “My grandparents had eleven children, and you know what? They lived like rich people! [Slamming his hands down on his thighs] Well, that’s also because they cultivated corn, beans, potatoes, coffee and so on. People don’t really cultivate food for personal consume anymore, and they’re also more focused on material things. Nowadays it’s difficult to support a family with only two children through the sole income of coffee. You have to choose between either investing money in your coffee, at the expense of your family or the other way around. It seems that everyone is getting rid of coffee. But you always have a small hope that one day prices will rise again. ”

Andrés expressed parallel concerns over a cup of coffee during a break in between digging holes for the young coffee plants of *Catimor*.⁵³ Like Felipe, he voiced hope in a future he presented as uncertain.

⁵³ The coffee variety *Catimor* is perceived rust-resistant to a certain degree by agronomists and farmers.

Andrés: “About fifteen to twenty years ago, coffee prices went through the roof again. People purchased land, cars, or bought or remodelled their houses. Many smallholders were quite prosperous. I for instance invested in land, by purchasing plots to some of my children where they could build their future homes. It was also easier to obtain loans from banks, because people were quite certain that they could return the money due to high coffee prices. Now however, it’s extremely risky to lend money from the bank, because of the low prices and low coffee productivity. You can’t be confident that you’ll be able to return the money. Most people don’t dare risk their houses and lands by taking such loans, I think, or at least I don’t. Still, coffee is *esperanza* (hope).” [I asked him to clarify] “Even though coffee isn’t profitable anymore, and perhaps not in the future, I always have hope that prices will rise to what they used to be.”

What these accounts have in common is the reference to a past that was more secure in terms of more *beneficios* (i.e. competition), yield in abundance, better living standards and better economic stability (as many also were self-sufficient in terms of food). Furthermore, both Felipe and Andrés compared this stability to the present in which farmers are struggling to provide for both their family and their *fincas*, people are abandoning coffee production, and competition is practically non-existent. Their accounts about loss might be analysed as endo-nostalgia, as they are based in personal experience. Such nostalgia is arguably becoming more evident as the rust-epidemic is adding to the mentioned struggles, making farmers’ economic situation increasingly uncertain.

Most producers who remained in the industry had to renovate parts of their plantations due to the effects of *roya*. During my stay, I participated in renovating parts of four of my key informants’ plantations, whereas the fifth had already renovated one part prior to my arrival in Costa Rica. Only two of my key informants, and in retrospective, merely four of my 21 farmer-informants who continued producing coffee, relied on loans facilitated by the *fideicomiso cafetalero* (chapter two). When asked why they did not take up such loans, they would express similar opinions as Andrés. They considered the future as uncertain in terms of prices and yield, and some, also in terms of replanting with the new variety, *Obatá* as I will return to later. Rather, farmers who did not take up loans financed the renovation by working as *peónes* on other farms, in construction, and other non-skilled labours besides assisting their own plantations. Many were also dependent on their children to provide economic support. Regardless of whether or not smallholders relied on the *fideicomiso* to renovate their respective plantations, many spoke

of coffee as hope: Hope that prices would recuperate to the level they once were, hope that plants will produce in abundance, thus indirectly hope of more secure times, despite the uncertain conditions. Such accounts suggests a longing for the “golden days” in the past.

Reciprocal alterations

Notions of loss were also prevalent when speaking of soil fertility, among farmers and agronomists alike.⁵⁴ Agronomist Carlos explained that soil fertility had decreased; “Erosion and extraction of large quantities of yield throughout the years, have produced high levels of soil acidity. This affects the plant by making it weaker nutritionally, which again makes it more prone to rust-attacks and other plagues and diseases.” Similarly, Sibelet et al. (2016) connect soil acidification to excessive use of synthetic fertilizers, which have led to nitrate pollution of soil and underground water sources. However, for farmers, soil fertility went beyond affecting merely coffee. As Juliana and I were planting some seedlings for various vegetables, she began reminiscing about her childhood memories.

Juliana: “When I was a girl, the soil was packed with nutrients. My father would plant many sorts of vegetables. I especially remember the cucumbers that would grow huge! [Using both of her hands to show me their size]. Now, the soil is exhausted. Whenever I try to cultivate cucumbers, they never grow to the size they reached before, they’re just this small [Using her thumb and index finger to show me their size]. It [the soil] just doesn’t give as much as it did before.”

Again, this is an example of endo-nostalgia. Her experiences that the soils gave larger vegetables in the past, compared with the smaller ones in the present created ideas of loss. The fertility of the soil was also interconnected to accounts of how much yield a coffee plant would produce compared to before. Like many others, Andrés complained about less fertile soils.

Andrés: “We just did the usual necessary work with a knife, and the plant would give loads of coffee. Now, we have to invest⁵⁵ in much fertilizers and other products for the

⁵⁴ See Mario’s account page 52.

⁵⁵ Notice the shift in talking about *dar* (to give) and *invertir* (to invest) in a plant. The latter is arguably more detached, associated with what scientists adopt when talking about chemical inputs. The former is closer to *being-in*: it is based in the bodily experience of relating to the plant on a daily basis. One might

plants to produce a fair amount. Basically, you just go around hoping that the costs of what you invested will at least be covered by the yield the plant produces. Still, it doesn't compare to the quantities that existed when we didn't even use such chemicals!"

The relationship between a farmer and his plants is of a reciprocal type, which might also explain why farmers frequently refer to them by using human analogies (chapter three). Farmers repeatedly mentioned that the plant would always produce (or give something in return) if they did *trabajillos* (small types of work) such as pruning or *giving* fertilizers. Now, however, the plants would not *give* as much as they did before. Analysed in Mauss' (1995) terms, it might seem as if the reciprocal relation has altered from a somewhat symmetrical type to a more asymmetrical one, due to the less fertile soils and the rust-epidemic among other factors⁵⁶. Initially, the relation might be considered one of a more symmetrical type: the producer would dedicate time, and *give* to the plant through maintenance works, without necessarily having to use chemical inputs. The plant would in turn *give* more or less satisfying yield *in return* according to farmers' accounts. Now, however, most notably with the rust-epidemic and its repercussions in the following years, the relation has grown more asymmetrical: the farmer invested increasingly more economic capital in the plant, by purchasing chemical inputs, such as fungicides.⁵⁷ However, he/she often experienced that the expenses were not covered by the yield provided by the plants.

As mentioned in chapter four, many farmers started fumigating whereas others started doing this more regularly after the rust-epidemic, meaning an additional economic expense. Some, on the other hand, claimed that they had eventually stopped doing certain practices because the time invested in the coffee did not reflect in the quantity of yield. As explained in chapter three, Diego experienced that the coffee plants would not produce as much in the year following the epidemic, despite investing in both fertilizers and fungicides, which was why he now had decided not to *give* anything except *medicines* (fungicides) to get rid of the fever (*roya*). In short, the rust-epidemic might be said to have contributed to alter the reciprocal relation between the plant and the farmer, making it more asymmetrical in the sense that the farmer often experienced that more is *given* to the plant, than is *given in return*. Hence, they

speculate whether this shift can be related to farmers' interactions with agronomists and the increased use of technological devices.

⁵⁶ Coffee plants' age and biennial rhythm are also central factors affecting its productivity.

⁵⁷ See Diego's account page 55.

experienced a sense of loss reflected in the reciprocal relation, which have been altered into one of asymmetrical nature, by giving little yield compared to the capital that is invested in the plant.

References to the past in terms of superior prices and quantity of coffee were quite common while farmers were talking about their renovation plans. Renovation is costly, in time and capital, which is why it was considered an investment. Farmers who renovated expressed hope that the newly planted varieties would provide good yield in the future, because of their greater productivity than elderly plants. Moreover, those who renovated would have to wait about two to three years before the plant could produce fully. Then have would have to rely on their production to cover the costs of the renovation. As one of their main concerns post-epidemic, ICAFE emphasized not only the importance of applying fungicides, but also renovating plantations by parts, with the objective of replacing old susceptible plants with young, preferably rust-resistant varieties. As noted, ICAFE recommended farmers to plant a coffee variety named *Caturra* several decades ago, which is why the majority of *turrialbeño* farmers have old plants of these. Unfortunately, this variety is severely attacked by coffee rust (or as farmers said; “*Caturra* is very sweet for *roya*”, again, using a human analogy to talk about *her* behaviour, and *her* taste for sweets). Due to this, ICAFE is now advising farmers to uproot *Caturra*, and replace it with newer varieties that are more rust-resistant. However, the replacement of a variety that is familiar⁵⁸ to farmers with a new unfamiliar variety, has added to the several aspects of imaginaries of the future as uncertain.

Knowing the coffee variety

Many farmers expressed difficulties in replacing varieties such as *Caturra* with newer ones, because it had *mucha fama*; it was renowned for decades due to its high productivity and adaptability. More importantly, it was associated with a time in which coffee was in abundance, and the future was looking quite bright. It was a materialized symbol of the past “glory days”. *Obatá* on the other hand, was a newly introduced coffee variety to farmers, and most had no knowledge of its characteristics or *behaviour* other than what agronomists or fellow farmers, who were experimenting with it, told them. Hence, it was with scepticism and uncertainty that

⁵⁸ *Caturra* is but one example.

farmers changed to a new variety of which they had no experience.⁵⁹ For several farmers, *knowing* the *behaviour* of the plant was in many instances decisive in the choice of variety to replant. Several of my informants who renovated with rust-resistant varieties did so with types that were familiar to them, such as *Catimor* and *Costa Rica 95*. Despite the threat of coffee rust, which, at any moment could grow strong, many farmers also chose to replant with susceptible cultivars, like *Caturra* and *Catuai* because they were familiar with their *behaviour*.⁶⁰

Karla, a 58 year-old coffee producer told me that she had recently replanted some *Caturra* due to its *behaviour*. When asked to specify what she meant by *behaviour*, she, like others, explained that she knew how it would respond to various types of works, approximately when it would start producing, and how much it would produce. On the other hand, farmers were not *acquainted* with *Obatá* (and *Costa Rica 95* in few cases, but mostly the former). New varieties might be perceived as a clean slate; they do not have “history” or “depth” that the elder varieties have. They are not a part of the “taskscape” of previous coffee producing generations, meaning that they were not associated with more secure times of coffee in abundance. Thus, replanting with familiar varieties such as *Caturra* might be a way to approach what is perceived an uncertain future in a secure manner – that is, facing the uncertainties of the future with a plant that one already has established a relationship, and thus *knows*.

Many preferred replanting with a variety that they were familiar with rather than getting to *know* a new one. Others however, like Daniel, were more curious of the new variety. He planted *Obatá* between rows of elderly and rust-attacked *Caturra* on parts of his plantation to see how it would behave in the following years, and from there on decide if he would continue planting it. He was clear that he would not cut the *Caturra* plants before seeing how the new plants would produce and behave. He did not *trust* the plant, and was afraid that if he cut the *Caturra* before getting to know the *Obatá* plants, he would be deceived by it. By not cutting *Caturra* plants, he would have these as a “back up” plan, relying on their slight yield if he was not pleased with *Obatá*. Hence, the uncertainty of the future is materialized within his plantation. Daniel chose to keep the severely weakened plants that provided low productivity, because he trusted and *knew* the *behaviour* of these plants. Again, in talks of knowing the plant, the analogy between coffee plant and human is again rendered visible. Farmers are somewhat sceptical to

⁵⁹ See discussion among Anthony and other farmers about *Obatá* page 63.

⁶⁰ Some of these informants also renovated with rust-resistant types.

invest in new varieties (or social relations) because they might end up being deceived (a person might prove to be someone else than what he/she was described as by others). Similarly, the uncertainty of replacing a familiar variety with “depth” with a new type with “no depth” (in terms of history), was connected to a general anxiety about losing important aspects of Turrialba’s coffee culture.

Fear of “cultural loss”

Accounts of loss of fertile soils, such as that expressed by Juliana, were often tightly connected to ideas of climate change. Similarly, Daniel voiced concerns regarding the future of the coffee culture when talking about the *cogollo* of the coffee plant (chapter three). The effects that the increasingly strong sun had on the *cogollo* created anxieties that coffee cultivation would suffer the same fate as other agricultural crops (beans, rice, and corn) in the future. Experiencing that his father had to adapt to the climate change by leaving the cultivation of these products, Daniel too (by *seeing*⁶¹ the effects on the *cogollo*), was afraid that he eventually would have to abandon coffee. Hence, it was with unease that Daniel observed these changes. Indeed, my key informants considered the *cogollo* as “the future” of the plant. This might also explain Alejandro’s ambivalence towards chemical products, which first made the *cogollo* look “bored” before looking “happy” again (chapter three).

Another day, Daniel was showing me *chapea/palea*; ancient techniques for providing organic fertilizers to the coffee plants. While gathering branches, fallen leaves and dried weed, he occasionally paused, to clear his throat and explain with his head held high what the utility of these were. Then, he continued commenting on how not many farmers bothered doing this because of its time-consuming nature.

Daniel: “Before, we would only use a knife to maintain the coffee. Now however, farmers want to be more efficient by using chemical products such as herbicides to remove bad weed and such. I’m afraid that some of the knowledge our ancestors taught us is being lost by choosing methods or chemicals to save time. You know, sometimes you have to listen to yourself instead of what agronomists say [referring to the episode described in chapter three].

⁶¹ Okely (2001).

This preoccupation of losing “ancient knowledge” is becoming evident as the *tico* farmer is increasingly relying on technological devices (chapter four). Daniel’s account insinuates a concern for losing ways of *seeing*⁶² by relying on agronomists’ more scientific approach of *looking*. His concerns might be analysed as endo-nostalgia. He has lived and participated in the gradual changes in management practices. Farmers are increasingly choosing products developed by science, perceived as more efficient than traditional practices. Daniel’s preoccupation is part of a general anxiety of losing Turrialba’s traditional coffee culture altogether in the future. Indeed, the decline of the activity was a concern for both agriculturalists and non-agriculturalists, as they regarded coffee as an integral part of the city’s culture and history.

A central part of this anxiety was the fact that younger generations do not find interest in pursuing a future in cultivating coffee. In fact, some farmers referred to the younger generations as those born from 1985 as the “lost generation”. Many – both farmers, agronomists and *turrialbeños* in general – complained that the younger generations do not take interest in coffee, because of all the hard work, struggles, and risks it entails. Adolfo and agronomists at *beneficios* Juan Viñas and Santa Rosa connected this reluctance to a declining coffee culture in the present and the future. When asked about his thoughts about Turrialba’s future in coffee, Adolfo smiled and paused before he said;

“It would probably be better not to record this. [Followed by a nervous laugh] I think what will prevail here is a decreasing coffee industry. The producers who will continue this activity are the ones who are most efficient and structured in the way they work, while simultaneously being open to changes and replanting new coffee varieties in their respective plantations.”

This might be interpreted as such: the farmers who will persist are those who are inclined to renew their plantations while adopting technological devices and methods as those are, by agronomists, considered more efficient. Indirectly then, he is implying that many farmers are yet to undergo “change”, that “*their* culture is *traditionalist*” as discussed in chapter four. Furthermore, agronomist Carlos explained on another occasion that the decline of the industry

⁶² Okely (2001).

might be better understood in the context of the growing amount of manufacturing plants in Costa Rica from the 1980s, which attracted many non-skilled young workers from various sites. Furthermore, as both farmers and agronomists commented, it has become easier for youngsters to educate themselves, as the state provides *becas* (scholarships). However, farmers in particular are sad to see their sons (and daughters in some cases) chose education or other types of labour over coffee, which further strengthens beliefs that the coffee culture might eventually disappear in the city. I will now proceed to the second level of temporality, to see how the process of renovating, due to the epidemic, opened up to setting in motion temporality of the landscape through memories.

The landscape as memory

Stories about the past as more secure merged together with imaginaries of the future as uncertain in farmers' accounts. Regardless if they continued cultivating coffee or not, coffee producers imagined a future of coffee filled with pessimism and uncertainties. 79-year-old Julio estimated that he had lost about 80% harvest to coffee rust during its worst outbreak. He showed me the remains of the plantation, where he was now in the process of uprooting the coffee plants to clear the field where he would relocate some of his cows. Although he was not renovating his plantation, Julio was altering it, which evoked memories of past generations and thoughts about the future ones. As we were walking through his *finca*, I noticed that he was carrying his body in a heavy manner; he was dragging his feet up the hills, with his head bent down when responding my question about how he felt seeing his field in such a condition.

Julio: “It’s very sad to see something to which my family and I have dedicated our lives withering away. During every harvest, the entire family would participate in picking coffee. Coffee is tradition. It is a heritage that has been passed down from one generation to another, from father to son, for *añales* (many years). In the past, it was practically given that a son of a coffee farmer would continue in his father’s footsteps. People were hard working before, not like youngsters today. They get scholarships to attend school and everything is laid out for them to take an education. My sons chose education over coffee production. It’s with a heavy heart I leave coffee. But with the prices, expensive products [inputs], *roya*, the tired soil and plants, we barely can afford rice and beans. So I can’t really blame them.”

Julio spoke of coffee as a crop of high cultural and familial value that connected past generations to present and future ones. However, as mentioned, the socio-economic conditions together with the epidemic have produced uncertain futures for coffee farmers. In turn, the reluctance of many youngsters to continue in the same agricultural activity as their parents strengthen farmers' and agronomists' beliefs that the coffee culture is gradually declining. This "lost generation" may be analysed as a rupture from past generations, by not following their footsteps, or their heritage, which is a central part of what defines farmers' social identity – the pride in being coffee producer who, indirectly, has participated in the process of "modernizing" the country through the prosperity that the crop generated. To use Ingold's (1993b) term; by not engaging in the "taskscape" of cultivating coffee, younger generations are not participating in shaping the landscape like their ancestors did. In this manner, their social identity does not become incorporated into the landscape, as it would have been if they engaged in the "taskscape" of cultivation. They do not leave "traces" in the landscape. This rupture from past generations then might be interpreted in terms of "path".

Regarding path, I refer to Anderson's (2001) usage of the term, who analyses it as a metaphor for history and social relations in Wogeo. She claims that human movement in a landscape produce such paths. A path is clearer and better the more times it has been followed prior to a person. Hence, when younger generations chose not to follow their ancestors' (or parents') paths, it becomes less clear. From this perspective, one might better understand farmers' concerns regarding the viability of Turrialba's coffee culture in the future. Furthermore, such paths might further explain why many farmers struggle to abandon coffee production despite the many factors that works against it. As a farmer said, "We have a lot of love for coffee, that's why we keep on fighting despite all odds. It's our heritage, we can't just abandon that!" On the other hand, those who eventually decided to do so, like Julio, left the activity with a heavy heart because it not only engaged his entire family, but it also connected his descendants to his predecessors. However, different to the children of Julio, Martín was one of the few exceptions who continued in his father's footsteps.

Unlike the mainstream of his generation, Martín was one of the few exceptions who had decided to pursue a future by devoting his time to cultivating coffee. In fact, he quit his job as a taxi driver during my stay to do so, as his father Andrés got ill. Previously, Martín had assisted him a couple of times a week. Eventually, he realized that Andrés could not work the fields alone

anymore as he was growing older, and someone would ultimately have to replace his position. Unlike his elder brothers and sisters, Martín was the only one who took interest in the crop. Although they did not wish to work in the field themselves, his brothers and sisters were pleased that he would take over their father's place, so that the coffee legacy would continue in the following generation. Martín considered it as his task to conserve and transmit knowledge of cultivating coffee, which was a central part of the family's heritage and history. Indeed, Andrés had provided for his family on mainly coffee, and some sugar cane his entire life.

Despite the uncertainties of the future, Martín believed that prices eventually would improve, since so many farmers were abandoning the crop. He explained this from a supply-demand rationale; less coffee would mean that people would pay more to obtain it. Conversely, he saw uncertainties regarding competition in the region, as there is practically none among the contemporary *beneficios* in Turrialba. Furthermore, he was aware of the constant threat of *roya*, which could suddenly grow "wild". As a manner of attempting to approach this threat in a secure manner, Martín and Andrés were renovating parts of their plantation with rust-resistant varieties. Many expressed similar thoughts about *roya* suddenly growing "wild" when justifying their decision to plant rust-resistant varieties. In fact, when I assisted Daniel in replanting about 300 rust-resistant coffee plants, I came to realize that upon cutting and uprooting elder coffee varieties, Daniel and I were not only removing diseased and unproductive plants, but we were also removing a piece of history that had manifested itself in the landscape throughout the many years of its existence.

Symbolic social relations

Daniel and I were carrying a large green basket between us as he guided me to a section of the plantation that required renovation. The basket was full of less-than-a-year-old *Obatá* plants from his coffee nursery, each in separate black plastic bags filled with soil. He told me that he and his newly deceased daughter had planted and taken care of these in the coffee nursery together. Sadly, she did not endure to participate in replanting these in the farm where they would develop larger roots and subsequently start producing. We put down the heavy basket as we reached rows of plants with few leaves. As Daniel grabbed a branch of one of these plants and bent it, I instantly heard them crack. "*Roya* dries life out of the plant," he said in a pessimistic tone. "These plants right here are all very old *Caturra*, almost eighty-year-old

plants! My father planted these. When I was younger, these plants would bend over due to the large amount of coffee they produced. But things are different now, I have no choice but to cut and uproot them,” he said with gloomy eyes.

This example illustrates how temporalities are set in motion through acts of renovation. Adopting Ingold’s (1993b) dwelling perspective opens up for the temporality of the landscape by treating the latter as a story embodied with the activities and the movements of past generations, who, through their tasks, have been *incorporated* into the landscape, and vice versa. Moreover, Ingold’s notions of technique and *being-in* are closely related to ways of perceiving the landscape as they both concern direct engagement and context-dependency. Farmers’ principal manner of acquiring knowledge then, might explain their ways of *seeing* the history of the landscape in Okely’s (2001) terms. For Daniel, the coffee plants were materialized features of the landscape and his father’s continuous work on the farm. By engaging directly with these plants and the environment on a daily basis, his father’s identity was integrated into the landscape of the farm, which in turn was inherited by Daniel. Hence, Daniel’s decision to cut and eventually remove several *Caturra* plants generated melancholy due to the long history, or more specifically due to the enduring social relation between his father, himself and these plants. Both of them had been incorporated into these plants through practical activities, and the plant had become a part of them. In a sense, they had become a part of their family as providers for it. The plants had generated income for his family for generations and they were a memory not only of his departed father, but also of a nostalgic past in which coffee was in abundance and recognized as the golden bean.

By cutting and removing the *Caturra* plants, Daniel would remove a materialized symbol of his father. In Mauss’ (1995) terms, it might be interpreted as denying or ending a social relation. As already discussed, the relationship between a farmer and his plants is of a reciprocal type. Farmers would for instance *give* food (fertilizers), the plant would *receive* it (“eat” the nutrients) and *give* coffee berries *in return*. Additionally, dedicating time was regarded as a way of giving and showing love for the plant, which would then always give something in return. Hence, by cutting, Daniel rather *takes* (life) than *give* (life), thereby ending an enduring relation between them. In this sense, Daniel would remove history from the landscape; i.e. materialized features of the landscape which symbolized his (or their) identity would be removed.

Like Daniel, Luis was proud to show me that he had a selection of what he called “memories” within his plantation. As we walked around, he showed me the first coffee varieties that were commonly used by everyone in Costa Rica. The eldest type did not really have any function other than a memory. Even though it produced berries, contemporary coffee processing factories do not have machines to process these. Another variety he showed me, *Hibrio*, was among the types that were commonly cultivated before *Caturra* was introduced. The plant was quite old, which was reflected in the relatively low productivity, he said. Despite this, he did not want to cut it, because it reminded him of his parents and grandparents, who had this variety in their plantations. Later, he presented me with a taller type of shadow trees, which also was common before. He smiled while explaining how his grandparents had to climb a ladder to prune these trees. Only one such tree lingered in his plantation as a memory. The remaining others were only tree stumps of 1,5 meters. He had to cut these a couple of years ago because they enabled coffee rust to disperse more easily.

Keeping a small selection of varieties and shadow trees that do not really have a function other than memories,⁶³ might be analysed as preserving materialized manifestations of social relations between his ancestors and himself, and their history and effort that have been invested into the landscape. In a similar manner, the Zafimaniry in Eastern Madagascar recognize houses as objectified social relations between lineages (Bloch, 1995). They believe that humans have the potential to become integrated into, and part of the landscape upon a “growing” marriage (i.e. family), which implies that the marriage is further stabilized. This growing stability is reflected in the house of the couple that becomes increasingly permanent through a process of “hardening” the house (Bloch, 1995:68). In the subsequent decades, the married couple, their descendants, and relatives slowly replace woven bamboo with heavy hardwood beams, and carving decorations as a way to harden and praise the stability of the social relation between the married couple and their descendants. Even after the couple’s death, this process endures, as their life is materialized in the house itself.

Parallels may be seen in the age of and the type of coffee variety in my key informants’ plantations. Everyone, except Sergio, had a small selection of elderly varieties in their plantations. They explained that they wanted to keep them as memories of their ancestors and

⁶³ The *Hibrio* plant might be said to have symbolic rather than economic value due to the low yields it provided.

a better time. Alejandro explained that it was a way to not forget the past, how things had changed. Similarly, Luis did not want to get rid of the elder varieties because they reminded him of his father and grandparents who worked with these types of varieties, despite that they did not actually work with those specific plants. Keeping these is a way of not forgetting ones' heritage and aspects that have been integral in Turrialba's coffee history. In one way, the process of continuing to work and assist these plants might be considered a dualistic process of "hardening". On the one hand, by engaging in the taskscape similar to that of their ancestors, farmers too have the potential to become a part of the landscape, through assisting the plants, which eventually become materialized manifestations a social relation between themselves and their ancestors. On the other hand, as years pass, the roots of the plants grow larger and harder in the soil. Thus, the elder the plant, the larger the roots, and the harder it is to root it up - both physically and emotionally, as it was for Julio due to the extensive familiar history entailed in them. The uprooting of these plants, for Julio, meant a rupture between his ancestors and his descendants' paths. Valuable knowledge would be lost, as his sons, who indeed had some knowledge of cultivating coffee, were relying on other types of professions to provide for their respective families.

Concluding remarks

This chapter discussed the emergence of precarious times for farmers, by analysing the decrease in coffee prices and the recent rust-epidemic as the two most central events. In my opinion, these events marked a rupture from the past by creating more uncertain times, in which notions of loss and hope arose. I analysed these notions as statements of nostalgia, despite its controversy. Moreover, I approached temporality at two levels to explore how this uncertain situation has on the first level, produced collective anxieties about the future of Turrialba's coffee culture, and on the second level, how it created preoccupations of losing familiar heritage. On the former, I exemplified how this uncertainty was reflected in farmers' choice of variety to replant with. Despite the lingering threat of *roya*, many farmers chose to replant with susceptible varieties, like *Caturra* because they were familiar with it. Hence, this might be a manner to approach what is perceived an uncertain future in a "secure" manner – that is, with a plant one already *knows*. This uncertainty was also materialized within Daniel's plantation; he planted *Obatá* between rows of *Caturra* in case he would be "deceived" by the former, which he was yet to acquaint. On the latter, I explored how acts of renovation set in motion memories

of the landscape, which their ancestors had shaped. Cutting and uprooting rust-diseased plants was a difficult task, as many of these had “depth” (extensive history). Hence, as acts of remembrance, several farmers had a selection of elder coffee varieties, which symbolized their ancestors and secure times. In retrospect, the varieties might represent materialized notions of hope of “better times” in the future.

Conclusion

Throughout the thesis, I have attempted to show how the rust-epidemic of 2012-2013 led to processes of change in various arenas. By focusing on farmers' and agronomists' statements, conceptions and knowledges about *roya*, I initially discussed how *roya* emerged as a social phenomenon and was given new meanings in the process.

In chapter two, I suggested to analyse the rust-epidemic as an “event” (i.e. an “unexpected situation” or state of crisis) (Kapferer, 2005). The event, I argued, initiated with the declaration of state of emergency, followed by various measures (e.g. donation of fungicides, economic relief, *fideicomiso*) to combat coffee rust. These donations, in turn, revealed the social structures of the coffee industry, in which coffee farmers find themselves at the bottom, receiving the least profit. More importantly, the actions taken on macro level consequently created a sense of “acuteness”, which allowed for the emergence of *roya* as a social phenomenon from *calma* to *brava*. I illustrated how this “acuteness” was conveyed to the median level, where ICAFE’s *charlas* became central in providing scientific knowledge to farmers about how to combat the disease. Having adopted Barth’s (1994) analytical levels, I continued to explore how the perception of *roya* as “wild” was both a top-down- and bottom-up process in chapter three.

Drawing on Mol (2002), I investigated the *enactment* of *roya* as a two-way process. First, it was a top-down process (or a *globe* perspective); various measures to combat coffee rust and the increased attention in media on macro level, together with the involvement of agronomists and conveyance of scientific knowledge in rust issues in ICAFE gatherings on median level were integral in *enacting roya* as “wild”. Moreover, I argued that the “discovery” of two new pathogen species of coffee rust that were more pathogen (i.e. aggressive) through inscription devices, together with references to the investigation centre in Portugal, and the status of the speakers in ICAFE gatherings, produced persuasive statements about *roya* as *brava*. The discovery of a more aggressive *roya* led to statements that differentiated between the previous *roya* as *calma* and the recent as *brava* in *charlas* and activities organized by ICAFE.

Second, it was a bottom-up process (or *local* perspectives), meaning that farmers' first-hand experiences with coffee rust and its repercussions too were integral in perceiving it as "wild". I discussed how coffee producers did not categorize a disease as such (or as "bad") before experiencing that it was causing severe damages, such as *broca* and *roya*. Although *broca* has only been mentioned briefly, I believe that it underwent similar processes as *roya*, but perhaps not to the same extent. *Broca* too was fresh in farmers' memories, as they often referred to it as the second most destructive disease they had experienced. Farmers' repetitive account of "*Antes no había enfermedades*" must then be understood in light of not only their different experiences with various diseases, but also the amount of attention, "talk" and involvement of agronomists and other agents in such issues.

Furthermore, I investigated how farmers' manner of acquiring "tacit" knowledge through practice was connected to a *local* perspective of *being-in-the-world* (Ingold, 1993a). Since such a perspective is based on practical engagement with the environment, I argued that farmers were particularly prone to live alterations within it, such as changes in weather. Moreover, their experiences of these changes might mediate and supplement the scientists' statements about climate change. The argument was strengthened by farmers' ambivalent attitudes towards chemical products, which they perceived to affect the coffee plant in both negative and positive manners (e.g. the plant being "bored" and then "happy" after fumigating). Due to this, many farmers believed chemicals to be one of several reasons in causing the sudden rust-epidemic. Conversely, such statements were non-existent on median- and macro levels. Furthermore, I argued that farmers' and agronomists' manners of acquiring knowledge through *local* and *globe* perspectives made them categorize *roya* in different manners. Farmers would speak of plants and *roya* as having agency, that is, human needs, emotions and desires (e.g. desire for something sweet [*Caturra*]). I explored how farmers' "tacit" manner of acquiring knowledge sometimes made it challenging to express themselves, as if lacking the terms. Unlike agronomists' who had a vast array of scientific concepts (e.g. anomalies and species), farmers' referred to a more familiar domain, namely the human body, to explain the rather unfamiliar "wild" *roya*.

Chapter four brought together the perspectives I connected to farmers and scientists respectively in chapter two and three. By analysing how farmers in particular continuously shifted between categories, I aimed at contributing to a more symmetrical study of knowledges. In doing so, I adopted Okely's (2001) analytical concepts of *looking* and *seeing* in order to surpass what, in my opinion, was a problematic distinction that reproduced dichotomies which it attempted to

exceed (see chapter one for critique of Ingold, 1993a). Although Ingold's notions of perceiving the world have been useful in highlighting my arguments about different types of knowledges and manners of conceiving, I believe that applying solely those concepts would have debilitated my analysis. Okely's concepts on the other hand pushed me in the direction of a more dynamic analysis *between* concepts rather than a static analysis *within* them. In the process, I discussed how various measures of controlling *roya* (e.g. conveyance of scientific knowledge through ICAFE gatherings and donation of fungicides) affected farmers' coffee management practices and the manner in which they approach coffee rust.

I argued that the donation of fungicides not only was an attempt to control *roya*, but it was also one of several measures in a greater agenda of "modernizing" smallholders' management practices, by promoting technologies or practices that would minimize diseases, the foremost currently being coffee rust. By analysing the rust-epidemic as an "event", it became possible to observe macro-dynamics in relation to micro-dynamics. In doing so, I unveiled interests of the donors (i.e. ICAFE and SFE) and their perceptions of smallholders. I connected their donation to Scott's (1998) synoptic gaze and Mauss' (1995) gift exchange logic, by suggesting that the donation was a manner to control the actions of coffee producers, as the latter would not be able to reciprocate the gift. By giving a gift that farmers could not return *directly*, ICAFE and SFE were somehow "steering" farmers' actions towards a larger scheme if "modernizing" the *tico* smallholder, by introducing them to technological devices that aimed at a better control of *roya*. In turn, this gift produced power effects of temporal differentiation and governability – effects that were further reproduced in ICAFE's gatherings on the median level. What farmers and agronomists believed to be a root cause for the epidemic, namely economic resources, were in such functions ignored. Rather, agronomists focused on educating farmers, whose "culture" (i.e. management practices) they perceived as "traditionalist". Displeasures of not having sufficient economic resources to invest in products that farmers knew they needed, were revealed in joking comments, analysed as hidden transcripts, or veiled manners of expressing political opinion. In short, these comments might show the intersection between macro- and micro-dynamics.

Macro-processes, such as the donation of fungicides might be said to reflect themselves in micro-processes. The donation produced alterations in smallholders' management practices, as many of my informants started fumigating more regularly or started to use such products altogether after receiving it. From agronomists' perspective, farmers' manners of *seeing* posed

a problem, as they often waited too long before applying fungicides. Activities (based on practice) were therefore necessary to present them to scientific knowledge and ways of *looking*. Moreover, I exemplified how the *tico* coffee farmer is increasingly relying on *looking* through technological devices (e.g. fungicides and soil analysis) combined with traditional technique-based practices and manners of *seeing* (or “reading”) the landscape. Hence, farmers were continuously shifting between approaching coffee plants as subject/object using technique/technology, *local/globe* perspectives, and *looking* and *seeing*. Furthermore, I highlighted how scientists too might *look* to *see* when checking the condition of a plant. I hope that this approach will contribute to a more symmetrical study of knowledges, which nevertheless needs new concepts to grasp the knowledges in between these static categories.

The historical backdrop presented in chapter one proved useful in chapter five, where I explored how farmers now find themselves in precarious times. Farmers and agronomists’ alike agreed that the decline of the traditional coffee industry in Turrialba began with the drop of the prices. The drop in prices eventually led to the closure of several *beneficios* and abandoned coffee fields. However, the rust-epidemic exacerbated the issue of uncertainty, leading to notions of loss, and hope that prices and yield would increase. Central in these accounts were temporal orientations of the past as more “secure” in contrast to the present and imaginaries of the future as “uncertain”. I analysed temporality at two levels. First, I exemplified how notions of loss and hope emerged within this precarious condition, by treating them as statements of nostalgia. I argued that such notions were part of general anxieties about losing Turrialba’s traditional coffee culture altogether. In short, I explored nostalgia as a window that connected experiences of more secure times in the past, by comparing it to those of the present, which, in turn, created imaginaries of the future as uncertain.

On the second level, I explored how farmers were facing changes within their plantations, due to the repercussions of *roya*. Among these changes was the relation between the farmer and the coffee plants. By drawing on Mauss’ (1995) gift change theory, I suggested that this had altered from a somewhat symmetrical type to a more asymmetrical relation due to less fertile soils and the rust-epidemic among other factors. Farmers experienced that they had to *give* more than what was *given in return* (yield and economic capital). Due to this, they complained that coffee was no longer profitable compared to before. This is another example that shows the utility of treating the rust-epidemic as an “event” (Kapferer, 2005). It illustrates how social relations (here; between farmer and coffee plant) are made visible and may change depending on the

outcome of the event. Whether the perception of this asymmetrical relation will persist after several farmers have planted new, and thus, more productive plants, will remain to see. Furthermore, farmers also faced other changes during renovation or upon leaving coffee cultivation altogether. In such circumstances, farmers expressed melancholy, and some chose to keep certain shadow trees and coffee varieties despite that they did not pose any particular economic-profitability. I connected this to Ingold's (1993b) notion of "taskscape" by analysing how previous generations' work have been materialized within the landscape. By working with the plants, farmers were linked to their ancestors, while simultaneously incorporating a part of their social identity into the plants. Younger generations' unwillingness to continue in the path of their parents, has added to the anxieties not only of Turrialba's cultural demise, but also fear of losing knowledge that has been transferred throughout generations.

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