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Growing Relations: An ethnographic study on rice, vanilla, and yams in Madagascar

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Abstract

I examine the various ways in which the rice, wild yams, and vanilla that grow in northern Madagascar feature in the lives of numerous people including rural community members, representatives of the Malagasy government, and foreigners, focusing especially on the distinctive networks of relationships entailed by each of these plants. Each case presents interesting dilemmas from which we can gain insight into the everyday lives and hardships faced by rural Malagasy. Rice is a staple crop which both feeds and employs many Malagasy. More importantly it is at the base of everyday life, sustaining and creating important social ties. Wild yams are a famine food which are largely foraged by food-insecure communities. Foreign investment in protecting this plant, along with other species and landscapes, has alienated those who rely most on it. Vanilla is an economically valuable cash crop, similar in some ways to gemstones or precious minerals, requiring producers to invest substantial time and effort in a commodity prone to significant swings market value. Producing vanilla connects rural communities to global markets, allowing for a greater flow of cash to vanilla producers, but also requiring farmers to navigate many risks. Looking at the similarities and differences among vanilla, rice, and yams, I detail the insights that can come from considering these cases alongside one another. In considering multiple perspectives and drawing from various bodies of knowledge, I explore the dynamics of these plants and the people who value them. I argue that as people invest in relations with these plants, they also enter into a network of relations with others.

Keywords

Africa/Madagascar, agriculture, anthropology, commodities, conservation, ethnography.

Summary for Lay Audience

This thesis is an analysis of plant cultivation in northern Madagascar, focusing on the ways in which relationships form between people through their various engagements with plants. By specifically focusing on rice, yams, and vanilla, I explore the different ways people become connected through plants. Rice is the most important staple crop in Madagascar, while yams are a famine food, and vanilla is a cash crop. In the accounts of each of these plants, I explore a variety of social dilemmas which illustrate some important aspects of everyday life in northern Madagascar. My research draws from interviews, surveys, and observations conducted during my fieldwork. Additionally, my research draws on the works of others who have explored similar themes and issues, especially within Madagascar. My findings suggest that people who have vested interests in these plants are connected to others in ways that enable the production of food, the development (and resistance) of conservation efforts, and the trading of export goods. I argue that due to the various demands required by different sorts of work required by these plants, people build or are forced into distinctive sets of sustaining social relationships.

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Chapter 1: Introduction

The basis of this thesis was developed during the third year of my undergraduate studies at Western University. While traveling in Madagascar in 2015 as part of a field course, my visits to markets made me interested in the different commodities people were selling. I became particularly interested in vanilla, a commodity I had recently focused on in a project in one of my other courses. I saw people selling bundles of the spice to tourists in the market, at the beach, on busy strips of the street, and in shops. Images of vanilla also featured heavily fabrics and artisanal crafts. The various ways vanilla permeated everyday life fascinated me and led me to want to focus my attention on further exploring it.

A cliché appropriate to so many of my experiences in Madagascar is that things do not always go according to plan. One should always expect the unexpected, assuming that anything that can go wrong, will. Airline strikes, cyclones, and even political crises are just some of what can overturn one's plans when visiting or doing research in Madagascar. The point I am making here is that my research did not go according to plan – I did not end up focusing entirely on vanilla. That being said, the change in trajectory I ended up following allowed me to consider some of my original research questions in a broader context. As my research progressed, my project grew into an open-ended, iterative, exploration of people's relations with various plants, and with various food crops in particular. From May to August 2017, I spent most of my time doing fieldwork in Madagascar talking with a variety of people including farmers, conservation workers, Peace Corps volunteers, and an array of others. These conversations focussed mostly on the place of three particular crops in people's lives: vanilla, rice, and yams.

In this introduction I first offer general information about Madagascar to provide the general setting of my work, followed by a discussion of the background information necessary to situate and contextualize my research. I will give an overview of the theoretical inspirations that have guided my work, as well as the methods I used in conducting my research. Lastly, I outline the research questions which guide each chapter, as well as the broader issues I address in the thesis as a whole.

Madagascar

Another cliché about Madagascar is that it is unlike anywhere else in the world. Madagascar is the fourth largest island in the world, roughly the size of Texas, and has a similar number of inhabitants (~26 million). The date of original settlement on the island nation is debated– archaeological findings place humans on Madagascar as early as 10,000 years ago, but more settlements were common after 500 CE and larger waves of immigration occurred around the 13th century (Battistini and Richard-Vindard 1972; Saplakoglu 2018). Although Malagasy people speak a common language (called Malagasy, in English), they differentiate themselves from one another with reference to how they speak Malagasy, the ethnic groups they identify with, as well as the places they and their families are from. The Malagasy people are commonly divided into 18-20 different ethnic groups, though people also often distinguish the island's inhabitants as being made up of coastal and highland populations. The official languages spoken in Madagascar are Malagasy and French, with Malagasy being marked by a high degree of dialectic diversity. The major religions are Christianity and Islam, in additional to traditional beliefs associated with the power of ancestors, royal lineages, and spirits. The majority of the population is under the age of 25; the nation's population growth rate is 2.39% and life expectancy is 67.3 years ("The World Factbook: Africa: Madagascar" 2020). Literacy rates are near 75% and the average number of years spent in school is 10 ("The World Factbook: Africa: Madagascar" 2020).

The natural environment of the country formed in such isolation that the vast majority of plants and animals on the island exist there and nowhere else. Indeed, Madagascar is considered a "biodiversity hotspot" due to its unique flora and fauna, 90% of which are found nowhere else in the world (Boucher 2011, 59). Today, it is estimated that more than 90% of the island's original forests have been destroyed, a fact that is frequently attributed to human activities including clearing land for agriculture and grazing. The effects of people's use of Malagasy landscapes for subsistence continue in the present. Kull (2004) states that "[b]etween 200,000 and 700,000ha of brush and forest are cleared and burned each year for agriculture" (19).

Madagascar's landscapes have come under the gaze of foreign parties who take great interest in the resource-rich island. Some work towards protecting what little is left of the nation's original forests and endangered ecosystems, while others work to extract precious

resources for profit. Cash crops, timber, and minerals are among Madagascar's major exports, all of them requiring the appropriation of, or significant interventions on, land in order to be produced. Agriculture in particular is the source of 30% of Madagascar's GDP, 40% of its exports, and involves more than 70% of its labour force (Depetris-Chauvin, Porto, and Mulangu 2017, 142). Within the DIANA region (in the far north of the island) where I conducted my research, fishing, agriculture, and mining are the most important economic activities. Tourism is an additional important source of revenue for Madagascar. In 2018, the nation saw approximately $879 million USD from tourism, accounting for 6.3% of Madagascar's gross national product (WorldData, n.d.). Madagascar is in a unique position of being able to profit both from exploiting and protecting its natural resources.

Madagascar is one of the poorest nations in the world. More than 80% of Malagasy people live on less than $2.00 a day (IMF 2007, 008). Access to food and clean water is limited, and a significant portion of the population experiences malnutrition. The limited accessibility of healthcare services and facilities have increased the presence and impact of preventable diseases such as malaria, cholera, and even the bubonic plague which continues to affect certain areas of the country (Harper 2002). The nation has also been impacted by great political instability; a coup in 2009 caused a national crisis, but two successful democratic elections have occurred since. People on the island have also faced a variety of other uncertainties over the years in the form of cyclones, drought, and locust invasions.

In sum, Madagascar is a unique nation and is home to many species found nowhere else in the world. Ongoing processes of exploitation and conservation of the island's diverse natural resources mean it is also a place where differently positioned people meet at intersections with different interests in mind, allowing for investigations of how different parties navigate relationships with one another and with environments in pursuit of sometimes conflicting demands. There is no question, however, as to what most of the Malagasy people I met in the course of this research were prioritizing in their relationships with others and with crops that I describe in this thesis – that is, their own (and their families') well-being and futures. As I discuss the various cases I encountered in my research, I stress the importance of keeping in mind the precarity faced by most people in Madagascar, and the very real obstacles people must face in meeting their basic needs in the

face of great uncertainty. In fact, it was one major cause of such uncertainty that led me to expand the scope of my research.

Background

In March of 2017, cyclone Enowa devastated the north-east coast of Madagascar, better known as the SAVA region, affecting over 245,000 people. The capital of this region, Sambava, is the vanilla capital of Madagascar, if not the world. It was also the initially proposed location of my field work. My original plan was to conduct an ethnographic study of the vanilla trade, which would require me to visit and live in the country's vanilla capital. The cyclone's impact, and the insecurity and uncertainties it brought to the area, led me to shift the focus of my research. With limited information on the post-cyclone state of the region, I needed a new plan that would allow me to complete my work through fieldwork elsewhere – specifically, in the north-west DIANA region where I had existing contacts (Maps 1 & 2).

Map 1: Madagascar

"Madagascar". Map, Google Maps. Accessed 22 May, 2020

Map 2: DIANA Region

"Madagascar". Map, Google Maps. Accessed 22 May, 2020

Although vanilla is produced on a much smaller scale in the northwest than in the northeast, it is still present and is growing both in scale and economic importance. Understanding that I might not be able to gain enough insight from the research I would be able to conduct in this area, however, I made the decision to broaden my project to include

other plants. At this point, a fellow student and friend who had just returned from doing MA research of his own in the region shared a piece from his own work about wild yams with me (Mercado Malabet, 2017). These yams were an undomesticated food crop that, as I will discuss further in Chapter 3, many Malagasy people turn to in times of crisis. This was not only an interesting case in and of itself but would, I thought, offer an important contrast to vanilla, allowing me to compare a cash crop with a famine food. Various other possibilities were suggested to me and I considered many, but it was not until I actually started my fieldwork that I decided to focus on rice as a third case. Early in my research, the omnipresence of rice in people's lives became very clear. Adding a staple crop to the project, I hoped, would enable me to tell a more holistic story of Malagasy relations with food crops, allowing me to highlight important differences and similarities among crops that were unquestionably all important to Malagasy people, but in very different ways. As I considered the significant ways these plants factored into people's lives, however, I also began to see the ways they facilitated relationships among people— connecting them to broader economic, organizational, and political networks.

Theoretical Framework

In planning for my research, I acknowledged from the start that I would be encountering various, and potentially opposing perspectives from the people I would be meeting and talking with. My goal from the start has been to accommodate these multiple perspectives and facilitate an analysis which considers them individually as well as in relation to one another in a holistic way. Drawing from multiple theoretical frameworks, I have established a matrix from which I can approach my findings and make connections to an existing body of knowledge and research. Using the works of Tsing, Kohn, and Osterhoudt, I will give an overview of the concepts I had in mind while conducting my research. I will then explain how all of these will be merged into the framework which guided my research and analysis. Although I do not explicitly return to these concepts in my thesis, I am discussing them here to provide a context for how I conceptually approached my own research. I drew inspiration from these ideas while conducting my fieldwork and as I analyzed my findings.

Tsing: "Polyphonic Assemblages"

In Tsing's *The Mushroom at the End of the World* (2015), music elements are drawn on as an analogy for exploring how humans engage with other people, places, and things (including mushrooms). She uses the term "polyphonic assemblages" to describe these relationships and the ongoing interplay of interactions which occur among the connected entities. To explain this, Tsing first describes polyphonic music as a form in which different melody lines "[come] together in unexpected moments of harmony and dissonance," allowing multiple differing elements to form a unified whole (158). Assemblages of plants, animals, humans, ecosystems, and other variables, she goes on to argue, work together similarly in "sporadic but consequential conditions" (158). Polyphonic landscapes require the interplay of organisms that one can 'listen' to so as to 'hear' the interplay of difference in the resulting assemblages.

An inspiration I took from Tsing's notion of polyphonic assemblages is the importance of the interplay among different actors, especially among human and non-human actors. Tsing is able to situate her research and the various narratives she incorporates within the scope of human-mushroom relations. The object (mushroom) is translated as the subject to illustrate how narratives are woven together. Positioning 'things' like plants under a personified guise (the subject) allows the object to be placed in the centre of an analysis of dynamic relationships. It is for this reason that I have conceptualized the various plants considered in my research as if they are important characters in a story. I will describe in my thesis the important relations of which they are a part, as well as who and what these relationships involve. In doing so, I am not referring only to the plants, but rather to the important ways they facilitate connections and engagements among people. Although this may sound as if I am discussing these plants as agents or as having agency, I suggest rather they are important components in the facilitation of human connections. However, I am not declaring or denying the agency of these plants. I want to ensure the focus of my discussion remains faithful to the words of those who participated in my research. Tsing's polyphonic assemblages allowed me to build questions and investigate these plants in a way that led me to understand the myriad relations formed and negotiated through the production and consumption of the plants I have researched.

Kohn: "Ecology of Selves"

Kohn (2013) uses the term "ecology of selves" to describe how selves are not only human. He describes how, through a myriad of interactions amongst human and non-human selves, a network of beings is in constant action, creating signs and materialising forms that allow mutual understanding. This perspective is described by Kohn (2013) as "enchanted", not in that it reckons mythical creatures, but "things" which think (16). 'Thinking' in this context becomes equivalent to life/sentience— to live is to produce subjective thought, and thinking is the mode through which an entity is a being (i.e., I think, therefore I am). Any living organism is capable of intentional communication as organisms (plants, animals, etc.) and forces (sun, water, etc.) operate to create the conditions that meet the requirements for life; a plant communicates with soil, herbivores with plants, predators with prey, and so on. Communication extends to every sense and perception of another; one's relation to others consists of interactions and engagements. Interactions in the ecology of selves create, sustain, and even destroy the conditions of life, but this is a constant negotiation for each self. For example, if a species is eliminated from the ecology, its absence reverberates as conditions are changed in response to any further shortages through the thriving or degradation of other selves.

I have taken inspiration from Kohn's ecology of selves in my own research analysis through my conceptualization of the types of relations and connections which are formed through the particular plants I researched. In detailing a diversity of perspectives from those engaging with or interested in these plants (i.e., farmers, conservation authorities, local vendors, and even global media), my aim is to establish the basis of an ecology, or map, of narratives; what this ecology represents is how the exchanges made through and around various plants connect people, places, economies, and other variables in important ways. The value of this approach is that it will allow me to draw from the different sorts of research I carried out in order to highlight connections among vanilla, rice, and yams and the various others to which they might be related. In approaching my research as both an ecological and social analysis, I am applying ecology as a working analogy to situate people and things within a network of relations that involves other people, specific places and important events, as well as the contexts (i.e., political, economic, environmental conditions) that are important in understanding the intricacies of this ecology. In this way, my research

could be considered a type of autoecology. Autoecology involves the study of an organism in relation to others in its environment, including humans ("Autoecology" 2018). However, my analysis includes many social variables which I argue are a necessity to properly describe the current context of each plant and those both directly and indirectly connected to the plants and their environments.

Osterhoudt: "Fugue"

Drawing once more on musical elements, I draw inspiration from Osterhoudt's (2014) conceptualization of "fugue" as part of my overall framework. In music, a fugue is defined as "a contrapuntal composition in which a short melody or phrase (the subject) is introduced by one part and successively taken up by others and developed by interweaving the parts" ("Fugue" 2020). In using the fugue as a theoretical concept, Osterhoudt (2014) states:

> I draw from the musical metaphor of the fugue to weave together economic botany and ethnographic approaches to understand the diversity contained within agroforestry fields. I illustrate how [Malagasy] vanilla farmers take a deliberate management approach to their landscapes, based in both agricultural technique and cultural values to selectively incorporate new crops and materials within their cultivation systems, while preserving the existing diversity of market, subsistence and medicinal plants. I also consider more general aspects of interdisciplinary approaches, and argue for a co-disciplinary framework that places specialized epistemologies side by side - in the manner of a fugue - without trying to blend either paradigm with the other (32).

Similar to Tsing's polyphonic assemblages, the fugue takes music as an analogy for drawing dissimilar parts together into a holistic composition characterized by great variety. Each subject is incorporated into a narrative which tells many stories together. The major difference between Osterhoudt's and Tsing's concepts is that Tsing places greater focus on human interactions within a natural setting, while Osterhoudt's attention is on the differing narratives which arise through a multidisciplinary approach to research.

Osterhoudt's understanding of the fugue might be discerned in both my presentation and analysis of the research findings discussed in the coming chapters. Mainly, I will base each chapter around a single plant about which different narratives might be, and are, relayed. The fugue is also an important consideration in how I arrived at my particular methodology and general approach for this project. I used mixed methodology in my fieldwork, and in researching the various aspects of each chapter, I have incorporated

insights from other disciplines. Many epistemologies are considered throughout my thesis, and like Osterhoudt's fugue, I do not try to blend them, but rather to understand them together.

My Framework

The aforementioned theoretical concepts are not ones which I will be referring back to throughout my thesis. The purpose of discussing them here is to highlight the important fact that these ideas shaped the approach I took to my own research. These theoretical inspirations guided the way in which I thought about the plants I researched and how people engaged with them. These theoretical perspectives were instrumental in helping me understand the tangible challenges faced by the people I engaged with throughout this research. Each chapter will focus on a different plant and the contexts in which they shape the lives of the people who grow, consume, or otherwise handle them. The next three chapters of this thesis might be read in any order, with each offering different perspectives on the relationships among people and plants that are ultimately the focus of the thesis as a whole. These relationships manifest differently depending on the contexts in which they develop, and my ultimate goal is to illustrate how they matter to people in varying ways.

Methodology

Between May and July of 2017, I conducted ethnographic fieldwork in various locations of Madagascar's DIANA region— the northwest of the island. All of the findings of this research were made possible due to the connection I have with my field partner, Jessico Snyders Betombo (Photo 1). Snyders and I met during my first visit to Madagascar in 2015 and have since developed a formidable friendship; our relationship reflects the Malagasy value of kin forming as we refer to each other as brothers. Snyders is my "*zoky be"* or "big brother." Snyders contributed significantly to the fieldwork of this project. Together we conducted, translated, and transcribed interviews in Malagasy (a language I cannot speak); his educational background in English made conducting interviews a very natural process as we could carry on uninterrupted conversations. Snyders' cultural knowledge also provided many insights as he helped interpret the varying significance of the findings. Snyders is a social advocate for youth in Madagascar and is involved with several projects aimed at improving the standard of living in his nation. Some of these projects involved

sanitation and hygiene, sexual wellness and contraceptive education, and fundraising. During my first visit to Madagascar in 2015, Snyders and I worked on a research project together involving surveys, interviews, and archival analyses. Our aim was to measure the impact of the NGO, Mada Clinics, on the communities is provided its services to. Having this previous experience with Snyders, I knew he would be a very valuable research assistant and he joined me without hesitation.

Photo 1: Snyders and I harvesting rice.

As previously mentioned, this research had to account for varying perspectives which required us to use different methods and ways of thinking. Using different methods throughout the research allowed us to explore the complex ways people engage with vanilla, rice, and yams. This project was approved for ethics by Western University's Research Ethics Board (REB) (Appendix I). Every participant in this research has been given a pseudonym to protect their identities. Additionally, each participant gave their verbal, informed consent to be interviewed, surveyed, photographed, and/or observed in addition to

allowing us to incorporate results from said methods into this research. In the following paragraphs, I explain the different methods we used throughout this research, and their importance.

Surveys

We conducted a survey (Appendix II) in three locations (Maventybao, Tanambao, and Ambondromifehy), collecting a total of 21 individual survey responses. These three sites are all the locations where Mada Clinics hosts clinics (Tanambao and Ambondromifehy are where remote clinics held once weekly whereas Maventybao is the NGO's primary location). Snyders and I traveled with the doctor at Mada Clinics and surveyed individuals waiting to be seen at the clinic or those at their homes in the villages. Although it may seem odd to survey individuals waiting at the clinic, the locals had questions for Snyders and myself which would often lead them to volunteer to participate and give their input. Participants were asked questions regarding the crops they grew, the methods they used in growing these crops, and the variables that impact their agricultural work and daily lives. The information from these survey responses gave insight into the main economic activities and subsistence strategies used by people in the various communities we visited. Additionally, after our initial analysis of the survey data, we incorporated some of the questions into the interviews for understanding the different crops people grew and relied on.

At the point of completing these surveys, I still had not committed to placing a focus on rice as a third case for my research. After a review of the data from the surveys, Snyders and I constructed a list of the various natural resources which the majority of participants identified as having cultivated or gathered from the wild. From our list, rice, charcoal, and khat were among the top of our choices we decided to explore further. From here we transitioned from our survey into conducting interviews.

Interviews

The questions asked in our interviews were derived from the survey, which provided a good framework for talking with agricultural workers. The questions began to change and developed into a structured introduction in which we could first ask general questions about the participant, then flow into a more focused conversation about the participant and their engagements with the particular plant(s) we were researching. We conducted 68 semi-

structured interviews during my fieldwork, most of which were digitally recorded. We spoke with people from different backgrounds and in many different contexts. None of the participants who were surveyed were also interviewed, each participant represents one individual (i.e., I conducted 21 surveys and 68 interviews with 89 participants). We spoke with farmers, forest-guards, conservationists, and many others as we explored my research questions.

These interviews provided insight into the important ways people connect with different plants in addition to many other details about the ways people relate to others because of their ties to these plants. Using a semi-structured format made it possible to keep my questions centred around the general topics I was interested in while providing fundamentally important flexibility. What I mean by this is that we were able to incorporate new questions with each participant to get a more complete understanding of their unique and individual cases. In addition, as we noticed potential patterns emerging, we were able to ask questions while following new ideas. Select interviews were transcribed and some were also translated to ensure their accurate incorporation into this thesis. The interviews selected to be described were ones which spoke most clearly and evocatively to the questions at hand. Many responses were echoed by a large proportion of participants, but occasionally someone would add just the slightest detail or tell a story which gave great clarity and was thus chosen to be transcribed, and/or translated, and/or included as seen fit by Snyders and myself.

Observations

Various forms of observation were utilized during this study. Participant observation, non-participant observation and landscape observation were incorporated as a means of connecting the ideas I read about to what I learned from interviews and surveys. These observations also led to an understanding of how different places and activities come into conflict under certain circumstances. Additionally, as I was able to engage in the actual work of many fundamental agricultural activities relevant to my research, I incorporated a phenomenological perspective in many of my observations. Having the privilege of being able to visit the sites of my research physically and not only through others' accounts gave me a better understanding of how people manoeuvre and manage complex landscapes as well as how different challenges (floods and droughts, for example) may affect these settings.

Participant-observation is a signature and key method in anthropology. As the name suggests, this method involves a researcher making observations while also participating in what it is they are trying to observe. Lederman and Dobrin (2016) provide a useful definition of the method:

> Participant observation involves living explicitly as a researcher among the people whose circumstances we seek to understand, and interacting with them by conversing with them in their own languages, fitting in with their rhythms of life, participating with them in those activities to which we are invited, and abiding by our hosts' preferences with regard to note-taking and other forms of recording. Participant observation contrasts with interviewing and conventional experimental procedures insofar as it does not involve extracting participants from their normal social settings (9).

The point of this method is not for the author to just relay how they experienced these events, but rather to use their experience to enable additional perspective in considering other observations and additional research. This method encourages researchers to engage with participants and understand particular parts of their lives and viewpoints.

At various moments during my time in Madagascar, I would see something or meet someone which opened important doors. Snyders and I built unexpected, unanticipated, and unforeseen connections with people in unplanned moments of spontaneity. Random encounters connected us to people and places in ways I could never have anticipated in planning this project. In addition to having a flexible interview style, being able to use observations as a key aspect in my analysis permits me to include important details which did not come directly from an interview or survey, but from what I experienced first-hand in my research. For example, as I physically engaged in the tasks required for producing the plants I researched, I gained valuable insight on some of the challenges the participants of this research encounter and navigate. Additionally, since language limited my ability to engage and interact with participants, observations served as a powerful means for me to be able to conduct this research.

Photography

In connection to an important aspect of my theoretical framework, I incorporated photography as an additional relevant method and source of referential support throughout my thesis. Referring to polyphonic assemblages, photography is an additional method for listening to landscapes and perspectives. Photos are important complements to written field

notes, serving as references and illustrations to depict profound particularities. Photographs capture important moments reflecting objects, people, places, events, and so much more. In this thesis, I use photos to add depth and texture to my analysis. Some photos represent my own point of view, as I was the one who took many of them. However, I have included some photos in which I am pictured, providing evidence of the account I provide in addition to details likely not captured in my writing. This of course was made possible by Snyders who joined me in all the various activities and helped capture various moments significant to this research.

Multi-Sited Research

My research was also multi-sited. By this I mean not only that my research took place in more than one physical location, but also that it considered historical, biological, political, and many other factors in exploring the many details and aspects associated with the plants, places, and people considered in this project. This broad approach taken in multi-sited ethnography is important as it allows local events to be considered within the "World System", or in relation to global events which ultimately influence and shape everyday life in consequential ways (Marcus 1995). This approach also connects to the earlier noted concept of the ecology of selves in which people, places, and things are conceptualized within various scopes of perspective. Every research site, physical or figurative, was vital in connecting the important details of my research. These sites allowed me to further understand and bridge what I had read, heard, and observed.

While I was able to spend more time at some sites than others, I will briefly breakdown the timeline of my field work. I spent 3 days in Mahamasina, 2 days in Anivorano, 1 day in Ambondromifehy, 8 days in Maventybao, 1 day in each Tsara Tanana and Tanambao (small rural villages located near Maventybao), 5 days in Ambanja, 2 days in Sadjoavato, 5 days collectively in Ramena and Ankoirhely (where Oronjia is located). A large portion of my time was spent in Antsiranana where I resided during my fieldwork. Here I planned for trips to the various field sites, as I was required to prepare for varying circumstances due to the sometimes rural locations of these sites. While in Antsiranana I was also able to meet with various contacts, analyse data, and explore various leads. Part of my time was also spent supporting Western University's Madagascar field course which took place during the first half of my field season.

Research Questions

Although the chapters that follow focus individually on specific plants, my reflections on people's experiences with and understandings of these plants developed throughout my time in Madagascar. As I proceeded with my research, I came to better understand the influence of various plants in creating social relations and interesting dynamics among people. I also started to comprehend the circumstances under which these plants come to be very valuable resources for people. The questions addressed in each of the following chapters represent trends and patterns which emerged throughout my fieldwork. Here I will introduce the guiding questions of each chapter, as well as the general themes that addressing these questions has allowed me to explore.

Rice

The first chapter focuses on rice and its great importance as a staple crop. Rice became incredibly important to my project very quickly during my fieldwork. Madagascar is the 11th largest consumer of rice per capita in the world; the average person consumes 100 kg of rice annually ("Rice Consumption Per Capita in Madagascar" 2020). Following a description of rice's long history in Madagascar, I explore the role of the crop in the country today, highlighting its great cultural significance as well as the uncertainties people face in its cultivation and consumption. Following this, I discuss my own experiences with harvesting rice and introduce a case in which farmers accustomed to a particular way of growing the crop were introduced to a new cultivation method, reflecting on what their reactions might reveal about Malagasy people's relations to foreigners and their approaches to risk management.

The first of the two questions I consider in this chapter is, what is the role of rice in creating and maintaining social hierarchies, and how does one's access, or lack thereof, to rice impact a person's or group's status? Rice represents a valuable resource for many households; not being able to access rice for any reason is problematic and a reason for concern. As I detail the many ways people depend on this crop, I give a basis for its cultural importance and how people's engagements with rice can be heavily impacted by any change (i.e., price, yield, quality). The second question I consider is, how does growing, selling, and consuming rice link individuals to each other as well as to local and global economies? I

provide different reasons for the economic importance of rice in Madagascar to showcase the national value of this crop. I then turn to experiences from my fieldwork to discuss ways relationships can form through rice, in addition to how these relations are shaped by a number of external forces including politics, weather events, and conservation projects.

Yams

The second of the three plants I am featuring in my thesis is the yam. In this chapter, I discuss the importance of yams in the lives of the Malagasy people I interviewed and spent time with during the course of my research. Specifically, I look at the role that wild yams play as a famine food and the barriers people must navigate in accessing this resource. Madagascar has a great variety of endemic yam species, several of which are threatened due to overexploitation. I detail an interesting case in which a wild, endangered yam species was protected by a conservation authority in a way that also limited vulnerable communities' access to resources they depend on. In my analysis of this conservation project and its impact, I explore reasons as to why the project poses problems, but additionally how this conservation project could offer important insights into conservation and community development.

One question I consider in this chapter is, how does the conservation of tubers in Madagascar influence the physical and economic well-being of locals living near protected areas? I attend to the perspectives of people who enter forests for different reasons in order to understand the complex engagements involving different people, some of whom depend on foraging and others who aim to conserve local forests. I explore different types of barriers that those I interviewed are faced with, as well as the conditions under which people are pushed to approach their relationships with plants in new ways. Another question this chapter considers is, what is the "wild"? More specifically, how do perspectives of the wild change depending on the different positions of individuals of different status (i.e., farmers, park guards, conservationists, etc.)? From the insights I gained through interviews and observations with different participants, I discuss how people's positions in relation to one another shape how they associate and interact with forests and protected areas.

Vanilla

The last plant I discuss in my thesis is vanilla, the crop which inspired this project.

Vanilla is a high-value cash crop, a major export for the country, and *not* endemic to Madagascar. I necessarily begin the chapter focusing on it with a discussion of how it is that Madagascar has become the world's largest producer of vanilla, from the origins of its cultivation in colonial times to the present. I also explore the labour-intensive processes involved in producing high-quality vanilla beans through a description of my experiences with farmers and curers, as well as an agricultural official in Ambanja. I then draw on research from others who have also explored vanilla and other high value commodities in Madagascar to illustrate some of the particularities of the social relationships that can develop around a high-value food crop that people do not actually consume themselves.

There are two questions I consider regarding Madagascar's vanilla economy. First, how can a crop that is also a global commodity shape the everyday lives of those producing it? For those growing, curing, and selling vanilla, I look at what is involved in the production of it and how the demands of working with this crop are different from and/or similar to those posed by other crops and commodities. I also explore the seemingly implausible stories about the vanilla trade that circulate widely in Madagascar, and how these stories provide important insights on how imaginings of vanilla fit with other kinds of speculation, concerning the position of Malagasy people in the global economy for example. The second question I consider in this chapter is, how do shocks to the vanilla economy impact communities where it is produced? I approach this question by exploring the various aspects of risk involved in the vanilla trade. Theft, crop failure, and market collapses are some of the hazards that vanilla-growing smallholders are particularly vulnerable to, providing yet more indications of the influence that vanilla has (or can have) in people's lives.

Research Objective

The concluding chapter will consider the findings from each chapter together. Looking at the similarities and differences among vanilla, rice, and yams, I detail the insights that can come from considering these cases alongside one another. The final chapter considers how people's engagements with plants enter them in a mix of relationships and presents a number of social dilemmas as well. This theme is touched on within each chapter, but I synthesize the findings in the conclusion to express broader trends.

Vanilla, rice, and yams together allow for an investigation of the multiple ways in which people's engagements with plants involve them in broader networks of relations. Each perspective explored throughout my research is highlighted and explored individually, however, considering these perspectives alongside one another illustrates the array of complex relationships which develop through and with these plants. The goal of my research is to gain insight into the intricate ways rural Malagasy people rely on, perceive, exploit, and conserve certain plants in consequential ways.

Chapter 2: Rice is Life: Entanglements with a staple food

After this project grew from an ethnographic account of vanilla to an account that would also include yams, expanding it further to incorporate rice was a strategic move. Vanilla is a cash crop that represents the growing demands of global markets on Malagasy people, and yams, typically a famine food in Madagascar, are a subsistence crop that can be relied on during times of uncertainty and drought. Rice, by contrast, is a staple cereal crop that plays an important role in the everyday lives of most Malagasy people. It is not uncommon to consume rice for every meal, and as the majority of the nation works in the agricultural sector, growing rice is a common occupational activity. I am beginning my discussion with rice instead of one of the other two plants featured in this thesis because of the major role rice plays in Madagascar, permitting me to establish a detailed context which will be informative in the chapters to come.

In Madagascar, agriculture is the main occupation for 70% of the population, approximately 85% of whom cultivate rice (Barrett and Dorosh 1996, 658; GRiSP 2013, 179). Rice is fundamental to the lives of most Malagasy; it is just as important in their daily lives as it is in ceremonial contexts. To understand how rice, as a staple crop, has such a great influence in Madagascar, there are two questions this chapter focuses on. First, what is the role of rice in creating and maintaining social hierarchies, and how does one's access, or lack thereof, to rice, and the means to cultivate it (i.e., land, water, and labour) impact a person's or group's status? Second, how does growing, selling, and consuming rice link individuals to each other as well as to local and global economies? In this analysis, I incorporate multiple perspectives in discussing the "social life" of rice, illustrating how rice is deeply ingrained in the everyday lives of the Malagasy.

The aim of this chapter is to demonstrate the complex relationships between people and rice. As I explore people's engagements with this crop, I suggest the ways in which rice also connects people to one another. Rice is entangled in the culture of the Malagasy and plays an influential role in building relationships among people. After an overview of rice production and consumption in Madagascar, I detail the history of rice and discuss its emergence as a primary staple crop in Madagascar. The latter half of this chapter draws from my own ethnographic research which I discuss and reflect on, using examples from

others who have considered similar questions in their research. To begin, I will describe the necessary ecological characteristics of rice and the conditions in which it is grown.

Botanical Background

Rice has been cultivated by humans since the early Neolithic era. Archaeological evidence from Thailand and China suggest that humans have been cultivating rice since as early as 10,000 BCE (GRiSP 2013, p. 2). Rice is the world's most consumed cereal crop, being consumed by nearly 50% of the human population, and all rice fields collectively represent the greatest use of space for growing food (GRiSP 2013, x). Those who grow and/or consume rice "form the bulk of the world's poor", to whom rice represents the most important source of food as well as primary economic activity (GRiSP 2013, 11; Barrett and Dorosh 1996).

Rice belongs to the genus of cereal crops called *Oryz*a which includes the two species consumed by humans, as well as a variety of wild species. Humans have cultivated two species of rice; *O. glaberrima*, which is also known as "African rice", and *O. sativa*, otherwise known as "Asian rice" (Grist 1959, 50). African rice is presently only cultivated in West Africa as a famine food, while Asian rice is a major world crop and is cultivated on every continent with the exception of Antarctica (Grist 1959, 50; GRiSP 2013, 2).

O. sativa (henceforth rice) can be grown as a dry-land crop or in semi-aquatic fields known as "paddy" – a term that is also commonly used to refer to the method for growing rice in this way and to the unhusked rice itself. Rice can be grown as a perennial or annual crop depending on the harvesting technique; ratooning[1] allows for a regrowth without a second cultivation and thus requiring less labour (Grist 1959, 50). Rice grows in a large range of soil types and climatic conditions, which has given rise to a great diversity of varieties, as well as making it appealing as a crop since it grows well with few requirements. The two most important factors necessary for growing rice are abundant sunshine and water supply. In terms of selecting an appropriate variety to grow, various factors must be considered including: if the variety grows better in dry or wet fields, the typical yield of a variety, as well as hardiness against pests, weeds and specific climatic conditions. As Grist

[1] Ratooning is an agricultural harvesting method in which a crop is harvested but a small portion of the plant's base and roots are left intact. The plant then is able to regrow a new crop within a regular growing cycle. Crops which can be ratooned include rice, sugar cane, bananas, mint, and many others.

(1959) reminds us, preference for a particular variety's flavour and aroma are also important considerations that are often overlooked.

Presently in Madagascar, rice is cultivated as both an upland and lowland crop. Both of these terms refer not to the crop itself, but rather the fields in which it is grown. Upland crops are grown in fields that are best described as "dry", meaning that at no point is the field flooded in order for the crop to grow. Most cereal crops including wheat and maize are grown in dry, upland fields. Lowland crops however are grown in fields that are "wet", referring to the fact that the field may be constantly puddled with water, situated to allow water channels to flood the field, or to allow it to be flooded seasonally by rains. As described by Pendleton (1943, 26), one of the highest yielding methods of rice cultivation involves transplanting seedling rice into puddled fields, allowing the crop a healthy, controlled start as well as preventing weed growth.

Swidden agriculture ("*tavy*" in Malagasy) is commonly used for clearing dry, upland fields in Madagascar; plots of land, typically bordering forested areas, are slashed and burned to leave a fertile soil in which farmers can cultivate rice for a few seasons. After each harvest, the soil quality gradually decreases, and farmers leave their fields to be overgrown and turn to another area to clear. Presently, swidden agriculture is a point of great debate in Madagascar as farmers search for more or better land to cultivate while government officials and non-governmental conservation organizations seek to protect forested areas. Some communities are located within or on the edges of national parks and other protected areas. Gezon (2006), whose research in the region in which I worked discusses this tension between the interests of local farmers and the national and international agendas of conservationists, makes it very clear, however, that it is not only slash and burn cultivation that has or can become political in Madagascar. Consider, for example, the distinctive politics enabled by paddy rice cultivation. Growing paddy rice is dependent on access to water, as well as geographic properties of the landscape, namely that lowland fields lay where rain and water can be naturally directed. Channels can be constructed around fields to direct the flow of water. This allows farmers to flood fields at timed intervals to grow their crops in properly saturated soil. Many villages in Madagascar share water from a single source, however, limiting access to irrigation sources and making water a matter of local politics in its use and

allotment (Gezon 2006). Before discussing how access to rice and land are negotiated, it is worth considering how this crop has become so central to people throughout Madagascar.

Rice in Madagascar

For as long as humans have inhabited Madagascar, and at least since permanent settlements have existed, it is likely they have grown and eaten rice. Most likely, rice was brought to Madagascar by early Austronesian settlers who cultivated it using the same methods and techniques they had practiced in their native lands (Grist 1959, 7; Hansford et al. 2018). Beaujard (2011) used linguistic and archaeological evidence to link the introduction of rice to Austronesians who arrived in the first millennium. These early inhabitants are referred to as the "Paleo-Indonesians," or "Proto-Malagasy," who subsisted from hunting, fishing, gathering, and agriculture, and who cleared and burned land for growing various crops, largely taro and, according to the oral history, *voavahy*— a type of string bean (Battistini, René and G. Richard-Vindard 1972; Callet 1908; Makhtar 1990, 701). They lived with the first African inhabitants of the island and were the first to live in the country's highlands— the Malagasy refer to them as the Vazimba. A second immigration wave of Austronesians during the ninth and thirteenth centuries, the "Neo-Indonesians" or Hova, are the ancestors of the Merina (Madagascar's largest ethnic group) and would have been very familiar with irrigated agriculture, especially rice (Battistini, René and G. Richard-Vindard 1972; Makhtar 1990, 701). By the sixteenth century, Madagascar was producing rice for export to parts of eastern Africa (Kent 1970, 70).

Andriamanelo (1540-1575), a King and one of the original Merina (the highland ethnic group that dominated the island through most of the 19th century, and, according to some, through colonial and post-colonial times as well), grew an expansive empire and led military campaigns against the Vazimba, largely in an effort to seize Analamanga, the highest of twelve sacred hills in the highlands. While Analamanga was never taken from the Vazimba during his reign, Andriamanelo left a legacy of striving to turn the lowland swamps surrounding Analamanga into irrigated rice plains (Rafidinarivo 2009, 84). Andrimanelo's son, Ralambo (1575-1612), initiated intensive rice cultivation in the swampy valleys of the highlands, especially in Alaotra (the "rice basket" of Madagascar), also introducing the first guns in the highlands through trade, leading to many successful military campaigns (Gray 1975, 468). New crops, including maize and manioc, were introduced

during the sixteenth century which led to an increase in dry crop cultivation (Battistini and Richard-Vindard 1972, 326). The regions of Betsileo and Antsihanaka, South and West of the Merina kingdom

("Imerina") respectively, implemented marshland riziculture during the 1600s and wet rice was grown extensively on the coasts and in the highlands (Campbell 2005, 24).

The following king, Andrianjaka (1612-1630), defeated the Vazimba king and was able to unify the highlands. Seizing Analamanga was essential for control over the Betsimitatatra plains below. Andrianjaka moved his capital to Ambohimanga which presently is Antananarivo, the capital of the nation (Gray 1975, p. 467; Rafidinarivo 2009, 24). During the last half of the seventeenth century, the reigning kings saw to further expanding the rice paddies in the Betsimitatatra plains by building dykes, an agricultural innovation that met the needs of the growing population in the highlands (Callet, 1908; Campbell 2005, 24; Rafidinarivo 2009, 84). Also during this time, the French colonized the Mascarene islands and initiated trade through ports along the Eastern coast; Governor Flacourt established a base at Fort Dauphin (1648-1658) noting that rice was the main crop cultivated in the highlands (Berg 1981, 290; Deschamps and Yvonne, 398; Kent 1970, 109). Trade mainly consisted of rice, timber, cattle, and slaves (Deschamps and Yvonne 1977, 398).

Since at least the 17th century, Madagascar has had a global reputation for its rice production. One of the first accounts of the introduction of rice to America is by Henry Woodward, an early colonist of Charleston, South Carolina. Woodward accepted a bag of rice seed from John Thurber, pirate trader and slaver, as payment in 1685. Thurber had obtained the rice seed on a voyage to Madagascar, or what he called the "great rice nation." Woodward had a successful harvest, and rice was an important crop in South Carolina for nearly two centuries (Grist 1959, 7; Herbert 1886, 480; "Rice Culture in America" 1874; Smith and Dilday 2003, viiriw).

During the reign of Andriamasinavalona (1675-1710), a seven-year drought prompted a major expansion of the rice paddies in Betsimitatatra; the King divided the territory between his sons to complete the labour. The project included redirecting water with underground canals and building dykes tens of kilometers long (Campbell 2005, 24; Rafidinarivo 2009, 84). Imerina experienced 77 years of civil war after the death of

Andriamasinavalona, limiting the expansion of the rice plains as infrastructure was destroyed during recurrent raids (Deschamps and Yvonne 1977, 400; Evers, Campbell, and Lambek 2013, 54). Trade continued to increase on the coasts and inland as well; the main exports were rice, cattle and slaves, and the major imports were firearms, gun powder, cloth and liquor (Campbell 2005, 55). By the mid-eighteenth century, rice was the primary crop being cultivated across most of Madagascar; most noted by European explorers along the east coast, rice was being grown in cleared bush, and increasingly in irrigated fields (Berg 1981, 291; Deschamps and Yvonne 1977, 393-397).

Andrianampoinimerina (1787-1810) reunited the Imerina kingdom and sought to not only rebuild the ditches and repair the damaged dykes of the Betsimitatatra rice paddies, but also initiated one of its largest expansions (Deschamps and Yvonne 1977, 399; Evers, Campbell, and Lambek 2013, 54; Rafidinarivo 2009, 101). Through forced, slave and corvée labour, the hillsides and slopes of the plains and highlands were converted into irrigated paddies to continue feeding the growing kingdom (Campbell 2005, 24; Deschamps and Yvonne 1977, 400; Evers, Campbell, and Lambek 2013, 65; Rafidinarivo 2009, 101). Andrianampoinimerina was the first to be recognized by Europeans as the "King of Madagascar", and his descendants are still considered by some to be the sovereign family of Madagascar (though they should not be confused with other regional royal families throughout the country). The next successor, Radama I (1810-1828), built relations with Europeans—signing a treaty with England to end slavery— and used his large military to exert control over his kingdom and as far as he could to the coasts (Ellis 1838, 432; Ellis 1870, 8). Radama I continued employing forced labour and created a taxation system for paying tribute to the monarch (Deschamps and Yvonne 1977, 404). His reign led to gaining control of most of Madagascar; through setting up fortified posts throughout the country and increased trade, Radama secured Merina authority over the populace (Deschamps and Yvonne 1977, 404). Under Radama I, slash and burn agriculture was widespread; beans, maize, tobacco, and rice were grown extensively (Evers, Campbell, and Lambek 2013, 65).

The first queen of Madagascar, Ranavalona I (1828-1861), was suspicious of increasing European power and initiated a closed economy for Madagascar. Trading became limited to firearms, gunpowder, and some manufactured goods in exchange for cattle and rice (Deschamps and Yvonne 1977, 408-409). By the second half of the nineteenth century, under

Ranavalona II (1868-1883), Merina forces took control over the majority of Madagascar, relations with Europeans were being restored, and the pacification and incorporation of other Malagasy kingdoms allowed for a further expansion of the rice paddies of the highland swamps (Deschamps and Yvonne 1977, 415). Madagascar was colonized by France in 1894 and the early twentieth century was filled with great internal unrest (Deschamps and Yvonne 1985, 527-532). The economy became based on "self-sufficiency" which included, "rice, cassava [and] sweet potato [cultivation], poultry [and] cattle [husbandry], house-building, the weaving of cloth, the plaiting of mats, iron work and small industries introduced by the Europeans such as brick-making and tin-smithing" (Deschamps and Yvonne 1985, 527). Additionally, at least 80% of Madagascar's trade was with France; exports included rubber, skins, raffia, cattle and wax, but largely consisted of newfound gold from Diego Suarez (i.e., what is today Antsiranana) (Deschamps and Yvonne 1985, 538).

Near the mid-twentieth century, during the second world war, French interests dominated the Malagasy economy through the work of four trading companies; exports included coffee, vanilla, sugar, tobacco, meat, rice, cloves, sisal, raffia, and lima beans (Gow 1984, 692-693). During the war, Madagascar was required to provide France with conscripted men, forced labour, and financial support as well as raw materials (Gow 1984, 675). In 1944, Malagasy farmers were required to "sell their entire crop to the government's Office du Riz at a low and fixed price, and then when they needed rice for their own use to buy it back at a higher cost", ensuring a readily available supply during the war (Gow 1984, 675). A revolt eventually erupted against the French but was devastatingly pacified; France contributed 44 million francs towards modernizing Madagascar's agriculture (which saw limited success), and the nation was eventually granted independence on June 26th, 1960 (Gow 1984, 680, 693).

Post-independence, Madagascar's economy remained 80% agriculture-based and nearly half of all trade was still with France (Gow 1984, 692-693). What export-industry existed consisted of the processing of agricultural exports including coffee, vanilla, cloves and perfume; and a growing mining industry allowed for the export of graphite and mica (Gow 1984, 693-694). Madagascar's agricultural economy, meanwhile, was largely based on rice agriculture and, on the east coast especially, the production of cash crops including coffee, vanilla, sugar, and pepper; however, less populated areas practiced extensive animal

husbandry and shifting agriculture (Battistini and Richard-Vindard 1972, 334-335). The country's population experienced rapid growth and areas with the most rice cultivation had the highest population densities; as early as 1973, demands for rice exceeded local supply and the Malagasy government began importing cheap, low quality rice (Allen and Covell 2005, 280; Battistini and Richard-Vindard 1972, 332; Gezon 2006, 108; Gow 1984, 695). Ratsiraka, president of Madagascar (1975-1993), led a socialist government which sought to enact great social reforms and economic initiatives, creating Madagascar's 2nd Republic (Gow 1984, p. 697). Ratsiraka reinvigorated Madagascar's traditional governmental system of the "fokonolona", giving more power to small holders and communities, but Madagascar's economy began to slow down (Gezon 2006, 107-108). Ratsiraka turned towards foreign lending to aid the country's struggling economy, following initiatives put in place by the International Monetary Fund (IMF).

Growing Rice Today

Since the 1990s, the area cultivated for rice production, the total production of rice, and overall rice yields in Madagascar have all increased; annual yields of rice near 4 million tonnes (Depetris-Chauvin, Porto, and Mulangu 2017, 144). As of 2005, agriculture is the most common economic activity of Malagasy people and rice represents the crop which is primarily produced and consumed (Depetris-Chauvin, Porto, and Mulangu 2017, 139). As noted previously, agriculture represents 30% of Madagascar's GDP, 40% of its exports, and involves more than 70% of its labour force (Depetris-Chauvin, Porto, and Mulangu 2017, 142). A 2005 household survey reported that the largest constraints to growing rice were a lack of access to cattle, labour, irrigation, and land, and an inability to manage the effects of plant disease and drought (Depetris-Chauvin, Porto, and Mulangu 2017, 144; Minten, Randrianarisoa, and Barrett 2007, 228). Rice is grown in the north, northwest, centralwestern regions, and the east; 82% of rice cultivation in Madagascar is irrigated, 60% of which is grown using the transplanting method (Depetris-Chauvin, Porto, and Mulangu 2017, 144).

The Malagasy government of the twenty-first century has been unstable and faced revolts and coups; the most recent major crisis was in 2009. While various exports, such as vanilla, have marketing boards, rice does not in Madagascar (Depetris-Chauvin, Porto, and Mulangu 2017, 145). The government does not control or set the prices of rice, rather exchange rates are typically negotiated between farmers and traders directly. Most rice

produced locally is also consumed locally. However, locally produced rice must also compete with imported rice in the market. While people prefer local rice and consider it to be of higher quality, imported rice is generally cheaper (Depetris-Chauvin, Porto, and Mulangu 2017, 145). The growing population continues to require increasing quantities of rice, resulting in increased imported rice— Madagascar is a "net rice importing country", meaning more rice is imported than exported (Depetris-Chauvin, Porto, and Mulangu 2017, 145). Of the 4 million tons of rice produced annually, approximately one-quarter to one-third is marketed (Depetris-Chauvin, Porto, and Mulangu 2017, 144). Decreased import prices can benefit the populace but small-scale farmers (which is the majority of the population, keep in mind) suffer when they cannot sell their rice; when prices of imported rice increase, however, nearly everyone suffers with the possible exception of wealthier households (Barrett and Dorosh 1996; Depetris-Chauvin, Porto, and Mulangu 2017, 145). The role of rice in Madagascar is vast and its significance is unquestionably embedded in Malagasy culture and social life.

Ethnographic Account

> Love is like rice, as the proverb says: when you transplant it, it grows, but never in the same way. It retains a bittersweet memory of its first soils. Every time it is uprooted, it dies a little; every time it is replanted, it loses a piece of its soul… But it also bears fruit (Naivo 2017, 188).

Even though my project did not start with a major focus on rice, rice ended up being at the heart of my research. Rice was a topic everyone was comfortable with and always happy to discuss. The social importance of rice made the plant impossible to avoid throughout my research; I encountered it everywhere I went. I had the privilege of engaging with several stages of rice cultivation and consumption at the different sites I visited. The two locations where my main focus was on rice, however, were Maventybao and Sadjoavato. The first a village of artisanal sapphire miners who also grew rice, and the second a village largely composed of agricultural producers growing rice. In the following sections, I explore the role of rice in people's everyday lives and connect experiences and understandings from my fieldwork to those of others who have explored the role of rice and other commodities in Madagascar.

As many people both grow and consume rice, shifts in the rice economy are a national concern. It is crucial that the price of rice stays somewhat stable as the crop is vital to the well-being of the great majority of the population, a sentiment reflected in another popular proverb, “rice is life”. Barrett and Dorosh (1996) found links between the price of rice and income, land, and market participation that reveal the real hardships of poverty in Madagascar. Their study shows that those with more wealth and land are the most likely to be self-sufficient, while small scale farmers with little land are more likely to rely more heavily on market participation; that is, they are more likely to sell what they produce soon after harvest, requiring them to purchase rice later in the year (Barrett and Dorosh 1996, 664). What these results suggest is that poor, small-scale farmers are the most likely to be impacted by rising market prices, and spikes can be devastating. In comparison, shifts in markets for other crops I considered in my research reverberate much differently.

Correlating to the fact that rice production operates seasonally, market prices of rice also fluctuate cyclically. The initial period just following harvest is associated with lower prices as high volumes of produce enter the market. As the year passes, the price of rice gradually climbs, reaching its highest point just prior to local harvests. Smallholders with limited plots of land are most vulnerable to unexpected events resulting in poor yields and are frequently forced to enter markets early, accepting lower prices as they struggle to make ends meet each season. Larger-scale, wealthier producers can withhold selling their crop until later in the season when the price is high. What this means is that timing is crucial when selling and buying rice, and one’s capital influences their ability to negotiate this timing by balancing their own resources.

In considering the central place of rice in different Malagasy communities, the diversity of ways in which it figures into people’s relationships with one another become apparent. The most immediate example of this is highlighted by Gezon (2006) who explores the importance of kinship and how these relations form “the basis for all social interactions” in a traditional, rural village (115). In Bevary, the village in northern Madagascar in which Gezon conducted her fieldwork, disputes between neighbours and families and requests for resources (i.e., plots of land, water, etc.) are negotiated through family networks, with elders representing the highest authority. Patrilineal traditions dictate the ownership and inheritance of land and marriage allows families to share resources, especially labour (Gezon 2006, 16).

Many traditional villages, like Bevary, largely consist of extended kin groups who practice shareholding and various acts of reciprocity in their daily lives. Rice cultivation, and all other agricultural activities, are completed by family members; all of whom benefit directly from participating. People's access to resources is often directly related to their connection and relations to others. Whether it is a share of a crop, or share of labour, people rely on their families to meet their basic needs. In my own fieldwork, while I did encounter similar networks of kinship, they were different than the sort described by Gezon, and illustrate how growing rice can not only rely on but can build social ties.

Maventybao

Maventybao is a small rural village located in a major sapphire mining region that, after a chaotic boom in the late 1990s, has seen the development of patterns of social and economic life familiar throughout Madagascar. As such, while most of its residents continue to work as miners, they also engage in small-scale farming, mostly of rice. Maventybao is also the location of Mada Clinics, an NGO offering medical care and primary education to surrounding villages with the aid of foreign volunteers and donations. My first visit to Madagascar in 2015 connected me to the NGO and members of the village who I have to thank for aiding so much in this research. Much of my time there was spent travelling between villages, talking with local residents about their own gardens and fields, and especially about how to grow rice. My 2017 return visit coincided with the harvesting season, so I was able to learn about the work of rice cultivation in a field and to "follow" rice from the field back to our dinner plates.[2]

Surveys and interviews with people in the region highlighted important patterns in ecological knowledge. In the responses we received, for example, there was a general consensus on how to grow rice; as we asked person after person, the same timeline was presented, the same methods were described, and the same tell-tale signs of maturation were referred to. Seed and field preparation coincide with the start of the rainy season (around November) and harvest coincides with the end of the rainy season (beginning in March), except in the case of paddy rice cultivation in which harvest falls later in the dry season. The

[2] In my research I take inspiration from Mintz (1987), Cook (2004), and similar others who use the "follow-the-thing" approach in their research in exploring the relations and impacts of distant markets with locations of production.

majority of the dry season is reserved for the harvest, as well as for processing rice from glumes (grains attached to stalks) to polished grains (wholegrain and white rice depending on the amount of germ remaining). Other agricultural activities are reserved for periods in which not much labour is required for rice. The main time periods involving less labour are near the end of the wet season for preparing and planting gardens, after the rice has been planted; and near the end of the dry season, after the rice has been harvested. All farmers in Maventybao and surrounding villages were either growing their rice in wet or dry fields and were using traditional methods; sowing seeds and/or transplanting.

In Maventybao, I was taught how to harvest, thresh, hull, and winnow rice. All of these processes are required to turn rice from a raw crop into an edible food. Adam is a father of two in his early 20s and is one of Mada Clinics' teachers. Adam dreams of teaching at a large school in Antsiranana and is an intense instructor with high expectations of his students. Outside of the classroom Adam is easy-going and playful, so much so I was at a loss of words to see how he taught and held full control over his students who all sat attentively and quietly. While in Maventybao, Adam and I spent most of our evenings together, learning each other's native languages with Snyders as our teacher. During my stay in Maventybao, Adam had to travel to a nearby village to assist his aunt with harvesting rice. Knowing that I was researching rice, he invited Snyders and I to join him, happy to share the laborious task of harvesting with friends.

On our way, we stopped to visit his uncle and male cousins who were threshing already harvested rice. On an open plain, the men walked zebu (humped cattle) in circles, trampling the rice which separated the husked rice grains from their stalks to be later collected. I joined in the threshing (Photo 1); walking behind the zebu, slapping them with small branches and shouting calls at them to keep them walking in the same circle. Once we made our way to the field, we met Adam's aunt and female cousin who we would be working with in the field. We all had sickles and began by grabbing a handful of stalks, then severed them a couple of inches from their roots (Photo 2). As we went, we formed piles out of our cuttings and started the long process of clearing the field. After hours of work, we went to a forested area at the field's edge and ended our day with a freshly prepared meal, as is tradition. One is always obligated to feed anyone who helps with the harvest.

Once we returned to Maventybao, we met neighbours preparing their dinners. Two young men holding large wooden poles were pounding raw paddy (threshed rice) to loosen and separate the husks. This involved a large mortar in which the two individuals alternated in a synchronized motion of pounding the rice with large wooden pestles, otherwise referred to as hulling (Photo 3). After being thoroughly pounded, women would collect the rice into a wide, woven tray with a short lip. They would then toss the rice upwards, allowing the wind to take away the loosened husks, leaving only the grains of rice on the tray; this is called winnowing (Photo 4). I was given the opportunity to winnow once, but I was stopped rather hastily on account of my “poor form”, as no one could bear to see me dropping rice.

Photo 1: Harvesting Rice

Photo 2: Threshing rice

Photo 3: Hulling rice

Photo 4: Winnowing rice

Rice is Life

Maventybao presents an interesting case of how rice, a necessity of Malagasy life, becomes entangled into the social lives of Malagasy people in distinctive ways. As this is still primarily a mining town, the major economic activity that keeps people here is not agriculture but mining. People in the community still engage in farming rice, however, for the purposes of subsistence, to ensure that they have something to eat whether or not they are successful in their mining. In a community in which agriculture is the basis of the economy, like Bevary or Sadjoavato (to be discussed soon), it is likely that the local population would consist of a number of families with ancestral ties to one another and to the inherited land on which they grow. In Maventybao, however, the population is largely made up of individuals born in other regions who have moved here to mine sapphires; an economic activity that has been drawing internal migrants to the region since the late twentieth century (Walsh 2003, 292). Of the 22 individuals I surveyed during my stay in Maventybao, all grew rice, none were born in the village, and many were from distant regions – as people in the region say, inhabitants of the community had "met when grown" (*benahono*), meaning that they had no pre-existing, kin-based relationships of the sort that tend to shape social life in other rural Malagasy communities like Bevary. People in Maventybao rely on building social ties in the absence of extended kin. Neighbours negotiated modes of sharecropping with longstanding residents of the region, for example, in which shares of the harvest are given in exchange for labour. In mining towns, people often only live there on a temporary basis; staying only as long as they can profit from mining (Walsh 2006, 5). In this situation, the principles of reciprocity become fundamental; people form fictive kinship relationships that are especially useful in helping them to fulfil the extra labour demands of subsistence agriculture.

When I was harvesting rice with Adam, although he referred to the owner[3] of the field as his "aunt", they were not related by blood. Rather, Adam formed a relationship with this woman and her husband after moving to the village; this relationship, and those like it, allow people without the resources of a well-established family (i.e., with multiple plots of land and

[3] From my conversations with locals in Maventybao, my understanding of land tenure here is that everyone rented their land from one local man. He had claim to the land through inheritance from his historical familial ties to the area and oversaw who used it and what it was used for.

various individuals capable of labour) to build social and economic standing. Among the various obligations and benefits of this network, Adam aided in the labour of planting and harvesting his "aunt's" rice and was given shares of the harvest in return. The family Adam had made in Maventybao gave him the ability to supplement his (low paying) work as a teacher—rather than a miner and/or farmer— with work that would provide him with a supply of food. The creation of fictive kin fulfils needs and demands of both parties but reflects changing traditions, leading many people to no longer reside in their ancestral lands and see agriculture as a secondary occupation— or even primarily as subsistence.

Lawson (2018) discusses the changing roles of women in Malagasy artisanal mining towns, a pattern which is also apparent in Maventybao. In mining, women are frequently delegated 'secondary' roles such as "digging or panning around the edges, transporting, washing and processing" which places them further from the sources of larger gemstones, and thus further from higher earnings (Lawson 2018, 173-174). Agriculture often serves as a secondary income, but women are less likely to own land or the necessary resources required for farming (Gezon 2006, 99; Lawson 2018, 174-175). As such, female miners have become strategic in fiscal management; a stark comparison when looking at the "hot money" phenomenon where many men invest in "hedonistic pursuits" (Lawson 2018, 177; Walsh 2003, 295). Women who successfully earn enough capital can afford to invest in land, cattle and labour to work the land, and even build their own businesses (Lawson 2018, 184). As households are typically headed by men, this shift toward female entrepreneurship is changing family dynamics as well as women's role and increasing status as independent from male relatives and/or partners. While this is encouraging, it is important not to overshadow the fact that many women are unable to access the resources and capital required for such autonomy.

Traditionally, rice cultivation has a distinctly gendered division of labour. Men typically plow fields, thresh and hull rice, and monitor water– roles which are physically demanding; and women plant, harvest, and winnow as well as cook rice– roles which are time demanding. Although this general division of labour is present, it by no means is a strict code of conduct. It is specifically worth noting that many of my research sites do not resemble a "traditional" village, and as a result, I witnessed likely a greater incidence of role reversal. The individuals and families of my research frequently lacked the supports of an

extended kin group in their communities are were thus required to fulfill more labour roles as required.

In understanding the fundamental necessity of extended social networks for smallholders living outside of their ancestral lands, fictive kin fill otherwise absent roles common to traditional rural villages. Adam's family in Maventybao was formed of many unrelated individuals, but every relationship was based on the important principle of reciprocity ensuring mutually beneficial commitments in the face of uncertainties shared by all. In cultivating rice, labour demands require multiple individuals to work together to grow the crop. In supplying his aunt with labour, ensuring she is able to harvest all her rice, Adam received shares, constituting his source of sustenance. Rice brings many people together and establishes important communities which are capable of providing for one another. In this rural mining village, with the absence of extended families, neighbours become important shareholders in one another's lives.

Sadjoavato

> "Rice are like people. Rice needs water, people need water. Rice needs food [...] and people need food; and if you don't have it, then it won't grow. And lastly, people need love and rice needs love. So you need to go and look at it often, and watch it and make sure that it's growing well [...]" (Amy 2017, interview by author).

The highway-side community of Sadjoavato presented a different view of agriculture from that of Maventybao. In Maventybao, mines cover the hilly landscape in bright patches of orange, and few paddies are visible from uphill; rice cannot be bought within the village unless from a farmer directly. Is Sadjoavato, by contrast, rice is everywhere; paddies stretch as far as you can see, mills are constantly processing rice, and the local restaurant serves heaping portions of rice. Additionally, rice may be purchased very easily along the roadside, and is sold as many people regularly pass through on the highway. While my time was limited in this village, I witnessed a side of rice production that speaks to the complexity of the rice economy. The majority of the village works in rice cultivation and it hosts at least two mechanized rice mills (Photo 5).

Sadjoavato is the destination of many skilled farmers from other regions of the nation; a large number of migrant workers from the highlands and the nation's capital,

Antananarivo, sought work here as seasonal labourers for local farmers and landowners. Since there are a number of large-scale landowners and rice producers in the area, people are able to hire labour on account of being able to profit from their yields. This situation is different compared to the other villages I discussed where labour is largely fulfilled by family and neighbours. Within the context of a high production village, the relations people build around rice change when compared to traditional modes of sharecropping. In Sadjoavato, the working hours of the day were filled with a constant mechanical noise from the mills that ran very frequently, and empty rice husks were fitted to many pathways as a bright, golden mulch. In the fields and paddies surrounding the village, meanwhile, waged farm workers began the work of harvesting at daybreak.

When I was in Sadjoavato, I was put into contact with a Peace Corps volunteer, Amy, who, as part of her service, had proposed several agriculture focused projects including a major one concerning rice. Amy is in her late 20s, American, and a post-secondary graduate. Her education background focused primarily on gender and nutrition, in addition to agriculture extension. Her working background prior to joining the Peace Corps centred around business and dairy farming. In my interview with Amy, she detailed the projects she was working on as well as some of the obstacles she was facing. The Peace Corps project involved implementing an "improved rice technique" (SRI) which Amy explained "almost all other countries use for their rice, and it started here in Madagascar, but it hasn't taken off. Only like 10% of farmers use it, if that; I would guess probably less." In describing the area's present cultivation techniques, Amy said "people here, in Sadjoavato, they either spread the seed, or they transplant at 2 weeks to 2 months of age", which is comparable with many other rice growing areas in Madagascar. The improved rice technique would require changes to these traditional methods. Fields (where access to water/irrigation is limited/non-existent) would need to be bunded—that is, to be surrounded by mounds built to allow for controlled flooding of the paddy. Additionally, fewer seeds would be used as only the best would be selected prior to planting. The new methodology was explained to me as follows:

> "The new technique, there's four categories in what to change the way people farm. First of all, water management, so you have to bund the field. And also, you don't always have water, but you let it dry out and you add water, and you let it dry out and you add water. That's not something people are used to; people are used to just filling the field with water. Second of all, weeding. [...]. So, weeds cause plant competition, and they can't grow as big, and so in this improved rice

> technique, you weed. And that's why you have to have it at certain space, so you can weed it with a machine. Because the machine will make it go faster, and the machine isn't expensive. [...] The third thing is you transplant a small young rice plant that only has two leaves; it's at that point in time in which the rice will have the ability to grow really big, if you transplant it then. You just have to take care of it—the rice transplant— but you don't want it to get too big. Because, if it's too big in its nursery, then it's not going to have the opportunity to grow as big, because the nurseries are pretty tight [...] and the fourth one is add organic matter to the soil" (Amy 2017, interview by author).

In 1963, Fr. Henri de Laulanié, a Jesuit from France, came to Madagascar to aid in developing agricultural methods. In 1983, de Laulanié and the Malagasy farmers he worked with developed a new low-input/high-output method of rice cultivation (De Laulanié 2011, 183; De Laulanié and Association Tefy Saina 2011, 1; Moser and Barrett 2003, 1088; Moser and Barrett 2006, 373; Stoop, Uphoff, and Kassam 2002, 250). This method is called the "System of Rice Intensification (SRI)" and initially received scientific critique and speculation over the announced yields ranging anywhere from two to seven times increase while using 3-30% less seed, but since has been backed by research and is implemented by more than "10 million smallholder farmers in over 55 countries" ("About the SRI International Network and Resources Centre (SRI-Rice)" 2015; De Laulanié 2011, 184; Vidal 2019). SRI is implemented by following a few specified steps: first, seedlings need to be transplanted early, and planted singly at spaced intervals; second, controlled water drainage and irrigation in the paddy; third, regular weeding; and fourth, harvest earlier to lessen waste and reduce processing time (De Laulanié, H. and Association Tefy Saina. 2011, 8). Presently in Madagascar, SRI is only practiced by about 10% of farmers while traditional wet and dry rice methods remain the most common practices.

Local reception to implementing this novel rice technique was underwhelming to say the least. At the time of our interview with Amy, only two people had participated in the project; one of whom had agreed to have their field used as the initial demo plot to display and teach the new technique to farmers. In discussing the lack of participation in her project, Amy noted several contributing factors. First of all, the biggest complaint, which Amy could agree with to some extent, was the increase in labour necessitated by this new technique. Initial setup would be a laborious task, and while other steps of the cultivation cycle might be shortened by using the new technique, transplanting would take longer and require more

precision. Many farmers do not have the time to set up a new field, nor do they have the resources. The two who did participate included a wealthy farmer with a great deal of land, and a woman with very little land but who wanted to grow rice. Secondly, when farmers came to view the demo plots, they remarked on how it looked like a game. Amy explained that the farmers called it "stone wall" which is a Malagasy game, but she reasoned that it can be hard to realise that the improved technique can get increased yields in decreased field sizes. Nonetheless, as the farmers perceived this technique to be trivial, the demo plots had a poor impact and made many farmers question the legitimacy of the new method.

The last implication Amy discussed is probably the most significant, and a strong indication as to why traditional methods are still preferred. In our interview, Amy stated:

> People don't want to do it; nobody wants to do it. They talk about it, they know it's better, but it's a lot of work— in the beginning. It ends up being less work in the end, but in the beginning it's a lot of work and labour is a huge thing. There's not a lot of incentive, they don't see that they're having problems now, so why would they change?

I can only agree with Amy. Why would they change? Malagasy farmers already face a number of other risks and threats, and traditional methods continue to prove successful. Loss of time, lack/loss of resources, and numerous unknowns all present anxieties about change which make it difficult to accept and adapt. Without any safety nets in place, an agricultural transformation is unlikely and unrealistic. This is especially true for places like Sadjoavato where farmers have not indicated decreasing yields, or access to land as a concern or issue. Until faith in traditional cultivation methods diminishes, or other events put strain on the rice economy, there is no pressing incentive to change.

In considering the ways some Malagasy people understand foreigners as different, Walsh (2005) explores insights from local sapphire traders speculating on the "willingness" of foreigners to take risks. A pervasive understanding is that foreigners are always willing to try new techniques or invest more into an uncertain project (i.e., digging a deeper mine, bunding a field, etc.), and that this is because of their relative affluence. Foreigners can afford to fail and so they can afford to experiment; the price of failure for Malagasy people, by contrast, is devastating and can leave families empty handed (Walsh 2005, 661). A lower cost associated with loss allows foreigners to engage in "deep play" in their endeavors; like children carelessly deconstructing their parent's watch to "learn" about it, foreigners dig

deeper and plant less because if they fail, they can still afford what they need to survive (Walsh 2005, 661). They can dig another mine, they can cultivate another field, and they can pack up and leave. Most foreigners do not have all of their own assets tied up in a single project whereas smallholders must invest everything into a single pursuit. In Sadjoavato, in other words, when farmers thought the new rice growing method looked “like a game,” they were not necessarily dismissing it. Resistance to change is much more than a fixation with tradition. It can also be connected to the position of smallholders within a broader economic framework in which they often face challenges that make the risk-taking they associate with foreigners hard to take on.

Photo 5: Rice mill

Conclusion

O. sativa, Asian rice, is the world's most important cereal crop and is cultivated across the globe. Rice has been cultivated for thousands of years and has a very long history in Madagascar. Being introduced as early as the first millennium, rice in Madagascar became a significant agricultural staple by the sixteenth century. It formed the basis of Madagascar's economy for several centuries, but presently is largely grown for national consumption.

In addition to its economic value in local markets, rice has an even greater social value. Having the means to consume and grow rice is frequently having the means required for meeting economic and nutritional needs. Rice permeates nearly every aspect of social life in Madagascar and holds significant influence over the decision making of farmers and consumers. My research in Maventybao highlights the importance of rice as a subsistence crop. In navigating between economic activities to fulfil basic needs, rice presents an important element in the basis of relationship building and the establishment of a highly organized system of fictive kin. While these farmers are directly connected to a local and global gemstone trade through mining, rice cultivation connects them with one another locally in reciprocal relations as important as those found in kin networks elsewhere in the region.

Even though the rice economy in Sadjoavato is booming and well established, the importance of traditional ecological knowledge regarding rice reflects both the pride Malagasy have in the quality of their rice, but also a form of risk management in which farmers can normally rely on the practices they have always implemented. As Amy carried out her project in Sadjoavato, she was very aware of the real challenges faced by those she worked with. By working so closely with rice farmers and supporting them through their labour, Amy highlighted an important point, "[...] I feel really lucky to be working in rice. Because, through rice, if you stay through all of the process, you can see how it reflects the rest of the culture [..] the way people work together, people move together, the culture flows to help each other out." Rice is entangled in the lives of the Malagasy and has greatly shaped the nation's history and culture. In Madagascar, people's engagements with rice and their engagements with one another through rice offer us important insights on their lives.

Chapter 3: God's Food: Navigating the boundaries of survival and conservation through yams

The yam entered into my project through my friend, Fernando Mercado Malabet. He was completing his thesis on issues related to primate conservation in northern Madagascar as I was revising my plans for fieldwork after a major cyclone had hit the region in which I had planned to do research on vanilla. Upon hearing my need for new research options, he told me about a wild yam he had encountered during his own fieldwork. In the case he described, conservationists were attempting to preserve an endangered yam and its habitat, both of which were important to the subsistence of local people. A key problem facing this conservation project was the fact that harvesting wild yams puts various other species at risk as large holes are dug and left unfilled; local people would flee from the forests in which they were digging up these yams out of fear of prosecution for trespassing within designated and monitored conservation areas. The story of this yam, then, presented a complex case in which conservation efforts posed challenges for certain food-insecure communities. As with the other cases considered in this thesis, Malagasy people's relationships with this particular food crop reveal a great deal about their lives in contemporary Madagascar. In this case, I focus especially on what people's relationships with wild yams reveal about the impact of conservation interests and strategies.

Throughout my research, I was frequently left wondering about the effects on some people's well-being as a result of the efforts taken to protect these yams— namely their access to food and ability to earn an income. How does the conservation of tubers in Madagascar affect the physical and economic well-being of smallholders? To explore this question, I considered wild yam conservation efforts in Oronjia, a protected forest in the far north of the island. Before reviewing this case, however, I detail my experiences of domesticated yam cultivation in two highway villages: Mahamasina and Anivorano. After detailing these accounts, I consider the so-called "wildness" of wild yams. More specifically, I ask how perspectives of the wild differ among individuals of different status (i.e., farmers, park guards, conservationists, etc.). To analyze this question, I look at the multiple and varying perspectives of those who engage with the forest in a large capacity. I connect my research to others who have explored the crossroads between conservation and agriculture,

specifically in Madagascar. Understanding people's engagements with yams, as well as the ways and places in which yams are cultivated and consumed, can inform understandings of their connections with others, and with larger social structures (i.e., local and global markets). In facing imposed barriers which restrict access to necessary resources, navigating these challenges pressures locals to be increasingly resilient.

In this chapter, I will provide a brief background on the properties of the yams I researched in addition to an historical account of yams in Madagascar. I will then detail experiences from my fieldwork and connect the information I gathered from interviews with farmers, guards, conservationists, and others to the conservation and consumption of yams within the everyday lives of those who rely on them most. I close by presenting an anecdote from my fieldwork to highlight the importance of community-focused conservation projects— such as the one I will be discussing— in addition to showcasing the important ways yams can give insight into the lives of people.

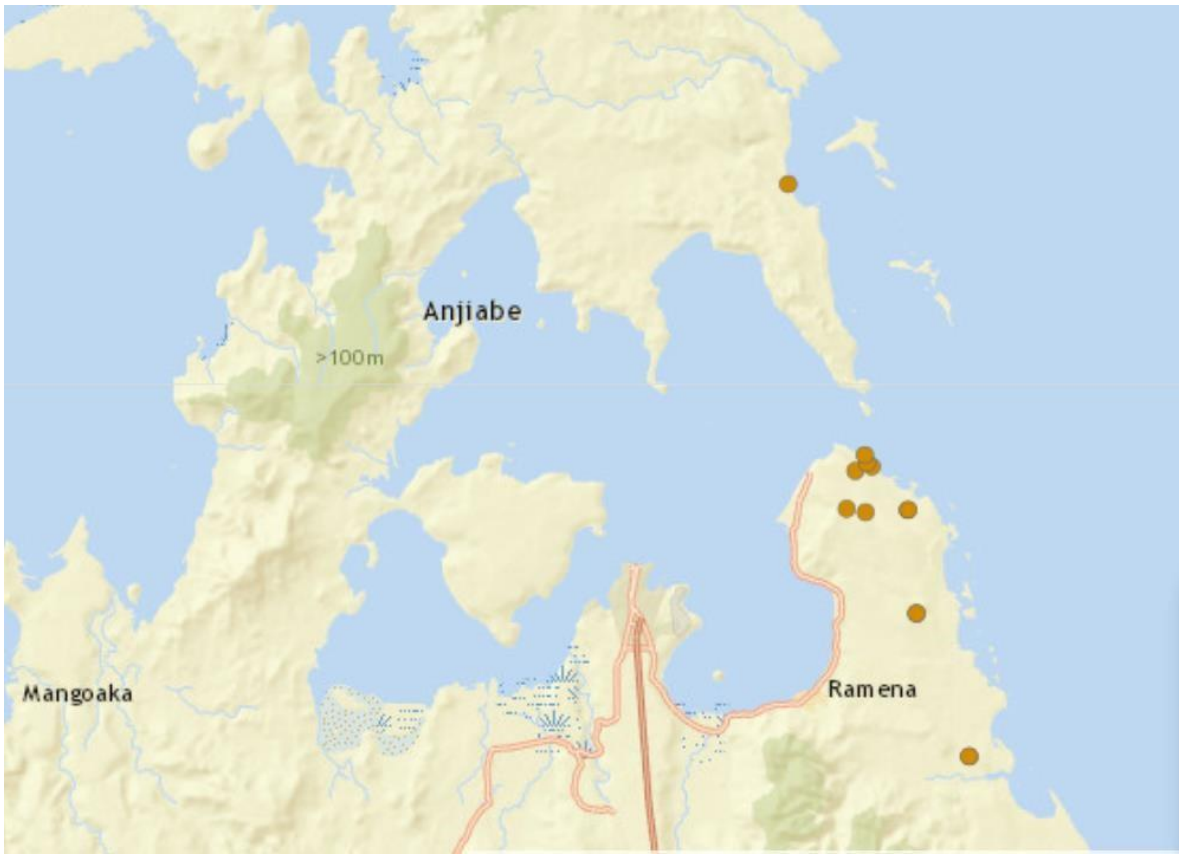
Yams in Madagascar

My research focuses on two types of tubers: varieties of wild yams, which are known interchangeably in Malagasy as *angona*, *ovy ala*, and *ovy*, as well as domesticated tubers, including the Malagasy *majola*, manioc (cassava), taro, and potatoes. For the most part, I will be following the example of those I spoke with by referring to wild yams as *angona* and to the domesticated tuber in most cases as *majola*. *Angona*, the wild yam, belongs to the *Dioscoreaceae* family of tubers which grows in tropical areas near the equator and have an annual growing cycle which coincides with the dry and wet seasons of the tropics (Viruel et al. 2016: 751). These tubers are geophytes, meaning they are characterized by an underground organ which stores energy and nutrients. The rhizomatic root structure adds to the durability of these plants and allows them to grow even in harsh conditions (i.e., flood and/or drought). An aerial stem grows above ground, typically relying on nearby supports to climb upwards (Viruel et al. 2016: 751; Wilkin et al. 2009). Those I spoke with about tubers indicated that *angona* and *majola* typically take one to two years to grow to maturity before they are ready to be cultivated. Normally, the tubers are consumed as a staple food between rice harvests, however, they are also consumed throughout the year— usually as a snack or

side dish. In most cases, tubers are only a primary food source when rice is either unobtainable or unaffordable (Battistini and Richard-Vindard 1972, 334).

While most tubers can be monocropped, their incorporation into larger ecosystems offers the best conditions for them to grow, allowing them to rely less on anthropogenic infrastructure, such as irrigation channels or trellis beams, that attempt to mimic nature. The use of tubers in agroforestry systems is both common and appreciated for its ease. While I did see a number of families incorporating trellis structures made with branches and bound together with banana leaves, it was also common for families without fields or gardens to plant the tuber "*lohany*" (head) by their trees and fences on their own properties. On more than one occasion, participants explained the importance of planting *majola* and other tubers beside trees; I was told that as the tuber grows, it brings up moisture and nutrients from deeper in the soil, allowing the trees and nearby plants to grow larger and stronger.

Dioscorea orangeana, the wild yam I will discuss in detail later in this chapter, is endemic to Madagascar; it grows naturally in forested areas along the northeast coast (Map 1). Madagascar has over 40 yam species; of the 33 endemic species, 12 are endangered (Kew n.d.). Foragers locate these yams by identifying their aerial stems and leaves, which crawl up trees for support. To harvest a wild yam, large holes are dug— roughly the same size as a grave, or small mine chamber— revealing a, hopefully, large yam consisting of sometimes several large clustered 'arms' diverging from the main 'body'. Harvesting these yams is problematic from a conservation perspective because of the destructive means required to dig them. Many other vulnerable species are placed at risk when these yams are dug, and the problem extends as holes are left unfilled once dug. Yams are one of the earliest foods exploited and cultivated in Madagascar, so it is important to understand the history of yam cultivation on the island.



Map 1: Ecological distribution of *Dioscorea orangeana*; concentrated in the Forêt d'Orangea (Wilkin et al. 2009).

History of Yams

Oral histories recollect a time before rice in which yams were the most important food of the "Vazimba"— the ancient Malagasy who originally settled the island. As noted in chapter 2, the Vazimba ruled the highlands before they were pacified by the Imerina king (of the Merina ethnic group; the largest group in Madagascar) Andrianjaka (1612-1630) (Battistini and Richard-Vindard 1972; Callet 1908; Gray 1975, p. 467; Makhtar 1990, 701; Rafidinarivo 2009, 24). As the Imerina kingdom expanded, so did rice cultivation and irrigated agriculture; by the end of the eighteenth century, tubers and other forest produce were a secondary dietary staple next to rice (Berg 1981, 291; Deschamps and Yvonne 1977, 393; Gray 1975, 397). After Madagascar was colonized by France in 1894, exports shifted towards cash crops (i.e., vanilla, coffee, cloves) which profited foreign-owned plantations, and the domestic economy became based on "self-sufficiency" (Deschamps and Yvonne 1985, 527).

Previously, I have noted how Madagascar's agricultural sector changed a great deal throughout the colonial era, most notably through the intensification of labour-intensive cashcrop production intended for export. This same era also brought new ways of thinking to bear on Madagascar's non-agricultural landscapes and resources – in particular, the spectacular landscapes and endemic flora and fauna for which the island is so well known today. During the late nineteenth and early twentieth centuries, many taxa in Madagascar were catalogued, including five species of *Dioscorea*; botanist J.G. Baker, and missionary Rev. Richard Baron, recorded the first endemic yam species in Madagascar (Wilkin and Randriamboavonjy 2012, 63).

Prior to independence, France directed several initiatives to modernize Madagascar's agricultural production which mostly gave the French greater control over Madagascar's economy and ensured a greater dependence on the French economy (Gow 1984, 693). Foreign interest in Madagascar grew by the time of independence (in 1960) and the nation saw an increase in researchers coming to see and study the island's unique landscapes, flora and fauna (Corson 2017, 2). Post-independence Madagascar also saw a socialist revolution through which the government gained greater control over its own economy and began incorporating tourism into its development agenda (Gow 1984, 694). When Ratsiraka entered into power (1975), shifts towards foreign investment via structural adjustment programs, resource exploitation (i.e., mining) and other turns toward foreign aid proved to be damaging to the nation's economy (Gow 1984, 694). The 1970s and 80s also saw a great increase in interest in protecting and conserving the nation's rare and unique wildlife. International conservation agencies began supplying aid to develop various conservation projects throughout the nation and Madagascar was famous for its natural diversity by the 1980s as reports flooded the media about new species and medicinal plants (Corson 2017, 4; Sodikoff 2009, 443). This is an important period in the history of Madagascar's conservation as it was the turning point of the nation's growing debt and dependence on foreign aid, leaving it vulnerable to the demands of growing foreign interest in the nation's natural resources.

Yams Today

As noted in Chapter 2, rice is the preferred dish of every meal for most Malagasy

people, a point that is made by the commonly heard phrase “tsisy vary, tsisy voky", meaning that without rice, one will not be full or satisfied. Yams are an inexpensive supplement that are more often relied on as a famine food than as a staple. While many people who eat rice regularly also eat yams as cheap snacks, when yams make up the larger portion of one’s meals, it is often because there is either no rice, or that rice is unaffordable. Indeed, to many people in Madagascar, eating tubers as a staple food is a signifier of low social status, often associated with a marginalized ethnic identity[4]. By no means am I suggesting that eating yams is an automatic signifier of poverty, but rather yams are relied upon more heavily by those without the means to buy or grow their own rice (Ramaroson Rakotosamimanana, Valentin, and Arvisenet 2015). Additionally, yam consumption can signify larger economic pressures as they are relied on during times of uncertainty— during political crises or major weather events, for instance. Unlike vanilla, rice and other crops, these tubers qualify as a famine food in that they are durable, able to grow in harsh conditions and accessible to people without large plots of land or expensive equipment. Additionally, because some tubers can be replanted with ease, they are an economically important resource for many households.

When talking about the use of tubers as a dietary supplement, or famine food, it is important to understand that most of the country’s population is impacted by poverty and their access to rice, and affordable rice at that, is seasonal as well as contingent upon yield. More than 80% of Malagasy live on less than $2.00 a day (IMF 2007, 008). These tubers are a resource used by many smallholders, largely out of necessity; Madagascar’s population is nearing 26 million, and food shortages are an increasing threat to well-being. As indicated by the GNI (Gross National Income) per capita, poverty in Madagascar has worsened between 1990 and 2018 ($1590-$1404) (UNDP 2019, 3). In 2007, the IMF (2007), in partnership with the Government of Madagascar, released the “Madagascar Action Plan (MAP)”, a five-year development strategy to support the nation in reaching the Millennium Development Goals set by the United Nations. However, political, economic, and environmental instability have severely impeded the nation in improving standards of living of the Malagasy. In the most recent report of the Human Development Index (HDI), which measures multiple variables to

[4] This stereotype is associated with Southern regions of Madagascar in which the arid climate does not allow for rice cultivation but is better suited for tuber cultivation.

track a nation's development, Madagascar has been ranked 162 out of 189 countries indicating a low level of human development (UNDP 2019, 02-03).

Tubers are a resource with a great variety of uses that extend from food to medicine. The *angona* in particular is frequently valued for its high-water content. Having a water-heavy resource has great importance especially during droughts and when people have limited sources of clean water. Many smallholders I spoke with iterated the importance of tubers in their everyday lives. Some tubers were prepared as a burn ointment; the leftover water from boiled tubers is applied to relieve pain and help the healing process. Some parents would give yams to children to satiate their appetites. Additionally, the *Dioscoreaceae* family is a source of diosgenin— the derivative in several commercial steroid products (Viruel et al. 2016: 752). Some research has even linked the *Dioscoreaceae* family to having cancer-treating properties, but this information is limited and contested.

As I have previously mentioned, the *angona* is an endangered species; however, it is important to understand what being endangered in this context means. At the various sites I visited in the course of my research (Map 2), I encountered different species and varieties of tubers. In each case, there were not any significant differences in local nomenclature or physical appearance that would lead me to understand them as different. While I thought I was seeing the same *angona* or yams in each place I visited, I was actually encountering different varieties, and likely different tubers in some cases. A closer look at these tubers would allow one to see differences in the leaf structure on their stems, water content made evident when consuming, and even taste if you have a refined enough palate. In my interactions with various people consuming *angona*, however, these distinctions were generally not made, nor were people concerned with the possibility of losing one or another variant of *angona*. Several participants indicated they always knew where to find more *angona*.

Various projects have been directed at protecting threatened variants of *Dioscorea* and the forests they grow within. Such conservation efforts do not always align with the needs of locals, however. In some cases, conservation efforts present challenges to people who are desperate for food or a resource to sell for income, requiring them to enter protected reserves illegally to harvest and smuggle out what had once been freely accessible. I explore this paradox in the sections below as I outline my ethnographic experiences with

smallholders who grow tubers in various communities and with a project devoted to conserving the *Dioscorea orangeana*, an endangered species of wild yam named for the region in which it can be found.

Map 2: The four major field sites where I encountered yams; Ramena (Oronjia), Anivorano, Mahamasina, and Ambanja. “Madagascar”. Map, Google Maps. Accessed 22 May, 2020.

Ethnographic Account

I began my field research in the small highway village of Mahamasina, located near the Ankarana reserve— a protected national park. Snyders and I started by asking local people about which plants were important in their lives as well as how they were being produced and used. This initial work gave me an understanding of some plants which were key to the survival and livelihoods of many people. Rice, cassava, and beans were the most reported crops which people produced; several other people we surveyed had beehives from

which they harvested honey, and charcoal was an important commodity being produced and sold locally. An observation Snyders and I made many times while speaking with local people was their tendency to position themselves on local landscapes when describing their relationships with various crops. What I mean by this is that as we spoke, people would point to the exact locations of their own gardens and fields (where domesticated crops were cultivated), but would point less precisely, in a general direction (always away from the nearby protected area), when talking about foods they foraged from the "wild". My interviews with locals in Mahamasina left me considering a question as specific themes were repeated from one person to the next. In considering the subsistence techniques of these smallholders, and others like them, I wondered what is the "wild" and who is it for? In exploring this question, I sought to speak with individuals who either use the wild to exploit resources or protect the wild from being over exploited or degraded.

Mahamasina

Naomi, a restaurant owner in Mahamasina, showed and cooked for me the first *majola* I saw in Madagascar. Naomi's neighbour dug the tuber for us from their garden, after which Naomi made it into "*sarwaba*"— a dish consisting of *majola* boiled in coconut milk and topped with sugar (Photo 1). While eating, we discussed some of the differences between the *angona* and *majola*. Naomi, and many others I spoke with, prefer the taste of *majola* over *angona*, and recognize its practical advantages; namely that it is easy to replant. The common sentiment surrounding *angona* was that it was not as tasty, harder to dig, and could only be found in the "*ala*"— here referring to the "forest", but also translatable as "wild". For the most part, people in this community seemed to only be relying on *angona* as a last resort; if anything else was available, no one had a reason to consume *angona*.

One of my days in Mahamasina was spent with a park guide, Dominic, who took us to meet various locals, but also introduced us to some of the wild plants people here exploit. Dominic showed us the tree most commonly used for making charcoal. He explained that due to the immense size of these trees, they damage many surrounding plants as they are felled. One of the reasons Dominic wanted to show us the size of the tree was because he wanted to show how, like these trees, harvesting wild yams is also damaging to their surroundings. While we were shown these trees in a 'neutral' space, Dominic explained that many people

still trespass in the park to collect trees, yams, and other valuable commodities including sapphires. When talking with Dominic and other park guides, their shared sentiment seemed to be that the wild was a place that needed "protecting"— largely meaning it had to be protected from other people. As I continued interviewing more people, a trend emerged in the form of a dichotomy; on the one hand, the wild was a resource-rich place which could be exploited if needed. On the other hand, however, the wild is a space which has *limited* resources and should *not* be exploited.

Photo 1: A plate of *sarwaba* made with *majola*, prepared by Naomi.

Anivorano

I stayed in the small highway market town of Anivorano, 20km north of Mahamasina, for a very short two days, but my stay provided me with a great deal of insight as to the important ways *angona* is connected to the everyday lives of smallholders who rely on

exploiting wild yams—endangered or not. My first interview in the Anivorano market was with a woman who was selling *angona*. She explained that she sold a variety of produce; she was selling *angona* because the rice presently in the market was not good, so more people were eating the yams. Following this interview, I spoke with five other vendors in the market who iterated the same point: more people were selling yams— especially *angona* and *majola*— because of a greater demand due to the current season (a time at which local rice was not yet widely available) and the influx of low-quality imported rice.

During our second day in Anivorano, my field partner, Snyders, was contacted by his friend's mother, Mama ny Bianca; we had interviewed her mother the previous day and her other daughters recognized Snyders. She insisted we interview her as well, on account that she was a khat farmer and could tell us a lot about it. Our interview took place in the home of Mama ny Bianca; it was surrounded by fields with rice and cassava. The inside of the cement home was well furnished with beautiful wooden pieces and was very orderly. As we talked, Mama ny Bianca told us all about khat, a natural stimulant which she harvests for a local producer. She also explained that she grows a variety of other crops and forages on her land as a means of subsistence in addition to selling what she can for income. For her, *angona* was a reliable resource which she knows she can exploit for as long as she has her land; knowing where to find angona and digging it up are the biggest challenges in its harvesting. When access to land becomes a variable in resource exploitation, the daily struggles many smallholders navigate for survival become even more stressed.

An additional interview I conducted while in Anivorano was with two gendarmes– armed police officers. I was also accompanied by my research supervisor's field partner and "*zoky be*" (big brother), Louis Phillipe, who was able to connect us with the gendarmes and translate our conversation. They wore military-like uniforms and carried guns with them, giving them a very authoritative and intimidating appearance. They explained they are responsible for "protecting the people and the forest"; they managed crime within the city, but also ensured people were not exploiting the nearby protected area. While they were adamant that the protected forests were in need of policing, they did extend the conversation to talk about implications involved in being the appointed "protectors" or "guardians" of the forest. Both of them were locals and, in doing their jobs, they were sometimes pitted directly against friends, family, and neighbours. Sodikoff (2009) explores how conservation projects

can pose problems like this for local people. Residents fill low-wage positions, including guarding protected areas, "disseminating the conservation message to people of their own ilk" (Sodikoff 2009, 444). In addition to holding these positions, however, "they also maintain their social ties to the moral economy of subsistence", leading them into conflict as to how they can balance the goals of conservation projects as well as national conservation laws (i.e., restrictions on swidden agriculture) (Sodikoff 2009, 444) with their own social lives. The dilemma described by Sodikoff was apparent in the work described by the gendarmes in Anivorano who were trying to protect the forest while maintaining their social relations. By no means did these guards want to prevent locals from accessing resources they needed as they recognized their struggles and understood how the forest can be a real source of sustenance. They also reflected on the importance of maintaining the lands of the ancestors and keeping alive all the plants and animals of the forest.

What is the 'Wild'

When discussing growing and/or harvesting tubers with people, it was always stated that *angona* is "*dy*" meaning wild, and most other tubers were "*tamana*" or domesticated. *Dy* is an adjective, ascribing the status of "wild" to objects— *angona*, is described as *dy* since it grows and is found in the space called "*ala*" a noun, which represents the wilderness or forests. I mentioned earlier that another name of the wild yam is "*ovy ala*", this simply translates into yam of the forest, or wild yam. *Tamana*, in contrast, is an adjective referring in cases like this to crops that are adapted to spaces that are inhabited and maintained by humans. *Tamana* and *dy* are the words people use to make the divide between not only crops and foraged items, but between the landscapes in which they are found. In interviewing various people, I became aware of a lived landscape wherein the boundaries between what is wild and what is not change depending a person's positionality. The topic of wild and domestic tubers when discussed by people of different economic, social, and occupational status showed how the value of the wild, or more importantly the things of the wild (i.e., yams, sapphires, and other valuable resources), is constantly changing and being negotiated.

The varied interactions with *angona* connect it to multiple perceptions of the wild, sometimes in juxtaposing ways. The differing ways people describe their interactions with the wild as well as interpretations of wild yams, and the spaces referred to as the "wild" or

"forest" highlight the many different ways the wild is valued. Park guides situated the wild in a conservationist narrative, problematizing it as a limited resource, over-consumed by rural communities, tourists, and even the state. Those who positioned themselves this way, sought to protect the plants and animals of spaces defined in this way — i.e., parks which prohibit foraging and destructive practices. More than one park guide told me stories of having to chase out people who enter the parks for foraging, mining, logging, and poaching. Significantly, the Malagasy term used to describe conservation areas in the region is "ala *fady*" or "taboo forest" (Walsh 2012, 71). While the message communicated by this term is clear – i.e., entering the forest is prohibited -- it is clearly a message directed at Malagasy locals rather than visiting foreigners who come as tourists and researchers. As noted earlier, during my time near the Ankarana reserve, whenever I asked people about *angona* and where they can be found, everyone would point in the opposite direction of the reserve. The redefining of the forest *(ala*) into a park *(ala fady*) influenced how people could interact with it, or at least with how they could describe their interactions with it to an outsider (i.e., myself) asking questions.

Other actors experience *angona* and *majola* quite differently. When I spoke with the two gendarmes in Anivorano, they described a tense relationship that was morally difficult to navigate. On the one hand, they were to keep local people from foraging in the forest in order to protect vulnerable species. On the other hand, they lived in this community and by restricting friends, neighbours, or, most simply, fellow human beings (*olombelono*) from entering this space, they understood that some will go without food as the forest is their last resort. In detailing similar relations in her research in the same region, Gezon (2006) states, "People contest resource use and access within overlapping sociocultural frameworks of ethnic identity, family relationships, subsistence patterns, and political laws and norms" (7). As the Malagasy engage with local landscapes around conservation areas in particular, they become entangled in the purview of outsiders. In some pursuits, such as artisanal mining and charcoal production, forests are entered for the purposes of profit, however, the commodification of the wild in this context represents the consequences of extreme poverty, rather than needless ecological exploitation. In cases in which people enter the forest to collect food, building materials, and other resources because they cannot afford them, the goals and aims of conservation can be restricting. As forests come under the protection of

national and international conservation authorities, real and symbolic boundaries are constructed to prevent people from entering the wild.

Competing interests in forests defined as protected can lead to conflicts between local communities, the Malagasy government, and international conservation initiatives. Gezon (2006) detailed this complex situation of competing voices. In the case she wrote about, declaring an area to be a national park, and instituting measures for protecting it, did not change the fact that it was located in the vicinity of many rice farmers and cattle herders. Gezon's work explores the impact of a conservation initiative and how national and international objectives do not always align with local needs. Indeed, implementing projects included in conservation objectives often precluded the participation of local people. As Gezon (2006) notes in reference to one project she describes:

> … the Project and the local people were in direct competition for the right to manage the land, since both claim exclusive rights. A consequence was that the participation of the local people could only be minimal and nominal, since to truly draw on the participation of the local people in designing and implementing a conservation project would entail granting them their dominant request: to have at least limited rights to use and manage the land (169).

The following section explores a case similar to the one presented by Gezon. In protecting a forest and conserving a yam, the interest of conservation workers and foragers come into conflict in ways that are clearly informed by how people engage differently with yams and how they understand the value of the wild with which some yams in particular are associated.

Oronjia

Oronjia is located near the villages of Ramena and Ankorikahely, just north of the provincial capital of Antsiranana. Forêt d'Orangea is a New Protected Area (NPA), classified as a Category V protected area under the IUCN. The area is currently and actively protected by le Ministère de la Défense Nationale whose base is located on the northern point of the Ramena peninsula (Mercado Malabet 2017, 20; Wilkin et al. 2009, 466). In the village of Ankorikihely, Missouri Botanical Gardens operates a research base and guards the southern entrance of the protected area (Mercado Malabet 2017, 21). Oronjia boasts a high degree of biodiversity, "[its] floristic inventory contains over 149 different species [...] Over 80% of these species are endemic to Madagascar, among which, 21% are endemic to the greater region and 4% are endemic to the site" (Mercado Malabet 2017, 19). In 1960, the first sample

of *Dioscorea orangeana* was collected but was not analysed until 2003; after its ecological distribution had been determined and considered in relation to rates of exploitation and regrowth, the species was added to the IUCN Red List with the status of “Endangered” (Kennerley and Wilkin 2017; Wilkin et al. 2009, 466; Wheeler 2010).

One conservation-oriented project that has been especially sensitive to local knowledge and uses of wild yams has been the outcome of a collaboration of two organizations with projects throughout Madagascar. The first, an American-based organization that can be found across the globe, Missouri Botanical Gardens (henceforth MBG), has gardens established throughout the country, and has initiated many projects geared towards supporting local ecosystems and their vulnerable species. MBG’s stated mission is “to discover and share knowledge about plants and their environment in order to preserve and enrich life" ("Our Mission & History" n.d.). Their further dedication to plant conservation has them working under the principles of the Global Strategy for Plant Conservation which is “to halt the continuing loss of plant diversity and to secure a positive, sustainable future where human activities support the diversity of plant life and where in turn the diversity of plants supports and improves our livelihoods and well-being” (Missouri Botanical Gardens n.d.). Kew, an extension of England’s Royal Botanical Gardens, is another research-based organization exploring new ways to approach conservation. On their website, Kew describes themselves as “a global resource for plant and fungal knowledge” ("Kew Science" n.d.). An ongoing collaborative project with Kew and MBG at their location in Oronjia is attempting something never tried before: they are experimenting with techniques to allow for the domestication of the wild yam. This would have two major positive impacts: first, wild yam domestication could pave the way for population growth of this endangered species, and second, this could mean greater access to this valuable resource for local populations (Kew n.d.). This project has been anything but easy to implement and I will present an anecdote here to discuss the dynamics of this case, but first I will describe the site and project in more detail.

The aim of MBG’s project in Oronjia is to protect the vulnerable species of the area. Locals living in close proximity to the protected area engage in multiple economic activities, including agriculture, foraging, and fishing, some of which lead them to resources from local forests. An important characteristic of the local population is its seasonal fluctuations which

correlate with the fishing season (i.e., people temporarily locate to the area during fishing season) (Mercado Malabet 2017, 22). When I interviewed residents in Ramena, many of them discussed the importance of fishing for the local economy, but also explained how growing restrictions prevented them from thriving in this industry. Efforts at making the local fishing industry more sustainable and at keeping larger fisheries in check have also had impacts on local fishers who now struggle to make a living off their once primary economic activity, a trend that, alongside others, has led locals to depend on foraging to make ends meet and survive. MBG has worked to understand the dynamics of local life under these circumstances, and in implementing their conservation initiative, they have strategized ways of including the local population to participate in mutually beneficial manners. By involving local people in actively protecting local resources, the project aimed to provide them with the benefits of engaging in sustainable subsistence strategies that would promote the growth of local species and, ultimately, provide more resources for community members. Implementing different cultivation methods to preserve the integrity of the land and improve the local standard of living is not a simple or straightforward solution, however. The following story explains exactly why this project is both challenging and an interesting case in community-based conservation.

"God's Food"

One day in Oronjia, an MBG employee led me on a tour through his gardens; one was near his house in a small plot and the other was in the forested area behind his home. Ornate plants and various seashells marked a pathway towards his garden plot. Leading me to a trellis, the farmer pointed out the overgrowth of dried brown vines covering the top; this dense ceiling shadowed the plants growing in the soil beneath it (Photo 2). The man explained he was growing *majola* with a couple of other plants because they grow well together. He detailed how anyone can plant and replant *majola* themselves by cutting off the head ("*lohany*") of the tuber and burying it in soil, ensuring that a new one will grow within two years. As *majola* grows and matures, only a single tuber grows at a time, making it different than *angona* which has a rhizomatic growing pattern that can produce multiple shoots of tubers as it grows. The trellis he used supported the climbing vine-like stems of the *majola*, which allows the tubers to grow healthy and large. Following the tour of his first

garden, he led us through a narrow pass into a small forested area. Amongst the wild plants, this farmer and his neighbours planted and maintained numerous plants they grew for food and other uses, including bananas and pineapples. Taking us to our destination, with a grin on his face, the man pointed to a skinny tree. Around the tree was wrapped a dried brown vine with a leaf on the end. I asked if this was another *majola* plant. He laughed and said he was growing *angona*. After some experimentation, he believed he had nearly figured out how to replant *angona*, a clear achievement for both him as well as Kew and BMG's project.

After touring these gardens, we began our trip home, discussing *angona* and what made it such a hot topic for conservationists. Walter, our field guide in Oronjia, had told Snyders and I about local taboos, "*fady*", particularly ones that are related to agricultural work. He described the common days of rest which are Sunday for prayer, as well as Tuesday and Thursday when turning any earth is prohibited (i.e., meaning no agricultural work, mining, etc.). *Fady* play into various aspects of social life and represent familial, cultural, and area-specific values and beliefs. For many Malagasy people, not adhering to certain taboos could bring misfortune not only to themselves, but their friends, family, and neighbours (Walsh 2002). For many of the participants in the conservation project, certain beliefs shape labour practices and influence interactions with the land. In the areas where I conducted research, as mentioned, Tuesday and Thursday are "*fady* days", meaning it is taboo to do any work which would result in the turning of any earth. Largely, this means that agricultural and mining activities are not conducted during these days. Not all forms of labour cease on *fady* days, however, and it is clear that these designated days offer more than cosmological equilibrium. Tuesdays and Thursdays are the days on which those with goods to sell bring their products to the market. These are the prime days to shop in local markets for the freshest meats, produce, and other food. These *fady* days, in other words, allow agricultural workers to enter markets both as sellers and buyers.

Photo 2: Trellis supporting the aerial roots of tubers.

Walter described an unfamiliar *fady* to me; relating to a category of plants to which *angona* belongs— he called these "God's food." In the past, *angona* had never been successfully domesticated. If a plant used by humans cannot be regrown by people— in the way that *majola* can, for example— it is seen as God's food, meaning that God grew this plant specifically as a gift for people. While I use the English word "God" here, this is not always directly associated with an omnipresent being for everyone, but instead is a potentially benevolent force; referred to as *Zanahary* in Malagasy. In this context, *Zanahary* represents the natural forces more than the supernatural realm of the ancestors; divine interference is seen in the weather, crop yields, the health of humans, animals and plants, as well as other natural phenomena. As Walter explained it, trying to grow *angona* was potentially *fady*, as it is as if one is trying to do God's work. Obviously, this complicates the entire methodology of the conservation project, raising the possibility that a project carried

out in the name of what some call conservation may be perceived by others as a threat to those occupying this shared landscape.

The less people can depend on fishing, agriculture, and other ways of accessing food and the economic benefits of local markets, the more they must rely on foraging. Madagascar is impacted by a high degree of political, environmental, and economic instability requiring more people to survive on fewer resources. In Oronjia, Mercado Malabet (2017) states, "[the] park plays an important part in the lives of the residents of Ramena and Ankorikahely. This is because of both the close proximity of these communities to the park boundaries as well as the livelihood opportunities that the park provides to nearby residents" (21). The potential of Oronjia as a conservation area that could provide livelihood opportunities to local smallholders exists in conjunction with the magnitude of instability and poverty they experience daily, however, making it likely that locals will continue to turn to the forest for resources in times of need.

Gezon (2006) analysed a similar case in Ankarana, concluding that:

> Rights to the land are actually ambiguous, overlapping, and even contradictory—and subject to continual negotiation. Effective control over land use, then, is situational more than it is a standard that is predetermined or consistently executed. In the eyes of the state and the international community, the state owns [the local forest] and runs it as a protected area. In the logic of the local system of royal authority, the *Ampanjaka* [local traditional ruler] and the local people hold ultimate rights to the land. I argue that, while formal ownership rights overlap, rights to use and manage the land emerge in specific situations, with effective ownership never lying entirely with the state or the local people. (164)

MBG's conservation initiatives focused in Oronjia are a hopeful opportunity for both local investment in conservation, as well as creating an opportunity for resource access in a foodinsecure area. In its conservation, Forêt d'Orangea is a resource removed from an already vulnerable population. However, if the farmer experimenting with *angona* is a reflection of local attitudes to any degree, people understand the importance of maintaining this endangered species. Additionally, even though the farmer seemed to break a taboo when regrowing *angona*, he did so in the domain of the "wild"; perhaps allowing for a neutral ground in which "God's food" could be regrown on 'God's land', negating the potential consequences what some might perceive as a transgression. Here it is worth noting that, like

rights to land in Madagascar, *fady* are often ambiguous and open for interpretation (Walsh 2006).

Conclusion

Where conservation efforts intersect with the resource-needs of communities, smallholders are required to navigate a complex array of barriers to meet their basic needs. Madagascar has many endemic yam species which have been exploited since the arrival of humans on the island. Yams do not make up the primary portion of diets, but they are a valuable resource in periods of drought, and a supplement in between the harvest seasons of other crops, especially rice.

Understanding the differing ways in which the people discussed in this chapter engage with the wild as a concept and with the physical spaces that are associated with the wild, forests in particular, is key to understanding their relationships with yams and with others. I heard differing viewpoints as to what the wild is as well is its value. The wild was universally acknowledged as a space containing valuable resources, however, people differed in whether they considered these resources as exploitable or as vulnerable and in need of protection from exploitation. Piecing together what the value of the wild is to different actors led me to understand the concept as fluid, and a reflection of contesting needs and interests of whoever is using it. The effects of such contesting perspectives are visible in the physical signs outside of reserves (i.e., that mark certain locations as "*ala fady*" or restricted to Malagasy people), in how those restricted from protected areas engage with it (i.e., or how they refer to their engagements by gesturing away from it), and in the unfilled pits that foragers leave behind after surreptitiously digging up the wild yams that at least some of them continue to pursue. The importance of these contesting perspectives is that they have real consequences. People are physically denied access to real places which could be potentially exploited for personal and economic use under the umbrella of "conservation", and endangered ecosystems and species deemed to be in need of conservation go on being threatened by activities that could unquestionably be more sustainable.

In highlighting the intersection of conservation efforts and the lives of people with access to limited resources, the case of Oronjia illustrates the need for incorporating community needs into conservation strategies. *Angona*, but more importantly, people's

engagements with *angona*, cannot be understood or protected without considering how people are connected to places and markets in powerful and meaningful ways. People's engagements with *angona* show how these smallholders face a matrix of barriers, but in conserving *angona*, smallholders are participating in a potentially mutually beneficial relation with this valuable plant.

Chapter 4: Not so Vanilla: Risky business and social narratives in Madagascar's cash crop economy

In March of 2017, Tropical Cyclone Enawo caused significant damage across the north-eastern coast of Madagascar, and especially in the area around Sambava, the country's vanilla capital. The storm resulted in 81 deaths and displaced over 245,000 people. It also seemed like a catalyst for a global vanilla crisis. As this unfolded, I was in the midst of planning for my field work in Sambava— my plans had to change.

I did not visit Sambava when I was in Madagascar, but I did see the vanilla industry thriving in Ambanja (in the DIANA region in the northwest) where I ended up conducting research. During my fieldwork, I also heard stories about the storm's impact in Sambava and the surrounding region, and I was surprised by what I heard. Damage and casualties were acknowledged, but the consensus was that the vanilla economy was only minorly impacted, and that, by June 2017, those working with vanilla in the region were making great fortunes. While it was true that vanilla prices were at their highest, comparable to the market price of silver, and that some in the region were profiting greatly from this booming market, the fact remained that it was cyclone-caused damage that made this price spike possible.

While doing research far from Sambava, I also heard elaborate stories from friends and informants about how the wealth earned from vanilla had completely restructured social relations in the region, making vanilla-related work more profitable and appealing than ever. Daniel, a friend of mine who taught English, was the first to tell me these stories. I met Daniel serendipitously one day while I visited Ramena beach. While purchasing some snacks at a bakery, Daniel happened to be assisting the owner and came to talk with me after hearing me speaking English with a friend. Daniel, in his early 20s, was looking for work in the area and was teaching local children to speak English during his spare time. I spoke with him for nearly an hour as, after I explained my research, he was eager to explain to me everything he knew about the plants I was investigating. Following our very detailed conversation, he took me on a tour and introduced me to many individuals in his community who he thought could offer valuable input on my research. What had initially been planned as a day-off ended up being an exceptionally productive research day, which I would suggest is a wonderful feat made possible by ethnographic and anthropological research.

During our conversation, Daniel told me of vanilla producers who had accumulated so much wealth that they did not know what to do with all their income. Another friend at l'Université d'Antsiranana, Kendall, told more personal stories, having felt the destruction of the cyclone first-hand while at home near Sambava, and then having had to make some major decisions about the direction of his life after losing all his crops. In addition, there were widely circulating stories retold to me a handful of times, on different occasions by both friends and informants. I was first introduced to these stories by Daniel who never doubted their legitimacy and, thus, took them as evidence of how a crop like vanilla can shape people's lives.

The first of these stories was associated with a particular photo circulating through social media locally. This photo was of a man wearing a suit made from many bills of the Malagasy Ariary— a suit made from money. It was said this man was from Sambava where the booming vanilla industry was making producers rich beyond reason. Not knowing what to do with all his newfound wealth, he found a practical use for his extra money that was also a way of showing off his prestige. The story of the money suit was told as an extreme example of gratuitous spending, but it also typically led to speculations about the changes caused by the vanilla boom. I heard that grand hotels were being built to accommodate the growing number of tourists visiting the area in recent years and that farmers were building mansions and buying expensive vehicles. Teachers and police officers were even said to be quitting their jobs for better wages growing vanilla. The moral of all of these stories was that this was the best time to be growing vanilla, ever.

A second story I often heard had a much different tone, much closer to the fantastical nature of a fairy tale or fable with elements of a cautionary tale. In this story, we again have a very wealthy vanilla grower; in some versions I heard, it was the same man who wore the money suit, but this was not a consistent detail. This man had an unfathomable amount of wealth, so much that its immensity drove him mad. He bought a big house, a big four by four, and had many children whom he spoiled with toys or anything they desired. The story takes a turn when this man runs out of things to buy and loses his mind as he gets wealthier and wealthier. As his money was so abundant, he decided he and his family would cook soup with the money and eat it. While maintaining the idea found in the stories cited above – i.e., that vanilla is associated with great wealth – this story also warns about overindulging and

gluttony; in the end, the man and his family who ate money soup all died. These stories of conspicuous consumption saturated the popular image of vanilla production; Zhu (2018) encountered similar stories researching vanilla in the Northeast.

In this chapter I explore people's engagements with vanilla in Madagascar in a way that I hope will shed light on the significance and seeming plausibility of stories like these. I do so by considering two questions related to the impact of global markets and economic shifts in vanilla producing communities. Firstly, how does a global commodity shape the everyday lives of those producing it? Secondly, how do shocks to the vanilla economy impact communities where it is produced? Cash crops are important exports globally and the labour force which produces them represents a vulnerable population exposed to risky economic conditions, posing many challenges to smallholders and communities.

In the next section, I discuss the history of vanilla itself and how it has come to be grown in Madagascar. Next I detail my own engagements with vanilla; what I experienced as I worked alongside farmers planting the crop, and while with labourers curing vanilla beans. Drawing from my research as well as the work of others, I will discuss how this plant is enmeshed in a network of narratives and social lives. I will be focusing on the intersection of international markets and local social relations in exploring the complex role of vanilla in Madagascar. To begin, however, it is worth specifying what vanilla actually is. One of the biggest factors influencing the high price of vanilla is the laborious process of producing it. First, a clipping is required from a matured plant; typically purchased from someone already established as a producer. These clippings then take up to four years to mature before they produce vanilla beans. If one were to use an unripe seed pod to grow a vanilla plant from scratch, the pods must first be boiled, then sterilized, separated, grown, spread apart, grown again, cleaned, and then planted as sprouts. It takes nearly seven years for the plant to grow using this method. In either case, the plant grows as a vine up trees or a trellis (DeYoung, Rowe, & Runkle, 2011). Once matured, orchids will flower annually for a six-week period, each blooming only for one day. During this period, the orchids must be hand-pollinated— as the bees that traditionally pollinate them are endangered and can only be found in Southern Mexico— the process laid out in detail here by an "orchid enthusiast":

> Push up the anther and remove pollinia. Press the yellow pollen mass out and hold it firmly with the right thumb and right index finger so it won't fall off. With the right middle finger push the anther back to raise the cap underneath it. Then

> with the left thumbnail peel down the front of the column about one-quarter of an inch. With the right thumb and index finger place pollen on ridge, push peeling back in place with left hand and cap down on top of it with right hand. By the second day the stem turns downward and begins to elongate. Flowers do not fall off, but wither to dark brown. The best time of day to pollinate seemed to be between 11 a.m. and 12 noon. Earlier in the day the pollen was less ripened and very hard to handle or place on the column. (Woebse n.d.)

Following pollination, pods grow from the orchids which can be harvested about nine months after they start growing. Next, the green vanilla pods must be cured. They are put under the sun to dry then wrapped at night to "sweat" for three days, then ripened for one month, followed by regular and rigorous massaging of the beans— a process I will detail further in my ethnographic account. The bean has reached perfection once it is deep brown in colour and oozes sap; curing takes roughly four months in total (LovettSmith 2016; Neimark 2019, 8). The result is what most readers likely imagine as vanilla – a crisp, dark brown long bean which is pleasantly aromatic. The cured bean is used in its whole, the individual seeds can be used, or its essence may be transformed into an extract. Vanilla is prized for its taste and aroma which are used for flavouring food, adding scent to cosmetics, and even has been used medicinally to treat fever and sexual impotence.

The History of Madagascar's Vanilla Trade

The earliest known origins of vanilla were in Mexico and South America where it originally grew near the equator. Vanilla had symbolic importance to Mayans and Aztecs but played a larger role in the culture of the Totonac for whom the spice was both sacred and a form of currency prior to European invasion in the sixteenth century (Ecott 2004, 7). The Totonac remained the largest producers of vanilla up until the nineteenth century (well after Europeans took an interest in it) thanks in large part to the fact that vanilla does not grow naturally outside of Central and South America – its sole natural pollinator, the Euglossine or orchid bees, only exist in this region.

The spice was first introduced into Europe during the early sixteenth century and very quickly became a highly prized and demanded commodity (Correll 1953, 299; Ecott 2004, 7). Prior to the nineteenth century, orchid propagation was an understudied phenomenon. In 1839 however, the Belgian botanist Charles Morren established that the reason the vanilla plants were not producing fruit outside of South America was due to the absence of the

insects that pollinated it (Correll 1953, 300). After realising this, Morren successfully handpollinated a vanilla plant which then produced fruit. In 1841, after this knowledge had spread, former slave Edmond Albius developed a sounder method for hand-pollinating vanilla while on a plantation in Reunion; this method continues to be used by vanilla growers today (Correll 1953, 300; Osterhoudt 2014, 126). Around 1840, vanilla was first introduced to Madagascar by Jean Laborde— a European industrialist who had close ties to the island's then highland-based Malagasy monarch Queen Ranavalona I (1828-1861) (Deschamps and Yvonne 1977, 409). Creole colonists from Reunion started the first plantations along the east coast in the regions of Antalaha and Manjary (Osterhoudt 2014, 126), and they proved so successful that vanilla production in Madagascar exceeded that in Mexico by 1886 (Correll 1953, 303; Deschamps and Yvonne 1977, 414-415).

Madagascar was colonized by France in 1894, enabling the French who oversaw the first vanilla plantations in the country during pre-colonial times to intensify their work (Osterhoudt 2014, 126). Vanilla production during the colonial era was carefully managed through French colonial policies of control and coercion. Vanilla production was only permitted on French-owned plantations where the Malagasy were first incorporated as wage labourers, largely due to a colonial policy of an annual tax paid by each household to the French government (Osterhoudt 2014, 126). Malagasy plantation workers quickly learned how to grow and harvest vanilla, leading some to smuggle plant clippings out of plantations and start growing vanilla on their own properties (Osterhoudt 2014, 127). As a means of controlling the vanilla trade, French officials would destroy any vanilla plants they found outside of plantations and only permitted the sale of plantation vanilla in markets as well as for export (Osterhoudt 2014, 127-128). As the colonial period continued, Malagasy people became involved in growing vanilla, but Madagascar's vanilla market suffered from instability in prices and Malagasy farmers faced challenges in making earnings on their crops (Cadot, Dutoit, & de Melo 2009, 3).

After Madagascar's independence in 1960, the country's first president, Tsiranana, was quick to intervene in the vanilla trade by creating a stabilization fund which ensured income for farmers; this is seen as the first of three phases the Malagasy vanilla trade has navigated since independence (Cadot, Dutoit, & de Melo 2009, 3). Farmers began growing vanilla outside of plantations and many successful small-scale producers have entered into

the trade since (Osterhoudt 2014, 129). This post-independence shift in the trade involved managing relations between farmers and private companies, ensuring fair and stable prices (Cadot, Dutoit, & de Melo 2009, 15). The "Vanilla Alliance" formed in 1962 between Madagascar, Reunion, and Comoros, creating a cartel that oversaw 80% of the world's vanilla production and secured a demand for vanilla in the global market while also maintaining very high prices (Cadot, Dutoit, & de Melo 2009, 16).

When President Ratsiraka came into power in 1975, he eliminated the stabilization fund in favour of taxation, rent, and price-hikes marking the second phase of Madagascar's vanilla trade (Cadot, Dutoit, & de Melo 2009, 3; Conway et al. 2003, 91). Growers, curers, and traders were all newly required to hold three-year licences, limiting who could participate in the trade and favouring large, established producers over smaller and new ones.
This occurred as Madagascar's Ministry of Trade gained greater control over the industry and worked to further privatize the vanilla market, making it easier for companies to thrive and leading individual growers to struggle (Cadot, Dutoit, & de Melo 2009, 17). At first, vanilla farmers were receiving extremely low prices for their crops because of high export taxes, but after the World Bank eliminated the vanilla marketing board in the early 1990s, export taxes peaked and compounded with currency overvaluation (Cadot, Dutoit, & de Melo 2009, pg. 17). Over this same period, Indonesia entered the global vanilla market and continues to be Madagascar's main competition today.

The third phase of the newly deregulated vanilla market has seen it opened, leading to greater participation by private corporations. STABEX, an EU commission that focuses on stabilizing export revenue, enabled stabilization in the broader market, as well as higher profitability for vanilla producers through practical changes such as branding (Photo 1) for identification and theft reduction, as well as compost programs to increase annual yield as a cost effective and sustainable alternative to other fertilizers (Conway et al. 2003, 91). Fixed prices in Madagascar were continuously eroded through the 1990s, and after a short period of high earnings from vanilla in the late 1990s, severe weather in the form of cyclones and droughts negatively impacted the market which has since continuously faced uncertainty in prices and production (Cadot, Dutoit, & de Melo 2009, 3; Osterhoudt 2014, 131). Licences are now required only by vanilla curers, which has allowed more farmers to enter the trade again (Cadot, Dutoit, & de Melo 2009, 19). When prices are high, farmers are faced with the

threat of thieves stealing their vanilla in violent raids; gangs have looted vast amounts of vanilla and some farmers have even been killed while protecting their crops (Ecott 2004, 187; Osterhoudt 2014, 130). The state continues to be involved in the vanilla trade, mostly in the form of quality inspection and determining harvest windows (Cadot, Dutoit, & de Melo 2009, 19). More recently, the vanilla trade has been seeing increases in earnings and production quantities, but this can easily change with any market shifts or major weather event (Osterhoudt 2014, 131).

Photo 1: Branded vanilla beans.

Vanilla Today

Following a disputed Presidential election in 2002, an economic crisis severely impacted Madagascar. In terms of agriculture, most harvests were plentiful, but producers faced the challenge of selling their crops both nationally and internationally (Conway et al. 2003, 37). Agricultural revenues dropped 37.6% which posed great risks to many already

impoverished farmers and resulted in increased family subsistence-focused farming, decreased movement of produce, and the implementation of cheaper methods of production (Conway et al. 2003, 937). Farmers were unable to hire labourers and had to increasingly rely on family members to work for them, leading to increased rates of unemployment in the agricultural sector (Conway et al. 2003, 37; Osterhoudt 2009; Osterhoudt 2016). Additionally, military roadblocks prevented farmers from moving their produce to larger markets or for export, so local markets became important for farmers to sell any of their crops. Regarding vanilla, trade was limited to those who could get their crop to collectors. Vanilla growers had to turn to cheap fertilizers to feed their crops, a trend that negatively impacted the quality of vanilla entering the market (Conway et al. 2003, 37).

Cadot, Dutoit, & de Melo (2009) outline the major divisions of labour in the production of vanilla beginning with growers, 80% of whom sell their vanilla to curers and 20% of whom cure their own vanilla beans (7). Once cured, the beans are either sold in markets or are packaged and exported (Cadot, Dutoit, & de Melo 2009, 7). As three exporters handle two thirds of Madagascar's vanilla, standardization policies are in place to ensure quality and compliance; these policies include bean branding for farmer identification, and specified harvest windows for theft prevention. National household surveys in 1998 showed that 79% of vanilla production occurs in Madagascar's northernmost province of Antsiranana, specifically in the SAVA (Sambava, Antalaha, Vohémar, and Andapa) region (Cadot, Dutoit, & de Melo 2009, 9). The 2010 Periodic Household Survey (EPM) included principle uses of agricultural crops: green, uncured vanilla was used primarily (~90%) for sale with limited personal (~5%) and other (~5%) uses; cured vanilla showed similar trends, used mainly for sale (~95%) with increasingly limited personal (~1%) and other (~4%) uses being stated ("Enquête périodique auprès des ménages 2010" 2015, 89). The investigative journalism organization Danwatch released a report on labour conditions in Madagascar's vanilla trade in 2016. Their findings show increased incidences of child labour in the production of vanilla, which is illegal as the country has ratified laws disallowing youth under the age of fifteen from working (Hansen & Lind 2016). While this does further problematize Madagascar's vanilla trade, the conditions and contexts under which children work in the vanilla trade are complex.

Ethnographic Account

Ambanja

As part of my field work, I wanted to see and understand what it takes to produce vanilla. Although I did not visit the large plantations in Sambava, the region surrounding Ambanja (in Madagascar's northwest) offered plantations and gardens of various scales, presenting the opportunity to learn about growing and curing vanilla. Ambanja is a major city in Madagascar and is the closest major city to the popular tourist destination, Nosy Be.

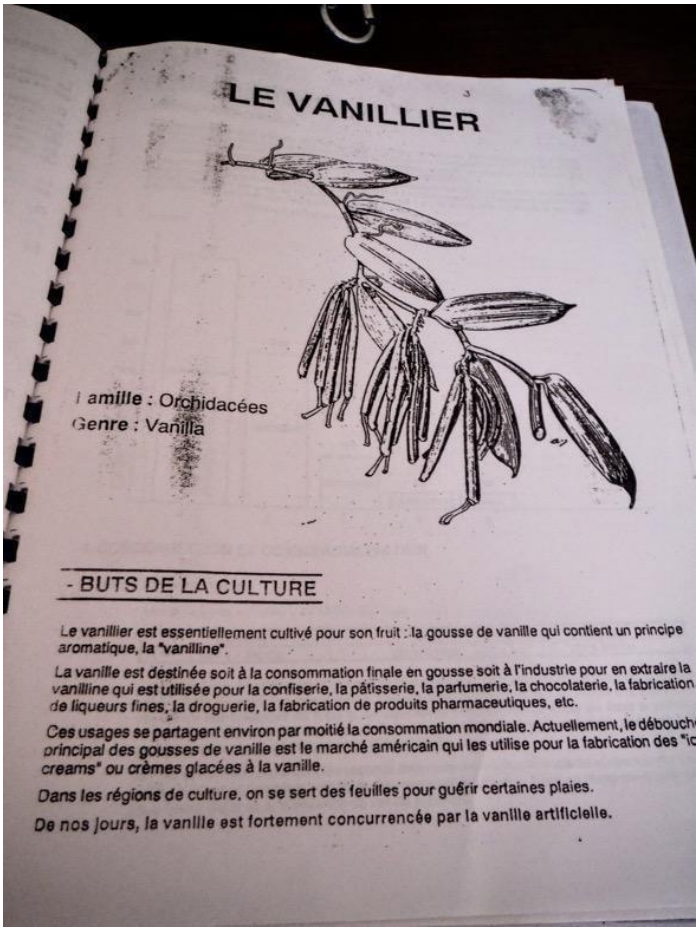
My key informant for this component of my project, Clark, is the director of a commercial garden near Ambanja. Clark is responsible for the management of staff at the garden and, as someone who speaks many languages, has many interactions with visiting foreigners. In the public space of the garden where tourists come to buy spices, the diversity of plants grown in the region is showcased. Clark pointed out the green pepper, red pepper and wild pepper; pineapple, ylang-ylang, coconuts, bananas, chilis, and amongst others, vanilla. Beyond this showcase garden lay larger plantations growing these crops at a commercial scale. To learn about the very first stage of growing vanilla, Clark had arranged for me to go plant some vanilla vines— and pineapple plants, just for fun— with local farmers who were starting to grow vanilla themselves. Our trip by cattle drawn carriage took us through what seemed like an endless plantation. It turned out to be one of the biggest and most popular plantations around, attracting many tourists. We passed acres of cacao, coffee, ylang-ylang, and orange orchards.

Our destination was just off the premises of the plantation and hugged the edge of a mountain. We wasted no time. The farmers immediately walked me through the steps of how to properly plant a vanilla vine. To begin, we took one meter of vine, removing any forming rhizomes— which are new vine growth— as we inspected the cuttings. Next, we had to orient the vines and make sure the leaves were sitting properly in a downward direction; this determines which end will be the bottom. To plant it, we dug a small hole beside a young, narrow tree and put the bottom end of the vine in the hole, covering it with soil. We then wrapped the vine around the tree, securing it in place with strips of dried banana leaves (Photo 2). Two of the three farmers went to plant the pineapples while I finished planting the vanilla with the third. Planting vanilla was so systematic and simplified that there was no

need for translation during my time learning. Every step was shown with a gesture, so I understood how and why everything was being done; Osterhoudt (2009) describes the transmission of vanilla-related knowledge, and notes it is often shared nonverbally (13). Rhizomes are removed to prevent divergent growth and disperse nutrients more evenly. The leaves lay flat down in one direction which it prefers to grow in. All the vines must be secured to trees so they have a support to grow on.

Photo 2: Planting vanilla in Ambanja.

My time in Ambanja also took me to meet the regional head of “FoFiFa”, the national agricultural and rural development agency for research and extension. His duties were to ensure that farmers were educated in how to properly grow crops, to address pressing issues such as pests or disease, and to encourage that local harvesting achieved its fullest potential. He shared educational booklets on growing vanilla, including a formal document that outlined every step involved in growing a healthy vanilla plant (Photo 3). It detailed the work of hand-pollination, removing stems at measured intervals, and treating leaf ailments or ridding plants of pests. A second document he shared with me was more like an illustrated children's book; it described the curing process for vanilla beans in a very simple manner, or at least simple compared to the document about how to grow the plant (Photo 4). Each step was presented with a colourful illustration to show every tool, process, and result. Seeing how this was actualized was very similar to what I was being presented in these documents.



LE VANILLIER

Famille : Orchidacées
Genre : Vanilla

- BUTS DE LA CULTURE

Le vanillier est essentiellement cultivé pour son fruit : la gousse de vanille qui contient un principe aromatique, la "vanilline".

La vanille est destinée soit à la consommation finale en gousse soit à l'industrie pour en extraire la vanilline qui est utilisée pour la confiserie, la pâtisserie, la parfumerie, la chocolaterie, la fabrication de liqueurs fines, la droguerie, la fabrication de produits pharmaceutiques, etc.

Ces usages se partagent environ par moitié la consommation mondiale. Actuellement, le débouch principal des gousses de vanille est le marché américain qui les utilise pour la fabrication des "ic creams" ou crèmes glacées à la vanille.

Dans les régions de culture, on se sert des feuilles pour guérir certaines plaies.

De nos jours, la vanille est fortement concurrencée par la vanille artificielle.

Photo 3: FoFiFa booklet for vanilla production.

Photo 4: FoFiFa booklet on curing vanilla.

While I was in Ambanja, the majority of vanilla had been harvested likely less than a month before. My stay coincided with the curing stage of processing vanilla which was marked by a very vivid scent. While traversing the city, I would occasionally smell a strong, warm aroma, much like fresh baking. As people cured vanilla beans, laying them out to sweat in the sun, the scent from thousands of beans perfumed the air in a wide radius. I took advantage of this to find individuals to interview. Just off the main road, there was a property where a large home was under construction. In a grassy clearing beside it, a group of men were gathering up bundles of vanilla, wrapping them in large sheets of fabric, and loading them into a van (Photo 5). After a short conversation, Snyders and I were invited to come back later that week to watch them when they would be curing more beans.

Photo 5: Group of men massaging vanilla beans as they are set in the sunlight to "sweat".

The curing process is exceptionally time-consuming, and those curing vanilla are detail-oriented experts who keep to strict standards. When we were invited back and given the opportunity to join in curing, I sat with a group of women for hours working hundreds of pods, one bean pod at a time.[5] The pods were spread across large square pans with wire bottoms (Photo 6), and working as a team, we massaged one pod at a time— which helped remove moisture. Then we had to sort each based on length and girth— with the help of a small, wooden vanilla 'examiner' (Photo 7); this process is repeated multiple times a week for several weeks. Later in the afternoon, the men had arrived and were ready to show us the first stage of curing, which is blanching. A large metal barrel was on top of a blazing fire; it was filled with water that was boiling. We joined the men in collecting bundles of green

[5] Similar to sapphire mining, women working with vanilla are frequently limited to positions which restrict their ability to earn a high income. In my own experiences, I only witnessed women curing vanilla, or selling it in small quantities to tourists, suggesting a gendered division of labour exists.

vanilla pods, which we then placed in a large wicker basket, filling it to the top. Three men worked together to blanch the beans in the barrel. Two of them lifted the basket with a wooden pole and plunged it into the boiling water. The third used a piece of wood to stir the beans, then used it to brace the basket over the barrel as it was pulled out and the water drained from it (Photo 8). From here, the beans would then be placed out in the sun to sweat and form their sweet resin.

Photo 6: Sorting beans based on quality during the curing process.

Photo 7: Using a vanilla “examiner” to determine a bean’s quality.

Photo 8: Two men hoist the wicker basket containing blanched beans over the barrel of boiling water as they let the water drain; after this, the beans can begin to be cured.

The time I was able to spend in Ambanja was very insightful and fruitful but was limited. I spent my 5 days in Ambanja working with and interviewing people who worked with vanilla in a variety of forms. I planted vanilla with farmers, seeing first-hand how the crop is grown. I then learned how to cure the bland green bean into a lucrative commodity. Seeing a fraction of the labour required to transform vanilla was enough for me to understand how the bulk of its value is derived from careful work in which it must be tended to meticulously in order for the quality to develop to its highest potential. I spoke with some market vendors about vanilla, as well as many others who assured me that vanilla is the best crop to grow. Everyone told me some sort of story about vanilla, including the stories I mentioned in the introduction, but these stories are not just about vanilla. The messages behind these stories speak much more about people's relationships with one another and how they can be shaped by global markets for what they produce together. While my own research only scratches the surface of the greater importance of these stories, others have

explored in greater detail how narratives about commodities reflect the intricacies of human social lives and the ways the material becomes a symbolic vessel of the social.

Risky Business

The vanilla trade can be lucrative, competitive, rewarding, as well as devastating. I began seeing the stories I previously mentioned as a sort of propaganda, a draw to this booming market. Certain individuals working in the vanilla trade are in positions where high income is a real possibility. My friend and teacher Martha, whose family is from Sambava, told me of how the vanilla economy is changing the social landscape. Martha owns a restaurant with her husband and taught me how to cook some traditional Malagasy dishes. She also taught me the importance of balance among her dishes to appease the very particular Malagasy palate. Always a mix of spice, but only in small quantities; plenty of fresh, cold fruit juice; and, most importantly, copious amounts of rice. Among her menu items was a house-made yogurt which she made fresh every night and sold out fast every morning.

One evening while she taught me how to make her famous yogurt, we got onto the topic of vanilla as it is a key ingredient in her recipe. Our discussion grew into a bright conversation on the impact vanilla was having in her hometown. “Teachers and doctors are quitting their jobs to grow vanilla,” Martha declared, continuing to explain how everyone sees these people selling vanilla and building large houses, wearing elegant fashions, and even literally giving away money. Agricultural workers, vanilla growers in this case, are earning more and living with more luxury than educated professionals—including but not limited to teachers, doctors, and tourism agents. This positive association between vanilla and wealth hides the fact that growing vanilla comes with a great deal of risk; this is especially true for smallholders.

In growing vanilla, farmers take on more risk than they would if growing most other commercial crops— like rice for instance. I began to understand the extent of the risk after talking with Kendall, a friend I met during my stay at l’Université d'Antsiranana. Kendall is in his early 20s and is a sophomore student at the University studying English. I met many students studying and learning English while in Madagascar and participated in several conversation clubs. The clubs are where students would get the opportunity to practice speaking English with other students, teachers, and occasional native English-speaking

guests. Being at the university was not Kendall's first choice, he explained to me. He found himself there as a last resort. The previous year, Kendall had begun planting vanilla with his grandfather who lives in Sambava. Although I have recounted the stories of how the vanilla industry was booming, even after the cyclone, Kendall did not see expected success. Every single one of the one hundred vanilla clippings he and his grandfather had carefully planted and tended to, with much investment of labour, was destroyed in the storm, leaving the family with no source of income. The choice to grow vanilla had left Kendall in a position of complete loss. He could either fully commit to growing vanilla again from nothing with nothing, or return to his studies. Due to the labour-intensive process of producing vanilla, many smallholders make up the workforce in the vanilla industry and collectively produce over 3000 tonnes annually (Depetris-Chauvin, Porto, and Mulangu 2017, 144; Zhu 2018, 257). Losing a vanilla harvest is the equivalent of losing a full year's income; many smallholder producers lack the resources necessary for recovering from such shocks (Abreu et al. 2017a). Keep in mind too that rearing a vanilla clipping to maturation takes up to four years before it will produce beans, assuming it survives.

Returning to school meant Kendall would have the resources to survive, and eventually the merit to pursue a career outside of agriculture. This one story does not cover the extent of the effects vanilla producers face annually from cyclones and other storms. Natural phenomena, as devastating and random as they can be, are only a single variable in considering the risk of this industry. Another factor that is key to highlight are fluctuations in the demand and price of vanilla in the global market – uncertainties that are less tangible and knowable to Malagasy growers. Kendall was certainly not the only one to lose many valuable vanilla plants during the cyclone. A great cut to the overall yield of vanilla was reflected both immediately in the country and the global market (Abreu et al. 2017c). Increased demand during a shortage in supply led to the highest prices for vanilla ever. Anyone still growing vanilla after the cyclone was earning great sums of money, and buyers were willing to pay the ever-growing price for the spice. This has happened before. Previously, in the early 2000s, the price of vanilla surpassed that of gold as a result of a major cyclone shortening the global supply; two decades later, although the price of gold has increased significantly, vanilla has once again risen to the value of a precious mineral, becoming more valuable by weight than silver in the global market, costing about $600(USD)/kg (Abreu et al. 2017a;

Fabricant 2004; Martinko 2017; Zhu 2018, 253). As a high value commodity, vanilla presents interesting insight into the lives of those producing it. In the next section, I will explore the dynamics of social relations through material objects; the varying ways in which working with a commodity such as vanilla connect people in a network of interactions.

"They become so crazy!"[6]

The wild and bizarre stories about vanilla farmers' vast riches and their many luxurious investments highlight the very real value of vanilla in Madagascar. Additionally, these stories reflect how broader economic forces and global markets for locally produced commodities can have meaningful impacts on communities in which vanilla is produced. High input commodities necessitate a labour force to produce them; as a labour-intensive crop, the cultivation and production of vanilla creates social and political contexts under which it becomes meaningful (Walsh 2020, 76). A complex division of labour connects people doing the earlier described "work of vanilla" to each other and to local and global markets; as well as to political forces both locally and nationally. To give a sense of the meaningful ways in which vanilla shapes the everyday lives of those producing it, I will explore the phenomenon of "hot money" as well how increasing prices that present certain advantages to vanilla growers also come with further threats and risks.

Where high value commodities like vanilla, sapphires, etc. are cultivated and produced, a phenomenon of conspicuous consumption referred to in Malagasy as *vola mafana* or "hot money" has frequently been described (Lawson 2018; Walsh 2003; Zhu 2018). In these economies associated with booms and busts, periods of boom are associated with a great amount of market participation as labourers earn, and then often quickly spend, great sums of money suddenly and erratically. Zhu (2018) describes the spending often associated with hot money as "[...] a creative cultural inflection of global market dynamics that provides a modest degree of pushback [i.e., by labourers]" (257); through momentary events of conspicuous consumption, these individuals express themselves through material relations as a nearly euphoric experience of wealth. Walsh (2003) expresses how these engagements between people and markets "[...] is the means to the momentary realization of

[6] Title is a quote from Daniel, interviewed by author, Ramena, 2017

fantasy" (299), to which Zhu (2018) continues, "[...] profligate spenders attain momentary autonomy, a cathartic release from the uncertainty of the new global economy" (256). Hot money is not therefore an effect of the ever demanding and changing forces of global markets, rather, hot money is a reaction to market-based anxieties; it is an active expression of self in which spenders may temporarily alter their status in their communities. Producing vanilla engages people in these passing and swift exchanges of capital and shapes communities. Vanilla offers Malagasy people unparalleled opportunities to speculate in and benefit from booming global markets, albeit in ways that, as stories of hot money suggest, are always temporary and impossible to sustain.

The high market price of vanilla, while beneficial to those who produce it, also creates more risks for growers. As mentioned previously, the price of vanilla exceeds that of silver; acquiring vanilla therefore means being in possession of great capital. The increase in global vanilla prices correlates with increased theft of vanilla from farmers in Madagascar; numerous farmers have been killed trying to protect their crops from thieves (Abreu et al. 2017a; Abreu et al. 2017c; Kacungira 2018; Neimark et al. 2019; Rabary and Holland 2019). While theft is not new to Madagascar's vanilla trade, measures imposed to protect farmers are not always enough. To ensure that only the farmer who grew their vanilla is the one selling it as well, a system of "bean branding" was initiated. Farmers put their initials on their beans as a means of identifying them as their property (Conway et al. 2003). In attempts at preventing theft, vanilla farmers have also been pressured to harvest their crops earlier than is ideal for a good quality bean. However, whole plants are frequently and easily stolen as the vanilla plant is a lightweight vine, requiring victimized farmers to establish their crops all over again (Neimark 2019, 9). Earlier harvests have made for smaller yields; additionally, as unripe beans are cured, they do not reach the quality standards which Malagasy vanilla is famous for.

The state is largely absent in protecting smallholders from theft; in fact, many farmers believe the state is to be blamed, at least to some extent, for the thefts they fear. Without a safety net in place, farmers in Sambava have organized themselves to guard their crops; theft has been met with "street justice" and farmers took to their own measures to protect their property (Neimark et al. 2019). Neimark et al. (2019) studied this growing phenomenon alongside the vanilla boom, "[...] placing street justice as enacted by smallholders into moral

economic framings that foreground the intersections of liberalized markets and state vulnerability" (5). In these vigilante acts recounted in international news, farmers enacted a form of autonomy:

> Farmers look towards street justice primarily as a means of protecting their crops, but also as a form of 'symbolic resistance' against the gendarmes who smallholders suspect of deputizing thieves to steal from farmers on behalf of state officials. These acts of vigilante justice by smallholders effectively challenge the state's legitimacy over the use of force (Neimark et al. 2019, 2)

Street justice was an important means by which smallholders could act autonomously in controlling their own security, while also making an important claim against the state. However, coinciding with the vanilla boom, violent clashes reached an all-time high; 100 vanilla-related deaths occurred in 2017 alone (Neimark et al. 2019, 2). Once the news of violence against smallholders reached the international press, the government was forced to respond under the pressure of losing consumers, investors, and ultimately authority. Being a high value commodity gives precedence to vanilla's welfare because of the high stakes role it plays in the nation's economy.

Despite the risks involved, many vanilla producers rely on their income from vanilla to make ends meet; they are able to invest in land, as well as build homes. In an interview by Abreu et al. (2017c), one farmer declared, "Without vanilla we would not be able to survive". While currently being a high value commodity makes vanilla significantly different from other crops produced in Madagascar, it is its uncertain value which connects it to other crops in important ways. Many vanilla producers are also rice growers; however, rice is typically grown for subsistence and not as an additional marketable crop (Osterhoudt 2009, 13; Osterhoudt 2016, 267; Steavenson 2019). Because of the volatile nature of the vanilla economy, farmers engage in subsistence agriculture as a method of countering the uncertainty they frequently face in trying to grow, tend, and protect a high-value commodity. In discussing the role of hot money and conspicuous consumption in boom economies, it is important that people's behaviours are 'conspicuous', however it is equally important not to miss what is less 'extraordinary' or unexpected about these behaviours. Things like building a home, buying land, buying and/or planting rice, and other similar practical as well as essential life investments that do reflect traditional modes of thought end up painted lavishly

in stories.[7] Regardless of the large newly built homes and people carrying briefcases of money, it is important not to forget what stories about a commodity boom, like vanilla, misses. Like Kendall, or the street justice to manage against theft, stories comparing vanilla to gold miss the very real potential for loss faced by smallholders. Vanilla cultivation is an investment in and of itself; its value is set by the global market, and it is valuable and has potential to grow in value. As Kendall will tell you, however, it is also extremely risky – whatever its real or potential value, it can also be a source of suffering.

Conclusion

Originally, in its native habitat, vanilla's life cycle was realized without the help of humans. Outside of this location however, the plant will never bear fruit without an aiding human hand. That vanilla plants bear fruit in places like Madagascar is due to human intervention; humans found a way to hand-pollinate the plant to harvest its fruit, then transformed it into a delicacy consumed and valued around the world. Ecott (2009) explored some of the old vanilla plantations of Reunion; sites that no longer sold vanilla nor propagated it and were overgrown with unproductive vanilla vines. When I visited Babaomby, the northern tip of Madagascar, we hiked through trails while visiting the Babaomby Nature Conservation "BNC" project, learning about the various unique flora and fauna of the area. At one point, we stopped at a tree to look at a vine growing on it. I was completely surprised to hear it was vanilla. While it did not appear that anyone was tending to it anymore, it was curious to see the plant growing in such a remote location.

For over a century, Madagascar has been the world's greatest producer of vanilla. As the Malagasy are famed for their iconic and high-quality vanilla, the commodity plays an important role in the nation's economy as well as in the lives of those producing it. Vanilla was introduced to Madagascar in the mid-nineteenth century and quickly assumed the role as a key means of connecting Malagasy people to global markets. While Madagascar was a French colony from 1894 until independence in 1960, the economy was completely controlled by the French. The strict policies for growing and selling vanilla left farmers vulnerable and often without income. Post-independence changes to Madagascar's economy

[7] Andrew Walsh, conversation with author, February 11, 2020

and agricultural sector ensured greater incomes for vanilla producers, as well as increased stability in maintaining high market prices. Although positive changes have continued to promote stable market prices and high incomes; a mixture of droughts, cyclones, and political instability has left vanilla producers in a fairly precarious position in which profits are unimaginably grand, but the potential for loss is even greater and riskier than ever.
While completing my field work with various farmers and labourers, I witnessed just a fraction of how labour intensive it is to produce vanilla. Analogies to other difficult processes are common amongst those most familiar with it. In an interview conducted by Abrea et al. 2017b, a farmer stated "Growing vanilla takes a lot of effort. It's like caring for an infant." The engagements, or input, required from producers to create a high value commodity tie people to this plant intimately, as well as connect them to others in the trade; and to larger social, political, and economic networks at meaningful and important intersections. Booms in the economy and events of conspicuous consumption provide smallholders with temporary agency. Reverberations in the global vanilla market connect to smallholders in unique and impactful ways. High prices correlate with higher incidences of violent theft; major weather events continue to strain the everyday lives of vanilla producers. The market remains unstable, and as a means of creating a safety net, many vanilla farmers rely on subsistence agriculture to supplement their households and make ends meet. Additionally, the local conditions and insecurity facing vanilla farmers have led to a lower quality product entering the market, ultimately jeopardizing Madagascar's position amongst competing vanilla exporting nations.

Vanilla represents a valuable and important export for Madagascar. In its production, farmers, curers, and others involved are connected to vanilla in meaningful ways; in their direct engagements with it, they give it value. Producers shape vanilla but are in turn shaped by it, as they face market pressures and threats of market volatility and theft. Through the stories about the trade, and various ethnographic accounts of vanilla producers, I have highlighted the influence and importance of vanilla. Moreover, in detailing how the local and global are intricately linked, I hope to have illustrated how vanilla's value is manifested not only in the commodity itself, but in the many relationships forged through its production.

Chapter 5: Conclusion

In this thesis, I have explored how people's engagements with plants enter them in a mix of consequential relationships. To conclude the thesis, I will review the cases described in previous chapters and discuss some of the dilemmas I encountered throughout my research. I end this chapter with a reflection on the value gained from the insights highlighted throughout my research.

Rice

Rice is arguably the most important crop in Madagascar, relied on by many Malagasy households as both the most consumed food and most common economic activity (i.e., cultivating rice). Rice has a long history as a significant food source for the Malagasy; the nation has literally and figuratively been shaped by the crop. Today, Madagascar is one of the world's top consumers of rice per capita, and its growing population is increasingly straining access to the crop. The nation produces four million tonnes of rice annually and is beginning to rely on cheap, imported rice to fill the high demand. Malagasy rice producers struggle to compete with the prices of imported rice and ultimately end up relying on just that to meet their own needs. The proverb "rice is life" represents the situation best -- rice is deeply incorporated into the everyday life of Malagasy people.

Cultivating rice is commonly done in groups of family and extended kin. In the absence of common ancestral land or kin, however, smallholders create important reciprocal relations necessary to rice production in order to fulfill many of the roles traditionally filled by kin – a possibility seen in the mining community of Maventybao. While such relations may be temporary, they are important signifiers of the demands required for cultivating rice and of how, in some cases, the ultimate necessity of labour for harvesting the crop can encourage certain patterns of Malagasy sociality. Although it may be argued that these relations form out of necessity, these networks of fictive kin extend far beyond the rice fields. More than just physical labour is taken on by fictive kin; very real and emotionally invested relationships of mutual obligation are formed and maintained even as many inhabitants live less permanently in Maventybao. Even though I use the term 'fictive kin', the families formed in this sporadic way are very real in their commitments to one another.

In other contexts, like Sadjoavato, however, harvesting rice on large tracts of land can involve hiring temporary workers. And in this second context I discussed, a proposed new rice cultivation method was met with much scepticism. The Peace Corps initiative promoted a promising new technique with a long history of success in Madagascar and elsewhere in the world, but local farmers did not see its value. In discussing this case, I highlighted the importance of considering the difference in risk assessment undertaken by local producers and foreigners who visit and introduce promising new changes. Outsiders commonly have the resources necessary to experiment with and mediate the risks associated with failure. They can even try again in some cases. However, if a local farmer were to lose their crop from experimenting, the results would be detrimental, and could be catastrophic.

Yams

The wild yams discussed in Chapter 3 are endemic to Madagascar and represent an important food source relied on by the Malagasy since their arrival on the island. Foraging is no longer a primary subsistence strategy and the introduction of domestic tubers has provided more practical crops which are easier to cultivate than their wild counterparts. However, the wild varieties are still relied on by vulnerable populations who have few other options. Madagascar's limited and dwindling forested areas are gradually being transitioned into protected areas, limiting the extent that local communities are able to continue exploiting the resources from within— if at all. The majority of Malagasy people are affected by poverty, and many are experiencing malnutrition. Additionally, unemployment rates have increased, and local economies are becoming unreliable forcing more people to resort to foraging, sometimes unlawfully in protected areas.

Oronjia is a unique case in conservation in which the methods which would empower and benefit the community are precisely what they are resistant to as it goes directly against their understanding of and relations with *angona*— the wild yam. To clarify, conservation projects producing local boundaries is not a unique scenario; what is distinctive about Oronjia is the fact that solutions meant to empower locals ignored their fundamental engagements with traditional spaces (i.e., the New Protected Area). This paradox expresses the importance of not only understanding community needs in conservation, but understanding a community's current relationship with its surrounding landscapes and the

resources found therein. Additionally, locals can be placed in conflicting positions through conservation projects. Conservation authorities must enforce the goals and laws of conservation, but must also understand the reliance of local people on traditional activities which sometimes counter conservation and utilise the resources of protected areas. Exploring these cases not only highlights the importance foraging and forests have for vulnerable populations, but the sometimes ambiguous ways in which conservation is realised. Foreigners who have no immediate use for the yam can seem to value it even more than locals who exploit it for subsistence. Local people, meanwhile, have been pushed to change how they relate to and value these yams, challenging their own taboos as a result.

Vanilla

Madagascar is the world's greatest producer of vanilla in both quantity and quality. Vanilla plantations were established in pre-colonial times and intensified during the colonial era, setting the stage for an industry that, today, continues to be characterized by booms and devastating busts. Vanilla is one of the most labour-intensive crops to produce and the modern economy is predominantly occupied by many smallholders who collectively produce 80% of the world's vanilla. This high-input, low-output crop is often worth the hassle because it is a high value commodity in the international market. However, the vanilla trade is also marked by a high degree of risk; most of which is faced by the smallholders producing this commodity. Farmers can lose whole crops to destructive cyclones and droughts and face the additional threats of theft as gangs violently steal and even kill to get vanilla. For those involved in the vanilla trade, their relationship with the plant enters them into a network of relations with many other people, locally and globally. The importance of this high-value export commodity in people's lives reflects how global demands can influence local livelihoods, social values, and everyday life. Stories of conspicuous consumption and theft attract global attention and highlight the ways this plant connects smallholders to foreigners in consequential ways. International demand for vanilla also allows smallholders to benefit from investing in vanilla as a crop. People are able to invest in property and build homes through their successes with vanilla. However, it is not only global demand that makes vanilla so valuable. Whenever there is a decrease in the global supply of vanilla— just like many other high value commodities, like gold for example— the market price increases.

Cyclones, droughts, theft, and other factors impact the amount and quality of vanilla reaching consumers in ways that also impact the Malagasy people who are left out of stories of boom – people like Kendall, whose family lost years of work and investment in the 2017 cyclone that preceded the most recent boom.

Theoretical Analysis of Findings

In the introduction I outlined the theoretical framework which would guide my work, introducing and explaining the matrix of concepts and perspectives which informed my research questions and, so, have informed the findings presented here. In this final analysis of my findings, I explore the ways in which each plant I focused on is similar to or different from one another. The aim of these concluding reflections is to reiterate the importance of understanding each plant within their own unique contexts, and to emphasize how the stories, concepts, and understandings I have related in describing each of them are part of broader narratives. People's engagements with these plants link them to other people in meaningful ways. Understanding people's engagements with these plants requires considering how their meanings are constructed and their value is reckoned through unexpected intersections of people, places, and things.

Important Differences

The clearest difference between each plant I researched is their economic values. Vanilla is a high-value cash crop, rice is a staple crop and common source of subsistence and income for many households, and yams and other tubers are cheap if not free – available at low cost in local markets and accessed by people in personal gardens and forests. Unlike yams or rice, vanilla is not an essential part of any diet; and external factors, such as the global market, have drastic impacts on its exchange value. This does not lessen the amount of investment involved in growing it, however.

Rice is heavily relied on by most of the nation. Its price is particularly important in everyday life and unanticipated fluctuations can be calamitous. Prices for rice vary seasonally, but poor yields can drive up prices, and increased imports of cheaper rice negatively affects locals from participating in markets. Yams have traditionally been a resource that many rural communities can rely on during times of need. They can be foraged

as well as purchased cheaply in local markets, but decreased access to the areas where they can be exploited has increased uncertainty for those living near cleared forests and protected areas.

Another important difference between the plants I researched are the methods in which they are cultivated and produced. The varied labour demands of each plant shape people's engagements with them and provide important insight into their value. Vanilla is the most labour-intensive of all three plants but is also the most economically valuable. Producers must invest years into establishing their own plants before they can even enter the market. Mature plants must be tended to regularly to ensure maintained quality of the crop, requiring producers to invest a great deal of time throughout the annual agricultural seasons. Additionally, the curing process takes several months of regular, tedious labour to obtain the high-quality end product Madagascar is famous for. One of the greatest limiting factors for growing vanilla is the ability to commit so much time to one crop, potentially limiting one's ability to produce other important crops for subsistence and/or income. The commitment one makes to vanilla has been compared to rearing a child due to how constantly involved producers must be with vanilla.

Rice is also a labour-intensive crop; the difference between it and vanilla, however, is who becomes involved in its cultivation, as well as other limiting factors. Often, rice is cultivated by family members and extended kin. They work together and partake in shareholding so everyone benefits from their own participation and maintains rights to their ancestral lands. This also means that rice cultivation is an activity with profound social and cultural implications in many communities in Madagascar; people often make major life decisions (i.e., marriage, relocation, etc.) with rice (and access to the land on which they might grow it) in mind. As I discussed in reference to my research, even without family ties, rice cultivation enables people to engage in important social relations to meet their economic and subsistence needs (i.e., sharecropping). One limitation to growing rice is availability of labour. However, other limiting factors are access to land and water which become increasingly scarce under increased demand. Additionally, traditional cultivation methods such as *tavy* (swidden agriculture) are being restricted and prohibited in and around protected areas.

Tubers have an important role in Malagasy life and are an important resource, especially for the most vulnerable populations. They are relatively easy to produce and reproduce, making them vital during challenging times such as flood and drought. Although many farmers do incorporate domestic tuber varieties into their own gardens, increasing pressures faced by rural communities require them to turn to foraging wild varieties to make ends meet. The complicated relationship between conservation and foraging was explored in my research, emphasizing the important role forests still have for locals who depend on these spaces for basic resources. As more forested areas become cleared or protected and communities become alienated from needed resources, people are being forced to modify and challenge their existing relations with the places and the plants that are so common to their lives. The limiting factors of cultivating the wild yams I researched are the physical and symbolic boundaries prohibiting people from entering the areas where the yams are.

Significant Similarities

Although maybe not obvious, vanilla, rice, and yams do share some commonalities. Each plant, within its own context, represents a valuable resource which permits many people to meet their basic economic and subsistence needs. Engagements with these plants enter people into networks of relations with many others. These engagements give insight into the variety of factors and forces that shape everyday life for Malagasy people. They also show how the Malagasy are connected to local and global markets, dynamic and changing social relations, as well as the array of obstacles that must be navigated on a regular basis— often out of necessity. In citing Geertz's work on the Moroccan bazaar, Walsh (2004) refers to the "fractionization of exchange" in the northern Malagasy sapphire trade through which "exchange is mediated across a thousand webs of informal personal contract" (229, citing Geertz 1979:220). Farmers, market vendors, park rangers, researchers, consumers, and many others described in this thesis might be understood as relating to one another through exchanges of this sort as well, in ways that can also shape the dynamics around how people engage with certain plants. Often ambiguous relations among people (between conservation guards and foragers, for example, or between Peace Corps volunteers and the farmers they are trying to help) only complicate the existing complexities of relations among humans and plants.

Another important similarity involving the plants I researched is the shared knowledge demonstrated by an unexpected uniformity in interview responses. Asking farmers about how to cultivate these different crops led to repetitive narratives in which participants relayed techniques in nearly the same way. Cultivation seemed to be approached very systematically, or at least its presentation to me was. I was presented with the timeline and growing seasons of each crop, the physical characteristics of crops were described as farmers explained how they know when an appropriate harvest time is, even step-by-step directions were repeated by the many different people I interviewed and surveyed. These results suggest a high degree of shared ecological knowledge (i.e., cultivation methods, botanical understanding, etc.) by those cultivating the plants I researched. Different farmers connected to the same crops in the same ways via their cultivation strategies and understanding of the plants' biologies. When I met with the head of FoFiFa in Anivorano, he showed me books on how to grow vanilla. He had many other manuals I did not get the chance to explore, but this meeting gave me insight on how farmers are supported by the state. Textbook-style guides on how to cultivate one's crops and troubleshoot challenges provided farmers with the basic knowledge for growing various crops. Such State-sponsored instructions (largely intended for export crops) are of course very different from the instructions that Malagasy people who grow up working with families in rice-fields learn throughout their lives.

One more important similarity shared among vanilla, rice, and yams is that each connects smallholders to the rest of the world in consequential ways. In my fieldwork and research, each case I considered reflected aspects of the place of Madagascar and Malagasy people in relation to foreigners. Vanilla's entire presence in Madagascar is connected to its demand by the rest of the world. The thriving world demand for vanilla permits the economy to continue to grow, continually influencing Malagasy participation within the trade. The value of this crop internationally greatly influences communities growing it as booms are celebrated and busts are devastating, adding to the already numerous threats faced by smallholders (i.e., cyclones and theft).

Historically, rice connected Madagascar to the rest of the world. Today, however, rice is largely reserved for national consumption and is vitally connected to Malagasy culture. I explored a Peace Corps project implementing a new rice cultivation method. Under

increasing pressure to conserve more resources and feed a growing population, SRI (System for Rice Intensification) seems like a promising solution to a growing problem. As smallholders cannot negate the potential impact of crop failure, experimentation with new methods overlooks the reality faced by many smallholders. Although SRI seems like the solution, it is important to understand the material and labour demands required to fully implement this system. Growing strains on time, labour, money, and land make farmers less likely to try new techniques, especially without any clear problems associated with traditional methods by those using them.

The wild yams I researched connected Madagascar to the world in a complex way, presenting distinctive consequences. The increase of protected spaces in Madagascar has come with an increase of protected species; these species are given special attention as they are declared threatened and at risk by global conservation authorities. In Oronjia, an international conservation organization protecting endangered yams meant that a community could no longer exploit them. But it has also offered opportunities for growing community investment in conservation initiatives. However, my findings suggest that in order for these new projects and relationships to be truly beneficial, they must be premised on good understandings of how and why locals currently engage with endangered but resource-rich spaces.

Insights

The differences between these plants are important in understanding the unique conditions under which people engage with them. Within the narratives I explore, there is a clear importance for understanding the ways difference saturates people's engagements with these plants. All three plants give insight into people’s lives, but within particular contexts. The ways people engaged with the plants on which I focused in my research suggested important details about their identities: conservationists conserved yams, locals harvested yams; smallholders grow vanilla, foreigners consume it; and people engage with many others through the production and consumption of rice, linking it intimately with one’s identity. The incorporation of difference is also vital in understanding the intricate mix of relationships each plant is involved in.

The similarities among these plants and the social networks around them underscore the different ways people become connected through their engagements with these plants. Each plant connects people to the rest of the world in consequential ways. These plants influence many aspects of social lives within Madagascar and provide insight into the interesting ways people construct value around plants. Understanding vanilla, rice, and yams together gives a broader picture of people's engagements with plants than any one of them would alone. Considering all the differing perspectives and unique connections associated with each plant illustrates the value of including not just a diversity of cases but a diversity of narratives in my research. In considering multiple perspectives and drawing from various bodies of knowledge I have explored the dynamics of these plants and the people who value them. Without diminishing the importance of each plant, in approaching each one differently and so highlighting the significant differences among them, I hope to have produced a broad and holistic, though by no means comprehensive, account of Malagasy people's relations with plants – an account in which each plant might be understood alone or together in meaningful ways.

Final Thoughts: So What?

Throughout this thesis, I have explored how people's engagements with plants enter them in a mix of relationships. The goal has been to consider people's varying perceptions of and interactions with vanilla, rice, and yams so as to communicate the importance of these plants, and of the relationships that develop around them, in their lives. As I conclude my research, I must address one more question which is important in any type of research. I must answer the question, "so what?" What is the point of any of this and why does it matter? The importance of my research is that it presents several social dilemmas. This thesis offers examples of a number of dilemmas that, considered together, draw attention to the distinctive uncertainties facing many Malagasy people today.

The first dilemma is the price of vanilla. Normally, it would be assumed that farmers making high earnings on their crops is a sign of success. For those producing vanilla, the high-value commodity reflects a volatile reality for smallholders. Cyclones, theft, and extreme weather destroy crops and establish a highly unequal economy in which some succeed directly due to the fact that some lose. The global price of vanilla has gained relative

stability, but this price fails to capture the continued uncertainty that those producing the commodity are confronted with. Limited support prevents many from entering the vanilla trade, and those who do enter only to fail risk losing everything. The case of vanilla highlights the dilemmas facing people involved, or thinking of getting involved, in the production of a highly valued global commodity.

The rice dilemma suggests that those growing this crop are firmly attached to traditional modes of cultivation and resistant to change. I urge for this to be understood as a case of experts questioning a new trend (and not a case of traditionalists fearing the new), as this better illustrates the point. Rice cultivation is an important component of life in Madagascar; the way people grow rice now reflects generations of knowledge and years of experience. The case of rice highlights the dilemmas facing people involved in producing the stuff of Malagasy "life", the nation's staple crop. Within the varying situations I explored, some contexts required people to establish new social relationships (based on traditional ideals of sociality) to enable the exchange of agricultural labour for the rice it produces. Other contexts revealed how new agricultural methods are viewed with suspicion; foreigners are able to invest in experimentation more easily than smallholders. Without guaranteed long-term support, changing rice cultivation methods presents a great deal of risk to farmers. One could say when it comes to rice, the Malagasy do not play around.

Yam conservation presented a rather complex dilemma, calling for a better understanding of the unique circumstances in which *angona* are valued. MBG's project of domesticating *angona* and providing locals with a resource they can depend on in addition to aiding conservation seemed like a well-developed initiative. A disregard for people's engagements with *angona* complicates this entire project, however, as a local taboo discourages locals from growing wild plants, like *angona*. The case is even more elaborate as a local farmer who has partnered with the project experimented with growing the wild yams within the forest. Concerns over cultural customs, conservation, and survival come together in a sporadic way but indicate the importance of community-focused initiatives, as well as the resilience of locals navigating numerous barriers. The case of yams highlights the dilemmas faced by people living in poverty on an island that is globally renowned for its rare and endangered natural "treasures".

People's engagements with certain plants provide insights into many facets of their lives. More importantly, as people enter into invested relations with plants, or crops (i.e., economic, subsistence, etc.), they also enter into a network of relations with others. The aim of this thesis has been to explore and question these relations as a means of getting a stronger understanding of their significance. Malagasy people's relationships with vanilla, rice, and yams illustrate how plants can become differentially valued in interesting and complicated ways while also channelling people into distinct networks of connections with one another – networks that, as noted in the previous paragraphs, are characterized by dilemmas from which there is no easy way out. Any efforts at addressing these, or other, dilemmas facing Malagasy people ought to proceed with a foundational understanding of the complexity of the lives, plants, and relationships involved.

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Appendices

Appendix I

Western Research

Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Andrew Walsh
Department & Institution: Social Science\Anthropology,Western University

NMREB File Number: 109117
Study Title: Madagascar's vanilla trade: An ethnobotanical study

NMREB Initial Approval Date: April 12, 2017
NMREB Expiry Date: April 12, 2018

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Instruments	Interview questions (traders). Received March 7, 2017.	
Other	Photographic release.	2017/02/20
Other	Interview questions (growers). Received March 7, 2017.	
Other	Confidentiality agreement.	2017/02/20
Other	Participant log. Received March 7, 2017.	
Other	Participant observation. Received March 7, 2017.	
Western University Protocol	Received April 6, 2017.	
Letter of Information & Consent	For Participant Observation and Interview.	2017/04/02

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 0000094[redacted]

_____
Ethics C[redacted]nson, NMREB Chair or delegated board member

EO: Eri[redacted]atelyn Harris___ Nicola Morphet ___ Karen Gopaul ___

Appendix II

Number:
Surveyor: Date: Location:
Participant: Age: Place of origin:

1.) When did you come to (location)? Why?

2.) Do you grow any plants? If yes, which types and for what uses?

3.) Do you use any wild plants? If yes, which types and for what uses?

4.) When are the plants ready to be harvested? How can you tell?

5.) Can you describe how the harvests of the past 5 years have been? (i.e., good or bad years, or more or less, etc.)

6.) How do both good and bad harvests impact your other agricultural choices? (i.e., reliance on alternative crops/wild crops, etc.)

7.) What methods do you use to harvest your agricultural and/or wild plants? (i.e., digging, cutting, picking, etc.)

8.) Are there any fady for growing, harvesting, or otherwise that are connected to agriculture?

Curriculum Vitae

Tyler J. MacIntosh

Education

2016 – 2020, Western University, MA Candidate, Anthropology, Socio-Cultural, Environment and Sustainability
2013 – 2016, Western University, HBA in Sociology, Minor in Environment and Culture with Distinction
2011 – 2013, Fanshawe College, Diploma in Social Service Work
2008 – 2011, Lord Dorchester Secondary School, Diploma

Language

English — Fluent in speaking, writing, and comprehension
French — Intermediate in speaking, writing, and comprehension

Awards and Honours

Western University, Dean's Honor List, 2016
Western University, Global and Intercultural Engagement Honor, 2015
Fanshawe College, Dean's Honor Roll, 2011, 2013
Lord Dorchester S.S., Communication Technology, 2009

Certificates

Western University, Comprehensive WHMIS Training, 2019
Western University, Completion of the Teaching Assistant Training Program, 2016
Western University, Employer Health and Safety Orientation, 2016
Western University, Safe Campus Community, 2016
Western University, Accessibility at Western, 2016
Western University, Mental Health Interactive Learning Module, 2016
Centre Linguistique du Collège de Jonquière, French as a Second Language, Elementary 2 and 3, 2016

Work Experience

Oxford Learning, *London Head Office Curriculum Department*, Assessment Clerk
January 2020 – Present
Responsibilities including reviewing incoming students' assessments, scoring teachers' training material, creating original student curriculum content, and fulfilling curriculum orders for over 100 Oxford and Gradepower centres across Canada and USA.

Western University, Graduate Student Teaching Assistant
September 2016 – December 2019
• Fall 2019- Anthropology 1021: *Introduction to Sociocultural and Linguistic Anthropology*
• Winter 2016/2018- Anthropology 1025: *Introduction to Sociocultural Anthropology*
• Fall 2017- Anthropology 2223: *Doing Fieldwork in Anthropology*
• Summer 2017- Anthropology 3322: *Madagascar Field Course*

- Winter 2017- Anthropology 2261: *Adventures of Pop Culture in Archaeology*
- Fall 2016- Anthropology 2262: *The Production and Consumption of Global Commodities*

Responsibilities including facilitating tutorials, holding office hours to support students' needs, marking as well as editing assignments, research papers, and examinations; proctoring exams, acting as a liaison between professor, student, and department; and providing students with resources related to academic achievement, mental health services, and professional development opportunities.

Jack and Jones, CF Masonville Place, Store Manager
October 2018 – June 2019
Responsibilities including visual merchandising of entire store, shipping and receiving store products and business supplies, POS operation, scheduling and strategy planning, sales and customer service, recruitment and training, marketing and social media management, opening and closing operations, product knowledge and styling, as well as employee performance evaluations.

PSAC Local 610, Departmental Union Steward
September 2016- August 2017
Responsibilities including providing union members within the Anthropology department of Western University with the most up-to-date information of the union via email, social media, and organized events; attending meetings to voice departmental concerns on current issues and changes within the department and/or union, voting on decisions, amendments, and changes of the Local 610; as well as acting as a liaison between department members and the union.

Dorchester Shoppers Drug Mart, Supervisor, Pharmacy Technician, Delivery Driver, Merchandiser, Photo Lab Technician, Cashier
October 2009 – August 2016
Responsibilities including leadership and team organization, assignment of shift duties, customer service, cashier supervision, preparation of prescriptions, delivering prescriptions; taking, editing, and printing photos, store setup, organization and cleaning, opening and closing duties, assembly and submission of daily deposits, loss prevention, and inventory.

Volunteer Experience

Aug 2017 – May 2018 — *Western Anthropology Graduate Society (WAGS)*, VP Communications
Responsible for disseminating relevant information to the General Membership and notifying the Executive members of meeting times and agendas, taking as well as sharing the minutes, served as the Elections Officer in soliciting, collecting, and counting ballots for the election of the incoming Executive; and responsible for organizing and advertising social events.

Mar 16th, 2017/Mar 16th, 2018 — *EnviroCon*, Event organizer
My duties involved contacting community and academic presenters, designing as well as distributing advertisement material to promote the event throughout the campus and community, organizing interactive workshops for event participants, event catering planning, and photography of presenters.

Mar 16th, 2018— *Centre for Environment & Sustainability*, Panel on Local Sustainable Food; Event organizer
My duties involved recruiting panelists to participate, selecting readings for attendees to familiarize themselves with background information on the event's topic, and developing questions to facilitate conversations.

Aug 2016 - Aug 2017 — *Western Anthropology Graduate Society (WAGS)*, Social Committee
My duties include planning and organizing social events for Anthropology graduate students and communicating with other WAGS members to coordinate efforts and allocate resources.

Jan 27th, 2017— *Centre for Environment & Sustainability*, Panel on Indigenous approaches to Environment and Sustainability; Event organizer
My duties involved recruiting panelists to participate, selecting readings for attendees to familiarize themselves with background information on the event's topic, and developing questions to facilitate conversations.

Nov 17th, 2016 — *Western University*, Gifted Itinerant Program: Anthropology Day; Event organizer
My duties included organizing a day for gifted high school students from the Thames Valley DIstrict School Board, creating and facilitating an educational game, teaching anthropological methods, and debunking myths associated with anthropology.

2015/5 - 2015/6 — *Mada-Clinics*, Volunteer
Fulfilling various roles and tasks that contributed to daily operation of the clinic and school which are run by Mada-Clinics. Some of these included carrying supplies to other villages for satellite clinics, teaching English classes, and studying the impact of the organization through interviews, surveys and clinic records.

2012/2 - 2013/8 — *The Salvation Army Correctional and Justice Services*, Courthouse Worker
Provided practical assistance to the accused and their families, witnesses, courts and those working in the courts. Communication link via cell visits, arranging bail and transportation, looking after personal affairs, and making referrals to accommodation or treatment centres. The facilitation of courses which were aimed at personal growth, professional development, and anti-recidivism held at The Salvation Army Center of Hope. Data collection/analysis on crime and crime demographics in London which was then used to create a proposal and outline of a new program.

Workshops and Educational Seminars
Jan 28th, 2017—Western University, Winter Conference on Teaching
- Leadership in Higher Education: What does it take?
- Teaching Writing as Ongoing Practise
- Great Ideas for Teaching (GIFT) Award Winners Presentation

Aug 30th, 2016— Western University, Fall Perspectives on Teaching
- Indigenous Pedagogies: Incorporating Indigenous Methodologies and Ways of Knowing into the Curriculum
- Bridging Classroom and Community: An Engaged Pedagogy

• Higher Education - The State of Play: Reflections from Western 3M Teaching Fellows

Sept 7th, 2016 — Western University, TA Day: Graduate Student Conference on Teaching
• Seven-and-a-half-hour conference • Session on "Helping Your Students Write Better"
• Session on "Facilitating Discussions" • Session on "Dealing with Difficult Students"

Aug 26th – 28th, 2016 — Western University, TA Training Program
• Intensive two-and-a-half-day session
• Seminar on constructive feedback
• Seminar on discussion facilitation
• Seminar on active learning methods
• Two hands-on micro teaching sessions
• Seminar on supporting classroom diversity
• Creating a "safe space" for learning
• Group work facilitation

Conference Participation

2018/03 — *Western University*, Presenter, Western Anthropology 6th Annual Graduate Student Conference. "What is the "Wild": Positionality and the conceptualization of the wilderness in Northern Madagascar."

2017/03 — *Western University*, Presenter, Western Anthropology 5th Annual Graduate Student Conference. "The People of the Land: Ethnobotanical insights into the peasants' way."

2016/03 — *Western University*, Presenter, MOSAIC. "Madagascar National and Global Identities: How do Malagasy music videos depict the relationship between Madagascar and the rest of the world?"

2015/11 — *Western University*, Poster Presenter, Africa-Western Collaboration Day. "Community Development and Healthcare: Measuring the Impact of a Small-Scale Development Project."

2015/06 — *L'Alliance Française,* Antsiranana, Madagascar; Co-Presenter with Jessico Snyders Betombo and Mitsou Stephanie Raharivelo; Conférence et Exposition: Recherches sur les Collaborations Interculturelles. "Community Development and Healthcare: Measuring the impact of a small-scale development project."

Skills

• Confident public presenter
• Highly organized
• Strong leader and team member
• Grant writing proficiency
• Excellent writing and editing abilities
• Strong critical thought and problem solving
• Intercultural training and experience
• Field work experience in mixed methodology
• Creative and flexible