

PERFORMATIVITY OF THE TORTOISE PANOPTICON

An Interconnected System of Human-Tortoise Relations, Taboos, and Radiated Tortoise Conservation in South and Southwest Madagascar

Naomi Ploos van Amstel - 941110658020

Master thesis - April 2019



Forest and Nature Conservation - Policy (FNP)

Supervisor Wageningen:

Koen Arts

Supervisor Madagascar/US:

Christina Castellano

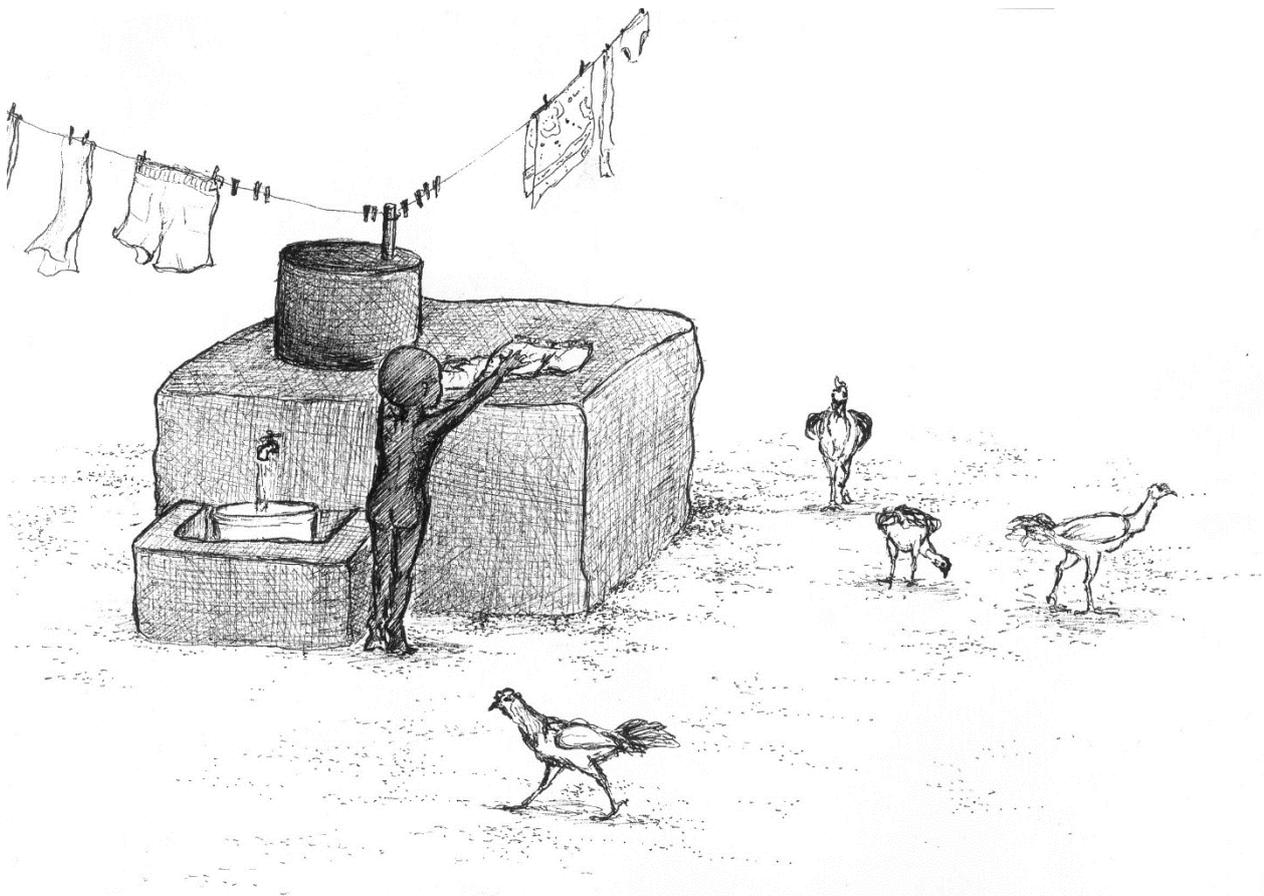


WAGENINGEN
UNIVERSITY & RESEARCH

Table of Contents

Tables.....	3
Figures	3
List of Acronyms.....	4
Executive summary	5
1. Introduction	6
2. Theoretical Framework	9
3. Methodology.....	12
3.1. Operationalization	12
3.2. Introduction to the case.....	13
3.3. Conducting interviews, selecting sites and sampling respondents.....	17
3.4. Method of analysis	22
4. Results	24
4.1. Description of the research sites and the conservation context	24
4.2. The tortoise in Antandroy and Mahafaly society	33
4.2.1. Ecological knowledge.....	33
4.2.2. Taboo-related knowledge.....	34
4.2.3. Other tortoise-related beliefs.....	39
4.2.4. Conclusion.....	41
4.3. The tortoise taboo: connection of knowledge and practice.....	42
4.3.1. Taboo content – Repercussions connected to the taboo.....	43
4.3.2. Influential factors from the local societal context	46
4.3.3. Conclusion.....	48
4.4. Madagascar societal context and the tortoise panopticon	50
4.4.1. Conservation practices.....	50
4.4.2. Appeal of poaching money.....	51
4.4.3. Political instability and corruption	52
4.4.4. Foreign aid presence	53
4.4.5. Missionaries and changing religion	54
4.4.6. Conclusion.....	56
4.5. Community beliefs supporting tortoise conservation	57
4.5.1. Step 1 (Step 2 of SEA): Problem scoping.....	57
4.5.2. Step 2 (Step 4 of SEA): Policy options.....	58
4.5.3. Step 3 (Step 5 of SEA): Key aims & indicators	58
4.5.4. Step 4 (Step 6 of SEA): Impact assessment of options.....	61
4.5.5. Conclusion.....	67
5. Recommendations for (TSA) radiated tortoise conservation	68
6. Discussion	72
7. Conclusion	79
Acknowledgements	81

References	82
Appendices	88
Appendix 1: Interview guide	88
Appendix 2: Coding categories in Excel, with the connected question(s) in the questionnaire (categories marked orange indicate those that result from analysis of the category they connect to, indicated with the same number)	90
Appendix 3: Schematic overview of the overarching aims, the connecting key aims and their indicators, and the policy objectives and their normalized ranges of impact per indicator	91
Appendix 4: Schematic overview of the exact percentages per indicator per site	93
Appendix 5: Ranking for multiple correspondence analysis	94
Appendix 6: Final rankings and corresponding weights – missing excluded	96
Appendix 7: Final rankings and corresponding weights – missing included	97
Appendix 8: Final scores per site	98
Appendix 9 (next page): Opportunities and threats per component of taboo adherence and protective sentiments, and related recommendations per research site	98



Front page design (and other drawings and pictures in this document): Naomi Ploos van Amstel, 2018-2019.

Tables

Table 1:	RHTs' categories and their function in nature conservation and management (adapted from Colding & Folke, 2001: 586), 4
Table 2:	The division in nine research sites, the districts and communes included, and the number of respondents per site, 19
Table 3:	Frequency of stories being told among the respondents, 32
Table 4:	Percentages of the mentioned beliefs per research site, 37
Table 5:	Schematic overview scoping the problem, 56
Table 6:	The symbols used to indicate the level of each indicator per site, 60
Table 7:	The levels of impact per indicator for each indicator per site, 61
Table 8:	Weighted scores per site and related final valuations , 62
Table 9:	Weighted scores per site and related final valuations, 63
Table 10:	General opportunities, threats, and related recommendations, 69

Figures

Figure 1:	A visualization of the hypothesis on the working of the tortoise panopticon, showing an assumed interaction between the societal context and the self-surveilling system of the tortoise panopticon, 5
Figure 2:	Map showing the South and Southwestern part of Madagascar, including the radiated tortoise's range as documented in 2000 and the area where the tortoise taboo is historically adopted by local tribes (Paquette & Lapointe 2007: 32), 11
Figure 3:	"Map showing focal areas (key communities in the Androy Region, Southern Madagascar" (Ball et al., 2012: 13), 17
Figure 4:	Locations of the Fokontany included in the research and indication of the division in nine sites for this research, 18
Figure 5:	Division in profession among the research population, 19
Figure 6:	Gender division and age distribution of the research population, 20
Figure 8:	Frequency of stories being told among the respondents, 32
Figure 9:	Antandroy and Mahafaly practices and knowledge placed within the model of the tortoise panopticon., 40
Figure 10:	Distribution of perceived human-tortoise conflicts per site, 46
Figure 11:	Influencing factors of the societal context and their connection with the self-surveilling system of the tortoise panopticon, 48
Figure 12:	The research sites and their final valuations for taboo adherence and protective sentiments, 64
Figure 13:	Final model of the tortoise panopticon, showing the bodies of surveilling power, the components of the self-surveilling system of the panopticon, and the shaping factors in the societal context, 70

List of Acronyms

CF: Conservation Fusion

COC: Community Outreach Center

EWCL: Emerging Wildlife Conservation Leaders

IUCN: International Union for Conservation of Nature

MBP: Madagascar Partnership

MCA: Multiple Criteria Analysis

NGO: Non-governmental Organization

RHT: Resource and Habitat Taboos

SEA: Strategic Environmental Assessment

TCC: Tortoise Conservation Center

TEK: Traditional Ecological Knowledge

TRC: Tortoise Rescue Center

TSA: Turtle Survival Alliance

UHZ: Utah Hogle Zoo

Executive summary

Species specific taboos are relevant to nature conservation, yet the relation of conservation with such social mechanisms and connected traditional ecological knowledge (TEK) is still underexposed in both conservation science and nature conservation practices (Berkes, Colding & Folke, 2000; Lingard et al., 2003; Shackeroff & Campbell, 2007; Berkes, 2008; Jones et al., 2008; Liu, 2017). The relevance of species-specific taboos to nature conservation is the topic of investigation in this thesis. The focus of this study is on radiated tortoise (*Astrochelys radiata*) conservation in South and Southwest Madagascar, which concerns a species which numbers are rapidly decreasing and which is listed as critically endangered by the IUCN (Leuteritz & Rioux Paquette 2008). The exact social effects of the tortoise taboo-inclusive practices do not receive much attention in current research. Individual compliance with taboos is partly enabled by the social and religious surveillance connected to them (Lingard et al., 2003). In this case, this research will hence speak of a 'tortoise panopticon', referring to the self-surveilling power of the tortoise taboo. However, whether the current tortoise taboo is a strong 'panoptic' system of self-surveillance, with the power to steer people's practices, remains the question. A wide variety of contextual factors influence and reshape the tortoise taboo and how it is performed. They determine the self-surveilling power of the tortoise panopticon, showing the adaptive interaction between knowledge and practice; its 'performativity'. More specifically, current taboo-inclusive tortoise conservation practices partly connect external reward systems to the tortoise taboo to incentivize adherence. In light of the radiated tortoise conservation practices, the introduced reward systems and other interventions may cause destabilization of the tortoise panopticon, and may even result in its collapse when the incentives disappear. For this reason, it seems crucial for tortoise conservation programs to obtain a thorough understanding of the current state of the tortoise taboo and its power systems – the 'tortoise panopticon' – and its interaction with the program's activities. The empirical objective is hence to define tortoise conservation potential and threats in the current state of the site-specific tortoise panopticon and the factors that shape it. Theoretically, the objective of this research is to obtain understanding of the dynamic relation between practice and meaning in panoptic species-specific taboo systems, connected to species conservation, by using the concept of performativity as a theoretical lens. These objectives lead to the following central research question: *How do human-tortoise relations and interactions, including tortoise conservation, relate to the performance of the 'tortoise panopticon' of the Antandroy and Mahafaly people of South and Southwest Madagascar?* For answering this question, over four months of data collection has been carried out in the focus region. The obtained data has been analyzed partly by following the steps of Strategic Environmental Assessment (SEA) to meet the empirical objective set for this research. Besides, a final theoretical model of the tortoise panopticon has will be presented to meet the theoretical objective.

1. Introduction

Species specific taboos are relevant to nature conservation, yet the relation of conservation with such social mechanisms and connected traditional ecological knowledge (TEK) is still underexposed in both conservation science and nature conservation practices (Berkes, Colding & Folke, 2000; Lingard et al., 2003; Shackeroff & Campbell, 2007; Berkes, 2008; Jones et al., 2008; Liu, 2017). Taboos can be defined as “a social prohibition of something that is regarded holy or unclean” (Lingard et al. 2003: 224) and in relation to nature they can be referred to as resource and habitat taboos (RHT) (Colding & Folke, 2001). Such RHTs can be divided in segment taboos, temporal taboos, method taboos, life history taboos, species-specific taboos, and habitat taboos as visible in Table 1 (Colding & Folke, 2001). These taboos, including the species-specific taboos, are usually internalized as informal, customary rules rather than official legislations of formal institutions (Lingard et al., 2003). Such existing informal institutions are able to improve communication and cultural understanding when included in conservation efforts (Colding & Folke, 2000; Tengö et al., 2007; Jones et al., 2008; Liu, 2017), and the stimulation and inclusion of species-specific taboos in conservation is even argued to be the only effective option in situations where external conservation implementation is limited or where enforcement of formal institutions fails (Jones et al. 2008; Colding & Folke, 2000). The relevance of species-specific taboos to nature conservation is the topic of investigation in this thesis.

Category	Function
Segment taboos	Regulate resource withdrawal
Temporal taboos	Regulate access to resources in time
Method taboos	Regulate methods of resource withdrawal
Life history taboos	Regulate withdrawal of vulnerable life history stages of species
Species-specific taboos	Total protection to species in time and space
Habitat taboos	Restrict access and use of resources in time and space

Table 1: RHTs' categories and their function in nature conservation and management (adapted from Colding & Folke, 2001: 586)

The focus of this study is on radiated tortoise (*Astrochelys radiata*) conservation in South and Southwest Madagascar, which concerns a species which numbers are rapidly decreasing and which is listed as critically endangered by the IUCN (Leuteritz & Rioux Paquette 2008). The two tribes native to this region, the Mahafaly and Antandroy people, traditionally follow a taboo on eating and (accidentally) harming tortoises. Locally present tortoise conservation agencies actively use this taboo and tortoise-related beliefs as a means and incentive in promoting community involvement in their activities (Paquette & Lapointe, 2007; Hudson, 2013). More specifically, this study focuses on a reintroduction program for confiscated radiated tortoises, initiated by the Turtle Survival Alliance (TSA) and Utah's Hogle Zoo (UHZ) (Walker & Rafeliasoa, 2012). Taboo-inspired practices are included in the program's approach and focus on promoting the tortoise taboo's cultural value, for example by organizing tortoise-themed festivals and distributing educational materials on the tortoise's cultural and ecological value, with the aim to create support for tortoise conservation among local people (Hudson, 2013). The exact social effects of such tortoise taboo-based practices, however, do not receive much attention in current research.

Individual compliance with taboos is partly enabled by the social and religious surveillance connected to them (Lingard et al., 2003). This can hence be connected to surveillance theory (Galič et al., 2017), and more specifically Foucault's theory of the panopticon as will be elaborated on later. Arguably, the taboo concerns a 'panoptic' self-surveilling system where the power of the internalized taboo contributes to people acting in a certain way. In this case, this research will hence speak of a 'tortoise panopticon', referring to the self-surveilling power of the tortoise taboo.

However, whether the current tortoise taboo is a strong ‘panoptic’ system of self-surveillance, with the power to steer people’s practices, remains the question. Current practices are not always in line with the taboo and with the laws related to tortoise protection. While local communities expressed their willingness to collaborate in the tortoise conservation practices, poachers often come from outside the local communities (Mittermeier et al., 2013). Besides, the local social context and related belief systems are changing due to an influx of migrants, delocalization of the people living in the area, and the introduction of other religions (Paquette & Lapointe, 2007; Cawthorn & Hoffman, 2016;). People coming from the cities are frequently considered to be culturally and spatially detached from the rural areas of the South (Ball et al., 2012). Research shows that the migrants “adhere to taboos less strongly than historical inhabitants”, but it is unclear if new taboos will develop after the migrants’ long-term settlement (Golden & Comaroff, 2015a: 41). A wide variety of contextual factors hence influence and reshape the tortoise taboo and how it is performed, and determine the self-surveilling power of the tortoise panopticon (see the hypothesis in Figure 1), showing the adaptive interaction between knowledge and practice; its ‘performativity’.

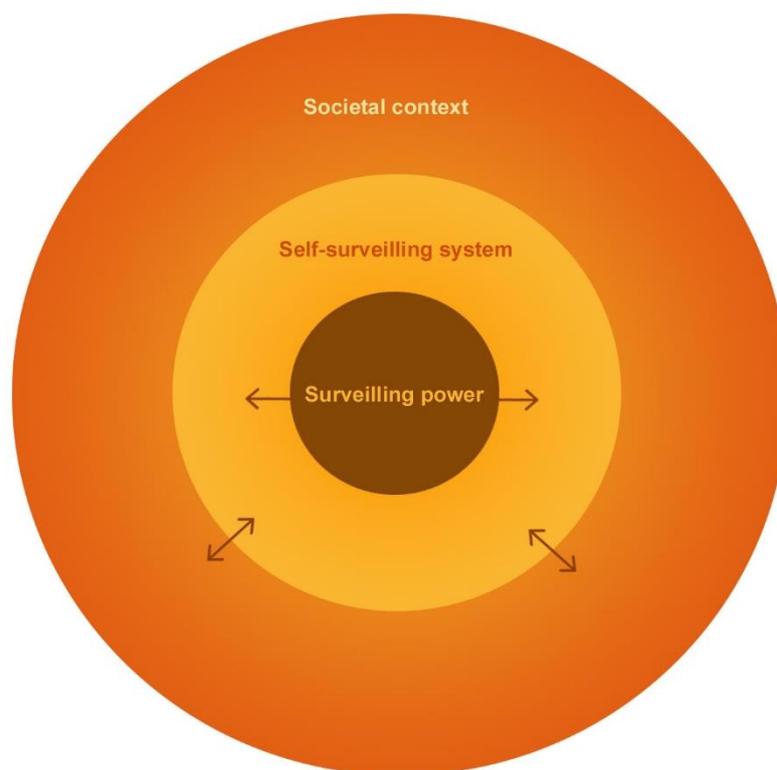


Figure 1: A visualization of the hypothesis on the working of the tortoise panopticon, showing an assumed interaction between the societal context and the self-surveilling system of the tortoise panopticon.

More specifically, current taboo-inclusive tortoise conservation practices partly connect external reward systems to the tortoise taboo to incentivize adherence. This may increase the power of the tortoise panopticon, yet it also introduces a risk on developing dependency on these incentives and rewards. Self-governing mechanisms such as taboos are widely neglected in conservation practices and literature, yet multiple examples exist where the introduction of rewarding systems results in eroding or complementing them (Travers et al., 2011; Narloch et al., 2012). This shows a risk of motivational crowding, where new incentives neglect or ‘crowd-out’ pre-existing motivations (Rode et al., 2014; Kczan et al., 2016; Moros et al., 2017). Local taboos and species conservation can also interfere and cause conflicts when taboos are violated by conservation practices (Liu, 2017). Therefore, it is argued that such interventions should be considered very carefully, while taking into account the context of the self-governing mechanisms already in place (Berkes, Colding & Folke,

2000; Narloch et al., 2012). In light of the radiated tortoise conservation practices, the introduced reward systems and other interventions may cause destabilization of the tortoise panopticon, and may even result in its collapse when the incentives disappear.

For this reason, it seems crucial for the reintroduction program to obtain a thorough comprehension of the current state of the tortoise taboo and its power systems – the ‘tortoise panopticon’ – and its connection to the program’s tortoise conservation activities. Besides, this taboo is not homogeneous, but differs from site to site and from community to community. That is why this research makes a distinction in the different sites included in the study, and tries to define the relevant factors influencing the tortoise panopticon for each site. The empirical objective is hence to define tortoise conservation potential and threats in the current state of the site-specific tortoise panopticon and the factors that shape it. Theoretically, the objective of this research is to obtain understanding of the dynamic relation between practice and meaning in panoptic species-specific taboo systems, connected to species conservation, by using the concept of performativity as a theoretical lens.

These objectives lead to the following research question:

How do human-tortoise relations and interactions, including tortoise conservation, relate to the performance of the ‘tortoise panopticon’ of the Antandroy and Mahafaly people of South and Southwest Madagascar?

Central to this research are the concepts of panopticon and power as presented by Foucault, and performativity as a theoretical lens originating from a practice-theory approach. Four sub-questions have been formulated to provide an answer to the central research question:

1. *How is the tortoise apparent in Antandroy and Mahafaly knowledge?*
2. *How is the knowledge connected to the tortoise taboo apparent in Antandroy and Mahafaly practices and the tortoise panopticon?*
3. *How does the societal context play a role in shaping the ‘tortoise panopticon’?*
4. *How can the strength of the tortoise panopticon be determined per site to distinguish sites with a favorable social situation for community support in tortoise conservation?*

First, the main concepts will be elaborated on in the theoretical framework. This will be followed by the methodology, which will clarify the research methods used in the data collection and analysis to answer the research question, and which will provide a first introduction to the case. Then, the results will be presented, starting with a more elaborate description of the research sites to create an understanding of the context. Subsequently, the sub-questions will be answered, still being part of the results. First, an overview will be provided of the ecological knowledge, taboo-related stories and other tortoise-related beliefs. Second, the tortoise panopticon will be further analyzed in relation to the local societal context in which this knowledge occurs. Third, the more external societal context and its role in the tortoise panopticon will be analyzed and elaborated on. Fourth, the deduced influential factors and components of the tortoise panopticon will be used to measure the strength of the tortoise panopticon and determine the extent to which favorable social situations exist in each site, while following the guidelines of Strategic Environmental Assessment. This will finally lead to the discussion and conclusion where concerns and limitations will be discussed and the main research question will be answered.

2. Theoretical Framework

The model and metaphor of the panopticon was first coined by J. Bentham, in his design of a circular prison with open cells and in the middle a watching tower that does not allow to see whether a guard is inside (Bentham, 1787). The design was built on the theory that the authority of the watching tower, with the possibility of a guard being present, creates a fear for repercussions among the prisoners so strong that they adjust their behavior to this fear and stay within their cells (Bentham, 1787). Bentham further applied this theory involving an “illusion of constant surveillance” (Galič et al., 2017: 12) to other designs for social spaces, yet it was P.M. Foucault who further developed the theory and extrapolated the prison-panopticon to other institutions in society (Dove, 2009; Galič et al., 2017).

Foucault's panopticon theory focuses on the power of state institutions in developing a scheme of self-surveillance, by means of the “promotion of a state of conscious and permanent visibility and thus vulnerability” (Dove, 2009: 123). This permanent surveillance is argued to result in a sense of observation and constant fear for repercussions, ultimately making the citizens themselves into a self-surveilling body that is argued to be even more effective than state surveillance on its own (Dove, 2009). Foucault defines his “panoptic principle” as “seeing everything, everyone, all the time” (Foucault, 2006: 52). However, it is debated whether permanent surveillance is necessary in this model, since Bentham's model involves the internalization of social rules where constant surveillance would ultimately not be needed anymore (Galič et al., 2017). Besides, Bentham discusses multiple versions of panopticons, aside from the prison-panopticon, and for these cases it is argued that:

“The panopticon should be seen as a template, which can and should be adapted to the specific circumstances of other parts of society, in which methods of control are more complicated and accompanied by increasing exceptions to continuous individual supervision” - (Galič et al., 2017: 13).

It is hence increasingly argued that Foucault's notion of Bentham's panopticon is too simplified and that the two theories do not completely cohere (Galič et al., 2017).

Aside from this critique discussing the extent of surveillance available and needed within the panopticon, Foucault himself warned that his theory was developed within a twentieth-century context, and that this Western analysis of power and the state may not apply to every society (Dove, 2009). Therefore, questions have been raised how to apply this Western-based theory to non-Western systems of surveillance (Lansing, 2003). This has been discussed only sporadically and is rather underexposed in literature (Dove, 2009). The more flexible interpretation of Bentham's panopticon stresses the adaption of the panopticon and its extent of supervision to each situation, and it can thus be argued to follow the defined need for a more fluid notion of power and surveillance for non-Western societies. This argues for the adoption of the more adaptive interpretation of Bentham's ‘panoptic principle’ for this case involving Madagascar society.

The sparse literature on the non-Western systems of surveillance, as well as Foucault himself, moreover, show that power is complex and multi-levelled, and it is acknowledged that many types of surveillance exist that are not only related to the power of the state but also to the power of religious beliefs (Foucault in Dreyfus & Rabinow, 1982; Lansing, 2003; Dove, 2009). This notion of the multi-levelled character of power is further discussed and defined by Foucault by speaking of ‘microphysics of power’ (Foucault in Dreyfus & Rabinow, 1982; Warnier, 2008). It involves the concept of ‘subjectification’ and self-governance, where all members of the concerned society are submitted and subjected to each other, hence creating a body of invisible panoptic power that can also be assigned to a certain social value or belief, such as a taboo (Lansing, 2003; Dove, 2009). In light of this case of the tortoise taboo in South and Southeast Madagascar, the adaptive interpretation of Bentham's ‘panoptic principle’ hence appears to be best applied to this case in combination with the notion of subjectification and microphysics of power.

The relation of surveillance and power to religious beliefs follows Foucault's claim that "power is not an institution, and not a structure; neither is it a certain strength we are endowed with; it is the name that one attributes to a complex strategical relationship in a particular society" (Foucault in Lansing, 2003: 374). This idea of a "complex strategical relationship" can be applied to religious beliefs, and is largely based on the sense that "the process of self-formation crucially involves the internalization of social norms", or "ethical systems" (Lansing, 2003: 374). In the context of taboos, this means that when these are violated, not only external rules are violated, but also oneself and the social norms that created this sense of 'self' (Lansing, 2003). This exposes a type of 'symbolic' power where taboos are part of the mentioned "complex strategical relationship" that shapes people on a societal and individual level. It hence shows their so-called subjectivity, where the people become subjects of the power that is shaping them and develop a sense of governmentality, in which governing rules such as taboos are internalized and become part of people's mentality, interactions, and identity (Agrawal, 2005; Müller et al., 2017). More specifically, this may result in environmentality, where people become subjected to external environmental values, and consequently internalize and develop new environmental concerns (Agrawal, 2005).

This research continues the application of the panopticon model to non-Western systems of surveillance, while following the more fluid interpretation of Bentham's 'panoptic principle' and Foucault's interpretation of power as presented above, by applying it to the Mahafaly and Antandroy tortoise taboo systems in place. The nature of the surveillance and the power of this tortoise panopticon is not static, however. Taboo systems and their power are highly dynamic and constantly changing due to many internal and external factors, and are prone to motivational crowding due to incentivizing measures that do barely or not take into account the intrinsic motivations in place (Rode et al., 2014; Kczan et al., 2016; Moros et al., 2017). Besides, the existence of taboos as such is shaping reality as well. To understand these dynamics of knowledge and practice, the theory of practice and more specifically the concept of performativity will be connected to the model of the tortoise panopticon, and will thus be the main theoretical lens in assessing the tortoise taboo and its panoptic character.

This research hence adopts an approach that is more in line with practice theory, despite the fact that Foucault is frequently associated with discourse analysis, which focuses on the construction and development of norms, values, and ideas, (Elgert, 2011; Turnhout et al., 2015). A main point of critique on discourse theory is, that it does not fully account for layers of influence to behavior other than discourses. These other layers become underexposed in the analysis, and the approach forgets about looking at the outcomes of the constructions on the ground, which are influenced by more than only discourses (Elgert, 2011). Besides, it does not try to understand how and why certain norms are articulated (Turnhout et al., 2015). Considering these critiques, and the more practical objective of the research, this research hence adopts an approach more in line with practice theory by focusing on performativity as a main concept. Practice theory moves away from the binary character of institutional and discourse theory – which mainly look at one aspect, thus limiting full understanding of a situation – by addressing the interaction between knowledge and practice (Hausermann, 2012). When addressing knowledge, practice theory appears to best cope with the influence of personal background, uncertainty, variability, and random happenings in creating this knowledge (Waterton, 2002). This makes the theory itself more in line with the objective of understanding the dynamics of practice and meaning in shaping taboos.

Performativity is one of the sensitizing concepts that enable practice analysis, and it refers to the continuous process of shaping and reshaping knowledge that is developed within and shaped by practices (Arts et al., 2013; Behagel et al., 2017). The concept was first coined by J.L. Austin from the perspective of language philosophy, where words are made to fit the world but are also shaping this world at the same time (Hall, 2000). This idea highlights "how reality emerges from our practical engagement with it" (Behagel et al., 2017: 5), and now it can also be applied to systems in society

other than language, such as the shaping of gender as highlighted by J. Butler (Hall, 2000; Czarniawska, 2016).

Taboos are yet another example of such a normative system, since their framing has the power to shape people's behavior, and in turn this behavior influences reality and the content of the taboo (Fleming, 2011; Berkes, Colding & Folke, 2000):

“While certain logics of ‘doing and saying things’ inherent in any social field tend to reproduce practices as they evolve over time—and push people to follow daily and professional routines—their agency also enables them to improvise upon norms and rules, to do and say things otherwise than expected, or to make a difference in routinized patterns. As a consequence, social (including policy) outcomes are rather unpredictable and only rarely match the rational optimum or the institutional fit” - (Wiersum et al., 2013: 41-43).

Taboos, then, are performed differently, yet their performance is not only shaped by the existence of the taboo as such. As mentioned before, many other factors are of influence in shaping behavior and the performative of the taboo itself. Such contributing factors include the social context in which the taboo occurs, such as low income, low food security, and high global demand and increased economic value of tortoises, and the changes that occur in the social-cultural context due to the influx of migrants and other delocalizing processes. Besides, taboo-inclusive radiated tortoise conservation in South and Southwest Madagascar involves education, cultural manifestations, and rewarding systems (Walker & Rafeliasoa 2012; Ball et al., 2012; Hudson, 2013; Randriamahazo, 2014), which is yet another performance of the taboo that is shaping as well as being shaped and reshaped by reality.

Consequently, it is important to include the social, cultural, and conservation context of the panoptic tortoise taboo in the analysis of its performativity. Performativity, then, enables a better understanding of the interaction between practice and meaning in the tortoise taboo, and the relation of this interaction to the panoptic power of the taboo's surveillance system. Such understanding and assessment could hence provide an insight in the stabilizing or de-stabilizing role of these contextual factors in the tortoise panopticon, and the potential risk on motivational crowding and breaking down the panoptic tortoise taboo when the tortoise conservation practices and contextual factors would change or even disappear.

3. Methodology

The main research question is:

How do human-tortoise relations and interactions, including tortoise conservation, relate to the performance of the 'tortoise panopticon' of the Antandroy and Mahafaly people of South and Southwest Madagascar?

Here it will be elaborated on how this research aims to answer the research question.

3.1. Operationalization

This research question includes the concepts of 'human-tortoise relations and interactions', 'performance' – which refers to 'performativity', and 'tortoise panopticon'. The use of these concepts in this research and how to measure them will be elaborated on further.

The concept of 'human-tortoise relations and interactions' refers to all tortoise-related practices and beliefs that are of relevance to the societal context of the radiated tortoise in Madagascar. This also includes the social, political, and economic environment in which these practices and beliefs exist and perform. The concept of 'performance' relates to performativity, which looks at the continuous process of interaction between the knowledge embedded in the taboo and the actual practices of the Antandroy and Mahafaly people involved. It is one of the sensitizing concepts used in practice theory, and this research thus typically follows the approach of this theory, which includes the focus on daily practices to answer the main question of "how is that done?" (Miettinen et al. in: Arts et al., 2013).

As stated by Arts et al. (2013:11-12), "performativity can be studied by observing the use of knowledge as constitutive of reality and involving power and unpredictability". Performativity thus integrates knowledge and meaning systems into practices, by focusing on the interaction between knowledge and reality, and by connecting this to unpredictability and power (Arts et al., 2013). This points out three components that operationalize performativity: the connection between knowledge and practices, their connection to the tortoise panopticon, and accounting for the unpredictability by including other influential factors to the knowledge, practices, and the panopticon.

This means that firstly, this research addresses "the use of knowledge as constitutive of reality" by studying the content of the tortoise taboo, referring to the knowledge including tortoise-related stories and beliefs and the believed taboo-related repercussions. These are compared to the actual practices related to tortoises. Since overnight staying at the included villages was not feasible, knowledge on practices have been acquired by interview questions related to them and information obtained from experts. The inability to stay at the villagers for a longer term also complicated the inclusion of thick descriptions, which is generally connected to practice theory (Arts et al., 2013), yet this too has been covered with field notes on observations and conversations with experts familiar with the local daily life and customs.

Secondly, the research aims to account for unpredictability by also defining other influential factors to people's behavior in the societal context, thus continuously considering the possible influences of unpredictable events, or 'surprises' coming from these factors. Hence, the research follows the idea of grounded theory, meaning that it has been a continuous process of interpretation and reinterpretation of new data (Boeije, 2010; Newing, 2011). This is enabled by taking fieldnotes and making memos, which are defined as a "brief summary of what you think" (Newing, 2011: 245), thus enabling daily reflection. This resulted in constant evaluation and sometimes adaption of the research approach and the interviews.

Thirdly, the research includes the question of power by further defining the tortoise panopticon, hence connecting the knowledge and practices to its systems of self-surveillance. Besides, this includes defining the level of strength of the panopticon per research site, to account for place-dependency. This strength defines to what extent people adhere to the tortoise taboo on individual and community level, and to what extent they actively protect the tortoises given that this protection is included in the content of the taboo. For that reason, this research defines two indicators for the strength: the personal adherence to the taboo and the protective sentiments displayed by the respondents. These three indicators are further explained in chapter 4.5.

3.2. Introduction to the case

The case of this research focuses on radiated tortoise conservation in the South and Southwest of Madagascar. This case will be elaborated on below.

Introduction to the social context

The radiated tortoise, locally called *sokake*, is one of the five endemic tortoises present in Madagascar, all listed as Critically Endangered (Castellano et al., 2013). The tortoise taboo is part of the traditional *fady*, which refers to a whole set of prohibitions that are informally ingrained within parts of Madagascar society since before the French colonization (Ruud, 1960; Jones et al., 2008). The Malagasy population is divided in 18 ethnic groups, denoted as ‘tribes’, who traditionally inhabit different regions of the country and who distinguish themselves with an own social and cultural identity. These tribes are the Merina, Sakalava, Betsileo, Tanala, Betsimisaraka, Bara, Antakarana, Antemoro, Antesaka, Antefasy, Antambahoaka, Tsimihety, Bezanozano, Sihanaka, Antanosy, Vezo, Antandroy and Mahafaly (Sipa, n.d.). Each tribe is sub-divided in clans, which members typically identify themselves as a community sharing the same forefather. As visible in Figure 2, the radiated tortoise is only present in the southern and southwestern spiny forest, for which it is said to be iconic, and which is historically inhabited by the Mahafaly and Antandroy tribes who mostly adopted the *fady* and its tortoise taboo in their traditional beliefs (Paquette & Lapointe, 2007; Hudson, 2013).



Picture 1: Antandroy men can be seen wearing their traditional tribal hat, a long piece of cloth around the shoulders, and a spear in their hand, especially during meetings.

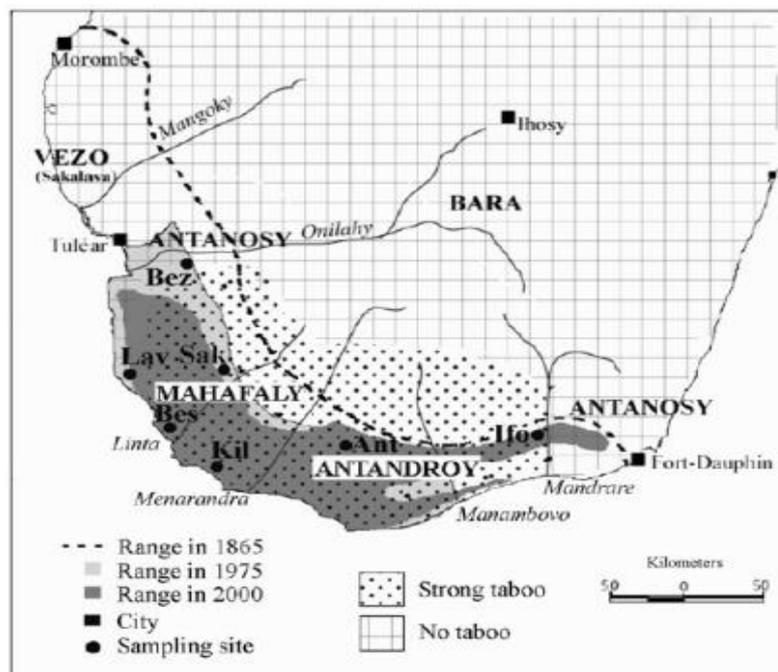


Figure 2: Map showing the South and Southwestern part of Madagascar, including the radiated tortoise's range as documented in 2000 and the area where the tortoise taboo is historically adopted by local tribes (Paquette & Lapointe 2007: 32).

Research in northeastern Madagascar shows that adherence to taboos is still high, hence showing a “deep social value” of existing taboos (Golden & Comaroff, 2015b: 42). It is thought that, in this region, “the strong adherence to taboos is likely to endure because of the powerful local belief that, if one violates those taboos, automatic sanctions will occur as a matter of spiritual retribution” (Golden & Comaroff, 2015b: 42). Meat preferences are influenced by the *fady* even in urban areas, causing strong dislikes for certain types of (bush) meat (Randrianandrianina et al., 2010). In this way, such taboos are known to influence the social acceptance of certain types of food, meat in particular (Cawthorn & Hoffman, 2016). The reasons behind each taboo are often unclear, although it is claimed that most “local Malagasy taboos arise from incentives for maintaining health and well-being” and beliefs based on certain biological traits of the species (Golden & Comaroff, 2015b: 42). Nonetheless, since they are a cultural expression, their effects are noticeable in society. Moreover, the taboo of the *fady* is said to partly define tortoises as “dirty or pests” (Ball et al., 2012: 9). These informal taboos have the potential to ultimately result in leaving the tortoises alone, which shows a common outcome with the tortoise conservation objectives, and hence its relevance to radiated tortoise conservation.

However, especially the Antanosy and Vezo tribes who come from the north, east, and far west appear to not respect the tortoise taboo, and harvest tortoises on a large scale (Hudson, 2013). In the region where the TSA is currently active, it has been observed how “well-organized bands of poachers (...) are dropped off in an area and then very efficiently clean out the tortoises” (Randriamahazo et al., 2011: 63). Nevertheless, in national law “it is illegal to eat, sell, or take tortoises”, which is in line with international conservation objectives (Leuteritz et al. 2005: 459). Besides, a *Dina* – a traditional law – for the tortoise taboo is now officially implemented in the Androy region following a TSA lobby. A discrepancy is hence visible in official wildlife legislations, that strictly prohibit hunting of all species, and actual hunting practices that also target protected species such as the radiated tortoise (Randrianandrianina et al., 2010: 411). Radiated tortoises are being harvested extensively, with the most recent example of around 11,000 that were confiscated from a house in Toliara (Gray, 2018). Such practices stay largely unpunished due to a lack of law-enforcing capacity (Hudson, 2013).



Picture 2: The radiated tortoise roams the sandy grounds of South and Southwestern Madagascar, where Antandroy tombs are a visual sign of ancestral worship.

The social context of Madagascar is a contributing factor, which includes low average income, low food security, high illiteracy, and unawareness of the species' ecological and cultural value, over-harvesting impacts, hunting seasons and other wildlife legislations (Randrianandrianina et al., 2010; Bell et al. 2012; Hudson, 2013; Cawthorn & Hoffman, 2016). International pet trade is another major driver of the extensive illegal harvesting of small, juvenile radiated tortoises, due to its appealing carapace and its ability to thrive in captivity (Pritchard, 2013). Other threats to the species include harvesting for its liver in response to an increased Asian demand, habitat loss, and large-scale collection for human consumption which in turn concerns larger adults (Pritchard, 2013; Leuteritz & Paquette, 2008; Hudson, 2013). Tortoise meat is considered a delicacy by those in Madagascar who do not adopt the taboo, especially during holidays like Easter and Christmas, is generally cheap, and hence a large regional market exists in Fort-Dauphin and Toliara (Ball et al., 2012; Mittermeier et al., 2013; Hudson, 2013). All those contextual social factors make the radiated tortoise to a species facing many threats.

Introduction to the conservation context

In Madagascar, there has been an influx of nature conservation organizations, especially from the 1960s onwards (Corson, 2017). In the case of the radiated tortoise, multiple initiatives are present that collaborate with local communities to conserve and protect this species. This is also the case in the nine defined regions of Nikoly, Marovato, Tranovaho East, Tranovaho West & Ampanihy, Imongy & Ankilivalo, Antanimora, Ejeda, Androka & Kaikarivo, and Itampolo. The organizations active in these regions include the Turtle Survival Alliance (TSA), Utah's Hogle Zoo (UHZ), the Madagascar Partnership (MBP), and Conservation Fusion (CF).

It is stated that "programs for restocking areas of suitable habitat with tortoises seized from the illegal trade will become increasingly necessary" (Hudson, 2013). Consequently, one specific measure for the conservation of the radiated tortoise concerns a reintroduction program as part of the conservation activities carried out by the TSA and the UHZ (Hudson, 2013). The confiscated tortoises are collected and cared for in the 'temporary residence facilities' (Hudson, 2013). Yet, due to a lack of capacity, residences become overcrowded and the ultimate aim of the recovery program is to release the tortoises back into suitable habitat (Hudson, 2013). For this reason, TSA and the UHZ work together in the action plan named "Confiscation to Reintroduction Strategy" which includes a plan for release and which is targeting "law enforcement, community outreach, reintroduction, habitat preservation, and the new joint TSA/UHZ Tortoise Conservation Center (TCC)" which was built in 2016 and is the place where tortoises recover after being brought to one of the tortoise triage centers located in Ambovombe, Tsihombe, Beloha, Ampanihy and Betioky (Randriamahazo, Hudson & Castellano, 2013; Goldstein, 2016; Gray, 2017). This research has been conducted in the light of this action plan and was hence funded by the UHZ.



Aside from reintroduction, the TSA action plan also includes the reestablishment and strengthening of the tortoise taboo with the aim to increase community involvement (Walker & Rafeliasoa 2012; Mittermeier et al., 2013). This is being done in multiple ways, involving increased media attention, education, the inclusion of local people in monitoring and patrolling activities, and initiating tortoise-themed festivals that appear to be popular (Walker & Rafeliasoa 2012; Ball et al., 2012; Hudson, 2013; Randriamahazo, 2014). For in the future, plans are being made for a Community Outreach Center (COC) near the conservation center, which will completely focus on such conservation activities involving the local communities (Gray, 2017). Education and community awareness materials have yet been developed within the past ten years, based on community workshops (Castellano & Hudson, 2013). This is part of the campaign strategy developed by a team of Emerging Wildlife Conservation Leaders (EWCL), in collaboration with the many organizations active in the radiated tortoise conservation. EWCL is "a training and professional development program bringing together individuals from the public and private sector to develop and implement an international

conservation campaign for a threatened species” (Ball et al., 2012). The campaign handbook that they developed, and has been used in the current conservation practices, opts for a bottom-up, community-based approach and defines lack of awareness due to “lack of education and communication” as a major issue still relevant to radiated tortoise conservation (Ball et al., 2012: 2). In this light, the COC and the current activities targeting the local communities are defined to be a crucial part of radiated tortoise conservation.



Picture 3: The Community Outreach Center under construction.

In addition to this focus on awareness, involvement, and cultural manifestations, the conservation interventions also include economic incentives and rewarding as a method, which will be elaborated on later (Mittermeier et al., 2013). In the light of motivational crowding, however, the possible downside of such a rewarding approach is the substitution of the already existing motivations based on the tortoise taboo. In cultural expressions of the taboo, reward and conservation ethos do not seem to be the main motivations to adhere to them, but rather their cultural value and the connected belief systems (Golden & Comaroff, 2015b). The “intent and purposes behind these rules”, the so-called ‘content’, thus differ from those of the conservation organizations (Colding & Folke, 2001: 594). Due to the fluidity and adaptability of the taboos, it can even be questioned if they really have a ‘content’, or that they are just ‘being done’. Despite this difference in (the presence of) ‘content’, the species-specific taboos and species conservation practices frequently, yet not necessarily, display the same outcome of not harming the species concerned. This difference in ‘content’ may fade due to the inclusion of new (extrinsic) motivations and educational practices, potentially resulting in the internalization of the conservation sentiments and the development of environmentalism. However, the same conservation practices may result in crowding out the pre-existing motivations, regardless of their coherence with the conservation aims (Rode et al., 2014; Kczan et al., 2016; Moros et al., 2017). This research hence aims to provide an insight in which side these developments currently lean to, focusing on the development of tortoise-related environmentalism on the one hand, and motivational crowding on the other.

3.3. Conducting interviews, selecting sites and sampling respondents

For answering the research question, about four months of fieldwork in the South and Southwest of Madagascar has been carried out from August 10 until December 21, 2018. Since the research is part of the larger Confiscation to Reintroduction Strategy action plan, the fieldwork has been largely funded by the UHZ for contributing to reaching the aim of community involvement within the action plan. This meant prior communication with mainly Christina Castellano, who arranged the funding and functioned as a second supervisor in the USA, and with Riana Rakotondrainy, who was the Research Coordinator and head of the Community Outreach of the TSA. Through this communication, documents with information on the social and conservation situation have been exchanged, and relevant topics have been discussed. This resulted in a final decision to focus on the topic of the tortoise taboo, after which a theoretical framework could be developed further, hence meeting the TSA demands as well as the researchers' interest. Exact research sites and interview questions would be further defined after arrival at the TCC, since the limited internet connection of the site hindered proper face-to-face discussions and site selection would have to involve other 'experts' too.

The fieldwork finally included taking field notes on observations and experiences, and conducting open and (semi-)structured interviews, thus involving selection of a field guide and interpreter, respondents, and research sites which will be elaborated below.

Interview approach

After arriving at the TCC, the methodology was further developed first, based on information provided by defined 'experts' on the social and conservation environment. These 'experts' included TSA staff members as well as other people familiar with the region and its culture, including three Peace Corps volunteers who were able to provide the research with reflections and observations from another 'outsider's' perspective. Open and semi-structured interviews have been conducted with these supposed 'experts' first, and partly recorded and transcribed, to obtain a more comprehensive view of the local situation. Based on this information, interview questions have been developed that were believed to be relevant to the context, to the objectives of the TSA action plan, and the research aims set in advance.

Second, a local field guide and interpreter needed to be hired to better select and access the villages, to easier gain trust of the respondents, to be able to speak to villagers in their own dialect, and to ensure cultural sensitivity. Based on these criteria, Rampanarivo was chosen, a middle-aged Antandroy man who had been working for TSA and other organizations with the local communities in the region for years. He possesses cultural knowledge based on his previous experiences and his identity as an Antandroy, and he knows the dialects of the region. Due to his previous work in the region, where he also grew up, he has many contacts with local leaders and other community members which more easily resulted in local leaders allowing to conduct interviews in their village. Besides, his identity as a member of the Antandroy tribe and his culturally high status as an older man provided him with a level of respect and trust that made respondents easier agree to participate in the interviews. Rampanarivo was hence regarded as a field expert, and thus the interview questions as developed before were discussed and adjusted with him and Rakotondrainy further.

Finally, the questions adapted to the research aims and the program's intentions were developed into an interview guide for the first interviews. The first research sites were selected partly for their value to the TSA for further improving conservation of the already existing tortoise populations. The research questions were partly adapted to this presumed value. Later, research sites were also selected for their known high poaching rates, as noted by the TSA, and identification as a potential release site based on previous ecological research on habitat suitability and/or past experiences with local communities. Based on these site characteristics, which will be elaborated on further below, and practical experiences obtained during the first interviews, the questions have been adapted slightly (as highlighted in Appendix 1). For the sites with high poaching rates, question 17 and 18 have been included, asking about reasonings why people would poach and what they would consider to be

helpful to make them stop. For sites identified as potential release sites, question 15 and 16 were included, asking about what people would think if the tortoise population would decrease as well as increase. This was later considered to be of relevance to other sites too, and therefore had been included for all following research sites. Also, after 12 days of interviewing, it was realized that including an explicit question on the strength of the taboo would be interesting too. Therefore, question 14 on this topic has been included for all next interviews too. This shows an adaptive process where questions have been adapted to site characteristics as well as practical experiences throughout the interview process.

In order to align with practice theory, questions on both knowledge and practices have been included since observations on practices and human-tortoise encounters were limited because of the inability to stay with one community for a longer period due to logistical and safety concerns. Whether questions are more related to knowledge or practices has been indicated in bold in Appendix 1. This interview guide was translated into French by Rakotondrainy, given to Rampanarivo, and translated into Antandroy and later Mahafaly by him. He used it as a guidance during the interviews which he conducted in the local dialect. Because of translation concerns and convenience, the interviews were largely structured. Sometimes, however, a later question was already answered in an earlier answer and was therefore skipped. Besides, further related questions were asked when a respondent showed extensive knowledge on the topic or brought up another related topic. This made the interviews more semi-structured in some cases. The answers of the respondents were, in turn, translated into English by Rakotondrainy. The answers were written down and typed up at the end of each interview day, when possible, to diminish loss of insights. Besides, the interviews have been recorded to enable later checking of the data when deemed necessary, hence displaying an approach directed to diminish the loss of relevant information during the interviews.



Picture 4: the research team in the regular set-up: sitting on the ground, recorder near the respondent and Rampanarivo, the interview guide near Rakotondrainy and me to follow the conversation and write down the answers.

Selecting research sites

Madagascar has several layers of administrative divisions, starting with 22 regions (City Population, 2014). These regions consist of several districts, which are sub-divided into multiple Communes, each with their own mayor. On the lowest administrative level are the Fokontany, generally consisting of one to three villages. The Chef Fokontany is on the administrative head of the Fokontany and is employed by the government. This position is not necessarily occupied by the acknowledged head or leader of the community, whose position may be based on heritage, communal election, or on other grounds depending on the customs of the community concerned.

The TSA reintroduction program is currently at the stage of preparing the release of part of the tortoises. Therefore, potential release sites are now being determined, based on ecological as well as social considerations. Some regions are already included in the current activities connected to the reintroduction program, whereas others are defined as potential, or still need to be assessed. The campaign handbook defines several key-communities that are of perceived significance to the program, based on traits related to local support, high impact of poachers, high tortoise meat demand, or police control (Ball et al., 2012; Figure 3). Considering the practical conservation objective of this research, the research population has hence been selected based on these criteria, as elaborated on below.

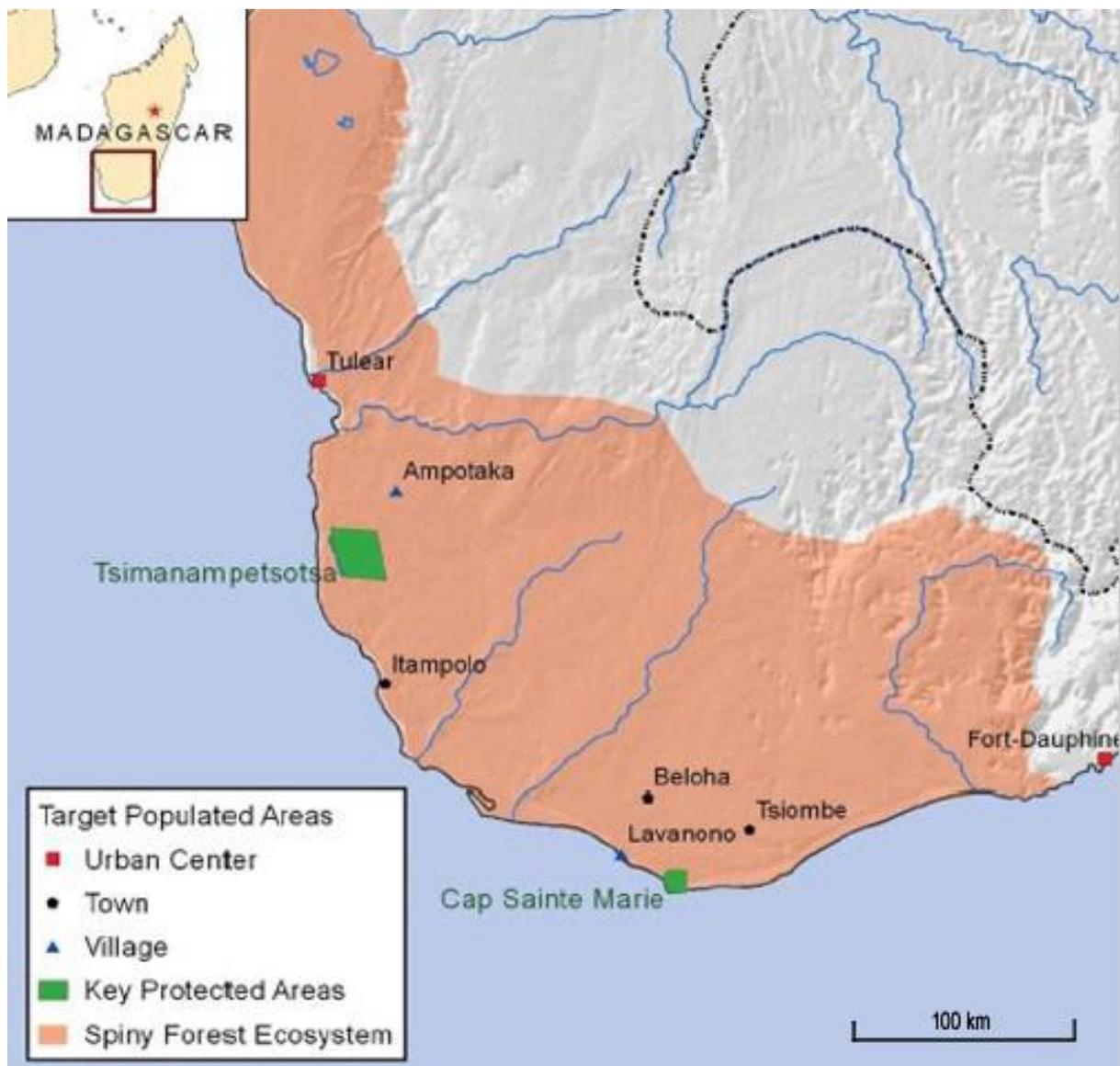


Figure 3: "Map showing focal areas (key communities in the Androy Region, Southern Madagascar)" (Ball et al., 2012: 13).

The Districts included in the research are Tsihombe, Beloha, Antanimora, and Ampanihy Ouest. The Districts and Communes were selected with purposive sampling based on multiple criteria. These criteria include previous involvement and experiences with the TSA and radiated tortoise conservation. Besides, the believed availability of a good tortoise habitat and/or (past) presence of a healthy tortoise population was used as a criteria for certain communes especially in the districts of Tsihombe and Itampolo. For the district of Tsihombe in particular, the selection of Communes was also based on their proximity to the TCC site. In the Southwest, the selection of districts and communes was further based on the criteria of the presence of a Mahafaly community, since this region is also inhabited by other tribes such as the Vezo and Antanosy people.

The Fokontany selection was more based on the criteria of accessibility with the TSA 4x4 vehicle and from the place of residence, and a differentiation in clans and location to prevent a bias and cover as much of the commune as possible. Besides, the criteria of previous involvement with TSA activities and a believed existence of a 'strong' taboo among the community members were used to make a selection. The selection of communities with a 'strong' taboo was based on knowledge from previous TSA experiences, knowledge and experiences of Rampanarivo, and of mayors and other officials who were approached before or during the visits to the Communes. Based on all these criteria, each time a list of potential Fokontany was created for each commune. However, interviews were not able to be conducted in every Fokontany on these lists for multiple reasons. Such reasons include a lack of presence or willingness of the Chef Fokontany or someone else in charge to give the other community members permission to collaborate, or a lack of possible respondents present at the moment of arrival. Sometimes, those in charge were considered to be too influential by instructing other potential respondents, and in such cases it was decided to move to another Fokontany. Such situations asked for improvising and asking around where to find another Fokontany, which means that part of the selection was based on convenience and snowball-sampling.

The various selection criteria resulted in the inclusion of the Fokontany as located in the map of Figure 4. Based on the Communes and spatial division of the Fokontany, nine research sites have been defined for analysis. Table 2 shows the communes included per site. Despite the relatively low number of respondents, Ejeda has been indicated as a separate site too because of its far distance to the other locations.

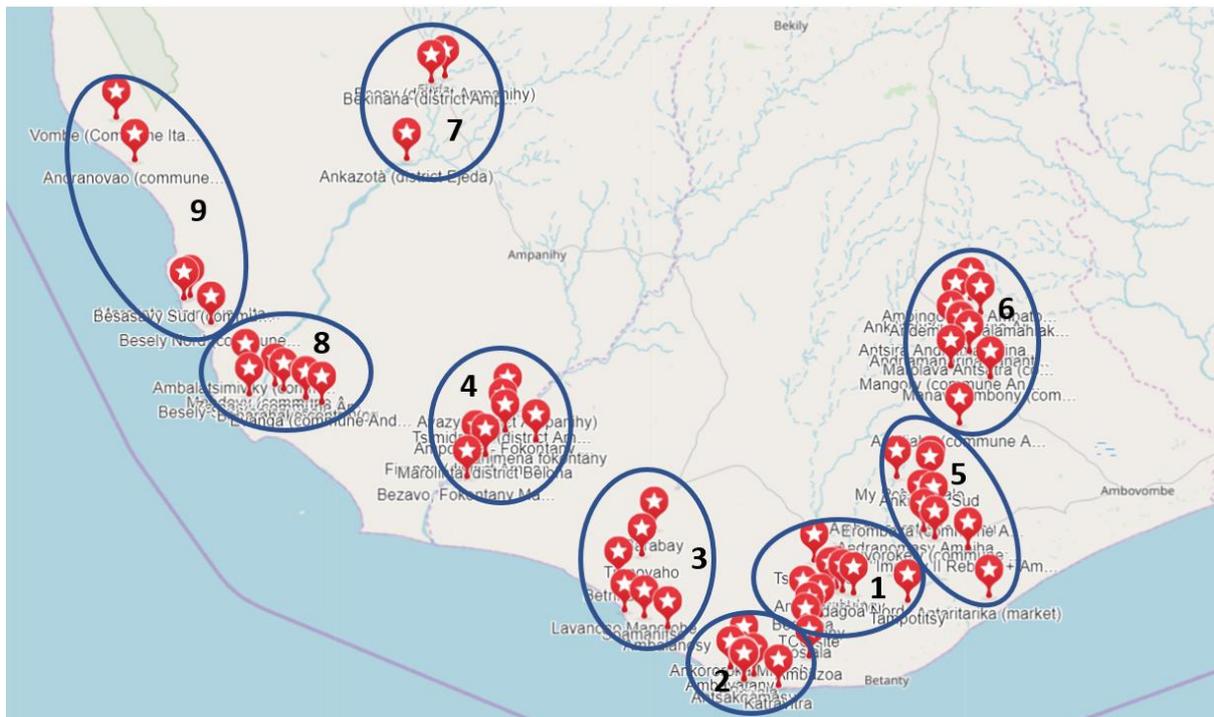


Figure 4: Locations of the Fokontany included in the research and indication of the division in nine sites for this research.

Region	District	Number defined region	Communes per defined site	Total count resp.
Androy	Tsihombe	1	Nikoly	37
	Tsihombe	2	Marovato	40
	Beloha	3	Tranovaho East	30
	Beloha & Ampanihy Ouest	4	Tranovaho West & Ampanihy	37
	Tsihombe	5	Imongy & Ankilivalo	35
	Antanimora	6	Antanimora	38
Atsimo-Andrefana	Ampanihy Ouest	7	Ejeda	15
	Ampanihy Ouest	8	Androka & Kaikarivo	25
	Ampanihy Ouest	9	Itampolo	25
Total				282

Table 2: The division in nine research sites, the districts and communes included, and the number of respondents per site.

Sampling respondents

The research focus on the tortoise taboo resulted in a research population exclusively including people from the Antandroy (200) and Mahafaly (82) tribes. More Antandroy were included since the Mahafaly region could only be covered in the last month of the fieldwork. For the selection of the respondents, first a preferred number per Fokontany had to be determined. A Fokontany usually consists of one or two villages inhabited by around 30-50 households. To enable triangulation, the minimum was set on three respondents. However, more than this minimum was preferred. Therefore, it was decided to aim for five respondents per Fokontany. More was considered unpractical for multiple reasons. In the first place, frequently villagers were out on their fields or to a market, which meant that finding five respondents was already experienced as challenging. Moreover, during the interviews the other villagers often sat together, which meant that with each respondent the risk on people discussing the questions with the upcoming respondents increased, despite frequent urging not to do so. Besides, a maximum of five respondents was logistically convenient, since on some days it meant that even two Fokontany could be covered.

The purpose of this research meant a preference for respondents who were knowledgeable on what happened in the community and/or in the taboo. Therefore, and because of common Antandroy and Mahafaly custom, the Chef Fokontany was usually included. Most of the time, a Chef Fokontany also practiced agriculture, as do most of the other villagers. Agriculture refers to both growing crops as livestock farming and is practiced by the majority of the people in the villages of all sites (see Figure 5). Only 15% of the research population practiced another profession than agriculture, such as being an *Ombiasa* (a witchdoctor), selling groceries, fishing in the coastal areas, carpentry, working for an organization, studying, or teaching. Respondent selection was not determined by profession.

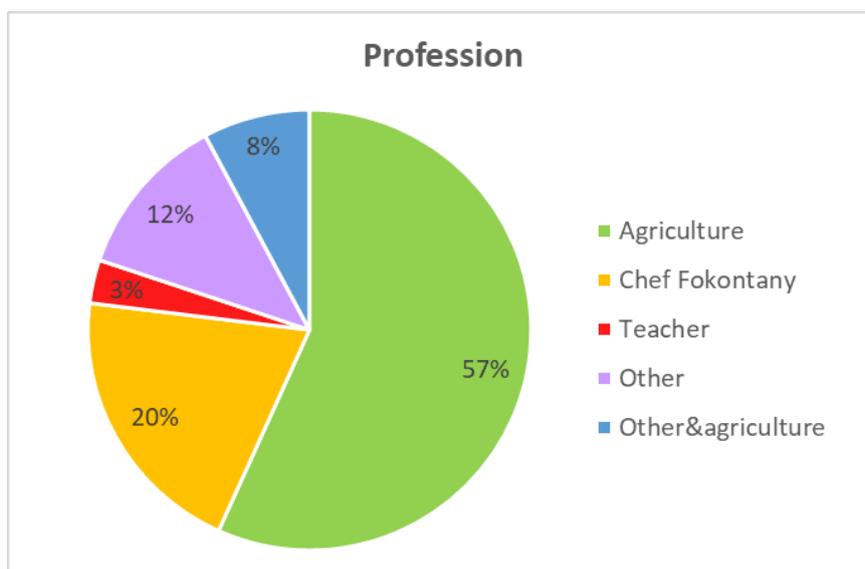


Figure 5: Division in profession among the research population

People of higher age were preferred, meaning 40 years or older, since usually the social status as well as the influence of the community members increases with the years. For this reason, it was assumed that those people know more about the taboo-related beliefs and practices than people under 40 years old. Especially people around 20-30 indicated that their age meant that they do not know as much as the elderly multiple times. Aside from age, the social status and (political) influence of people in Antandroy and Mahafaly society also depends on the gender. Usually, women do not take part in meetings concerning political decisions or certain ceremonies, meaning that they are less likely to be well-informed about what happens in the village. Besides, the husband or another man should be asked for permission to interview a woman most of the time, which makes it harder to interview a woman. For those reasons, the main target group for interviews were elderly men, and this resulted in a population consisting of 189 men and 93 women (see Figure 6). However, it was also aimed to include multiple age groups and both genders to cover all societal groups in the research. Therefore, also younger people and women were included, resulting in a normal distribution of age as visible in Figure 6.

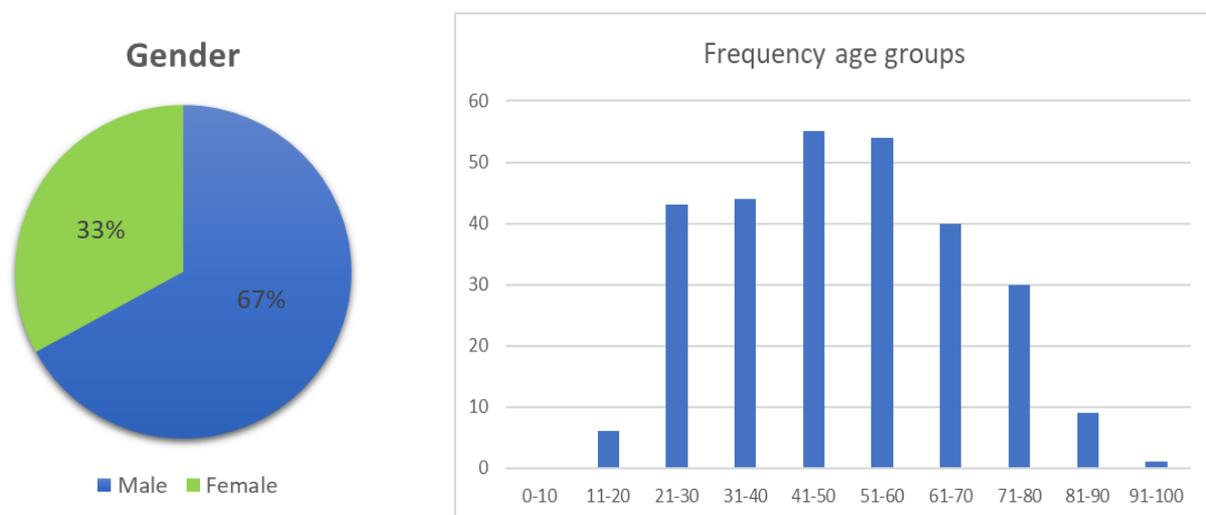


Figure 6: Gender division and age distribution of the research population.

The respondents were selected by snowball-sampling. When entering a Fokontany, Antandroy and Mahafaly custom requires to first explain the reason for visiting to the Chef Fokontany or another person in charge. He should be asked for permission to conduct the interviews among the people of his Fokontany. After explaining the details of the research, the way of working, and the preferences for respondents, this man usually provided suggestions for suitable respondents. Respondents were paid 5000 Ariary each (about €1,20), yet this exact amount was generally not mentioned in advance in order to avoid respondents participating only because of the reward or demanding more. In some cases it was still noticed that respondents were largely focused on the money during the interview, or wanted to bargain on the price in advance, and in such cases the interview was stopped when possible. Finally, the selection of respondents was also dependent on those people who happened to be in the village at the moment of visiting, which could not be foreseen in advance.

3.4. Method of analysis

The answers of the respondents have been written down per question number during the interviews and have been typed-up the same evening when possible. At the same time, an Excel sheet had been developed summarizing the interviews per question and striking quotes had been highlighted to enable immediate preliminary analysis and enable quantitative analysis with graphs later in the analysis process.

Therefore, this Excel sheet has been the base of the further data analysis, where multiple answers have been converted into yes/no options based on criteria of relevance to the topic visible in the answers. This enabled producing percentages for questions of deemed relevance for further analysis. The percentages are summarized for each research site, and each site was aimed to be valued for its conservation potential socially. Strategic Environmental Assessment (SEA) is used in especially European environmental policy to evaluate policy options, and it is defined as “a systematic process for evaluating the environmental consequences of proposed policy, plan of programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate state of decision making on par with economics and social considerations” (Sadler & Verheem in Dalal-Clayton & Sadler, 1999). It presents a step-by-step process that may include the following steps (adapted from: Netherlands Commission for Environmental Assessment, n.d.; European Commission, 2001):

- | | | |
|--|--|--|
| <ol style="list-style-type: none"> 1. Screening 2. <u>Problem scoping</u> 3. <u>Documentation of baseline situation</u> 4. <u>Policy options</u> 5. <u>Key-aims</u> 6. <u>Impact assessment</u> 7. Public consultation 8. Final selection 9. Decision making 10. Mitigation measures 11. Monitoring & reporting | | <ol style="list-style-type: none"> 1. Problem scoping & documentation of baseline situation 2. Policy options 3. Key-aims 4. Impact assessment |
|--|--|--|

For this research, the nine different research sites have been defined as separate policy options, and in this light (part of) the steps presented in SEA have been used as a tool to value each site on its taboo adherence and protective sentiments. This involves step 2 to 6, where step 2 and 3 are covered by the answers on the first three sub-questions. Sub-question 4 further analyzes the data by covering step 4, 5, and 6. For convenience, these steps have been further deduced to four final steps followed in this research, as indicated at the right of the SEA steps presented above. A valuation per site (or policy option) has been made based on this analysis, making use of multiple criteria analysis (MCA) with weighted scores. Since step 7 of public consultation will be taken in a later stage of the reintroduction project, and ecological suitability still needs to be considered a final selection of sites is not provided. However, the MCA scores have been further analyzed while including the more qualitative knowledge of the research, hence resulting in recommendations suiting this site analysis. The steps and their results will be more elaborated on in chapter 4.5.

4. Results

In this section, the results related to each sub-question will be discussed. First, however, a more detailed introduction to the research sites and their conservation context will be provided to enable understanding of the research population's context.



Picture 5: Mothers wrap their babies on their back while balancing buckets filled with water or other cargo on their heads, making their way through the sandy environment of the spiny forest of South and Southwest Madagascar, with the ancestors watching them from their tombs.

4.1. Description of the research sites and the conservation context

A thorough understanding of the social and environmental context in the locations where the fieldwork has been conducted is necessary to properly contextualize the respondents and the presented results. Therefore, this section will start with providing an impression of this context, largely based on own observations and information found in literature. The nine research sites include the sites of Nikoly, Marovato, Tranovaho East, Tranovaho West & Ampanihy, Imongy & Ankilivalo, Antanimora, Ejeda, Androka & Kaikarivo, and Itampolo. In the following descriptions, they are roughly grouped per district.

Conservation activities applying to all research sites are awareness campaigns targeting no specific region. An example is *Tortoises in Trouble*, which is the title of an awareness video on the radiated tortoise conservation activities launched by the TSA, The Oriante Society, MNP (Madagascar National Parks) and MOZ images (a film company) (Randriamahazo, Hudson & Castellano, 2012). It targets officials as well as other people living in the region and it is part of the larger awareness campaign of the TSA (Randriamahazo, Hudson & Castellano, 2012). This campaign also included the distribution of wristlets, stickers, and posters (Randriamahazo, Hudson & Castellano, 2012). During the fieldwork, sometimes these posters were visible in offices and on the walls of houses, hence showing a continuing use of the awareness materials at least to a certain extent.



Picture 6: Radiated tortoises rescued from confiscations find a new temporary home at the TCC, although sometimes disturbed by ring-tailed lemurs being very interested at their food.

Nikoly, Marovato and Imongy & Ankilivalo (District Tsihombe)

The communes of Nikoly and Marovato were covered first, since they are relatively close to the TCC-site. They are part of the Tsihombe district and located southeast of Tsihombe Town. There is no plan to release tortoises here yet, considering the proximity to Tsihombe Town and its roads connecting to other places where poachers come from. However, there are still many tortoises in this area which the TSA wishes to conserve. Besides, the TCC has been built in forest provided by four supportive communities of these two Communes – Anosiala, Besakoa, Bereny, and Ambazoa (Hudson et al., 2016). All four Fokontany have been included in this research. Together, these communities shape the Ala Mahavelo Association, and in turn for their support they are provided with job opportunities, a place to sell their crops, and a place to fetch water.

The region north of Tsihombe Town including the Communes of Imongy and Akilivalo, on the other hand, has been indicated as a potential release site.

Especially Imongy had been defined to be most interesting before, based on past experiences of collaboration with the TSA. Ecological surveys have been done in this region yet and the forest is believed to be dense and hard to access, hence displaying a good habitat for tortoises. Despite the rather close distance to Tsihombe Town when looking on the map, the travel to the included villages takes long due to the small curvy roads, sometimes more suitable for zebu carts than a 4x4 vehicle.

Tsihombe is a relatively large town compared to most villages around the TCC. Market days transform it into a busy hub with countless zebu carts parked on the dry Manambovo river bed at the border.

People come from the many small villages surrounding it, either to buy or sell their goods, just to socialize and look around, or deliberately on the search for someone to hook up with. A camion packed with people, their luggage, packages, and animals, is waiting on a small square until really nothing else can be loaded onto the vehicle anymore. The chicken hanging upside down at the side are patiently waiting until the camion takes off on its bumpy journey on the road to Ambovombe (the Androy capitol) or another destination. – Personal field notes

Tsihombe's inhabitants are a diverse mixture of Antandroy people from the region as well as other tribes from different places, hence influenced by the many different perspectives that accompany this diversity. Tsihombe is a town that is known for a growing tortoise consuming population and it is even claimed to be "a confirmed tortoise-consuming center" (Randriamahazo et al., 2011: 67). People do not sell tortoises out in the open, but several informants indicated to have experienced cases where they were offered tortoise meat or heard of people selling it. The fear of repercussions for violating the widely adopted tortoise taboo, as displayed in the small villages, appears to be partly faded in this town.

The diverse crowds of the Thursday market in Tsihombe are in large contrast to the quiet, remote villages surrounding it. Zebu cart roads spread their arms in all directions away from the town, and lead to countless Fokontany existing of about twenty to forty wooden houses.

These are the villages where vazaha ('outsiders') are frequently believed to be on the hunt for people's organs, resulting in wide eyes filled with fear and people sprinting away as soon as you come in their sight. The camions do not come in the remote villages that are only accessible through a narrow road suitable for herds of cattle and the zebu carts. The people of those Fokontany also travel by foot, bicycle or sometimes a motorcycle. The zebu carts frequently make the journey to and from the Manambovo river bordering Tsihombe Town, carrying large containers of water since this cannot be accessed in the villages themselves. Water is scarce, and the river is not flowing during the dry time of the year. Instead, holes have been made in the ground of the otherwise flowing river, in that way accessing the salty water that is still stored in the soil. People do everything with and in this water, and hence it can barely be called clean drinking water. The long journey that has to be made to fetch water makes that people in the remote villages rarely waste the precious substance to wash themselves nor their clothes. Drinking water is the first priority and is not spilled unnecessarily. – Personal field notes

A Fokontany to highlight in the Commune of Marovato is the Fokontany Antsakoamasy, located in the outskirts of the Cap Sainte Marie reserve that accommodates a large radiated tortoise population (Hudson, 2013). Here, a group of local people has been reported to be actively engaged with tortoise protection, starting from the prevailing tortoise taboo where "tortoises are seen as the embodiment of their ancestors" (Hudson, 2013: 71). As a reward for these conservation efforts, the TSA provided money for a school and a zebu to be sacrificed for ceremony sealing the TSA's Memorandum of Understanding for tortoise conservation with the villagers (Randriamahazo et al., 2011; Randriamahazo, Hudson & Castellano, 2012; Randriamahazo et al. 2013). This is reported to have obtained much attention from people outside the village, and the community "has since become a regional model that establishes a strong link between protecting tortoises and long-term benefits for the community" (Hudson, 2013: 72). While conducting interviews in the Fokontany, the school was closed due to the summer holidays, but this history was noticeable in the behavior of the Chef Fokontany who seemingly tried to leave a good impression by attempting to carefully instruct and select the respondents, despite the clear indication that the research was independent from the TSA. To prevent such a bias, no more than two interviews have been conducted in this village.



Picture 7: The view of the TCC environment shows a slightly hilly landscape with the low vegetation of the spiny forest covering different colors of sandy soil, while the children of Bereny are curiously looking up.

Tranovaho East (District Beloha)

The Commune of Tranovaho, which has been split in an eastern and western part for this research, belong to the District of Beloha. This district is still part of the Androy region but more south of Tsihombe. Beloha Town can be compared to Tsihombe in size and in the presence of a variety of people coming from different regions of Madagascar. There are many people passing through this village, such as the lobster trucks, and foreign aid presence seems high.

Near the church with its striking colored glass windows, is a large base of CRS, where many white motorbikes with the CRS logo can be seen. A little further, a large storage of USAID can be seen, packed with stacks of, amongst others, flower bags and boxes with Plumpy SUP (food supplements) to be distributed. – Personal field notes

These are just two out of many organizations present. While residing here, several missionaries were met who go into 'the woods' to visit far away villages to "bring them the good news". Related to tortoises, there is a Forestry department which is, among others, in charge of tortoise confiscations and other tortoise-related violations.

Such violations are not uncommon in Beloha Town, which just like Tsihombe is considered to have a growing tortoise consuming population (Randriamahazo et al., 2011). In the past, many of the *Hotelies* (small food corners) alongside the main road illegally sold tortoise meat. In the past few years, many of the people involved have been caught and ended up in jail. Due to a fear for possible resentful feelings of the family members, the TSA staff generally only eats at the few *Hotelies* which owners have not been involved with tortoise poaching when residing in the town. However, just like the sites in Tsihombe, most Fokontany that were included are rather far from the large town and the connecting road and, are less exposed to the many 'outsiders' and their views present in Beloha Town.

From Beloha Town, a relatively large but still bumpy unpaved road goes towards the coast. Finally, the end of the plateau is reached and the ocean can be seen meters below. A narrow and steep road goes down those cliffs, leading to the lower costal area where the Fokontany of eastern part of Tranovaho are located, including the village Lavanono. Zebu carts, cyclists and motorcycles carrying several large fish at the back, and even 4x4s struggle up and down this tricky road.



Picture 8: The large, oddly shaped trees in the village of Bejavo, Tranovaho, create shady and quiet spots very suitable for some interviews.

Lavanono is a small, rather quiet place. The village center exists of a little square with some small grocery and coffee stores, and some wooden houses around it. That is where music can be heard in the evening and children are dancing and playing. A few places with bungalows for visitors are right at the sea, since Lavanono is known for its good surfing places and valued for its quietness. A group of French speaking kite surfers who were in an arranged surf-themed travel along the coast, shows the village is also known among foreigners. Foreigners, however, are still not numerous and the visitors belonging to the ones most frequently passing are the lobster buyer trucks that fetch freshly caught lobster to bring them to other places in the surroundings, including Fort Dauphin. These are also frequently mentioned by the respondents to come to villagers to collect tortoises. – Personal field notes

In the end of 2014, an awareness campaign called *Soccer for Sokake* took place in Lavanono. This initiative included a tortoise-themed soccer game and the donation of the sports cloths and footballs to the community (Hudson, 2015). This was meant to create affinity with the tortoise conservation among the community and to “facilitate learning about the conservation” (Hudson, 2015: 19). The festival itself was experienced as successful, although problems have been experienced with a proper distribution of the clothes.

Tranovaho West & Ampanihy (District Beloha and Ampanihy Ouest)

The western part of Tranovaho borders the Menarandra river which indicates the border between the Androy region and the predominantly Mahafaly Southwest. On the southwestern side, Fokontany of the Ampanihy Ouest Commune have been included, which are near to the sacred forest of Ankirikirike and which is an area that is known by the TSA for its community support protecting tortoises.

At the time of the interviews, the drought in Ampanihy Ouest was striking compared to previous locations, visibly diminishing water and food availability for both animals and humans.

It is hot, and sand dusts in the desert wind. Cacti are looking thin and yellow, showing a lack water even in the soil. It has been two years since good rain, one of the respondents explained. He apologized for not being able to provide food as would be the custom for visitors. “Here we don’t have watermelons or mangos” he explained. – Personal field notes



Picture 9: A general view of a parking place, since zebu carts (sereti) are the main mode of transport when one needs to go to neighboring towns or villages with the family, or transport other cargo like long sticks of sugar cane or jerrycans of water.

In and near to Ampanihy there are no tortoises to be seen. They have been poached to an extent that they are not visibly present anymore, and those that are left are hiding for the heat and the burning sun. The Fokontany that have been targeted are about 50 to 60 km away from the city, near to forest that had been surveyed before and declared of good quality for releasing tortoises.

Ampotoka, of the Commune of Tranovaho, is especially a Fokontany that has been working with the TSA in the past. In 2011, it was stated that “the Ampotoka community would like to improve the outlook for the Sirempo forest by strengthening its protection using a community-managed forest system” (Randriamahazo et al., 2011: 66). In October 2011, about 2000 tortoise carcasses were found in Tranovaho, poached. However, Ampotoka as well as Tranovaho were defined as places suitable for release because of good habitat and “adjacent communities supportive of tortoise protection” (Randriamahazo, Hudson & Castellano, 2013). Besides, both villages have adopted a *Dina* that includes monitoring of the forests and reporting cases of poaching (Randriamahazo et al., 2014). For this reason, over two hundred tortoises have been released in both areas over several years (Randriamahazo, Hudson & Castellano, 2012; Hudson, 2015). Moreover, tortoise conservation promoting campaigns have been active in the region. 260 radiated tortoise t-shirts have been provided by the TSA and distributed among the heads of the households in Marolinta, another village, to wear during a parade at Independence Day. Also, a cell phone including phone credit has been given to the people of Ampotoka to enable them to report tortoise poaching activities to those in charge in Beloha (Randriamahazo et al., 2011). In this way, the area has been exposed to tortoise conservation values through multiple conservation efforts yet.



Picture 10: Market day in Marolinta means a colorful mass of people looking around for lambas, food and second hand clothing, leaving the surrounding villages empty of respondents.

Antanimora (District Antanimora)

In the Commune of Antanimora, the TSA has not been considerably active with tortoise conservation activities. However, tortoises are present in the area and therefore it is considered to be of relevance in tortoise conservation. Antanimora is a hilly town slightly bigger than Tsihombe, on the road to Tana, surrounded by hills and mountains.

The main road stands out for its quality. From Ambovombe it starts off rather bumpy, but when one comes closer to the town the road is more flattened. The last kilometer or more, the road turns from sand almost magically into a concrete one, starting with a large blue sign with a circle of small stars, proudly indicating that it has been sponsored by the European Union. The beauty of a relatively good road is partly overshadowed by the lurking danger of bandits who sporadically attack people on this same road. They became even more active during the current presidential elections, since much attention goes to guarding the candidates and their delegations on their many trips and visits. Despite the fact that Antanimora is on the route to Tana, not many vazahas stay in the village for more than a few hours. 4x4s stop for a snack at the 'station' and proceed their journey. Antanimora is not connected to the power grid. Some people have solar panels, and only one hotel offers access to electricity - a light bulb that works from around 18:00 till 06:00 in the morning and a possibility to charge one's phone in the connected grocery shop. A laptop does not stand a chance to be charged. – Personal field notes

In the Fokontany around Antanimora Town, the Andriamanarina clan is most abundant and hence they make up for over 50% of the research population in this site. They claim to be the 'clan of the king' and consider themselves more important than any of the other Antandroy clans. During the interviews, many times respondents from this clan mentioned at least once, but most often multiple times, that they were the royal clan. Before entering one of the Andriamanarina villages, the field guide and translator needed to sit in a slave pose in order to make the people acknowledge his presence and make them willing to speak with him. According to other informants, however, other clans generally do not acknowledge this royal claim, thus being more a self-declared status. Another village that stood out was Manavy, which largely existed of people practicing exorcism. Multiple respondents from this village clearly stressed this by especially starting to wear long white clothing that is typical for the exorcists in that village. Both the Andriamanarina clan and this village show a visible pride for their identity.



Picture 11: The concrete road leading into the town of Antanimora, usually passed with only a quick stop before travelling more up north.

Ejeda, Androka & Kaikarivo, Itampolo (District of Ampanihy Ouest)

The District of Ampanihy firstly includes Ejeda Town and its surrounding Fokontany. Ejeda Town is located more land inwards and known for being one of the tortoise consuming centers yet still containing a considerable tortoise population (Randriamahazo et al., 2011). Its environment is flat, bare and has many large open spaces.

The sun burns on the dry soil and a shivering of hot air floats close to the ground. Here the raketa looks thin and deprived of water. According to one respondent, this was very different in the past. Many more tree species could be seen and the river was deep and was inhabited by crocodiles. Now, the riverbank is patched with only few shimmering pools of muddy water, eagerly used for bathing, washing clothes, and other purposes. The town is not connected to the electricity net and hence people solely use solar panels to generate energy.

Not many fruits or vegetables can be found in town. Mangos are everywhere, however, since it is the season. Children slam the un-peeled mangos to a hard surface at hand and suck the sweet juice from a small opening in the skin. Casually people walk around with a half-peeled mango in their hands, the juice dripping down from their hands, sometimes loudly slurping to prevent the sticky juice from getting too much in their face. It is almost impossible to prevent the fibers from getting stuck between one's teeth and to wipe away all traces, and many interviews have been done with still some proof of the mango season visible on hands, face or clothes. – Personal field notes

Not many tortoises are left around the town. The interviewees of the two villages near to the town all indicate that the number of tortoises decreased drastically over the years, and poachers are not an exceptional presence. The village Ankazotà, however, is located more away from the town and a curvy road leads through a rather hilly landscape, passing by some seemingly denser forest. When arriving in the village, the first interview is with a man with a proud look in his eyes, from under his hat, a large blanket wrapped around his shoulders. Later it has been informed that this was the king of the Temanatoly clan. A pride for this heritage shows in how the respondents frequently mention their status as member of the king's family.



Picture 12: Conducting interviews in Ankazotà, Ejeda, while the king's family is watching from a distance.

The drive from Ejeda to the coastal regions of Androka, Kaikarivo and Itampolo takes about half a day with a 4x4 vehicle following a bumpy road. Itampolo is a larger village, and, just like Lavanono, a place known among surfers and tourists are thus not unfamiliar to the village inhabitants.

Its three nightclubs let their music play from early in the evening until about 2 in the morning daily, except on Sundays. Visitors have the choice of multiple hotels, including rather high-end bungalows where food options are considerably more extensive than in the village itself. On the village market, fish is abundant, whereas fresh fruits other than mangos and vegetables are harder to find. On the white beach, fishers and their boats are waiting patiently for the right tide to embark in the turquoise ocean, children are playing in the tide puddles, and a group of woman and children is peeling a large pile of sea urchins along the shore. – Personal field notes

Despite the abundance of water represented by the large waterbody of the ocean, freshwater is scarce in the surrounding area of Lavanono. Multiple respondents indicated the last time that ‘good rain’ fell was seven years ago, which means that previous years have been hard for farming on the dry land. This also means the risk on malnutrition is high, and so is the dependence on fishery.

Close to Itampolo is the village Lavavolo where another TSA Tortoise Rescue Center (TRC) is located. “The Lavavolo area was selected as the initial site for long-term conservation since the people of Lavavolo still maintain the local “fady” (taboo) against eating or harming tortoises” (Rafeliarisoa, 2009). The building of the TRC was started in 2016, “in response to that community’s desire to see tortoise confiscations remain within the region” (Hudson et al., 2016: 25). From a survey among the people in Lavavolo, it became clear that electricity and water were two of the main deficiencies in the region. Therefore, a plan to enable electricity access by means of solar and wind power came to existence, while at the same time providing job opportunities in the TRC itself. Aside from the TSA presence, Conservation Fusion (CF) is another organization active in the region. CF is, in their own words, focusing on education as a means in radiated tortoise conservation, stating that “by producing conservation messages tied to community-based efforts, education ultimately functions as the key component in creating a united and therefore sustainable tortoise conservation program throughout the region” (McGuire, 2011: 77). It targeted Lavavolo where they distributed educational materials, organized a ‘festival of tortoises’, and developed conservation branded T-shirts and tortoise mascot costumes (McGuire, 2011). Besides, opposite of the TRC it established a school that includes environmental education, also on tortoises, called the ‘DREAM school’ (McGuire, 2011). These cases show a high exposure of the surrounding villages’ inhabitants to conservation values.



Picture 13: The dusting sand on the bare coastal lands of Ambalatsimiviky, Kaikarivo, make it hard to record by times, yet a single tree can provide the necessary cover to create a spot to conduct yet another interview.

4.2. The tortoise in Antandroy and Mahafaly society

The radiated tortoise roams around in all the research sites, and dependent on its population density often crosses the paths of the human inhabitants. Not only is the tortoise part of the natural environment, it also plays a role in the people's beliefs and practices. In order to understand this human-tortoise relationship, and more specifically the tortoise taboo and the dynamics of its panoptic system of self-surveillance, it is necessary to know the existing knowledge related to the tortoises first. That is why this chapter will discuss the first sub-question:

How is the tortoise apparent in Antandroy and Mahafaly knowledge?

The tortoise-related knowledge can be divided in three types of knowledge that have been deduced from the interviews: ecological knowledge, taboo-related knowledge, and knowledge connecting other beliefs to the tortoise. These three types have been deduced from the topics that came up and were discussed during the interviews. Ecological knowledge, in this use, is defined as knowledge that is scientifically acknowledged, such as the species' behavior and role in the ecosystem. 'Beliefs', in this case, refer to knowledge that is not scientifically acknowledged but still adopted by the respondents. This distinction is acknowledged to be debatable yet adopted in this research to enable a clearer grouping of the knowledge described.

4.2.1. Ecological knowledge

Respondents were asked if they see tortoises around their village and what they know about them. Most of the time, the answers of the respondents largely displayed a general knowledge on the tortoises' behavior. When the weather is very sunny, the tortoises are observed to be hiding underneath the vegetation, whereas they come out and walk around at the lesser hot times of the day, especially when it rains. Respondents see them eating most of the reachable vegetation and anything else that they can find, even *zebu* (cow) poop as mentioned by some. This knowledge is mainly based on personal observations.

Respondents seem to be less aware of the tortoises' traits that are less easy to observe in daily life, or at least it is not something that generally people think of when they are asked about what they know about tortoises or what would happen when tortoises would disappear. Once, a respondent mentioned:

When the Tabé tree drops its seeds, those seeds grow by themselves, but they are not so strong. When the tortoise first eats the fruits and poops out the seeds somewhere else, the seeds are much stronger and grow much better. Therefore they are important to the forest – Respondent 202, Antanimora

This shows an awareness of tortoises' seed dispersing role in the ecosystem, and hence their function in maintaining the forest. Besides, a sense of the tortoise as part of the ecosystem has been expressed in a more general manner yet lacking the ability to explain the exact purpose of the tortoise in this system. As metaphorically expressed by an Antandroy respondent:

A hand has 5 fingers and when 2 fingers are missing, it is not a well-functioning hand anymore. So when the tortoises are gone, nothing will work anymore – Respondent 118, Tranovaho

In most cases, however, respondents did not mention such more holistic insights in the more complicated role of the tortoises in the ecosystem. Besides, not always seem respondents aware of the radiated tortoise's habitat range. This shows, for example, in cases where respondents indicated that the radiated tortoises have disappeared from the northern regions, whereas in reality the radiated tortoise never occurred here, or that tortoises only occur in Antandroy areas, sent by *Zanahary* ('the creator', the equivalent of God) as mentioned by some Antandroy respondents. These respondents are hence displaying knowledge on the tortoise more based on what is locally observable in daily life or stories related to their spiritual beliefs that have been told by other (elder) community members. Therefore, it can be concluded that (scientific) ecological knowledge on the tortoise is limited among the Antandroy and Mahafaly research population, which is not surprising considering the limited education available in the region.

4.2.2. Taboo-related knowledge

The taboo on tortoises is part of the larger *fady* system consisting of a variety of taboos, differing per tribe, clan, community, and even per family (Ruud, 1960). As simply stated by a respondent: “If it is something the ancestors didn’t eat, it is taboo for us too” (Respondent 250). The tortoise taboo is one of the animal taboos, and these taboos have different reasons, stories of origin, connected repercussions, and strengths.

Lizards and snakes are taboo too, but these are just animals that we don’t eat. We don’t know the story behind them and just call it fady because we don’t eat them. The tortoise taboo is also stronger because it came with a curse – Respondent 251, Kaikarivo

This shows that knowing the story of the taboo origin is perceived as a contributing factor in determining the strength of a taboo, which is why these stories are of relevance to this research.

Multiple stories on the origin of the tortoise taboo exist and they differ from village to village and even within each village the stories and their versions vary. People usually indicate to learn about those stories from the elders of the village or their father, and the knowledge of those stories is typically orally transmitted by storytelling as is common in traditional ecological knowledge (Shackeroff & Campbell, 2007). No written versions have been encountered in the field. Storytelling can be defined as the “art of using words and actions to reveal the elements and images of a story while encouraging the listener’s imagination”, and stories are believed to be “preserved as a collective experience” (Fernández-Llamazares & Cabeza, 2017: 2). Such collective experiences are bound to the location and community in which the stories are being told, and cooperative interaction during the storytelling process is generally perceived as “adapting to new sociocultural scenarios” (Brown, 2013; Fernández-Llamazares & Cabeza, 2017: 3). This explains the wide variation in stories on both the village and personal level.

Especially the Antandroy respondents often mentioned that the stories only apply to the Antandroy people – frequently showing a hint of pride for their tribe – and that only their own tribe has the tortoise taboo. The Mahafaly respondents seem to be more aware of the fact that they share the taboo with the Antandroy, or at least they do not feel the need to emphasize the uniqueness of their taboo. Despite the many different versions and ways of telling the stories, several stories are reoccurring, as visible in the overview displayed in Table 3 and Figure 8. The content of these stories will be outlined later in this chapter.

Story	Antandroy	Mahafaly
Cooking pot	74%	60%
Lady parts	7%	5%
Other	6%	24%
Lady parts & cooking pot	7%	4%
Other & cooking pot	1%	1%
Other & lady parts	0%	1%
Doesn't know	7%	5%

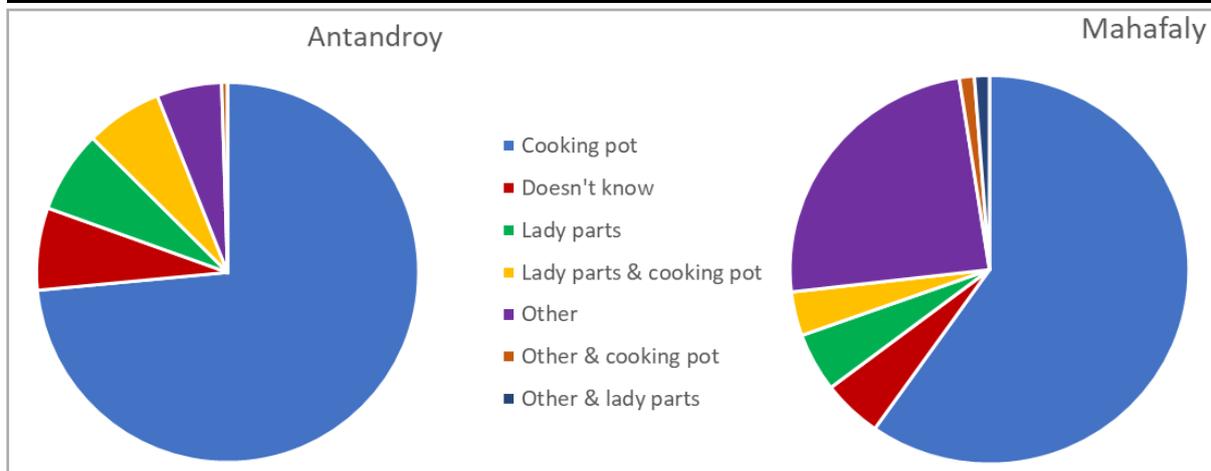


Table 3 & Figure 8: Frequency of stories being told among the respondents

Whether people are Mahafaly or Antandroy, the stories do not vary much. Respondents from both tribes tell the cooking pot story most frequently. The versions of this story differ, but this seems to be more dependent on place rather than tribe. No clear distinction can be made between the Mahafaly and Antandroy versions. After the cooking pot story, the story about the lady parts has been told most frequently, half of the time as the alternative story of the cooking pot story since the story is often considered to be “too shameful” to tell. Aside from those stories there are multiple other ones that are told, which in the table and the figures are grouped as “other”. This group is clearly larger for the Mahafaly respondents than the Antandroy, differing with 24% compared to 6% respectively. This difference is largely due to the respondents from the Temilahe and Temitongoa clans, who have stories that are more clan-specific. The story told by many Temitongoa people is about how their Antanosy ancestor came to the area they live in now and hence adopted the taboos from that region. In this way, the story can be seen as a more historical one because it does not explain where the taboo came from in the first place. Again, the difference in explanation how the taboo started can better be explained by a difference in clan than a difference in tribe, meaning that when a certain target group is addressed, assumptions and decisions on an approach cannot easily be made based on basic knowledge on tribes only.

To provide an idea of the content of the different stories being told by the respondents, eight stories have been reconstructed as a compilation from all these versions. These are the stories that have been mentioned at least more than once during the interviews, or distinguish themselves as a considerably different story. They are no exact transcriptions, but a representation following the freedom of improvisation typical in storytelling (Fernández-Llamazares & Cabeza, 2017), meant to provide an impression of the content of each story, and to provide an insight in the components that they include.



The clay cooking pot (vilany tany)

The most frequently told story is that of the broken clay cooking pot, the *vilany tany*. A long time ago, so goes the story, all people were still eating tortoises. It was the time before the taboo existed. One day, people decided to cook a tortoise – some say it was a man and a woman involved, some say it was an Antanosy and an Antandroy (or a Mahafaly when it is told by a Mahafaly). The Antandroy (or Mahafaly), however, did not cut the tortoise before cooking it. Maybe it was still at the time people did not

have knives yet, maybe the Antandroy (or Mahafaly) just missed some basic knowledge on cooking skills. One way or the other, the tortoise ended up in the clay cooking pot as a whole, still alive. The water in the pot was of course very hot, and as soon as the tortoise started to feel the heat, it started moving. The tortoise clearly did not like the idea of being cooked and ultimately its movements made the clay pot break. Succeeded in its intention, the tortoise took off and reached its freedom. The humans, in turn, were very upset. Such cooking pots were said to be rare in those days, and this meant that the family did not have something to cook with until a new cooking pot was arranged. This might have even caused the death of several of the children. Ultimately, all the consternation ended up with the decision that in the future no Antandroy (or Mahafaly) would be allowed to eat tortoise once again. These were the ancestors of all Antandroy (or Mahafaly) people and their decision resulted in a tortoise taboo ever since.

The woman and her lady parts

Another story, which is said to be more shameful but frequently claimed to be true even more, tells about women going into the forest to collect tortoises. They find many and bring some of them home to their husband. However, one woman, an Antandroy (or Mahafaly, again depending on who tells the story), decides to steal a tortoise, supposedly a large male individual. To keep the tortoise unnoticed, the woman sits down on it and hides it under her *lamba* (sarong, typically worn by women). The tortoise, not very surprisingly, does not appreciate this treatment and starts to bite the woman in her thighs and her lady parts. Apparently, the woman is very determined to keep the tortoise hidden, because she continues sitting on the tortoise and does not set it free even when she starts bleeding. The tortoise, in turn, continues its attack, and ultimately all the blood does not stay unnoticed. Some say the woman died due to the blood loss, some say the husband notices the blood before it is too late. Anyway, the shame and/or the anger resulting from this happening where the tortoise bit the “man’s belonging” (an indication for the lady parts of the man’s wife) made these ancestors decide that none of their offspring would ever eat tortoise again. Since it was so shameful, it is sometimes said that therefore they came up with another story – the cooking pot story – which now is the story most commonly being told.



The dead son of the king

A rather different story tells about a king whose son just had died. The king’s son was buried according to the customs of that time, in a tomb covered by stones, and the king was in mourning.

The next day, however, a child passes by the tomb and hears something moving inside. He does not see what it is, and quickly he runs to the king’s residence and brings him the message about what he had heard. The king is immediately alarmed and with his people he takes off to the tomb of his son. Under the impression that his son may still be alive, a zebu is brought already to start a sacrifice ritual. When they arrive at the tomb, they indeed hear something inside, yet when they remove some of the stones, a tortoise appears from where the son had been buried. The tortoise climbs out and takes off. At that time, the people did not know what it was, but they saw the tortoise as an opening (*nisokake*) to the other world of the ancestors and arguably being a reincarnation of the son of the king, the ancestor of the Antandroy (or Mahafaly, depending on the storyteller). For this reason, it was decided that no Antandroy (or Mahafaly) would ever be allowed to eat tortoises in the future.



The death of the two brothers

Only once the following story was told by an Antandroy respondent from the Fokontany Ankilivalo Nord. A long time ago, there were two brothers; one brother was living at the western side of a large open space, the other was living at the eastern side. They both had grandchildren. Then, the oldest

brother died and many zebu were sacrificed for his burial ceremony. His tomb was built at his side of the open space. One day after this had happened, one of the grandchildren of this man visits one of the female grandchildren of the other man – the younger brother of the man who died. It is night, the stars are out and the boy passes by the tomb of the older brother. There, on the tomb, sits a tortoise, and it suddenly makes a hissing noise when the boy passes by. The unexpected noise frightens the boy, and when he sees the shadow of the tortoise, he concludes the noise came from the man who died. The next day, he tells his story to the community, and they all follow him back to the tomb to see for themselves. The tortoise is still there, and when the villagers see it, they conclude that the tortoise must have eaten the man who died. The part of the community living at the side of the younger brother decides to eat the tortoise as an act of revenge, whereas the others wish to respect it for being the animal that ate the grandfather. The people who ate the tortoise became the Antanosy people, the ones who did not became the Antandroy people. Together with the decision to not eat that particular tortoise, the Antandroy tortoise taboo started, including a curse that all Antandroy who eat a tortoise will have a bad life. The story continues with the day that the other brother died. His tomb was built near to his brother. One day, another grandchild walks by, and in the tree next to the tomb he sees a group of goats. Suddenly, it strikes him that one of them has a beard just like the old man who died. When the community members see this, they believe the goat must have eaten the old man. The ones who did not eat the tortoise before, decide to kill and eat the goat this time, as a revenge, and that is how the Antandroy people started to eat goats.



A savior from enemies

Not so frequently mentioned, only by the Antandroy respondents, is the story of an Antandroy man who went into the forest with his zebu. They had been walking there for a while, when, all of a sudden, the man hears the voices of some people. He recognizes these voices; they are the voices of his enemies. He runs away from them, taking his zebu with him, deeper into the forest. He finally becomes tired and finds a hiding place for him and his zebu. The enemies, however, were close behind him and they are still approaching. He is about to be found. Yet, then the man notices a tortoise near to the place where he and his zebu are hiding. When the enemies come very close, the tortoise makes the hissing noise they all make when they suddenly hide themselves in their shield. This noise

surprises the enemies and frightened for whatever made that noise they quickly take off and disappear in the woods. The Antandroy man was saved and from that time onwards tortoises and humans became friends.

Healing a wounded ancestor

A story that has only been told by some people from the Andriamanarina clan, from the Antandroy tribe, is about a man who lived a long time ago, and who was sick. His skin was all swollen on one place due to a wound or another reason. The man was suffering and very weak. One he felt tired and he sits down at a shady spot under a tree to rest. While sitting there, he suddenly sees a tortoise walking. While observing it, the man starts realizing the tortoise comes towards him. When it is close to where the man is sitting, the tortoise approaches even more and it starts scratching the man's skin

on the place where it is swollen. Miraculously, the swellings disappear after this happening, and so the man was cured by the tortoise. That is how this same Antandroy man decided the tortoise should be taboo for his descendants from that day onwards.

The king who was waiting for his people or: the kokolampo of the Temilahe clan

Multiple times, a version of the following story has been told by Mahafaly respondents. All versions tell about someone with much power over a community. In some cases this refers to a king, in the Temilahe clan it refers to a *kokolampo* which is a spirit that sometimes possesses people. The king was much respected by the community (as was the case with the *kokolampo*), and so was everything he said. One day, the king (or the *kokolampo*) wants to gather all the villagers to speak to them on a Thursday. However, no one of the villagers is around at that time, because they are all in the forest collecting tortoises since tortoises are their main source of food. The king (or the *kokolampo*) waits the entire day in vain, and when no one shows up he needs to leave. The next day he returns, but the same thing happens all over again. It goes on like this for a few days, in the exact same way. Ultimately, the king (or the *kokolampo*) becomes very annoyed by the situation caused by the villager's urge to collect tortoises. Therefore, he decided that from that day onwards eating tortoises would become taboo for those people and their generations to come.

The Antanosy ancestor of the Temitongoa clan (and Andriamaro)

The origin of the tortoise taboo and the origin of the Temitongoa clan are related to each other, and therefore it is the story of the origin of the clan that has been told by multiple Temitongoa respondents. The versions of the story widely vary, but they all agree that the clan originates from the Antanosy tribe in the Southeast, arguably from the Sorania clan in Fort Dauphin. The following version was told by one respondent from Besasavy Sud:

A long time ago, before the colonization, there was a powerful Ombiasa in charge of this entire region, including the Districts of Betioky, Menarandra, and Linta. His name was Andriamaro. One day, he decided that three taboos would have to be respected by all people under his reign. The first is the taboo on hafotse, which is a tree that people commonly make rope of. The second taboo is that of 'rakemba tsy misorona', which means that women are not allowed to do sacrifices or anything else at the Hazomanga [the sacred place where the ancestral realm can be accessed and all ceremonies take place]. The third taboo that he proclaimed is the tortoise taboo. The three taboos were brought by Andriamaro to the Hazomanga, where they were approved, meaning that something will always happen when the taboo is broken. To undo this decision, the exact same ceremony needs to be held at the exact same Hazomanga. This is practically impossible and thus started the tortoise taboo.

As continued by another respondent of the same Fokontany:

The Temitongoa clan originally comes from Fort Dauphin. They were Antanosy people from the Sorania clan. One day, two people left Fort Dauphin to find another place to live: an Antanosy from the Sorania clan, named Tsivaly, and an Antandroy named Andriambelava. They both travelled to the northwest, and finally they arrived in Ejeda where the king of Ankazota ruled. The name of this king was Andriamaro, and he welcomed them in his kingdom. He allocated each of them a place to settle, under the condition that the two would respect the tortoise taboo of his people. They accepted these terms, and the Antanosy moved to Lembitobe, whereas the Antandroy moved to Vohitsitonta of which the river Linta is the southern border. That is how the Antanosy ancestor of the Temitongoa clan adopted the tortoise taboo and ended up in this region.



When looking at the different versions of the origin stories related to the tortoise taboo, some common components can be distinguished. For the stories about the cooking pot, the lady parts, and the king waiting for his people, the decision to start the taboo is connected to something bad that happened due to the tortoise, thus connecting a negative sentiment to the tortoise. In the case of the stories about the king's dead son and the two brothers, the tortoise becomes regarded as an ancestor itself, hence adding an ancestral value to the tortoise. Positive sentiments are also connected to the tortoise in the stories telling about a tortoise healing an ancestor and rescuing one from enemies, thus showing a positive role of the tortoise in the tribe or clan's past. The last story of the Temitongoa clan is more practical and does not explain how the taboo started in the first place. Looking at the frequency to which each story is told, it seems that the stories with a negative connection to the tortoise prevail. Nevertheless, the respondents generally do not express considerable anger towards the tortoise, but rather an acceptance of the decision that their ancestor made a long time ago. The main component can thus be defined as an ancestor of the tribe or clan deciding the tortoise to be taboo for all his or her descendants, which decision is still respected by many to this day. Possessing the knowledge of the origin story has been defined by the respondents as a main indicator for a strong taboo, yet the exact content does not seem to matter much in the level of respecting the taboo, since it is rather the respect for the ancestors and the *Hazomanga* that makes people respect the taboo too.

4.2.3. Other tortoise-related beliefs

Multiple other beliefs can be distinguished that are related to tortoises yet not directly to the tortoise taboo. Table 4 first shows four categories of beliefs that have been deduced from the interviews, including the related percentages of mentioning per site. These categories include the connection to rain, to blessings, to good fortune and/or a good trip, and protection from diseases. Such beliefs generally connect positive attributes to the tortoises, thus relating positive attitudes and sentiments to them. Therefore, the table also shows the percentage expressing concerns when the tortoises would be gone, since such concerns were frequently explained by the fear of losing one or more positive attributes ascribed to the tortoise. The four categories will be elaborated on below, with the beliefs connecting blessings and good fortune and/or a good trip being discussed together since they appear to be frequently related.

Expressed belief	1. Nikoly	2. Marovato	3. Tranovaho East	4. Tranovaho West & Ampanihy	5. Imongy & Ankilivalo	6. Antanimora	7. Ejeda	8. Androka & Kaikarivo	9. Itampolo
% of respondents in location X connecting rain to tortoises	11	15	43	81	60	50	60	84	80
% of respondents in location X connecting blessings to tortoises	68	43	47	62	54	61	7	68	56
% of respondents in location X connecting good fortune/ a good trip to tortoises	5	8	20	24	3	18	33	16	32
% of respondents in location X connecting protection from diseases to tortoises	0	3	30	3	6	5	0	8	20
% of respondents in location X expressing concerns when the tortoises would be gone	/	/	70	89	71	71	93	92	96

Table 4: Percentages of the mentioned beliefs per research site

Tortoises and blessings, good fortune and a good trip

On the question what the respondents do when they see a tortoise, over half of the respondents mentioned to either put green leaves or pour some water on the tortoise. Tortoises are frequently encountered on the road, but especially when being on a trip to the market, or more specifically on a trip that is considered important like going to an *Ombiasa* for medicines, the sight of a tortoise on the way has a special, positive meaning. Frequently it has been indicated as a sign that the trip will be good, that good fortune will be upon the traveler, and/or that blessings can be obtained. As expressed by one respondent:

Tortoises are like ancestors us. This means that we ask blessing from them – Respondent 276, Itampolo

For blessings, most respondents believe something needs to be done in order to receive them. When on the road, one may pick some green leaves and throw them on top of the tortoise, either asking for blessings out loud saying “sokake ty havelo” (“open the blessings”) or just by the act of doing it. This sentence already shows the connection between tortoises and blessings, since the meaning of *sokake* (tortoise) also refers to the verb ‘to open’ (*nisokiake*). In this reasoning, tortoises are a means to open the way to the ancestral realm, allowing the person to ask for and receive blessings and good fortune from their ancestors. When a tortoise is encountered in the village, frequently pouring some water on the tortoise is preferred over green leaves to ask for blessings and good fortune, this time less related to a good trip. This belief of tortoises providing a way to communicate with the ancestors shows a practical value of live tortoises that has been adopted by the majority of the respondents. Therefore, multiple times the fear has been expressed to not be able to receive such blessings anymore when tortoises would disappear from the region.

Tortoises and rain

Another belief that connects tortoises to the realm of the ancestors and Zanahary, is that tortoises can ask Zanahary for rain. As explained by one respondent:

“The tortoises cannot grow anything as humans do and therefore Zanahary sends them rain. The rain makes trees grow which are like crops for the tortoises.” – Respondent 283, Itampolo

In this reasoning, rain comes to the region because tortoises ask Zanahary for rain to drink, to make their food grow, and to survive. When many tortoises come out of their hiding places, thus goes the belief, the tortoises gather to ask Zanahary for rain, on which Zanahary responds since Zanahary takes care of them. Seeing many tortoises, for this reason, is frequently said to be a sign that, and the reason why, rain comes. In a region where water is scarce and can make the difference between life and death, rain is highly valued:

When there won't be any tortoises anymore, rain won't come because Zanahary sends rain to the tortoises. Everyone here will die (...) The tortoises make us live because they make rain to come every month. We will live [when there would be more tortoises]. – Respondent 275, Itampolo

This shows a sharp contrast of life and death related to tortoise presence. No rain is indicated as a ‘bad year’, typically including a bad harvest, famine, and death. A fear for such years is frequently expressed by the respondents, and the belief that the presence of tortoises can diminish the risk on such years thus seems a strong driver for people to ensure this presence. Besides, some respondents also expressed the belief that the lack of rain may be caused by the wrath of Zanahary and the ancestors because too much tortoise blood has been shed and the taboo has been broken too many times. In those cases, tortoise protection and adherence to the taboo are both means to ensure rainfall, or at least ways to decrease the risk on a bad year.



Tortoises and protection from diseases

Multiple times, tortoises are mentioned to protect chicken and/or humans from diseases, most frequently in the research site of Tranovaho East where it was mentioned by about 30% of the respondents. Madagascar has many cases of impactful outbreaks of infectious diseases, including measles and black plague. The respondents, who often have limited access to regular health care, showed a fear for such diseases, and multiple times it has been mentioned that the last plague outbreak had not reached the South due to the protection of the tortoises. This ascribes a protective power to the tortoises that has a large impact of the people's wellbeing. Such a belief also connects to a fear for the loss of this protective power, as illustratively expressed by one respondent:

When the tortoises would be gone from this area, diseases would come because the tortoises make you healthy. When they wouldn't be here, the diseases will get you. – Respondent 94, Tranovaho

4.2.4. Conclusion

It can be concluded that the tortoise is visible in many different aspects of Antandroy and Mahafaly knowledge. In the first place, at least a basic ecological knowledge on tortoise behavior seems to be present among the respondents, most likely due to the rather high frequency of tortoise encounters. More in-depth ecological knowledge on tortoises' role within the ecosystem, however, seems less prevalent among the research population. Secondly, multiple stories on origin of the tortoise taboo exist, and the knowledge of such stories connected to the taboo are indicated to be one of the factors showing a high strength of the taboo. The versions differ among the research locations as well as the clans, and even differ from person to person, yet a significant difference between the Antandroy and Mahafaly tribe cannot be found. All stories tell about how an ancestor started the taboo, hence connecting the power of the ancestors to the tortoise taboo. Thirdly, knowledge on several other tortoise-related beliefs are apparent among the research population. These include the connection of tortoises with blessings, good fortune, a good trip, rain, and protection from diseases. These beliefs all relate positive attributes to the tortoises and thus create a fear for losing these benefits when tortoises would disappear. Especially the knowledge on these beliefs and the stories of the taboo origin shows to be highly prominent among the Antandroy and Mahafaly respondents. This knowledge and its role in targeted communities is therefore argued to be relevant to consider in tortoise conservation. Its role in the tortoise panopticon will hence be elaborated on below.

4.3. The tortoise taboo: connection of knowledge and practice

The knowledge connected to the tortoise as presented above is at the base of the tortoise panopticon, where different influential factors determine if and how this knowledge is put into practice and is transformed due to these practices. Therefore, the connection between this knowledge and practices will be discussed in this chapter, while asking:

How is the knowledge connected to the tortoise taboo apparent in Antandroy and Mahafaly practices and the tortoise panopticon?

Answering this sub-question requires further specifying the preliminary model of the tortoise panopticon presented in Figure 1. This chapter elaborates more on this specification, where three major surveilling powers are distinguished, creating a panoptic self-surveilling system within the community consisting of two components. In the societal context, three interacting factors are defined as having a destabilizing or re-enforcing and stabilizing influence: a sense of belonging to the community, beliefs connecting positive attributes to tortoises, and human-tortoise conflicts (Figure 9). First, however, the taboo content will be elaborated on, which describes the customary and legal repercussions when the taboo is broken by a community member and by people from outside the community, hence displaying three surveilling powers and two self-surveilling components in the tortoise panopticon. This will be followed by a further analysis of three factors within the community influencing the tortoise panopticon thus showing its dynamics.

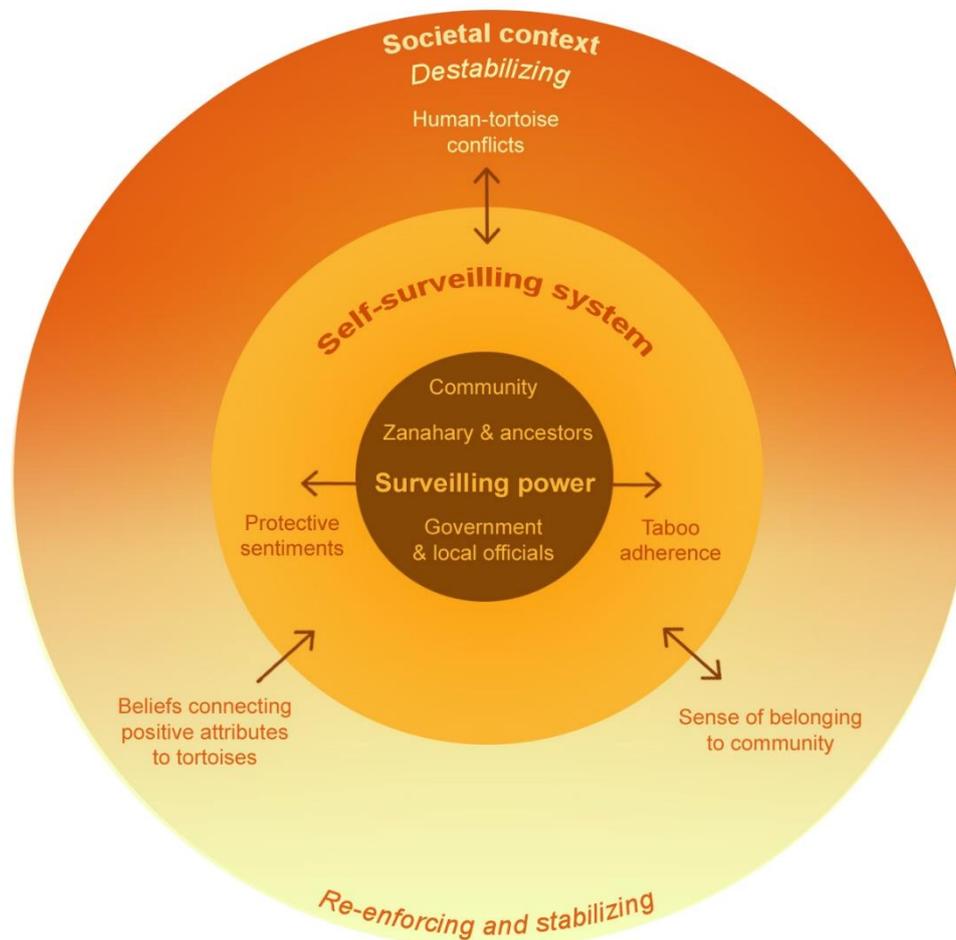


Figure 9: Antandroy and Mahafaly practices and knowledge placed within the model of the tortoise panopticon.

4.3.1. Taboo content – Repercussions connected to the taboo

Multiple different repercussions that are connected to the tortoise taboo can be defined, coming from multiple bodies of power. Below, three types are distinguished: 1) repercussions when the taboo is broken by a community member – coming from the community and the realm of the ancestors and Zanahary, 2) repercussions when someone from outside the community breaks the taboo – coming from the community only – and 3) legal repercussions.

Repercussions when taboo is broken by community member

When the taboo is broken by someone from the same community, multiple things are mentioned that may happen, and this generally differs from village to village and even from person to person. Based on the answers of the respondents, the repercussions have been grouped in repercussions that are taken by the community, thus having a social impact, and repercussions that affect the violator directly, coming from the wrath of the ancestors and/or Zanahary. The repercussion taken by the community largely refer to banning the violator. This can include multiple components. In the first place, it can refer to physically banning the violators, meaning that they cannot access the village anymore. As explained by a respondent in Antanimora:

Here, people breaking the taboo would be banned and must leave the community. No sacrifice can be done to undo it. Even if they want to come back to the community they won't be accepted because they would bring shame to the village. - Respondent 189, Antanimora

However, banning a violator also frequently implies banning the violators socially. This may entail losing the respect of the family and community members and losing their rights as a community member. This can mean that the community members will not share their food with the violator and community water cannot be accessed. Besides, it can include the loss of access to the Hazomanga and hence the ancestors, and the violator will not be buried with the rest of the family as is the tradition. It has even been mentioned several times that the person is not considered to be human anymore. This loss of rights can be illustrated by another case of a woman breaking the taboo in Antanimora:

No one wants to marry her anymore, nor any of her kids. All of them still live in the same village but no one wants to interact with them. The nuns come there and provide them with food and bring the children to school for education. Because no one wants to marry them, they marry among themselves. - Respondent 175, Antanimora

Among the repercussions that come from the ancestors and/or Zanahary, affecting the violator directly, is a 'curse' that has been connected to the taboo by the ancestor who started it. This curse is activated when someone violates the taboo hence disregarding the ancestors. It means that the violator's life will be negatively affected in some way. This is usually broadly mentioned to refer to the start of a bad life colored by misfortune, including no more children, and no more luck with cattle, crops, or jobs. When the person dies, he or she will not be welcomed among the ancestors. Besides, the violator may be affected physically and mentally. The possible physical repercussions include holes in the throat, skin rashes, misshaped newborns, and even death. Mental effects may include losing one's mind, a change in behavior, and mentally ill newborns. Moreover, Zanahary and the ancestors may not only affect the violator alone, but may even punish the entire community:

Here, it has rained less because Zanahary and the ancestors are not happy that there are fewer tortoises. They are angry at the people here and this is their punishment. – Respondent 82, Tranovaho.

A long-term study on the taboos of Madagascar in the mid-20th century shows multiple repercussions or 'punishments' that are reoccurring among the different taboos as well as the different regions (Ruud, 1960). Most of the repercussions mentioned above have been mentioned as the most common punishments in this study too. This may indicate a limited change in the knowledge related to the tortoise taboo, at least over the past 60 years.

Whether and how something can be done to undo that what resulted from breaking the taboo, differs from village to village and from person to person. Considering the societal structure of the Antandroy and Mahafaly, it can be assumed that the influential voices in the final decision on the punishment are

the *Ombiasa* (witch doctor communicating with the ancestors), the one in charge of the sacrifices, the head of the clan, and the Chef Fokontany. About 45% of the respondents stated that nothing can be done to clean the guilty person and to undo that what was caused by the 'curse' that is connected to the taboo (see Appendix 4 for the percentage per site). However, over 50% of the people state that something can be done to clean the person and at least undo part of the effects of breaking the taboo. Most of the time this includes a sacrifice. Since it is generally considered to be a strong taboo with severe effects, usually only a zebu sacrifice suffices, which is considered as the highest ranked among the animals that can be sacrificed. Goat and sheep are sometimes claimed to work too, and even less frequent a chicken is supposed to be enough to clean the person. This need of a zebu sacrifice in most cases shows the supposed high strength of the taboo and high expenses connected to breaking it.

However, despite this knowledge on the believed repercussions, other knowledge from cases of people actually breaking the taboo may change the prevalence of the more 'traditional' knowledge presented above. This can be illustrated by an example heard from one of the respondents in the commune of Nikoly, from the Fokontany Akatampoly Antanambao. He told the story of Tsitaho, who was travelling with his younger brother around the villages.

The intention was to lend goats, for which, in return, baby zebu should be given. When the two brothers arrived at the first village and the people asked them how many baby zebu they had, Tsitaho was honest and said he had none, but his younger brother lied and said he had five. That is how the younger brother received many goats. The same happened in another village and it ended up with the younger brother having many goats and Tsitaho having none. Tsitaho went into the forest, being very hungry, and there he decided to cook a tortoise. After this, he decided to continue eating tortoise regularly from that day onwards. No one else of the village followed his example but they also did not stop him from doing so. They just watched him. Tsitaho ended up as a wealthy man, having many children, and ultimately he was buried in a large tomb near the village. – Respondent 28, Nikoly

The conclusion of the respondent was, that apparently the taboo is not very strong, at least not for this man. Such example stories and experiences of people who break the taboo but still live a prosperous life are most frequently present in towns like Tsihombe, Ambovombe or more faraway places where an increasing number of people do not have the taboo or do not respect it anymore. Therefore, the extent to which people travel appears an influential factor in the exposure to knowledge opposing the 'traditional knowledge' on repercussions connected to the taboo and, in that way, how people act upon this 'traditional knowledge'.



Picture 14: Awareness posters on the protection of the radiated tortoise can be seen in a hotel building in Lavanono, Tranovaho, yet the taboo clearly does not include sea turtles as visible from the hawksbill turtle.

Repercussions when the taboo is broken by someone from outside the community

The people who poach should be burned alive or they should be beheaded! It's like selling your ancestors... – Respondent 100, Tranovaho

Despite some examples of such excessive expressions, the tortoise taboo is not necessarily connected to practices that protect the tortoises from people who do not have the taboo. Especially this question on what will be done when someone from outside the community comes to take or kill tortoises shows divergent answers among the respondents. A distinction can be made in different categories of approaches.

In the first place, there are the people indicating to take no action at all. A frequently mentioned reason for such an approach is that the poachers do not have the tortoise taboo and therefore the respondents see no reason to stop them taking the tortoises. It is taboo for the respondents to not eat or harm a tortoise, but if other people from tribes without the taboo do so, this is not their concern. This can be illustrated with the following example:

In Tsihombe there lives a guy, Mili, who came here many times in the past to collect tortoises for food. He possesses many cars. When he first came to the village, many years ago, he resided in the forest and asked the people of the village where he should go to find tortoises. The villagers told him gladly and they provided him with food when he needed it while being in the forest to kill tortoises. He came back many times afterwards, until he became too old to travel that far. He always had to stay outside the village when he was killing the tortoises, and the people wouldn't let him in their houses using their dishes, but they did not have a problem with his practices and they even provided him with food. – Respondent 28, Nikoloy

However, tortoise blood is taboo too for many respondents, and therefore usually the villagers do not want the poachers to kill the tortoises near to their village, crop area or water source. Besides, sometimes the concern is expressed that the zebu might eat from the tortoise carcasses which is also not desired. For that reason, respondents indicate that the poaching is only accepted when the carcasses are buried or killed elsewhere.

A second type of approach is to simply ask the poachers to leave when they are encountered. Frequently this does not involve any punishment or repercussion for the poachers, other than a warning not to return or the authorities would be called. In multiple cases it is indicated that this approach is adopted because anything that would be offered by the poachers, whether it is a zebu or money, would come from the blood of the tortoises and are thus taboo too.

Thirdly, an approach that does include punishment can be distinguished. This occurs to different degrees and in different ways, and can involve the authorities or are solved within the community. The latter can sometimes be very passionate, as described by one of the respondents of Antanimora:

Five poachers came to collect tortoises near to the village. They dug a hole and there they hid a bag with 28 tortoises. A kid from the village saw it by accident and reported it to the village. When they heard about it, about 30 villagers went to the forest, found the poachers and almost beat them to death. They dug a hole and buried three of the poachers alive. The other two left and never returned. When poachers come here, we would never ask for something because we would never eat a zebu that comes from a tortoise. All we can do is beating them until we are satisfied and let them go after this has been done. – Respondent 192, Antanimora

This is an extreme approach not adopted by most villages. Some indicate to rather call the authorities and let them handle the situation further, without asking for anything from the poachers in return. However, the assumption that anything coming from the poachers is equally taboo as killing or eating tortoises yourself is not adopted by everyone. Many times, people say to ask the poachers for a sacrifice to clean the land, which usually involves one or more zebu or sometimes another animal.

Legal repercussions for people who break the taboo

Aside from those customary repercussions, tortoises are also protected by law. Law enforcement, however, still proves to be an issue (Randriamahazo et al., 2011, Goldstein, 2016; Gray, 2017). After a TSA meeting with the minister of environment forests in Antananarivo, the following focus points for the government concerning tortoise conservation in the South were defined:

“(a) assessing of the social conventions or “Dina” and their effectiveness in relation to the framework of the justice system; (b) mobilizing regional and districts authorities to meet their obligations to protect tortoises; (c) dismantling the “tortoise mafia” network; and (d) establishing an action plan for Radiated Tortoises” (Randriamahazo et al., 2011: 67).

Sometimes, a *Dina* law is already in place, which is a ‘traditional’ legislative agreement on regulations and includes strict guidelines what to do when these are violated (Randriamahazo et al. 2014). A *Dina* needs to be started with a sacrifice ceremony and it is locally enforced, hence it varies per Fokontany (Hudson, 2015). The *Lilintane* is a more specific type of *Dina* which was developed in 2006 and especially applies to cases of tortoise poaching (Sylvain, email interview, 17-01-2019). This includes a fine, the obligation to provide the community with a zebu for a cleaning sacrifice and a goat, and 2 years of imprisonment (Sylvain, email interview, 17-01-2019). Applying such a *Dina* when poachers are caught in the village means the adoption of an approach that includes both the governmental authorities and the villagers who obtain compensation, hence aiming to incentivize the villagers to report cases of poaching. However, in the encountered cases where people consider that what comes from poachers as taboo too, this legislative framework does not seem to completely align with some of the local situations.

The *Lilintane* has already been adopted in many communes and districts especially surrounding Tsihombe, but it does not reach to the Southwest yet. From the research sites, the *Lilintane* has been applied six times in Marovato, 52 times in Tranovaho, and one time in Antanimora. In Nikoly and Imongy, the *Lilintane* has never been applied yet. Ejeda, Androka, Kaikarivo and Itampolo are not part of the Androy region and hence the *Lilintane* is not adopted in these places (interview Sylvain). This does not mean no other *Dina* is in place, however, and an overview of the places adopting a *Dina* similar to the *Lilintane* would hence be an insightful addition to understand the legal repercussions adopted locally.

4.3.2. Influential factors from the local societal context

Based on the taboo content, three factors in the societal context influencing the self-surveilling system of the tortoise panopticon can be distinguished locally. These are the extent to which a sense of belonging to and a connection with the community exist, the existing beliefs connecting positive attributes to tortoises, and the existence and prominence of human-tortoise conflicts. How these community-related influential factors shape the panopticon is elaborated on below.

A sense of belonging to and connection with the community

The community has been defined as one of the three powers in the surveilling tower of the tortoise panopticon. The repercussions coming from the community largely relate to exclusion from this community and its benefits. For this reason, it can be argued that the dependence on these benefits and the emotional connection felt by the individuals determines whether the community surveillance is a determining factor in adhering to the taboo.

Most visited villages show a low accessibility and the means of transport of research population are largely limited to zebu carts, bicycles, and sometimes motor cycles. Access to public transport is limited too in most places. The travel to more faraway places is therefore less likely to be made by the inhabitants of the more remote villages that have been included in this research. Besides, many people practice agriculture on land near to the village, which binds them to their fields for maintenance purposes. This shows a population highly bound to the village and close environment, indicating a high dependency on the fellow-villagers.

This also shows in the lifestyle of the villagers, where children are said to learn about the taboo from the elders in the village and families generally live in the same village and take care of each other. Clans such as the Temitongoa and the Andriamanarina show a high pride on their identity which they feel the need to express. Family tombs are located near the village they and their ancestors originate from, which is often the same place as they are currently living in. Being buried in the family tomb according to local customs is considered to be of high importance in order to be reunited with the ancestors after death. Knowledge on the sacred sites within and surrounding the village is crucial to

know what is allowed and what is not and is thus vital to move around. Such knowledge is transferred through the community members and is therefore very much place-based. Hence, many factors can be defined that bind the villagers to a specific location and the connecting community.

Besides, self-identification as a community can also be observed. *Vazaha* is the term being used for 'outsiders' and is often used as not only referring to foreigners but also to, for example, people from the larger cities, people from outside the region, people not speaking the local dialect, or people not knowing the local customs. Identifying other people as 'outsiders' inherently shapes an exclusive group of 'insiders' which shows the self-identification as a community among the term's users. Moreover, the following statement is not exceptional among the respondents:

It [respecting the taboo] is the same for the rest of the people here in the village because we are one community. – Respondent 249, Kaikarivo

This all displays a high dependency on and connection to the community, and a high sense of belonging. Repercussions that involve exclusion from this same community are thus considered to have a high impact on the villagers, which results in a high power of the community in the surveilling tower of the panopticon. However, delocalization can be caused by people travelling to or even settling in other places for studying, work, marriage, or other reasons. This diminishes the dependency on and feeling of belonging to the community for such individuals, thus diminishing the fear for its repercussions, weakening the role of the community in the tortoise panopticon, and weakening the panopticon as a whole. The sense of belonging to and connection with the community on an individual as well as a community level is hence defined as a determining influential factor in the local societal context.

Beliefs connecting positive attributes to tortoises

Multiple beliefs have been distinguished that connect positive attributes to tortoises, including the beliefs of tortoises bringing rain, blessings, good fortune, and protection from diseases. When respondents were asked about what they would think when tortoises would disappear from their environment completely, expressed concerns usually related to being unable to benefit from those positive traits. As expressed by one of the respondents:

There won't be people anymore when the tortoises would be gone. The tortoises bring blessing and rain and when this is all gone, the Antandroy people will not be here anymore – Respondent 102, Tranovaho

Therefore, it can be argued that the tortoise-related beliefs connecting positive attributes to tortoises contributes to both protective sentiments and taboo adherence, in order to continue to be able to benefit from them.

This introduces an alternative way of benefitting from tortoises without harming them, as opposed to poaching. What benefits are most highly valued – that of money from poaching or those connected to the beliefs – depends on the strength of those beliefs and other situational circumstances, which makes it hard to determine for a community. Nevertheless, the beliefs do include an incentive in the tortoise panopticon that can strengthen both the components of taboo adherence and protective sentiments. In that way, it is one of the main factors, next to conservation practices, clearly stimulating protective sentiments. For that reason, the beliefs present a panopticon-shaping factor with a high potential in creating and determining a favorable social environment for tortoise conservation.

Human-tortoise conflicts

People in the villages live outside most of the time and are largely farmers, and tortoises are numerous in many places that were visited. This results in a high rate of human-tortoise encounters. Such encounters are not always experienced as positive by the respondents, however, as can also be seen in other cases (Camperio-Ciani et al., 2016; Galapagos Conservancy, 2019). Tortoises know how to make their way into the crop areas since they are usually not completely fenced. Respondents thus frequently express irritation that especially the young crops are being eaten by the tortoises. Opinions differ on whether the tortoises are really considered destructive, however, which may depend on the density of tortoises and whether people fence their crop land. Nevertheless, many people expressed frustration and even aggression when they spoke of the tortoises destroying the crops (see Figure 10 for the percentage of perceived tortoise conflicts per site). As expressed by one respondent:

When there would be many more tortoises, we would just simply stop planting crops. I used to have crop land in the forest but there were too many tortoises that ate my crops. I abandoned the land and got a piece of cropland near to the village. – Respondent 142, Ankilivalo

This shows the existence of human-tortoise conflicts largely relating to encounters in the cropland. Such negative sentiments may result in practices harming tortoises that are even not in line with taboo-related knowledge. Although rarely shown, the following statement illustrates this behavior:

Tortoises eat crops and that makes people upset! Therefore, sometimes people will kill a tortoise with a shovel, bury them alive or put them on their back. – Respondent 190, Antanimora

Also, protective sentiments may be diminished due to the negative attitudes towards the tortoise, as has been expressed by one respondent in Ejeda:

Too many tortoises may be a bad thing too because they eat crops. This is one of the reasons why we let the Antanosy take them. – Respondent 221, Ejeda

Most of the time, however, people say they carefully remove the tortoises from their cropland, despite the frustrations on the tortoises damaging the crops. Respondents usually explain this behavior by their taboo on harming tortoises. In that way, a two-way interaction can be seen with the tortoise panopticon. In the first place, negative sentiments resulting from human-tortoise conflicts may cause practices not in line with the taboo hence weakening the tortoise panopticon and especially the component of protective sentiments in its self-surveilling system. In turn, the already existing strength of taboo adherence and protective sentiments show to influence people’s practices in the human-tortoise conflicts. An interaction between the tortoise panopticon and this influential factor within the local societal context can hence be distinguished.

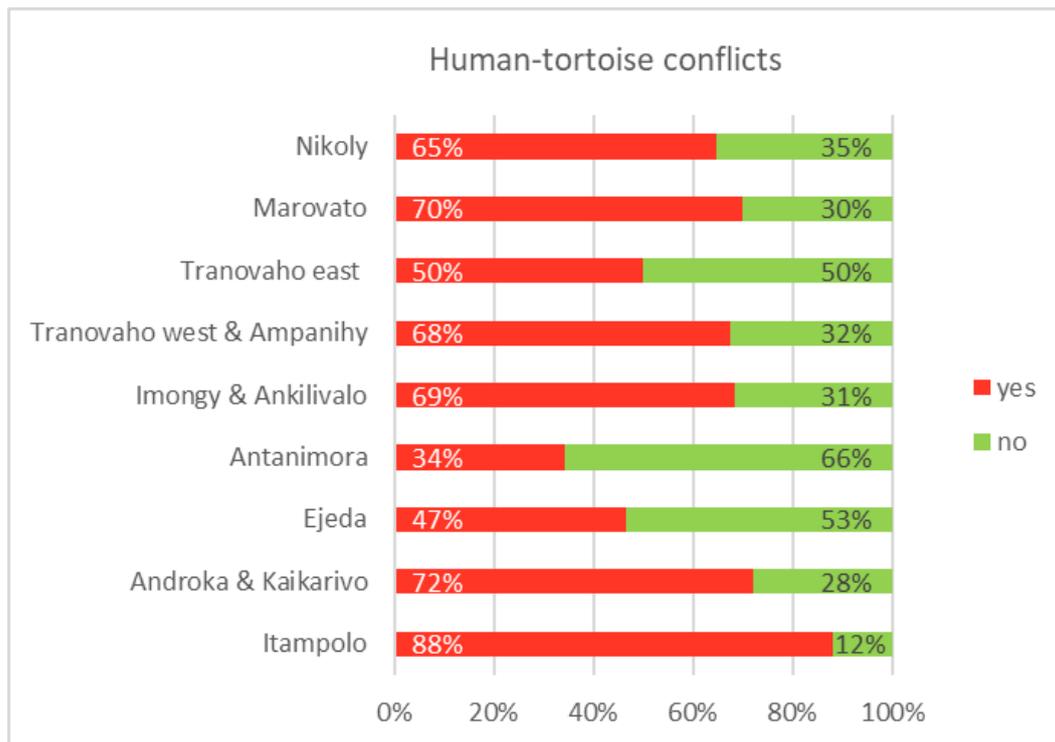


Figure 10: distribution of perceived human-tortoise conflicts per site.

4.3.3. Conclusion

Protective sentiments towards the tortoise seem not to be necessarily implied in a strong adherence to the taboo. Therefore, the self-surveilling system within the panopticon can be divided in two components of relevance to tortoise protection: protective sentiments and adherence to the tortoise taboo.

A fear for repercussions from three surveilling powers can be distinguished. In the first place, the repercussions when the taboo is broken by a community member come from the ancestors and Zanahary, usually involving bodily reactions as well as general misfortune. This makes the realm of the ancestors and Zanahary one of the surveilling forces. In the second place, the repercussions come from the community the violator belongs to. These punishments generally include the violator being banned from the community, thus socially and/or physically excluded. This makes the community itself to another surveilling power. In the third place, punishments such as fines and imprisonment can be legally implemented due to the protected status of the tortoise nationally, and the implementation of the *Lilintane* on the District, Commune, and Fokontany level. In this way, the government and the local government officials are the third surveilling power.

The three surveilling powers arguably create a self-surveilling system potentially resulting in adherence to the tortoise taboo on the one hand, and protective sentiments towards the tortoises on the other. The adoption of *Dina* like the *Lilintane* and national law adds legal repercussions to the taboo, hence increasing the fear of repercussions when the taboo is broken. Arguably, this also increases the strength of the self-surveilling system of tortoise panopticon. The two components of adherence and protective sentiments within the self-surveilling system do not necessarily cohere, yet they are not completely independent. From the interviews it became clear that adherence to the taboo not always implies active tortoise protection, yet in several cases the cultural significance of the tortoises did induce protective sentiments. Besides, such sentiments originating from the cultural significance of tortoises can strengthen the adherence to the tortoise taboo. This shows the two components distinguished in the self-surveilling system of the tortoise panopticon are in constant interaction yet cannot be assumed to be a natural synthesis.

Within the societal context, three main influencing factors can be distinguished that are connected to the community itself. Firstly, the perceived power of the community's surveillance depends on the community members' sense of belonging and a feeling of connection to this same community. The extent to which such sentiments exist within the community and its individual members thus influence the power of the tortoise panopticon. Secondly, the noted beliefs that connect positive attributes to the tortoise increase people's positive sentiments towards the tortoise and may thus result in stronger protective attitudes. The existence and prominence of such beliefs are therefore another factor that influence the tortoise panopticon's power. Thirdly, mentioned conflicts with tortoises as experienced by the respondents, especially due to the tortoises eating from their crops, show a negative influence on people's perception of tortoises and their protective sentiments. The existence as well as the intensity of such sentiments thus largely negatively impact the tortoise panopticon's power. The three community-related factors in the social-political context of the tortoise panopticon hence shape its outlook and strength, while also being shaped by the self-surveilling system's components in the case of human-tortoise conflicts and a sense of belonging to the community.

4.4. Madagascar societal context and the tortoise panopticon

As discussed before, the tortoise taboo is shaped by many different factors related to the taboo itself. However, as visible in Figure 11, the tortoise panopticon is shaped by other factors too that seem less related to the tortoise taboo. These factors have been deduced from observations in the field, conversations with TSA staff and other people encountered during the fieldwork, points highlighted in literature, and points that came up during the interviews – especially with the question what people thought to be the drivers of poachers to break the taboo. That is why this chapter discusses the most influential factors on the tortoise panopticon in the social-political context shown in Figure 11, asking:

How does the societal context play a role in shaping the ‘tortoise panopticon’?

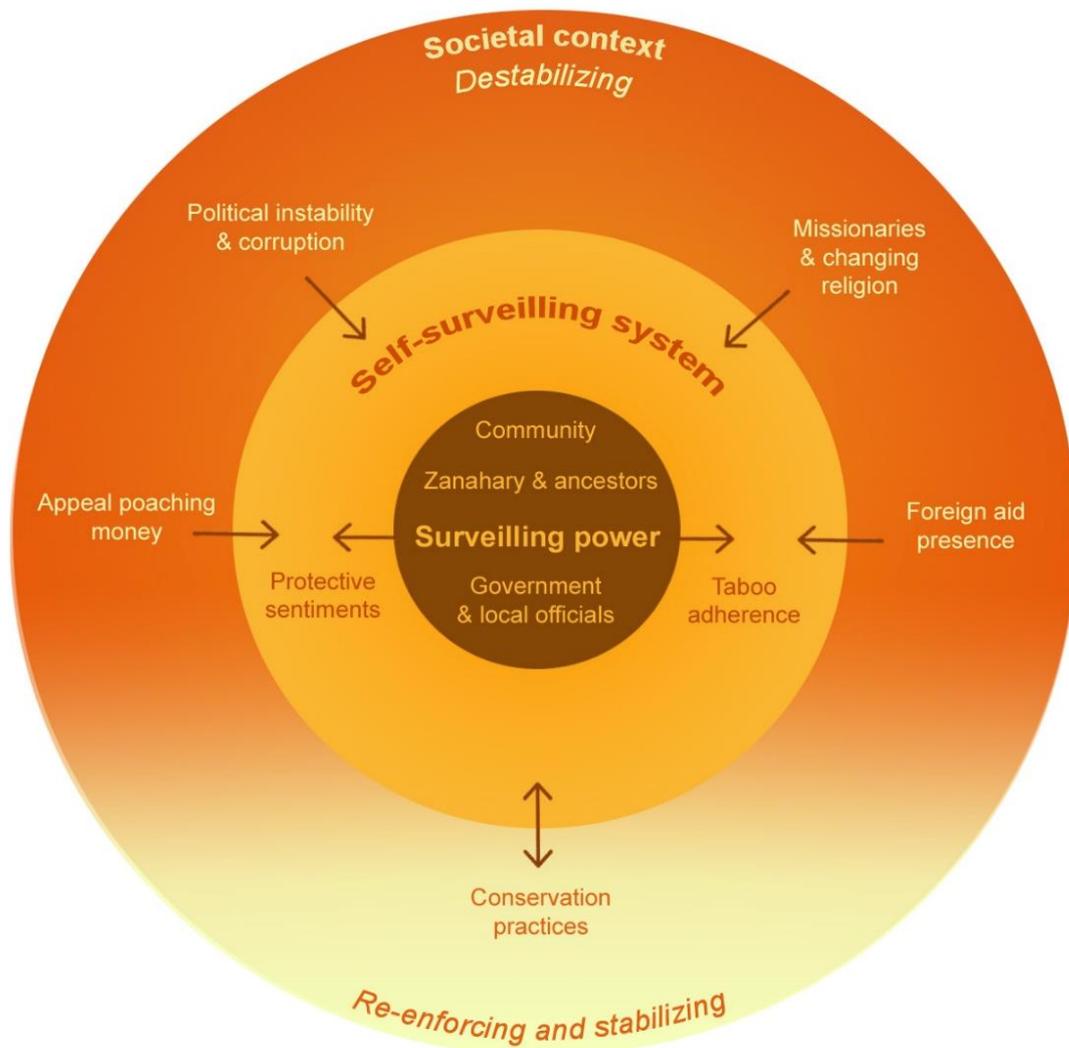


Figure 11: Influencing factors of the societal context and their connection with the self-surveilling system of the tortoise panopticon.

4.4.1. Conservation practices

Tortoise conservation practices are present in several of the research sites, yet they have been more visibly present in the surrounding area of the TCC and the environment of Itampolo where the TRC is located. The exact influence of these practices is hard to determine with this research, since it requires monitoring and evaluation of tortoise-related attitudes and practices since the start of each project.

Nevertheless, the rewarding approach of the TSA displayed in the provision of a school to the people in Antsakoamasy has been argued to have resulted in an increased local interest in the tortoise conservation practices (Hudson, 2013). This also shows in the willingness of the Fokontany Anosiala, Besakoa, Bereny, and Ambazoa to support tortoise conservation by allowing the TSA to use part of their land for the TCC. Besides, it has been claimed that “this new spirit of community conservation and cooperation [displayed in Antsakoamasy] has resulted in an increasing number of Radiated Tortoise confiscations, both in the South and at the airport in the capital city of Antananarivo” (Randriamahazo et al., 2014).

As outlined before, protective sentiments are not necessarily included in the tortoise taboo and hence the tortoise panopticon. The tortoise conservation practices, however, stress this protective component with their awareness campaigns and other tortoise conservation-promoting activities. This influence of especially awareness campaigns can be deduced from several answers of the respondents as illustrated below:

“Before, the people here didn’t care about poachers killing tortoises, as long as they didn’t touch the water and hence make it ‘dirty’. When the government started an awareness campaign, we were told that something bad would happen to the land when the taboo was broken. For this reason, we started to protect the tortoises. What happens to the poachers still depends per case, however. Some would ask for the Dina, others would just let the poachers leave.” – Respondent 165, Antanimora

This shows how awareness campaigns can increase protective sentiments as well as taboo adherence, hence re-enforcing or even introducing the protective component among the local communities. In that way, such conservation activities change and strengthen the tortoise panopticon in a way that is more favorable for the tortoises’ survival.

Moreover, the community-based approach visible in the TSA conservation activities shows a preference for conservation practices interacting with and involving the communities. This means they are assumed to respond to already existing sentiments and taboo adherence, as shown in the case of Antsakoamasy and the founding of the Ala Mahavelo association, among others. This displays a constant interaction with the tortoise panopticon’s self-surveilling system and conservation practices, where the practices influence and shape its components, while in turn being shaped by these existing components.

A two-way interaction between the tortoise panopticon and a factor of the societal context can hence be seen in this case. Not all factors show such an interaction, however. The next four influencing factors have been identified as largely having an influencing effect, without being much influenced by the self-surveilling system themselves. Their effect is hence defined as only one-way and they are regarded as having a largely destabilizing influence on the tortoise panopticon.

4.4.2. Appeal of poaching money

Madagascar is a country where over 70% of the population lives under the national poverty line, and this percentage is even higher for the rural areas within the country (World Bank Group, 2001; 2012; World Bank 2014). The Androy region has even be measured to be the second poorest region in the country in 2010, with a poverty level of 93% in the rural areas (World Bank, 2014). Households generally include many children who do not all have access to education and illiteracy rates are found to be highest in the Toliara region which is located in the Southwest (World Bank, 2014). Besides, food consumption patterns seem to be shifting to “lower quality food items over the decade” rather than showing improvement (World Bank, 2014: 4). Famine is a concept that is not uncommon to the research population and obtaining enough water and food is a challenge many households face on a daily basis.

Respondents indicate that the taboo has been broken by some community members especially in times of famine, yet most of the respondents strongly stress that even in such times they would never eat a tortoise and break the taboo. Nevertheless:

Your belly makes you do many things and directs you in many ways. It is all about the belly.”
– Respondent 275, Itampolo

Besides, poachers come from outside the region and are known to offer large sums of money to people for collecting tortoises (Randriamahazo et al., 2011; Mittermeier et al., 2013). The poachers are known to possess much money themselves too, and they are generally said to be well-equipped with good cars and tools. In the context of poverty, the lure of such easy and quick ways of obtaining a substantial amount of money provide a major temptation. As expressed by one respondent:

“We humans kill each other for money, so it is no wonder that they kill tortoises for money too.” – Respondent 203, Antanimora

These temptations exist within the context of poverty that does not seem to be elevated anytime soon and of limited opportunities for obtaining an alternative income. Besides, other means to obtain an income are not likely to be as lucrative as poaching, showing a challenge that has been expressed by multiple respondents:

“The people who poach are used to get money from tortoises and therefore are not interested in money coming from other sources anymore. They are used to the easy tortoise money. People who want to protect the tortoise then may offer them jobs, but they will have a salary of 30,000 Ariary. Then, the poachers would come and offer 2,000,000 instead. Well, that’s an easy choice! Those poachers will never stop. I have a relative in Tamatave and he sold weed for 100,000 Ariary. He wanted to stop, but then boats came and they offered 1,000,000. Well, that’s an easy choice again. It is the same for tortoises. For this reason we will never get rid of poaching, because of the large sums of money involved.” – Respondent 192, Antanimora

The combination of poverty and poaching money being offered by the tortoise traffickers and poachers hence displays a major factor that can weaken the tortoise panopticon.

4.4.3. Political instability and corruption

TSA mentions the existence of “an arcane law dictating that wildlife laws must be enforced from afar (Antananarivo, or a regional office), and thus local officials have no legal capacity to apprehend poachers. Enforcement action is often several days away, which makes the system easy to circumvent” (Hudson & Horne, 2010: 6). This means that the regional and national officials need to be well-operating in order to implement this law effectively. However, Madagascar is generally considered to still be colored by political instability and corruption and law-enforcement still proves to be challenging.

In 2010 it has been stated by the TSA that “the recent collapse of the central government and political instability” are one of the factors aggravating the tortoise situation. It has been stated that “the government is effectively nonoperational, international tourism is at a modern low, and any and all natural resources are apparently for sale in marginal efforts to keep the government “running” by funding the payroll of federal employees” (Hudson & Horne, 2010: 6).

Currently, while conducting this research about eight years later, the political situation is still instable, especially with regards to the unrests prior to and during the presidential elections. Multiple informants indicated the safety situation had decreased during this period, and an increase in bandit attacks on the roads has been reported. The two main candidates, Ravalomanana and Rajoelina, had already been president in the past, where Rajoelina was the subsequent president taking power after the coup that ousted Ravalomanana in 2009. The fear of another coup hence showed among informants since coups have been experienced as a factor destroying much of the country’s achieved developments twice before, including tourism. It is a precarious situation with high uncertainty, being able to change many people’s lives from one day to the other.

Besides, corruption is something that can be seen on a daily basis and it is woven in many layers of society. Multiple cases have been mentioned where money or goods ended up in other hands than was intended, and multiple statements of respondents underline the declaration that the poacher network goes up into the highest layers of Madagascar society, including national politics (Hudson et al., 2016). This power play and resulting instability visibly shows in an abandoned, unfinished pipeline which is supposed to provide many villages with better access to water in this region.

It should have been finished months ago yet work and money flow stagnated and candidates for the upcoming presidential elections now use it as a way to obtain votes. They promise the people to finish this project, yet many of the informants consider it to be an empty promise as so many proved to be before. Most parts of the ditches that are meant to contain the pipeline look empty and abandoned, whereas on some places, for example near Beloha, people are visibly digging and installing a part of the pipeline. – Personal field notes

In such an instable and uncertain political situation, priorities are generally not directed to finding and arresting tortoise poachers and contributing to tortoise conservation as illustrated by the following statement of a respondent showing a lack of fear to be arrested for such matters:

Those poachers have no other options and if they would steal something they would end up in jail. This is not the case for collecting tortoises and that is why this is the easiest option. –

Respondent 171, Antanimora

This political context and related challenge of law enforcement thus show another destabilizing factor that adds uncertainty to the tortoise panopticon.

4.4.4. Foreign aid presence

'Outsiders' or *vazaha* can be found in a number of unexpected places, due to the numerous organizations and NGOs present in the region. Alongside the road and in the villages that have been visited, even in the seemingly remote places, hints of foreign aid presence can be seen. The 4x4 vehicles that can be seen on the road are often marked with an NGO logo, and signs placed alongside the road or in a village indicate the presence of a project, school or other building that has been financed by multiple NGOs, while telling about the program it was part of. Frequently the sign contains an emblem of the Norwegian flag, indicating it has been "financed by the people of Norway". Examples of organizations are USAID, UNICEF, World Food Program (WFP), SEED international, Catholic Relief Services (CRS) – which cars and motor cycles are particularly visible on the road – and the Food and Agriculture Organization (FAO). This is only the tip of the foreign aid iceberg.

These organizations have projects focusing on topics differing from economic enforcement to reproduction health, and distribute food, oil, food supplements like Plumpy, water filters, multiple types of services, and money, each among their own target groups. It appears to be a chaos of different approaches, backgrounds, intentions, focus points, and interests, each of them rarely interacting with each other according to some of the informants. Projects come and go and are frequently left unfinished due to a lack of money or for other reasons. Various informants mentioned instances of programs that seemed to do more harm than good. One exemplifying story tells about seeds that were distributed, but which turned out to contain a crop disease resulting in a failing harvest and leaving the people with famine or *kere*. The responsible organization already left. Another example tells about how an organization distributed food to a target area for a considerable amount of time. The targeted people started to count on this influx of food, and therefore they did not prioritize their own harvest. However, the program stopped abruptly, and since the people did not grow much food anymore, they were left without enough food and income, again resulting in famine. These are just two of the many stories told by the informants, and they leave the impression that despite the assumable good intentions of all the NGOs, it often turns out that projects create dependence and wrong expectations rather than providing sustainable solutions.

The free distribution of food and money seem to have created an expectation among the villagers to always receive something from foreigners, which multiple times resulted in people unwilling to do interviews when no money was given in advance, complaints about a too low amount of money given, and even Chef Fokontany demanding rather large sums of money in advance to receive permission to do interviews in one Fokontany (those cases were refused). This attitude of connecting an economic gain to every activity, rather than holding on to more traditional values of hospitality in the past which would have included receiving guests without asking for money, arguably makes the people more

receptive to outsiders who offer much money for activities that are not in line with such “traditional” values, such as collecting tortoises. It can thus be argued that this is just another way of obtaining a substantial amount of wealth without much effort, similar to the foreign aid approach of distributing money and goods.

Most importantly, the presence of the many NGOs with their diverse approaches and many short-term projects provides an unstable social and economic environment of the tortoise taboo and tortoise conservation. Projects are usually only active for several years, and hence local circumstances are constantly changing. This displays an environment with a high degree of uncertainty and therefore long-term planning and stability is an aim hard or even impossible to achieve. For the tortoise panopticon this means an unstable factor prone to unexpected change, hence undermining its stability.



Picture 15: Traces of foreign aid are visible everywhere along the road, as is also the case in Marakalo, Nikoly, where white wooden houses bear signs and logos of multiple organizations.

4.4.5. Missionaries and changing religion

With delocalization due to for example travelling, social media, and the high foreign aid presence, the people of the research sites become exposed to new values and ideas. Besides, Christianity is spreading in Madagascar. In the research sites, often a church was present, often made from stone and sometimes including colorful windows, thus shaping the outlook of the village largely existing of wooden and clay houses (see Picture 15). Foreign missionaries as well as their Malagasy companions have been encountered several times, on their way to, in their words, “bring the good news to the people out in the woods”. By visiting remote villages with their 4x4 vehicle, they actively try to convert their inhabitants into Christianity, and depending on the views of the missionary this also includes the complete or partial abandonment of ‘traditional’ beliefs and practices. Muslims are less visibly present yet a mosque in Tsihombe Town own shows their existence too.

During the interviews, the change towards 'religion' in the region has been mentioned multiple times, and it is always considered to weaken previously adopted beliefs related to the ancestors. As illustrated by an example provided by one respondent:

The taboo is an ancestral belief and comes from the cooking pot story. A long time ago, people got holes in their throat when they would eat a tortoise. But at that time no one prayed to the Christian god. Now Christianity has more power; the majority of the people are Christian and the fady has less power which means that it is not powerful enough to destroy your throat. – Respondent 6, Nikoly

The change towards Christianity does not necessarily mean a complete abandonment of the ancestral beliefs, however. It seems that mainly the tortoise-related beliefs that are not related to the taboo degrade. The taboo appears to be more common to remain among the people who consider themselves Christian, as for example can be deduced from the following statement:

Before, I wasn't religious (Christian) yet, and back then I expected blessing when I saw a tortoise. Now I regard tortoises as just another creature like all the others. (...) All community members know about the taboo and respect it. They protect the tortoise and even I, as a Christian, respect the taboo. – Respondent 80, Tranovaho

Nevertheless, it has also been stated by such respondents that the effects of the taboo is less strong for them because of their Christianity. Therefore, it may be more due to custom and pressure from the social environment that such traditions are still adopted. The extent to which these customs continue or are abandoned, still remains unclear however, and may need further research when one wants to understand the exact influence of Christianity. Based on information obtained from the respondents as well as historic examples (Bastian, 2000; Jensz, 2012; Swartz, 2018) it can be concluded that the change towards other religions also changes traditionally adopted beliefs and customs, including those that are protecting tortoises. In that way, the changing religion becomes another destabilizing factor influencing the tortoise panopticon.



Picture 16: Churches are frequently standing out as one of the largest buildings in a village, as is visible in this case in Fokontany Ambazoa, Marovato.

4.4.6. Conclusion

The influencing factors of the societal context as defined in this research each display their own effect in the self-surveilling system of the tortoise panopticon. Tortoise conservation practices show an interaction that works in two ways: they influence the components of protective sentiments and taboo adherence on the one hand, and are influenced in their approach by the already existing self-surveilling system on the other. This influencing factor of conservation activities in the societal context can hence strengthen the tortoise panopticon and even introduce protective sentiments where they are still lacking in the local panopticon. TSA approaches providing a reward in turn for conservation efforts to the communities, like providing a school or job opportunities, add a component of reward to the tortoise panopticon that is largely based on (a fear of) punishment. Such a connection may make the panopticon more dependent on such rewards and risks motivational crowding. However, since protective sentiments are not inherent in the tortoise panopticon, motivational crowding seems unlikely in this case.

Aside from this potentially strengthening factor in the tortoise panopticon, four more destabilizing influential factors in the societal context have been mentioned to influence the self-surveilling system of the tortoise panopticon. The context of poverty in combination with high sums of poaching money being offered presents a high temptation to practice activities that are not in line with their 'traditional' values connected to the tortoise taboo. In that way, this factor destabilizes the tortoise panopticon. Moreover, an unstable societal context is created by the political instability and foreign aid presence, which add a high factor of uncertainty to the tortoise panopticon. Weak law enforcement related to the political instability and corruption also diminishes the panoptic power created by surveillance related to government officials. Furthermore, a change towards Christianity increases the risk on abandonment of tortoise protective beliefs and related practices, hence presenting another destabilizing factor to the tortoise taboo. All these factors in the societal context thus show considerably different effects on the tortoise panopticon, yet they display a highly relevant role in shaping it.

4.5. Community beliefs supporting tortoise conservation

The surveilling powers of the panopticon, the influencing factors in the societal context, and the two components of the self-surveilling system have been defined in the previous chapters, yet the strength of the components and powers vary per site. This has also been acknowledged by the TSA:

“So with Vezo poachers invading from the west and the Antanosy coming in from the east, the strength of the protective fady is being put to the test. In some villages it is very strong and they will go out of their way to confront poachers, believing that the tortoises harbor their ancestors’ spirits. In other villages the fady may be weak and benign, and though they may not eat or harm tortoises, they do not mind if others come in to take them. This is why we must create a strong connection between having tortoises in your village with an improved community” (Randriamahazo et al., 2011: 68).

This place-dependency asks for further definition of the tortoise panopticon for each site separately, and it is hence the question how to determine the strength and content of the taboo for each region. Therefore, the fourth sub-question will be discussed in this chapter:

How can the strength of the tortoise panopticon be determined per site to distinguish sites with a favorable social situation for community support in tortoise conservation?

Unlike in the quote before, this research will not speak of the strength of the taboo when referring to protective sentiments connected to the taboo. The question whether the taboo is strong for the people individually is independent from the question if protective sentiments are also included in the taboo. Therefore, this research defines two factors that relate to the taboo: its strength (the strength of the adherence) and its content (the protective aspects that are connected to the taboo. This means, that the following factors are distinguished to be of relevance in determining a suitable site for tortoise release:

1. Personal adherence to the taboo
2. Protective sentiments among the community members

As outlined before in the methodology, the steps presented in Strategic Environmental Assessment (SEA) has been used as a tool to further determine the social suitability of the sites systematically. The four steps in SEA earlier defined as of relevance to this research will be elaborated on below. The actual number of the step in the SEA scheme is mentioned between brackets.

4.5.1. Step 1 (Step 2 of SEA): Problem scoping

The first step of problem scoping refers to identifying the key issues to define what needs to be further assessed in order to make decisions suitable to solve the defined problem (European Commission, 2001). These issues are defined as of relevance to meeting the objectives of the program to release tortoises an area where the community is supportive and likely to protect the tortoises from poaching. Besides, this research is also aimed to contribute to the protection of the already existing tortoise population. The problem scoping hence starts with the identification of the main issues in the area concerned. The targeted area is defined as the entire habitat range of the radiated tortoise, which is Madagascar’s southern and southeastern region. Within this area, nine research sites have been defined, and the social context and its issues have largely been covered in the previous chapters yet. However, a schematic overview of the issues outlined before is presented in Table 5, with a reference to the chapters in which each issue is covered.

Context	Ecological	Social / Cultural	Economic	Legal / policy requirements & agreements
Issue	<ul style="list-style-type: none"> • Radiated tortoise as protected species • Patrolling for poachers is difficult • Habitat suitability for release partly unknown <p>(covered in introduction & chapter 3.2)</p>	<ul style="list-style-type: none"> • Tortoise taboo opportunities • Tortoise-related beliefs opportunities • Human-tortoise conflicts • Poachers part of well-organized network • Limited means to stop poachers <p>(covered in introduction & chapter 4.1, 4.2, 4.3, 4.4)</p>	<ul style="list-style-type: none"> • Economic opportunities for collaborative local communities • (Economic opportunity from tourism) • Threat of poachers offering large sums of money • Threat of high poverty rate • Threat of limited economic opportunities <p>(covered in introduction & chapter 4.1, 4.4)</p>	<ul style="list-style-type: none"> • IUCN Red Listed • Illegal to kill or collect radiated tortoises • <i>Dinal Lilintane</i> traditional law • Law-enforcement • Community support and involvement • Patrolling for poachers <p>(covered in introduction & chapter 3.2, 4.3, 4.4)</p>
Stakeholders	<ul style="list-style-type: none"> • Poachers • Local (Antandroy and Mahafaly) communities • Government officials • Community leaders • TSA staff 	<ul style="list-style-type: none"> • Local (Antandroy and Mahafaly) communities • Farmers • Poachers 	<ul style="list-style-type: none"> • Local (Antandroy and Mahafaly) communities • Poachers 	<ul style="list-style-type: none"> • TSA staff • Government officials • Community leaders
Area	<ul style="list-style-type: none"> • Parks • Landscape 	<ul style="list-style-type: none"> • Parks • Landscape 	<ul style="list-style-type: none"> • Parks • Landscape 	<ul style="list-style-type: none"> • South and Southwest Madagascar

Table 5: Schematic overview scoping the problem.

4.5.2. Step 2 (Step 4 of SEA): Policy options

The policy options of this case consist of the nine defined research sites as potentials for release or for tortoise conservation involvement in general. These are the sites visited during the fieldwork, and have been defined later based on their administrative distribution, where sites are composed of Fokontany of the same Communes as much as possible, while also accounting for the spatial distribution of the sites:

- Site 1: Nikoly
- Site 2: Marovato
- Site 3: Tranovaho East
- Site 4: Tranovaho West & Ampanihy
- Site 5: Imongy & Ankilivalo
- Site 6: Antanimora
- Site 7: Ejeda
- Site 8: Androka & Kaikarivo
- Site 9: Itampolo

4.5.3. Step 3 (Step 5 of SEA): Key aims & indicators

Part of the empirical aim of this research is to determine the existence of favorable social circumstances per research site for potential release and community involvement in tortoise conservation. Therefore, only community-related key-aims and related indicators have been distinguished and developed following a SEA approach. First, two overarching aims have been distinguished, based on what previously has been determined as the two main aspects of relevance to tortoise conservation within the tortoise panopticon: adherence to the taboo and protective sentiments among the community members. These two overarching aims have been divided in multiple key aims connected to them, to be able to account for the many factors involved with the overarching aims. In that way, nine key aims have been distinguished. The indicators for each key aim have been developed according to the questions that have been asked during the interviews, while aiming to be SMART (specific, measurable, attainable, relevant, timely).

Adherence to the taboo

Whether people adhere to the taboo, depends on multiple factors. A panopticon is a self-surveilling system that is argued to be largely based to fear, since the sense of observation also includes a constant fear for repercussions (Dove, 2009). In the tortoise panopticon, the repercussions come from the ancestors as well as the community the violator belongs to. Many times, a sacrifice has been mentioned as something that needs to be done when the taboo is broken. However, even when the sacrifice has been done, many respondents indicate that the effects of breaking the taboo still show on the person. Most often it has been indicated that a sacrifice can undo banning from the community and enables burial with the community members again. Physical and mental impacts are more often said to be irreversible, as well as a bad fate and the loss of good fortune. That is why a distinction in indicators is made in the percentage that mentions a sacrifice at all (to show that at least something is likely to be done when the taboo is broken, and that providing something for a sacrifice is still useful), and the percentage mentioning that all negative effects of breaking the taboo can be erased (which might indicate a lower feeling of commitment to the taboo since its potential negative effects can all be undone anyways).

The level of fear for the taboo's repercussions can arguably be connected to the feeling of belonging to this community and the respect for the ancestors. Besides, it depends on the content of the taboo as adopted by the community – the nature of the repercussions that are believed to be connected to the violation of the taboo. Severe repercussions, a high sense of belonging to the community, and a high respect for the ancestors seem hence argued to be desirable social circumstances in tortoise conservation. Limited or no repercussions, a low sense of belonging to the community, and a low respect for the ancestors, on the other hand, are hence not desirable when looking for a supportive community for reintroduction. Besides, the actual occurrence of people of the community breaking the taboo is aimed to be low. Within adherence to the taboo, four key-aims can thus be distinguished, which can be measured with several indicators deduced from the interview questions and answers of the respondents.

1. Existence of a fear of repercussions when the taboo is broken
 - % of respondents in location X indicating the offender to be negatively affected when the taboo is broken
 - % of respondents in location X connecting a curse to the taboo
 - % of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions
 - % of respondents in location X indicating nothing can undo all results from breaking the taboo
 - % of respondents in location X indicating the tortoise taboo to be the strongest taboo
2. No community members breaking the taboo
 - % of respondents in location X indicating the taboo has been broken within the community in the past
3. Existence of a fear of losing connection with the community
 - Respondents' level of a sense of connection with the community as reflected throughout the interview (not really quantifiable, more a general impression perceived during the interview)
4. Existence of a fear of losing the goodwill of the ancestors
 - Respondents' level of respect for the ancestors as reflected throughout the interview (not really quantifiable, more a general impression perceived during the interview)

Protective sentiments among the community members

Several questions related to protective sentiments were asked during the interviews. In the first place, multiple positive attributes have been ascribed to the tortoise by the respondents. These include the belief of tortoises as the ones asking Zanahary for rain, tortoises as the ones who can open the way to blessing from Zanahary, tortoises as indicating a good trip and good fortune, and tortoises as the ones protecting people from diseases. Besides, the interviews included a question on what the person would think when all tortoises would be gone. Negative responses with this question indicate a positive attitude towards tortoises where they are seen as something positive that is regrettable when

missed. Therefore, it can also be translated into a way to measure the fear of losing positive influences.

Secondly, a feeling of responsibility for protecting tortoises shows the existence of protecting sentiments. This can be measured with the indicator of an expressed indifference when poachers would come to the village. In the interviews, this can be seen in the percentage that clearly states to not care if poachers come to collect tortoises, sometimes provided that the poachers take certain measures to make the practice being still in line with the locally present taboo. This percentage also includes those people that do not know what should be done in such a case hence displaying ignorance and/or indifference towards the regulations.

Thirdly, a key aim connected to protective sentiments is the community showing a reactive attitude towards poachers. It can be measured by the percentage that indicates to take action when poachers come to collect tortoises in the village. This refers to respondents who stated that they would not allow poachers to collect tortoises at any place in or near their village, who would call the authorities, or clearly stated that the poachers would be punished in any way. Respondents who only indicated that they would ask the poachers to leave are not included in this percentage, since the impact of such an attitude is assumed to be limited.

Fourthly, an indication for the level of protective sentiments are defined as the negative attributes that are ascribed to tortoises. It refers to the key-aim of the lack of fear of the negative impact of tortoises, where the existence of such negative sentiments towards tortoises is assumed to diminish the level of protective sentiments. The way to measure it is by looking at the percentage that indicated the tortoises to cause a conflict on the one hand, and at the percentage that expresses concern when the number of tortoises would increase on the other. The latter is to display the gravity of the mentioned conflicts, since when people see the tortoises as causing a conflict, but are not concerned with their number increasing, it can be assumed that the conflicts are minor.

Lastly, the occurrence of poachers coming to the village is a factor that needs to be taken into account when considering protective sentiments. This shows the existence of five more key-aims and connecting indicators deduced from the interviews.

5. Existence of a fear of losing positive influences of tortoises
 - % of respondents in location X expressing concerns when the tortoises would be gone
 - % of respondents in location X connecting rain to tortoises
 - % of respondents in location X connecting blessings to tortoises
 - % of respondents in location X connecting good fortune/ a good trip to tortoises
 - % of respondents in location X connecting protection from diseases to tortoises
6. Existence of a feeling of responsibility for protecting tortoises
 - % of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises
7. Existence of a reactive attitude towards poachers
 - % of respondents in location X indicating to take action when poachers come in or near the village for tortoises
8. No negative sentiments connected to tortoises
 - % of respondents in location X that mentions the existence of human-tortoise conflicts
 - % of respondents in location X that expresses concern in the case the number of tortoises would increase
9. No poachers coming to the area to the village for tortoises
 - % of respondents in location X indicating that poachers came to the village in for tortoises in the past

4.5.4. Step 4 (Step 6 of SEA): Impact assessment of options

Next, normalized ranges of impact have been developed. To ensure sufficient differentiation, a 5-point scale has been used, the levels ranging from very high, high, moderate, low, to very low. This refers to the level of impact of the indicator on reaching the key aim that the indicator belongs to.

Based on the already observed frequencies of occurrence per indicator, 10% or lower has been defined as a very low contribution to reaching the key aim. Next, the range per level is 20%, which ultimately results in the following normalized range:

- **Very high** = > 70%
- **High** = 51% - 70%
- **Moderate** = 31% - 50%
- **Low** = 11% - 30%
- **Very low** = ≤ 10%

However, in some cases the impact of the indicator is reversed because the indicator is formulated negatively. This is the case for the following indicators:

- % of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions
- % of respondents in location X indicating the taboo has been broken within the community in the past
- % of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises
- % of respondents in location X that mentions the existence of human-tortoise conflicts
- % of respondents in location X that expresses concern in the case the number of tortoises would increase
- % of respondents in location X indicating that poachers came to the village in for tortoises in the past

In these cases, the following normalized range is used:

- **Very high** = ≤ 10%
- **High** = 11% - 30%
- **Moderate** = 31% - 50%
- **Low** = 51% - 70%
- **Very low** = > 70%

In order to reach the policy options of determining adherence of community members to the taboo and determining protective sentiments among the community members, a policy objective of a minimum or maximum percentage or level has been decided per indicator. These decisions are based on reasoning following the knowledge on previous TSA collaborations and general knowledge obtained over the course of the fieldwork. It has been reasoned that for indicators positively impacting the key aim, a minimal occurrence of 30% among the respondents should be aimed. This means that at least about one-third of the respondents aligns with the indicator, which arguably presents a group segment large enough to be significant for policy decisions. The other way around, 30% has been determined to be the maximum in the case of 'reversed' indicators (see Appendix 3 for a complete schematic overview).

The indicators on the level of a sense of connection with the community and on the level of respect for the ancestors are less clear-cut, since their level has not been determined based on specific questions within the interviews. Instead, the level is determined based on argumentation following what showed throughout each interview entirely. These indicators are hence less in line with the SMART guidelines, yet more based on the knowledge of the researcher as an expert.

In the first place, the sense of connection with and belonging to the community determines whether people are afraid of losing this connection with it, as has been argued before. The self-definition as a close community as well as the high value ascribed to many place-based factors points at a strong

sense of belonging to the community, and for that reason this is considered to be very high in all research sites.

In the second place, the level of respect for the ancestors among the community is arguably connected to a fear of these ancestors. As mentioned before, the ancestors ‘traditionally’ influence a large part of Antandroy and Mahafaly life, and death. The ancestors determine most of the repercussions that are connected to breaking the taboo, and who started the taboo. Therefore, when the taboo is broken, this is frequently mentioned to be like disregarding and disrespecting the ancestors. The fear for the ancestors’ ‘revenge’ and the fear of losing access to them – which is part of the curse and thus a reoccurring repercussion of breaking the taboo – hence make people stronger adhere to the taboo. However, when this respect for the ancestors is weak, it is more likely that people easier dare to break the taboo. Most respondents, however, showed a high level of respect for the ancestors, and indicated that their obedience to the taboo is because everything that came from the ancestors should be respected. For this reason, it can be assumed that the level of fear for the ancestors is high in every research site.

Both indicators are considered to need at least a high level in order to enable sufficient adherence to the taboo within a community. The reasoning behind this decision includes the consideration of influence of community members on the rest of the community. In a localized social setting as observed in the research locations, different views and sentiments of just a few community members may easily spread and thus influence the rest of the (small) community’s views and sentiments. Considering this, policy is argued to ideally aim for high or very high levels of those two indicators.

In Appendix 3, the level for each indicator per location has been indicated, using the symbols shown in Table 6. The exact percentages can be found in Appendix 4.

Level of impact	Symbol
Very high	++
High	+
Medium	+/-
Low	-
Very low	--

Table 6: the symbols used to indicate the level of each indicator per site

(Next page) Table 7: The levels of impact per indicator for each site

Overarching aims	Key aims	Indicators	1. Nikoly	2. Marovato	3. Tranovaho East	4. Tranovaho West & Ampanihy	5. Imongy & Ankilivalo	6. Antanimora	7. Ejeda	8. Androka & Kaikarivo	9. Itampolo
Adherence of community members to the taboo	1) Existence of a fear of repercussions when the taboo is broken	• % of respondents in location X indicating the offender to be negatively affected when the taboo is broken	++	++	++	++	++	++	++	++	++
		• % of respondents in location X connecting a curse to the taboo	-	-	+	+	-	+/-	+	++	++
		• % of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions	+	--	-	-	+/-	+/-	-	--	--
		• % of respondents in location X indicating nothing can undo all results from breaking the taboo	+	+/-	+/-	+/-	+	+	+	+/-	+/-
		• % of respondents in location X indicating the tortoise taboo to be the strongest taboo	/	/	+	+/-	+/-	+/-	++	+	+
	2) No community members breaking the taboo	• % of respondents in location X indicating the taboo has been broken within the community in the past	+	+	+	+	+	+	+	+/-	+/-
	3) Existence of a fear of losing connection with the community	▪ Respondents' level of a sense of connection with the community as reflected throughout the interview (general impression)	++	++	++	++	++	++	++	++	++
4) Existence of a fear of losing the goodwill of the ancestors	▪ Respondents' level of respect for the ancestors as reflected throughout the interview (general impression)	++	++	++	++	++	++	++	++	++	
Protective sentiments among community members	5) Existence of a fear of losing positive influences of tortoises	▪ % of respondents in location X expressing concerns when the tortoises would be gone	/	/	+	++	++	++	++	++	++
		▪ % of respondents in location X connecting rain to tortoises	-	-	+/-	++	+	+/-	+	++	++
		▪ % of respondents in location X connecting blessings to tortoises	+	+/-	+/-	+	+	+	--	+	+
		▪ % of respondents in location X connecting good fortune/ a good trip to tortoises	--	--	-	-	--	-	+/-	-	+/-
		▪ % of respondents in location X connecting protection from diseases to tortoises	--	--	+/-	--	--	--	--	--	-
	6) Existence of a feeling of responsibility for protecting tortoises	▪ % of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises	+/-	+	+	+	+	+	+/-	+	+
	7) Existence of a reactive attitude towards poachers	▪ % of respondents in location X indicating to take action when poachers come in or near the village for tortoises	+/-	++	++	+/-	+/-	+	-	+/-	-
	8) No negative sentiments connected to tortoises	▪ % of respondents in location X that mentions the existence of human-tortoise conflicts	-	-	+/-	-	-	+/-	+/-	--	--
		▪ % of respondents in location X that expresses concern in the case the number of tortoises would increase	/	/	/	/	+/-	+	+	++	++
9) No poachers coming to the area to the village for tortoises	▪ % of respondents in location X indicating that poachers came to the village in for tortoises in the past	+/-	+	+/-	+/-	-	--	--	--	--	

Based on the ranking, values ranging from 1-5 have been given to each indicator per site, where 1 represents the very low level, and 5 the very high level. These values have been used in multi criteria analysis where each indicator has been ranked to allow for prioritizing indicators. This rank has been determined by comparing each indicator to the other while for each pair deciding on the priority. This has been done separately for taboo adherence and protective sentiments (see Appendix 5 and 6). As visible in Table 7, some values are missing for the following indicators:

- % of respondents in location X indicating the tortoise taboo to be the strongest taboo
- % of respondents in location X expressing concerns when the tortoises would be gone
- % of respondents in location X that expresses concern in the case the number of tortoises would increase

Since weighted MCA scores cannot be calculated when values are missing, these indicators have been removed for these calculations. However, especially the indicator ‘% of respondents in location X expressing concerns when the tortoises would be gone’ had been ranked first among the indicators for protective sentiments, and the ‘% of respondents in location X that expresses concern in the case the number of tortoises would increase’ was ranked third (Appendix 7). Because of this perceived high relevance, these indicators are still considered separately in the final evaluation of the sites. The final scores are presented in Table 8 and Table 9.

Taboo adherence

Taboo adherence shows high scores in all locations (Table 8).

Taboo adherence – missing excluded		
Policy option	Total weighted score	Final valuation
1. Nikoly	4.43	Very high
2. Marovato	3.95	Moderate
3. Tranovaho East	4.24	High
4. Tranovaho West & Ampanihy	4.24	High
5. Imongy & Ankilivalo	4.33	High
6. Antanimora	4.43	Very high
7. Ejeda	4.43	Very high
8. Androka & Kaikarivo	4.24	High
9. Itampolo	4.24	High

Table 8: Weighted scores per site and related final valuations

The very high valuations based on taboo adherence can be seen in Nikoly, Antanimora and Ejeda. For Nikoly, the high scores can be explained by its relatively high scores on whether a sacrifice can be done to undo at least part of the effects of breaking the taboo (criterion 3), and the indication that nothing can be done to undo all that results from this (criterion 4) (see Appendix 8 for the scores per indicator for each site). This location hence shows a high prominence of the belief that the effects of the taboo are permanent, thus showing a high fear for the taboo’s repercussions. In Antanimora and Ejeda this combination of high scores on both criteria 3 and 4 is less striking, but still the scores are high on the indication that nothing can be done do undo all results of breaking the taboo (criterion 4). The same high value can be seen in the site of Imongy & Ankilivalo. The level of respect for the ancestors (criterion 7) has been ranked as the most influential, and had been defined as very high for all sites, which partly explains the high weighted scores in general. Marovato stands out for a relatively low score, which is explained by its low value for indicating that a sacrifice can be done to undo the effects of the taboo (criterion3), and whether a curse connected to the taboo was mentioned (criterion 2). This shows that the effects are more frequently considered to be not permanent, also since permanence has been frequently related to the curse, thus pointing to a lower fear for repercussions when breaking the taboo. The scores for mentioning a curse are especially high in the sites of Androka & Kaikarivo and Itampolo, showing that the respondents in these sites adopt the belief that negative effects like a bad life and misfortune are inherent of the taboo. It can thus be concluded that when looking at a favorable social situation related to taboo adherence, all sites can be defined as suitable, although Marovato less than the others. These scores thus result in the final distribution of suitable sites for the factor of taboo adherence, as visible in the last column in Table 9. Scores below 4.00 have been labelled as ‘moderate’, whereas the highest scores of 4.43 have been labelled ‘very high’. All scores between these two scores have been labelled ‘high’ in order to show the variation.

Protective sentiments

The scores on protective sentiments show more diversity, with the lowest score being 2.56 and the highest 3.56 (Table 9).

Protective sentiments – missing excluded		
Policy option	Total weighted score	Final valuation
1. Nikoly	2.56	Low
2. Marovato	3.00	Moderate
3. Tranovaho East	3.48	High
4. Tranovaho West & Ampanihy	3.56	High
5. Imongy & Ankilivalo	3.22	Moderate
6. Antanimora	3.37	Moderate
7. Ejeda	2.67	Low
8. Androka & Kaikarivo	3.48	High
9. Itampolo	3.44	Moderate

Table 9: Weighted scores per site and related final valuations

None of the locations scores very high on the indicators of relevance to facilitate protective sentiments. The scores have been given a final valuation shown in the last column of Table 9. The valuation is based on the given scores varying from 1 being very low to 5 being very high, but also adjusted in order to show the variation visible in the scores. In that way, the lowest scores under 3 have been defined as low, the scores varying from 3.00-3.44 as moderate, and all above 3.50 as high. In that way, Nikoly and Ejeda are the two sites that are valued low on their protective sentiments. These low scores can be explained by their relatively low scores on both criterion 5 (whether they care if poachers come for tortoises) and criterion 6 (if they take action) (see Appendix 8 for the scores per indicator for each site). These indicators have been ranked high in the calculation of their weight since they show indifference towards poachers which is considered to be an important indicator of a lack of protective sentiments. The sites that are valued relatively high on their protective sentiments are Tranovaho East, Tranovaho West & Ampanihy, and Androka & Kaikarivo. For Tranovaho East, the high weighted score can be explained by its relatively high scores both on criterion 5 and 6. Besides, it scores relatively high on connecting rain to tortoises (criterion 1) and not mentioning the existence of human-tortoise conflicts (criterion 7). The sites of Tranovaho West & Ampanihy and Androka & Kaikarivo score especially high on connecting rain to tortoises and the other beliefs connecting positive attributes to tortoises, as does Itampolo. Itampolo, however, scores rather low on an active protective attitude and a high number of people mentioning human-tortoise conflicts, which is why it is still labeled as 'moderate'.

The final valuation of both taboo adherence and protective sentiments have been indicated in the map of the research sites, as visible in Figure 12 on the following page. This shows site 3 (Tranovaho East), 4 (Tranovaho West & Ampanihy), and 8 (Androka & Kaikarivo) as having high valuations for both components, which makes them seem to have a positive social environment facilitating them. Site 6 (Antanimora) shows a very high valuation on taboo adherence combined with a moderate valuation on protective sentiments, which still can be considered as a positive social environment favorable for tortoise conservation. Site 1 (Nikoly) and 7 (Ejeda) show very high valuations on taboo adherence, but low valuations on protective sentiments. The latter may thus be a point of concern for tortoise conservation in both sites. The moderate valuations on protective sentiments in location 5 (Imongy & Ankilivalo) and 9 (Itampolo) are combined with high valuations on taboo adherence, which makes them still display a positive environment for facilitating the both components, yet the protective sentiments may be a possible focus point for improvement in these regions. Site 2 (Marovato) shows moderate valuations on both components, which shows a potential (since they are not negative) yet a need for improvement on both components when a positive social environment facilitating them is wished to be developed.

4.5.5. Conclusion

The SEA approach can be used to define priority sites by defining a social environment able to facilitate both taboo adherence and protective sentiments, which has been argued to be favorable for community involvement with tortoise conservation and potential tortoise release. Multiple indicators have been developed to measure both components of the self-surveilling system in the tortoise panopticon. By following the steps presented in SEA, including multiple components analysis (MCA), final weighted scores and valuations could be calculated and defined. The map resulting from those valuations provides an overview of the extent to which the components of taboo adherence and protective sentiments are present within each site, according to the MCA valuation. This shows which sites already possess a high potential for facilitating both components, such as Tranovaho East, Tranovaho West & Ampanihy, and Androka & Kaikarivo, and which sites need extra attention to one or both components, as is the case with Nikoly and Ejeda which score low on protective sentiments. Overall, it can be concluded from the scoring and more quantitative valuation that especially protective sentiments are a factor of concern when a favorable social environment is aimed to be established in one of the sites, which is in line with the earlier conclusion that protective sentiments are not necessarily included in the taboo content. However, the scoring needs to be placed within the already acquired qualitative knowledge on the regions' social environment, and hence a connection between the scores and the conservation reality will be elaborated in the following chapter on recommendations.

5. Recommendations for (TSA) radiated tortoise conservation

For the Madagascar Tortoise Program, the TSA concludes the following:

“Our primary challenge is to identify healthy populations of tortoises that are in close proximity to villages that practice a strong protective fady, and then work with those communities to provide incentive for protecting tortoises” (Randriamahazo et al., 2011: 65).

This research defined taboo adherence and protective sentiments as the focus points when identifying such potential target communities. Besides, the valuation of both components per research site is argued to help defining the related opportunities and threats for that region. This research included nine defined research sites: Nikoly, Marovato, Tranovaho East, Tranovaho West & Ampanihy, Imongy & Ankilivalo, Antanimora, Ejeda, Androka & Kaikarivo, and Itampolo. These nine sites have been valued on their (potential for) taboo adherence and protective sentiments by using part of the SEA steps and multiple component analysis as a tool. The map presented in Figure 12 shows an overview of the final valuations for both components for each region.

The valuations are indications of tortoise conservation potential in the included communities, as well as challenges that may need improvement when community involvement in tortoise conservation is aimed for in that region. For this reason, Table 7 presents a more detailed insight in the valuations of the components and related indicators (see Appendix 4 for the exact percentages), hence showing which components may need extra attention or may be emphasized in program strategies because of already existing high ratings on certain indicators. Based on this information, the site-specific opportunities and potential threats have been defined in Appendix 9. Moreover, recommendations following on these defined opportunities and threats are provided, based on the researcher's background knowledge and experiences and the knowledge acquired from the fieldwork.

As visible in Appendix 9, all sites have three common measures. In the first place, it is recommended to promote and provide information on the cultural and ecological values of tortoises in a way that is attractive to the target group. Illiteracy in the research population is relatively high, hence people do more rely on oral transmission of information by storytelling. Besides, it is argued that a mismatch can frequently be observed between conservation and (indigenous) local knowledge (Berkes, 2008; Brown, 2013; Fernández-Llamazares & Gavin et al., 2015; Cabeza, 2017). Biocultural approaches to conservation are argued to be a way to overcome such a mismatch and are defined as “conservation actions made in the service of sustaining the biophysical and sociocultural components of dynamic, interacting, and interdependent social-ecological systems” (Gavin et al., 2015: 140). The communities' storytelling context of the tortoise taboo and the tortoise-related beliefs can be defined as such a social-ecological system (Berkes, Colding & Folke., 2000). This displays an opportunity to further build on the existing local knowledge by adopting a biocultural approach and by further including this knowledge in the tortoise conservation actions. Besides, multiple examples exist in which approaches that include storytelling and promotion of (indigenous) local knowledge proved to be effective in engaging communities with nature conservation, and in enabling effective communication (De Groot & Zwaal, 2007; Fernández-Llamazares & Cabeza, 2017; Gavin et al., 2015). This also includes a case in Ranomafana, Southeast Madagascar, where “a variety of storytelling formats [were used to] promote local pride for lemurs as well as emotional connections with the forest” (Fernández-Llamazares & Cabeza, 2017: 6). Drawing upon this example, the inclusion of storytelling in the (TSA) conservation approaches may hence be a tool to spread tortoise conservation values in a way that fits the local context of high illiteracy, the storytelling tradition, and the already existing cultural stories.

In the research sites, storytelling can be done on different locations such as schools, may include visuals, and would require the establishment of a special team within the TSA focusing on such environmental education. In the region around the TCC, the information of cultural and ecological values can be provided in and spread from the future Community Outreach Center (COC) that is currently being constructed. In the region around the TRC in Lavavolo, the building of a similar center may be considered. However, the Dreamschool established by Conservation Fusion already focuses on conservation education (Conservation Fusion, 2011) and thus shows the existence of a readily available center from which conservation values are being spread. Opportunities can hence be seen in establishing (further) collaboration with the DREAM school and drawing upon their conservation education experience, while also considering the added value of storytelling. Moreover, the outcomes

of this research argue for a focus on the cultural value of tortoises in such practices, especially as bringers of rain and good fortune. In the other regions, no center is present (yet), meaning that spreading of the cultural and ecological value more relies on awareness activities such as themed events, storytelling in schools or other already existing buildings, and/or the distribution of materials promoting the values.

Secondly, human-tortoise conflicts have been defined as diminishing protective sentiments and are largely connected to tortoises eating people's crops. Similar conflicts can be seen in the case of the Galapagos giant tortoise, and with the species' increase, the conflicts have notably increased too (Camperio-Ciani et al., 2016; Galapagos Conservancy, 2019). The Galapagos Conservancy organizes workshops with farmers to define strategies to diminish these conflicts, and supports farmers who purposely keep the tortoises in their lands for attracting tourism (Galapagos Conservancy, 2019). In the case of the radiated tortoise, the use of tortoises in agricultural land as tourist attraction is rather unlikely due to low accessibility of most agricultural lands and a relatively low number of tourists. Therefore, defining suitable methods diminishing the current conflicts and protecting the crops is therefore recommended for this case. Where deemed essential, means to enable such methods (such as fencing material) could be provided. However, fences may obstruct migration routes and limit the food availability for tortoises too (Camperio-Ciani et al., 2016). This means that the development of strategies mitigating human-tortoise conflicts should also include considerations on the ecology of the radiated tortoise, and possibly asks for further research on their potential effects. Again, the future COC and the TRC location in Lavavolo including the DREAM school, provide potential locations where workshops can be held and information on defined strategies can be distributed. In the other locations, such information can be spread by making use of more mobile methods like field visits or distribution of information materials. In this way, it is aimed to develop an approach that diminishes the negative sentiments connected to tortoises, to better facilitate supportive sentiments for reintroduction and protective sentiments in local tortoise panopticons.

Thirdly, it has been mentioned and observed multiple times that the threshold to report violations by poachers is rather high. Especially in sites where tortoises have been released, local absence of law enforcers associated with the tortoises proved to be a reason for delayed or even omitted reporting of poaching cases. Increased presence of such people who function as a 'tortoise-representative' and a contact person for tortoise-related cases thus may be a way to ease the path for local people to report poaching violations. Therefore, an increased presence and visibility of law enforcers and/or people associated with tortoise protection, including TSA staff, is recommended for all target sites; especially the release sites. This is also in line with the aim of increased law enforcement of the program (Randriamahazo, Hudson & Castellano, 2013) and may imply more regular field visits to these particular sites and/or establishment of contact persons among the targeted communities. Such an approach may hence contribute to reaching the aim of increased reporting of poaching cases in time, while limiting an increased use of more militarizing methods like raising punishments.

Aside from these three measures based on the site-specific valuations of taboo adherence and protective sentiments, more general opportunities and threats for both components have been defined (Table 10). For each opportunity and threat, aims for those involved with tortoise conservation have been developed. Besides, ideas for more practical approaches to reach the defined aims have been provided. These are based on personal knowledge, conservations, and field experiences, and are therefore meant to serve as an inspiration rather than strict guidelines.

When looking at the components of taboo adherence and protective sentiments (visualized in Figure 12), the sites of Tranovaho East, Tranovaho West & Ampanihy, and Androka & Kaikarivo show high potential on both, which would make them most attractive for reintroduction. Comparing these values to other background knowledge on the sites further stresses this potential. Tranovaho East contains the Fokontany Lavanono, which has been a targeted by TSA in the past and includes some officials who have been positively collaborated with yet. This shows a rather solid ground for further collaboration, and thus shows social opportunities for establishing community engagement and potential reintroduction. The site of Tranovaho West & Ampanihy includes the sacred forest of Ankirikirike where the surrounding communities have been defined as supportive before. This

appears to indicate a relatively positive social environment for community support and reintroduction too. The same can be argued for the site of Androka & Kaikarivo, since it is close to the TRC in Lavavolo. Consideration of both the final MCA valuations and other background knowledge hence present all three research sites as attractive options for community support and potential reintroduction.

The site of Itampolo shows a high potential for taboo adherence, yet the potential is only moderate for protective sentiments. Nevertheless, the presence of the TRC in this site needs to be considered when assessing the site for its potential too. For example, its existence facilitates a relatively high visibility of law enforcers associated with tortoise conservation, including TSA staff. Besides, the DREAM school of Conservation Fusion opposite to the TRC provides an opportunity for a base from where education and storytelling meetings on cultural and ecological values of tortoises can be arranged. The consideration of other background knowledge on the site of Itampolo hence defines it as a location with a rather high socially desirable situation for community engagement and potential release too.

The research sites surrounding the TCC site present a similar favorable social situation as those close to the TRC in Lavavolo. Firstly, Marovato shows moderate opportunities for both taboo adherence and protective sentiments, yet it borders the rather well-protected Cap Sainte Marie reserve. Besides, the site includes the Fokontany Antsakoamasy which has been experienced as collaborative before and where past TSA activity is still visible in a school building finished around 2012 (Hudson & Castellano, 2012). It hence seems an attractive option to continue further stimulation of community engagement with tortoise conservation. Secondly, the site of Imongy & Ankilivalo shows a high valuation on taboo adherence and moderate on protective sentiments. These valuations are the highest among the sites relatively close to the TCC, although it is much further away than Nikoly and Marovato. Moreover, the site is believed to contain good forest more towards the northern Fokontany, which makes it seem like a suitable site for release on both its social and ecological components. Considering the moderate potential for protective sentiments, however, this component appears to need special attention when collaboration and release is aimed for. Thirdly, Nikoly shows a very high potential on taboo adherence, yet its low potential for protective sentiments and its close proximity to Tsihombe Town seems to indicate a situation unfavorable for tortoise release both socially and geographically. The sites of Marovato and Imongy & Ankilivalo thus seem to best suit the needs for establishing tortoise release and community engagement.

Ejeda and Antanimora are the two sites furthest away from any TSA site, aside from Tranovaho West & Ampanihy, and they did not receive much TSA attention yet. The Fokontany visited in Ejeda score low in potential for protective sentiments, yet very high on taboo adherence. Moreover, Fokontany Ankazotà is located rather far from Ejeda Town, near forest that seemed to be of potentially good ecological quality as habitat for tortoises. This shows a potential for future collaboration and release, provided that protective sentiments will be increased considerably. The site of Antanimora has not been extensively targeted by the TSA before either, yet it shows a very high potential for taboo adherence and a moderate potential for protective sentiments. If the latter will be focused on and increased by the TSA in the future, this hence displays a site with a socially desirable local situation for tortoise conservation as well as release. No strong connections with the communities of both Ejeda and Antanimora have been made yet, however, which means that establishing new collaborations is likely to cost more time and effort than those sites that have been targeted yet.

Finally, it can be concluded that each site provides both opportunities and threats when thinking of reintroduction and potential facilitation of community engagement. These opportunities and threats are place-dependent, and therefore it is argued to be of high importance to define them properly, and act accordingly. Therefore, a final recommendation is to continue interviews similar to those conducted for this research in locations defined as potential release sites in the future. Besides, the model of the tortoise panopticon shows many factors in the local societal context that influence the local situation, as well do unexpected events. Continuous evaluation of the social situation in the target sites is therefore recommended, for example by regular field visits. Together, all recommendations are aimed to help developing more adaptive approaches, applicable to the local social reality in which the tortoise conservation exists.

Aim			Recommended aims	Possible approaches to reach the aims (inspiration)
Taboo adherence	Opportunities	Very high feelings of connection within the community	<ul style="list-style-type: none"> - Facilitate continuation of the current feeling of community connection - Increase social pressure to protect tortoises 	<ul style="list-style-type: none"> - Involve and reward communities as a whole (instead of focusing on individuals) - Focus on support from and collaboration with those in charge (Chef Fokontany, respected elderly men, etc.)
		High respect for the power of Zanahary and the ancestors	<ul style="list-style-type: none"> - Facilitate continuation of the current feeling of respect for Zanahary and the ancestors 	<ul style="list-style-type: none"> - Promote inclusive religion allowing for continuation of traditional beliefs (start communication and possible discussion with missionaries)
	Threats	Changing religion due to missionaries and other changing factors	<ul style="list-style-type: none"> - Ensure adoption of the taboo despite a changing religion 	<ul style="list-style-type: none"> - Promote inclusive religion allowing for continuation of traditional beliefs (start communication and possible discussion with missionaries)
		High appeal of poaching money due to many factors, including high poverty rate and draught (connected to a high reliance on favorable weather circumstances for crops due to limited alternative sources of income)	<ul style="list-style-type: none"> - Increase livelihoods of the targeted communities - Reduce reliance on agriculture only - Increase access to alternative sources of income 	<ul style="list-style-type: none"> - Promote agricultural techniques suitable for and resilient to the local climatic situation - Provide and/or promote alternative sources of income - Provide better access to schooling
		Instable societal environment because of high foreign aid presence and political instability	<ul style="list-style-type: none"> - Increase self-reliance of targeted communities - Increase educational level 	<ul style="list-style-type: none"> - Facilitate new, stable sources of income (e.g. provide knowledge on effective agricultural techniques suitable for the region) - Ensure facilitation of schools and presence of teachers
Protective sentiments	Opportunities	Connection of tortoises to rain, blessings, good fortune and protection from diseases	<ul style="list-style-type: none"> - Further strengthen and spread the beliefs connecting positive attributes to tortoises 	<ul style="list-style-type: none"> - (Further) implementation of awareness campaigns including storytelling and visually attractive materials focusing on the beliefs connecting positive attributes to tortoises, especially rain and good fortune (which are commonly highly valued)
		Nationally acknowledged laws and <i>Dina</i> such as the <i>Lilintane</i> in place protecting the tortoises.	<ul style="list-style-type: none"> - Know which sites do and do not adopt tortoise-protecting laws - Increase adoption of tortoise protecting <i>Dina</i> in all sites, also outside Androy 	<ul style="list-style-type: none"> - Create a clear overview of the communities adopting a tortoise-protecting <i>Dina</i> - Continue promoting adoption of protecting <i>Dina</i> as done with the <i>Lilintane</i> before
		Very high percentage of people expressing concerns when the tortoises would be gone in (almost) all sites	<ul style="list-style-type: none"> - Strengthen awareness of the concerns expressed when tortoises would disappear completely - Facilitate a societal environment where an active attitude reacting on the expressed concerns is easy and rewarded 	<ul style="list-style-type: none"> - Further stress the expressed concerns (losing advantages now provided by the tortoises, losing an animal of Zanahary, etc.) with awareness campaigns - Improve current awareness of and accessibility to authorities in charge of tortoise poaching cases and develop rewarding systems for those who take action after witnessing poaching
	Threats	Not an inherent connection between taboo adherence and protective sentiments	<ul style="list-style-type: none"> - (Introduce and) strengthen the connection of protective sentiments to the tortoise taboo 	<ul style="list-style-type: none"> - (Further) implementation of awareness campaigns focusing on the beliefs connecting positive attributes to tortoises
		Low reactive attitude towards poachers	<ul style="list-style-type: none"> - Increase presence and visibility of TSA staff/ authorities in charge of tortoise protection - Increase community engagement with tortoise protection 	<ul style="list-style-type: none"> - Increase presence and visibility of TSA staff and tortoise-related law-enforcers - Increase field visits to collaborative communities and focus regions - Establish (paid) patrolling teams and ensure continuity with provision of the necessary tools and regular check-ups
		Lack of law enforcement	<ul style="list-style-type: none"> - Improve law enforcement 	<ul style="list-style-type: none"> - Establish patrolling teams and ensure continuity with provision of the necessary tools and regular check-ups
		Lack of respect for and ridiculing of those protecting tortoises	<ul style="list-style-type: none"> - Improve image of those involved with tortoise protecting 	<ul style="list-style-type: none"> - Awareness campaigns focusing on the positive attributes of tortoises (including the beliefs)
		Human-tortoise conflicts	<ul style="list-style-type: none"> - Decrease human-tortoise conflicts 	<ul style="list-style-type: none"> - Collaboratively develop approaches to diminish conflicts and spread knowledge on methods keeping tortoises away from the crops - Provide necessary means to enable such methods when necessary

6. Discussion

This research included multiple methods for both data collection and analysis. First, the results will be discussed further, as an answer to the research question. Then, the discussion will elaborate on the broader theory and the place of the research in this theory. Finally, the methods will be reflected upon by outlining the limitations and considerations.

Discussion of results

The results as presented before provide answers to the sub-questions. Here, these results will further be discussed to provide an answer to the main research question:

How do human-tortoise relations and interactions, including tortoise conservation, relate to the performance of the 'tortoise panopticon' of the Antandroy and Mahafaly people of South and Southwest Madagascar? The empirical objective was to define tortoise conservation potential and threats to the current state of the site-specific tortoise panopticon and the factors that shape it. Based on the panopticon theory developed by Foucault, a hypothetical basic model of the tortoise panopticon has been defined in an early stage of this research, showing a surveilling power shaping and influencing a self-surveilling panoptic system, which in turn interacts with the societal context (Figure 1). Both the surveilling power as the societal context were assumed to influence the power of the self-surveilling system of the tortoise panopticon. Analysis of the data gathered during the fieldwork of this research resulted in a further development of this model, of which Figure 13 is the result.

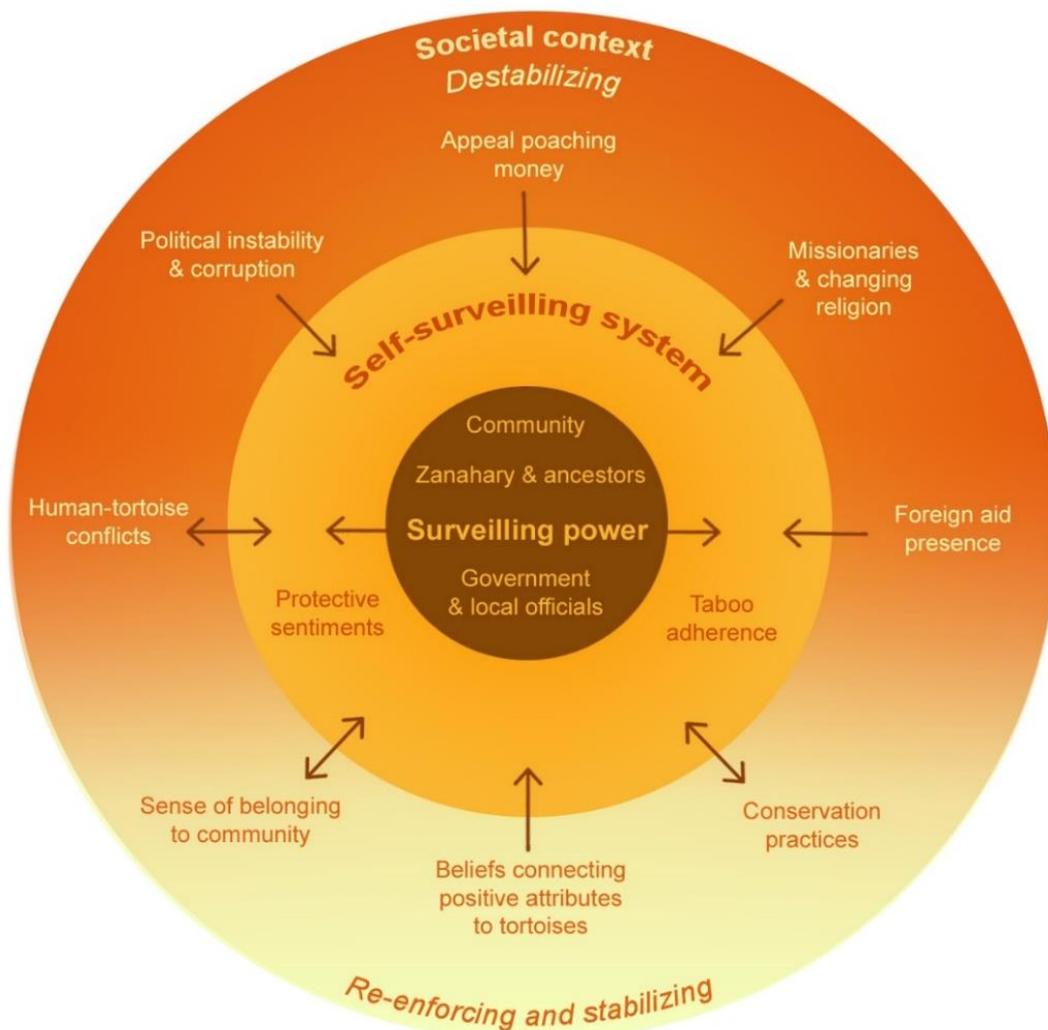


Figure 13: Final model of the tortoise panopticon, showing the bodies of surveilling power, the components of the self-surveilling system of the panopticon, and the shaping factors in the societal context.

Foucault defines power as a “complex strategical relationship” in a society (Foucault in Lansing, 2003: 374). Related to tortoises, not just one, but multiple of such strategical relationships can be defined, making the panoptic self-surveilling system even more complex. From the data, three largely independent surveilling powers of relevance to the tortoise panopticon have been deduced: the community, Zanahary and the ancestors, and the government including local officials. Firstly, the community is considered to have a surveilling power since the research population has been defined as a close community being highly localized, and repercussions when the taboo is broken are partly community-related. Secondly, repercussions are believed to come from the realm of Zanahary (the creator) and the ancestors, which makes these powers having a surveilling function too. Thirdly, the government and local officials are defined to have a surveilling power due to their legal entitlement to enforce the national laws protecting tortoises. Taboos are generally claimed to be internalized as informal, customary rules rather than official legislations of formal institutions (Lingard et al. 2003). A *Dina* like the *Lilintane*, however, converts traditional, customary laws on tortoise use and protection to the nationally acknowledged legal level. This power adds legal repercussions to the tortoise panopticon, and the resulting fear of repercussions coming from all three surveilling powers is argued to shape and strengthen the self-surveilling power of the tortoise panopticon.

The power of the three surveilling bodies each can make people to their subjects and shape them, thus making them internalize the tortoise-related rules that they prescribe. The development of such governmentality is argued to shape one’s values, identity, and behavior (Agrawal, 2005; Müller et al., 2017). However, a perceived limited power of one or more of the surveilling powers has been argued to weaken the power of the tortoise panopticon as a whole, thus imposing less influence on the subjects’ behavior. This power of each surveilling body is influenced by multiple factors in the societal context, as visible in Figure 13, thus showing a dynamic interaction.

Firstly, communities are indeed increasingly acknowledged as powerful in conservation literature, and their relationship with nature is stressed with the development of the concept of social-ecological systems, referring to the complexity of the system in which nature and people are connected (DeFries & Nagendra, 2017). The tortoise’s cultural value displayed in this case, including the tortoise taboo, further confirms this connection. An increased arguing for community-inclusive conservation follows this notion, yet cases exist that show community support cannot be taken for granted (Bennett & Dearden 2013; Butler et al. 2015). The surveilling power of the community in the tortoise panopticon hence depends on the extent to which sentiments supporting tortoise conservation exist within that community. Besides, the extent to which someone acts upon the rules prescribed by the community, and thus the strength of the community’s surveilling power, is partly dependent on the community’s sense of belonging as well as an individual feeling of connection among its individual members (Montenegro, 2018; Tanaka, Davidson & Craig, 2018; Salami et al., 2019). With a low feeling of connectedness, repercussions like exclusion from the community are argued to be less impactful, meaning the pressure to adhere is lower.

Secondly, the surveilling power coming from the realm of Zanahary and the ancestors partly depends on the strength of belief in these powers. In turn, the existence of a common belief in these powers may create and/or strengthen a community (Montenegro, 2018), hence increasing the panoptic power of the community too. Generally, a high respect for the will of the ancestors and Zanahary can still be observed, yet the presence of missionaries and other people aiming to convert local people to another religion displays a factor threatening to lower this respect. People who become ‘religious’ frequently abandon ‘traditional’ beliefs connected to the ancestors and Zanahary (Bastian, 2000; Jenz, 2012; Swartz, 2018), hence significantly weakening the surveilling power coming from this surveilling body.

Thirdly, the strength of the government and its local officials’ surveilling power is decreased by poor law enforcement, influenced by the current state of political instability and corruption. The two other surveilling powers of the community and the ancestral realm may prove to be enough to fulfill tortoise conservation needs when they create a tortoise-protecting self-surveilling system. However, this research stresses that protective sentiments are not inherent in Antandroy and Mahafaly society, and since poachers come from outside the communities too, the legal power still appears to be of relevance to tortoise conservation and the tortoise panopticon. Nonetheless, law enforcement is argued to be more related to top-down “fortress conservation”, and a ‘war on wildlife crime’ has

proven to be not effective in many cases (Neumann, 2004; Duffy et al., 2015; Runhovde, 2017; Wilfred, 2017). Law enforcement hence cannot be regarded as a solution in itself but rather as of complementary value to the tortoise panopticon, implying that it needs to co-exist with the other two powers.

Each surveilling power is exposed to factors within the societal context that have the potential to stabilize or destabilize their strength, thus impacting the strength of the self-surveilling system of the tortoise panopticon too. It can hence be argued that the definition of the tortoise panopticon shows complex and situational interactions that determine its strength. However, the valuations of the tortoise panopticon do not indicate the actual strength of the tortoise panopticon per site. They rather value the site on its opportunities (and threats) to develop a favorable social environment for tortoise conservation and potential release, including both components of taboo adherence and protective sentiments. The definition of such opportunities and threats thus shows the social potential existing within a region. This defined potential thus presents a lead for those involved with tortoise conservation in further developing and stimulating the locally available components of taboo adherence and protective sentiments.

Discussion of theory

The theoretical objective of this research was understanding the dynamic relation between practice and meaning in panoptic species-specific taboo systems, connected to species conservation, by using the concept of performativity as a theoretical lens.

The panopticon and its complex dynamics connect with Foucault's theory on microphysics of power, arguing that an invisible self-surveilling system is created by society's members being subjected to each other due to a panoptic power in society (Lansing, 2003; Dove, 2009). In the introduction and theoretical framework, the tortoise taboo has been argued to create such a panoptic system that people adhere to, based on (invisible) social surveillance, thus creating a panopticon as visualized in the hypothetical model of Figure 1. However, for tortoise conservation the focus cannot be limited to the taboo alone. Data analysis shows that tortoise protection is not inherent in the taboo and that more components than only the taboo are connected to the system of self-surveillance involved with the tortoise. The concept of the tortoise panopticon thus expands to two components of the self-surveilling system deduced from the data: protective sentiments and taboo adherence. For tortoise conservation, the simultaneous presence of both components is argued as of high value to a favorable social environment in facilitating community support.

The dynamics of the societal context shaping and reshaping the surveilling powers, and vice versa, illustrate the prominence of performativity in the tortoise panopticon. The interaction between knowledge and practice is addressed in practice theory, while accounting for uncertainty and (individual) variability (Waterton, 2002; Hausermann, 2012). Performativity further sensitizes this dynamic interaction, by focusing on the practices in reality as opposed to knowledge embedded in normative systems (Hall, 2000; Arts et al., 2013; Behagel et al., 2017). The tortoise taboo with its related tortoise panopticon shows a case in which normative systems are developed indeed, due to the surveilling powers and other influential factors in the societal context. Knowledge includes stories on the tortoise taboo and other beliefs that connect positive attributes to tortoises, hence providing an incentive to protect tortoises. Considering performativity, once again this case highlights that individual behavior is not only steered by one's knowledge and connected values. Economic insecurity and large sums of money offered by poachers present situations where individuals are tempted to abandon their initial values, in order to improve their situation at that moment. Moreover, human-tortoise conflicts lower the positive sentiments connected to tortoises, thus potentially diminishing protective sentiments. So, despite the respondent's mentioning of a deep respect for and adherence to the taboo, individual violations are reported and frequently connected to unexpected events such as draughts and to the lure of money in the context of a low income and a lack of alternative opportunities. This outline of complex interactions in the tortoise panopticon, as visualized in Figure 13, further strengthens practice theory in its claim that reality is constantly being shaped and reshaped by knowledge-practice interactions. It stresses reality cannot be fully understood by solely looking at abstract constructs of knowledge, as is largely being done in discourse theory (Elgert,

2011; Turnhout et al., 2015), but needs to be placed in its context of practices and other influencing factors by using performativity as a concept in a more practice-based approach.

Tortoise conservation practices have been defined as being part of the societal context too, showing a two-way interaction where they shape the strength of the tortoise panopticon and at the same time are being shaped by it themselves. In the radiated tortoise conservation approaches, it is generally aimed to include and engage the local communities, hence largely focusing on the component of protective sentiments within the tortoise panopticon. It is especially this component that can be argued to be shaped and strengthened by the conservation activities, considering the conclusion that tortoise protection is not innate in the tortoise taboo. In literature, concerns have been expressed about motivational crowding in such situations, resulting from incentivizing measures that not consider already existing motivations locally (Rode et al., 2014; Kczan et al., 2016; Moros et al., 2017). This would 'crowd-out' the motivations locally present yet. In this case study, however, the protective component in the tortoise panopticon seems to be absent or relatively low in the tortoise taboo. The case of radiated tortoise conservation therefore does not provide clear indications for crowding out motivations for protecting tortoises, since they are limited yet. Motivational crowding can thus not be observed in this case; tortoise conservation rather shows to provide an addition to the tortoise panopticon by strengthening its protective component. Species conservation activities thus present an opportunity to stimulate and even introduce components in local panopticons, without significantly destabilizing them, yet sensitivity to already existing social structures and institutions is required and asks for their constant assessment.

To fully understand the dynamics between knowledge and practice in the local panopticons, more long-term and in-depth research that also involves observations on the actual practices as displayed in human-tortoise encounters is recommended. This may involve staying with the communities for at least multiple weeks. Besides, the case of tortoise conservation is not unique, and species conservation frequently exist within a complex social context of species-specific taboos and/or other informal institutions (Colding & Folke, 2000; Tengö et al., 2007; Jones et al. 2008). Future research applying the panopticon model as presented in this research to other case studies is therefore recommended, to further explore and develop the theory as well as its application in species conservation.

Discussion of methods

The methods used to answer the research question display multiple limitations that need to be discussed. Firstly, site selection was partly dependent on accessibility of the sites. From the cities where the research team resided, the fieldtrips to the research sites frequently involved a one to two-hour drive with the 4x4 vehicle, following small and bumpy roads. Despite this relatively bad condition of the roads and long travel distance from the larger towns, it also meant that all research sites were potentially accessible for other people with 4x4 vehicles, including poachers. This may have caused a bias, while potentially excluding sites that are even more remote and thus may have been even better options for tortoise release due to a lower exposure to 'outsiders' and limited accessibility for poachers.

Besides, interviews were carried out by making use of two interpreters: one to conduct the actual interview in the local dialect and one to translate what has been said in English. This means a high dependency on the interview techniques of especially the first interpreter speaking the local dialect. An interview guide was provided and discussed first, in order to ensure standardization and to prevent misunderstandings due to miscommunication. During the interviews, the questions were constantly reviewed and questioned when necessary by the interpreter translating into English. These measures aimed for consistent, comprehensive interviews conducted with a limited bias, yet due to the language barrier this cannot be ensured completely. Moreover, nuances of the language are likely to have been missed for this same reason, as well as the exact course of the conversation, hence researchers familiar with the local language may be preferred in future research.

Aside from the language barrier, sensitivity of the interview topics needs to be considered. The tortoise taboo typically does not involve a taboo on speaking about it, yet the social disapproval and other repercussions connected to breaking the taboo still make it a sensitive topic. Sometimes, this

made respondents visibly hesitant in answering the questions, despite the relatively neutral nature of questions like those on the origin of the taboo and other beliefs related to tortoises. During the fieldwork, it was tried to overcome this challenge by informing Rampanarivo to clearly state that sensitive information would not be shared with third parties and that the research was not conducted in name of the TSA. Besides, Rampanarivo's already existing connections in the communities were used to gain trust among the participants. More neutral questions involve the content of the taboo, including the existing stories on the taboo origin, and hence these answers are considered less likely to be distorted. Besides, these stories have been partly verified with other Antandroy and Mahafaly informants in more open interviews. Whether the truth was told about the occurrence of breaking the taboo is less easy to confirm due to its sensitive character. The provided information has been discussed with Rampanarivo and Rakotondrainy, and compared to the information provided by Sylvain who is in charge of implementing the *Lilintane*. Based on this information and these discussions, it was concluded that some respondents clearly held back information, yet the majority did reply in a way fitting the already existing knowledge of the TSA members. From these considerations it can thus be assumed that sensitivity of the topics did not significantly distort the research outcomes, but in future research further verification of the information provided by the respondents may be recommendable.

In order to make people participate in the interview, respondents needed to be paid, since NGO's come to do surveys many times and people always get paid for those surveys too. This means that Free Prior and Informed Consent (FPIC) could not be established, and only Prior and Informed Consent (PIC) was adopted. It was aimed to not tell about the reward in advance, in order to avoid people participating solely for the money. However, frequently a reward was demanded by the Chef Fokontany beforehand, and in such cases it was unavoidable to tell that some reward was included. However, the exact amount was still not mentioned since this was likely to result in bargaining for more. This involves an ethical choice to equally distribute the money over the respondents, hence not favoring one respondent over another. The price was therefore non-negotiable, and in case the Chef Fokontany or respondents demanded for more or refused to do the interview before the exact amount of money was mentioned, the interview was stopped. Sometimes this meant that another Fokontany had to be found. Despite these precautions, still a bias may have occurred of people only being interested in the reward, and the prospect of a reward may have steered people's answers.

Furthermore, the *vazaha* (outsider) status of the research team was clearly visible due to my Western appearance and the non-Antandroy/Mahafaly tribal background of Rakotondrainy, despite the presence of the Antandroy Rampanarivo. The arrival with a 4x4 vehicle – something most respondents cannot even dream of to own – further confirms this image. Generally, people look up to *vazahas*, and when considering power, this difference in wealth and available means automatically places the researcher above most of the respondents in their perception, which is hard to overcome during a 15-30-minute interview. This may imply that respondents lean towards providing information that they consider to be favorable, in line with this perceived status. This presents again another argument in favor of a researcher from the region in future research, although entering the sites without a 4x4 vehicle is almost impossible and will be time consuming.

Moreover, the respondents were selected by using snowball as well as convenience sampling. This implies that the first contact person in a village – usually the Chef Fokontany – could influence the selection of the respondents. Besides, there was a dependency on the people present in the village during the moment of visiting, which was usually in the morning or early afternoon. This means that the selection of the respondents would have been different when the village was entered at another time of the day, and might have caused the exclusion of people that are less often present in the village. This may have caused a bias towards people that are frequently in close proximity to their village, thus being more closely connected with it and being more localized.

A final consideration on the fieldwork connects to the inability to stay with the researched communities for a longer period due to time constraint and for logistical and safety reasons. Moreover, there is an urgency to define suitable communities for tortoise conservation and potential release, and such in-depth and time-consuming research does not suit this situation. Thick description and participatory observations of actual practices were hence impossible, yet this lacking information has been

substituted by interviews with 'experts' who were considered to possess such experiences already. This displays a dependency on a limited number of expert informants, and since these largely included TSA members the information may be biased towards their perspective.

The obtained data have been analyzed by making use of a way of direct coding in an Excel sheet for each interview, where answers to the relevant questions were summarized. It was chosen to use Excel because this was an already available program, while downloading of other programs was impossible due to limited internet. After the fieldwork, coding in another program was considered, yet due to time constraint and considering the direct coding that had been done during the fieldwork yet, the already existing Excel file was considered to be sufficient to use for further analysis. In order to standardize, multiple coding categories have been defined, based on the questions being asked during the interview, and have been listed in Appendix 2, including the considerations connected to each category. In this way, the coding technique is aimed to be transparent, yet for future research other coding techniques may be considered because of their common use.

In order to determine the valuation of each research site with regards to a favorable social situation for tortoise protection and potential release, only part of the steps presented in Strategic Environmental Assessment (SEA) have been followed as a tool. SEA is generally used to value the environment for specific policy options, yet for this case the research sites have been defined as separate policy options. This shows an adaption of the approach to serve the purpose of this research, also to enable the use of multiple criteria analysis (MCA) to connect a value to the two components of taboo adherence and protective sentiments. Arguably, these values are arbitrary, including the ranking process, yet the steps being taken are included in Appendix 5-8 to provide an insight in the decision-making process. Besides, the values are considered within the qualitative knowledge on the conservation context, hence functioning as an additional point of reference rather than an outcome in itself.

On a more general level, the role of the TSA in this research needs to be discussed. The research was carried out in collaboration with the TSA and funded by the Utah Hogle Zoo as part of the TSA radiated tortoise conservation program. Some directions for the research were provided by Castellano in advance, yet much freedom was given to define a topic of relevance to both TSA and my own scientific objectives. Documents from the TSA as well as other scientific articles have been used, and the conclusions drawn from this information have been discussed with Castellano in order to come to a final research topic. Castellano is no staff member of the TSA yet highly involved with its Madagascar activities and its staff. Despite the relatively high initial freedom that was given, the final definition of the research topic is hence partly steered by its connection with the TSA.

For the methodology, the dependency on the TSA is more obvious. Rakotondrainy was the TSA research coordinator at that time, and the research-site selection has been largely determined by her, Sylvain's, and Rampanarivo's background knowledge on the sites. Besides, following the TSA objectives, a high number of interviews conducted in multiple sites was preferred, resulting in conducting interviews that were more structured than initially intended. Moreover, the research was dependent on the availability of the 4x4 car of the TSA, and despite it being assigned for this research only, it was confiscated for other use multiple times. This resulted in covering less sites than aimed for initially, and in the case of Ejeda in the inclusion of Fokontany closer to Ejeda Town than intended. Hence, the fieldwork of this research was partly steered and shaped by TSA decisions, which displays a relatively high power of the organization over this research.

Aside from the power of the TSA, also the power of the researcher (me) and this research should not be overlooked. This research will be presented to the TSA and connects to their action plan in which the reestablishment and strengthening of the tortoise taboo is aimed for, to increase community involvement. Such a focus on promoting only traditional values is debatable, however, and it may be argued that this holds back changes that follow the natural course of globalization and delocalization. Besides, the beliefs that are aimed to be promoted are generally not in line with Western beliefs and scientific knowledge (Ogunniyi, 2011). The TSA point of view of protecting tortoises can best be placed within secular environmental ethics, which is based on more ecological as well as emotional arguments to protect a species, less related to religion (Pedersen, 2015). Saving the tortoise based on beliefs connecting positive attributes to tortoises presents values and grounds for conservation that

better connect to religious environmental ethics (Pedersen, 2015). This shows the existence of two ethical systems and worldviews that in this case become intertwined, and it raises the question if it is ethically justified to steer behavior by promoting values that one does not completely believe in themselves, to reach the final aim of protecting the radiated tortoise. However, such a binary distinction in Western versus non-Western, scientific versus non-scientific, or secular versus religious worldviews is becoming more and more contested (Gasco, 2007; Pedersen, 2015; Falade & Coultas, 2016). One worldview does not necessarily exclude the other, and considering the aim of effective intercultural communication and of adapting conservation practices to the local cultural environment it can hence be argued that including worldviews other than that of the (foreign) conservation organization can indeed be justified.

Finally, the results of this research will most likely start playing a role in radiated tortoise conservation practices and it aims to contribute to well-informed decision-making. Based on the outcomes, the TSA may further build their future conservation approach. This implies a potential power of the researcher (me) and this research to steer and influence the conservation activities, hence becoming included in the societal context of the tortoise panopticon. Moreover, this research argues in favor of stimulation of the panopticon's component of protective sentiments, and in that way it is aimed to be placed in the re-enforcing and stabilizing zone of the societal context. This research will hence start to shape and reshape the self-surveilling system the moment that this text is being read by decision-makers of any level, thus becoming part of the ever-evolving system of the tortoise panopticon.

7. Conclusion

This research attempted to answer the research question: *How do human-tortoise relations and interactions, including tortoise conservation, relate to the performance of the 'tortoise panopticon' of the Antandroy and Mahafaly people of South and Southwest Madagascar?*

The tortoise panopticon and its interactions have been outlined, showing the three surveilling powers of the community, the realm of Zanahary and the ancestors, and the government and its local officials. These powers construct a self-surveilling system around the tortoise which include taboo adherence and/or protective sentiments. The results of this research show these two components are not inherently connected, hence arguing that each component needs separate attention when reviewing the strength and nature of the tortoise panopticon for target communities.

Aside from the shaping influence of the three surveilling powers, the tortoise panopticon is shaped by the societal context in which it exists. This can be divided in factors with a destabilizing effect and those that are supposed to be more re-enforcing and stabilizing. The former group includes human-tortoise conflicts, political instability and corruption, the appeal of poaching money, missionaries and a changing religion, and the high foreign aid presence which creates an environment of uncertainty. To the latter group belong the factors of a sense of belonging to the community, beliefs connecting positive attributes to tortoises, and the conservation practices. From these influencing factors, three can be defined as more internal and related to the community concerned: a sense of belonging to the community, the beliefs connecting positive attributes to tortoises, and human-tortoise conflicts. The other factors are defined as the more external forces of influence to the panopticon. All these factors shape and reshape the self-surveilling system of the panopticon, hence displaying the interrelatedness of all components in its performance.

The model of the tortoise panopticon with its components has been used to further develop indicators for existing potential on the components of taboo adherence and protective sentiments separately. This enabled the development of a valuation scheme valuing each indicator for each site, following the steps of Strategic Environmental Assessment (SEA). By applying multiple component analysis (MCA), the indicators have been ranked, and MCA values have been calculated, resulting in final valuations of each site for the potential on both taboo adherence and protective sentiments. This systematic tool hence provides guidelines to define values for the two defined components of the tortoise panopticon in different sites, thus presenting socially available conservation potential for each site.

The values have been further assessed and placed within the conservation context of each site, based on the more qualitative data gathered for this research. This ultimately resulted in the definition of site-specific as well as general opportunities and threats related to the social situation on both components of taboo adherence and protective sentiments. For radiated tortoise conservation, recommendations have thus been provided based on the defined potential per site and in general. For each site, three main points of focus can be defined. These include diminishing human-tortoise conflicts by exploring ways to protect crops from tortoises, and lowering the threshold for reporting poaching cases by increasing visibility of people associated with tortoises. Most importantly, increasing the local prominence of the cultural values of tortoise is recommended, with an emphasis on the connection of tortoises to rain and blessings, by using storytelling as an approach integrating local traditions. These recommendations are aimed to increase the protective sentiments, hence strengthening this component in the self-surveilling systems of local tortoise panopticons.

With this study it is shown that, in South and Southwest Madagascar, tortoises are embedded in Antandroy and Mahafaly society in many ways, and their survival connects to a variety of factors in their societal context. To fully comprehend these dynamics, each of these factors and their performing roles requires to be considered separately, as do the three surveilling powers. More long-term and in-depth research on the actual tortoise-related practices may hence be required in the future, to fully understand the interaction of knowledge and practices per site. Research comparable to this study, preferably done by someone familiar with the language, is also recommended to further assess other potential release sites. For such assessment, the model of the complex system of the tortoise panopticon captured in the final Figure 13 presents a means to better understand local human-

tortoise connections for those engaged with tortoise conservation. Furthermore, the development of the indicators and the steps taken to further value each indicator per site provides guidelines to define opportunities and threats which can be used as a base for further development of a tortoise conservation approach in line with the defined local social situation. This research thus presents a tool, also for future assessment, to define and highlight focus points for those engaged with tortoise conservation and aiming to avoid motivational crowding by developing a conservation approach fitting the local social environment.

The focus of his research is the case of radiated tortoise conservation, showing the tortoise panopticon is composed of multiple components and many factors performing it. Species conservation in general frequently exists within similar complex and dynamic systems of a species' social environment, including destabilizing and re-enforcing, stabilizing components. This case thus seems to be no exception but rather an illustrative example outlining the challenges in species conservation. Besides, this case shows assumptions on an inherent connection between species-specific taboos and the species' conservation cannot be made blindly. Understanding not only the ecological environment, but also the complexity of the social environment and its nature, including that of the species-specific taboos, is thus the first step in developing conservation approaches accounting for and customized to this environment. The panopticon model, in combination with practice theory focusing on the dynamics between knowledge and practices, presents a theoretical model that may also be applied to other cases of species conservation. Further exploring its application to other case-studies in future research could contribute to further develop and sensitize the theory. In the case of radiated tortoise conservation, this research shows a need for acknowledging the performing role of tortoise conservation practices in the existing informal institutions, to develop approaches and activities that account for what the model of the tortoise panopticon presents: a dynamic and interconnected system of human-tortoise relations and taboos within the communities of South and Southwest Madagascar.

Acknowledgements

This research would not have been realized if not with the help of the many people surrounding me. In the first place, I therefore wish to acknowledge Christina Castellano, who introduced me to the case of radiated tortoise conservation, who brought me into contact with the TSA, who arranged the funding for the research project (for which I also need to acknowledge the Utah Hogle Zoo), and supported me throughout the duration of the whole research, even in the most difficult and challenging moments. Indirectly I therefore also want to thank Erin Shattuck for bringing me into contact with her and whose enthusiasm is always a source of inspiration. Secondly, I wish to express my special thanks to Riana Rakotondrainy for her continuous support, for accompanying and translating at every field-trip, and most of all for being a wonderful friend, research companion and source of motivation, while sharing many laughs despite the frustrations encountered throughout the research process. Moreover, I thank Koen Arts for our ever-inspiring and helpful talks and all the useful feedback as a supervisor, leading me in the right direction. Also, the TSA should be acknowledged, for providing me with a place to stay at the TCC and providing the necessary equipment and contacts. Finally, I wish to express my gratitude to all other people who supported me throughout the writing process and those in Madagascar who helped me during my stay, especially Rampanarivo for being a loyal field guide and interpreter for all interviews, Limbe for always driving us around for hours to the most remote places and patiently watching the car while the interviews were being conducted, Andrew for his private language and culture classes and for being a great friend to share my experiences with, Ismael and Jodi for introducing me to the Tsihombe life, the staff members of the TCC for sharing laughs and making me feel welcome, Filson for being a very enthusiastic sharer of Antandroy knowledge, and finally the coffee and *mofo* woman near the TCC site for providing caffeine and fatty bread when this was most needed!

References

- Agrawal, A. (2005) 'Environmentalism: Community, Intimate Government, and the making of Environmental Subjects in Kumaon, India' *Current Anthropology*, 46(2): 161-190.
- Arts, B., J. Behagel, S. van Bommel, J. de Koning & E. Turnhout (2013) "Chapter 1 – Prelude to Practice: Introducing a Practice Based Approach to Forest and Nature Governance" in: B. Arts, J. Behagel, S. van Bommel, J. de Koning & E. Turnhout (eds.) *Forest and Nature Governance: A Practice Based Approach* Dordrecht, Springer: 3-22.
- Ball, L., K. Freund, C. Huang, T. Walter & Z. Kibret (2012) *Radiated Tortoise Conservation Campaign Handbook* Emerging Wildlife Conservation Leaders Program.
- Bastian, M.L. (2000) 'Young Converts: Christian Missions, Gender and Youth in Onitsha, Nigeria 1880-1929' *Anthropological Quarterly*, 73(3): 145-158.
- Behagel, J. H., B. Arts, & E. Turnhout (2017) 'Beyond Argumentation: A Practice-based Approach to Environmental Policy' *Journal of Environmental Policy & Planning*, 1-13.
- Bennett, N.J. & P. Dearden (2013) 'Why Local People do not Support Conservation: Community Perceptions of Marine Protected Area Livelihood Impacts, Governance and Management in Thailand' *Marine Policy*, (44): 107-116.
- Bentham, J. (1787) *Panopticon; or the Inspection-House* [online version].
- Berkes, F. (2008) 'Community Conserved Areas: Policy Issues in Historic and Contemporary Context' *Conservation Letters*, (2): 19-24.
- Berkes, F., J. Colding & C. Folke (2000) 'Rediscovery of Traditional Ecological Knowledge as Adaptive Management' *Ecological Applications*, 10(5): 1251-1262.
- Boeije, H.R. (2010) *Analysis in Qualitative Research* Utrecht, SAGE Publications Ltd.
- Brown, L. (2013) 'Storytelling and Ecological Management: Understanding Kinship and Complexity' *Journal of Sustainability Education 4* [online journal].
- Butler, J.R.A., J.C. Young, I.A.G. McMyn, B. Leyshon, I.M. Graham, I.Walker, J.M. Baxter, J. Dodd & C. Warburton (2015) 'Evaluating Adaptive Co-management as Conservation Conflict Resolution: Learning from Seals and Salmon' *Journal of Environmental Management*, (160): 212-225.
- Camperio-Ciani, G., F. Benitez-Capistros, J. Hugé, F. Dahdouh-Guebas & N. Koedam (2016) 'Galapagos Giant Tortoises and Farmers: Coexistence or Conflict?' [presentation] *Island Biology, 2nd International Conference on Island Evolution, Ecology and Conservation*.
- Castellano, C. & R. Hudson (2013) 'On the Road Again: Radiated Tortoise Conservation in Southern Madagascar' *Turtle Survival Alliance Magazine*, (2013): 30.
- Castellano, C.M., A.G.J. Rhodin, M. Ogle, R.A. Mittermeier, H. Randriamahazo, R. Hudson & R.E. Lewis (2013) 'Introduction: Turtles on the Brink in Madagascar' in: C.M. Castellano, A.G.J. Rhodin, M. Ogle, R.A. Mittermeier, H. Randriamahazo, R. Hudson & R.E. Lewis (Eds.) 'Turtles on the Brink in Madagascar: Proceedings of Two Workshops on the Status, Conservation, and Biology of Malagasy Tortoises and Freshwater Turtles' *Chelonian Research Monographs*, (6): 11-16.
- Cawthorn, D.M., L.C. Hoffman (2016) 'Controversial Cuisine: A Global Account of the Demand, Supply and Acceptance of "Unconventional" and "Exotic" Meats' *Meat Science*, (120): 19-36.
- City Population (2014) 'Madagascar: Administrative Division', retrieved from: <https://www.citypopulation.de/php/madagascar-admin.php>, 02-08-2019.

- Colding, J & C. Folke (2000) 'The Taboo System: Lesson about Informal Institutions for Nature Management' *Georgetown International Environmental Law Review*, 12(2): 413-445.
- Colding, J. & C. Folke (2001) 'Social Taboos: "Invisible" Systems of Local Resource Management and Biological Conservation' *Ecological Applications*, 11(02): 584-600.
- Conservation Fusion (2011) 'DREAM School; Be a Part of a Change', retrieved from: http://conservationfusion.org/home/dream_school, 03-28-2019.
- Corson, C. (2017) 'A History of Conservation Politics in Madagascar' *Madagascar Conservation & Development*, 12(1): 1-12.
- Czarniawska, B. (2016) 'Performativity of Social Sciences as Seen by an Organization Scholar' *European Management Journal*, (34): 315-318.
- Dalal-Clayton, B. & B. Sadler (1999) 'Strategic Environmental Assessment: A Rapidly Evolving Approach' *Environmental Planning Issues*, 18 (1999) [paper].
- De Groot, W.T. & N. Zwaal (2007) 'Storytelling as a Medium for Balanced Dialogue on Conservation in Cameroon' *Environmental Conservation*, 34(1): 45-54.
- DeFries, R. & H. Nagendra (2017) 'Ecosystem Management as a Wicked Problem' *Science*, (356): 265-270.
- Deyfus, H.L & P. Rabinow (1982) *Michel Foucault: Beyond Structuralism and Hermeneutics – Second Edition: with an Afterword by and an Interview with Michel Foucault* Chicago, The University of Chicago Press.
- Dove, M.R. (2010) 'The Panoptic Gaze in a Non-Western Setting: Self-Surveillance on Merapi Vulcano, Central Java' *Religion*, (40): 121-127.
- Duffy, R., B. Büscher, F. St. John & D. Brockington (2015) 'The Militarization of Anti-Poaching: Undermining Long Term Goals?' *Environmental Conservation*, 1(4): 1-4.
- Elgert, L. (2011) 'Certified Discourse? The Politics of Developing Soy Certification Standards' *Geoforum*, (43): 295-304.
- European Commission (2001) 'Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001; On the Assessment of the Effects of Certain Plans and Programmes on the Environment' *Official Journal of the European Communities*, L(197): 30-37.
- Falade, B.A. & C.J. Coultas (2017) 'Scientific and Non-Scientific Information in the Uptake of Health Information: The Case of Ebola' *South African Journal of Science*, 113(7/8): 1-8.
- Fernández-Llamazares, A. & M. Cabeza (2017) 'Rediscovering the Potential of Indigenous Storytelling for Conservation Practice' *Conservation Letters*, 11(3): 1-12.
- Fleming, L. (2011) 'Name Taboos and Rigid Performativity' *Anthropological Quarterly*, 84(1): 141-164.
- Foucault, M. (2006) *Psychiatric Power; Lectures at the Collège de France 1973-1974* Hampshire & New York, Palgrave Macmillan.
- Galapagos Conservancy (2019) 'Human-Tortoise Interactions, Conflicts, and Mitigations' retrieved from: <https://www.galapagos.org/conservation/our-work/tortoise-restoration/human-tortoise-interactions/>, 04-12-2019.
- Galič, M., T. Timan & B.J. Koops (2017) 'Bentham, Deleuze and Beyond: An Overview of Surveillance Theories from the Panopticon to Participation' *Philosophy & Technology*, (30): 9-37.

- Gasco, J. (2007) 'Local Science vs Global Science: Approaches to Indigenous Knowledge in International Development - review' *Journal of Ethnobiology*, 27(2): 280-284.
- Gavin, M.C., J. McCarter, A. Mead, F. Berkes, J.R. Stepp, D. Peterson & R. Tang (2015) 'Defining Biocultural Approaches to Conservation' *Trends in Ecology & Evolution*, 30(3): 140-145.
- Golden, C.D. & J. Comaroff (2015a) 'Effects of Social Change on Wildlife Consumption Taboos in Northeastern Madagascar' *Ecology and Society*, 20(2): 41.
- Golden, C.D. & J. Comaroff, (2015b) 'The Human Health and Conservation Relevance of Food Taboos in Northeastern Madagascar' *Ecology and Society*, 20(2):42.
- Goldstein, H. (2016) 'TSA Announces Grand Opening of the Tortoise Conservation Center in Southern Madagascar' retrieved from: <http://www.turtlesurvival.org/blog/1-blog/427-tsa-announces-grand-opening-of-the-tortoise-conservation-center-in-southern-madagascar#.WuiHOoiFOM8>, 05-01-2018.
- Gray, J. (2017) 'Fine Tuning the Strategy to Save Madagascar's Iconic Radiated Tortoise' retrieved from: <http://www.turtlesurvival.org/blog/1-blog/515-fine-tuning-the-strategy-to-save-madagascars-iconic-radiated-tortoise#.WuiE8liFOM9>, 05-01-2018.
- Gray, J. (2018) 'Monumental Radiated Tortoise Seizure!' retrieved from: <http://www.turtlesurvival.org/blog/1-blog/536-monumental-radiated-tortoise-seizure#.WuiADYiFOM8>, 05-01-2018.
- Hall, K. (2000) 'Performativity' *Journal of Linguistic Anthropology*, 9(1-2): 184-187.
- Hausermann, H. (2012) 'From Polygons to Politics: Everyday Practice and Environmental Governance in Veracruz, Mexico' *Geoforum*, 43(5): 1002-1013.
- Hudson, R. & B. Horne (2010) 'Troubled Times for Radiated Tortoises' *Turtle Survival Alliance Magazine*, (2010): 3-8.
- Hudson, R. (2013) 'Troubled Times for the Radiated Tortoise (*Astrochelys radiata*)' in: C.M. Castellano, A.G.J. Rhodin, M. Ogle, R.A. Mittermeier, H. Randriamahazo, R. Hudson & R.E. Lewis (Eds.) 'Turtles on the Brink in Madagascar: Proceedings of Two Workshops on the Status, Conservation, and Biology of Malagasy Tortoises and Freshwater Turtles' *Chelonian Research Monographs*, (6): 67-74.
- Hudson, R. (2015) 'Turning the Tide on Tortoise Poaching Requires Action on Multiple Fronts' *Turtle Survival Alliance Magazine*, (2015): 16-20.
- Hudson, R., H. Randriamahazo, C. Castellano & R. Rakotondrainy (2016) 'Opening of Tortoise Conservation Center Offers Ray of Hope Amidst a Brutal Year of Intensive Poaching Activity' *Turtle Survival Alliance Magazine*, (2016): 20-25.
- Jensz, F. (2012) 'Missionaries and Indigenous Education in the 19th-Century British Empire. Part II: Race, Class, and Gender' *History Compass*, 10(4): 306-317.
- Jones, P.G., M.M. Andriamarivololona & N. Hockley (2007) 'The Importance of Taboos and Social Norms to Conservation in Madagascar' *Conservation Biology*, 22(4): 976-986.
- Kaczan, D.J., B.M. Swallow & W.L.V. Adamowicz (2015) 'Forest Conservation Policy and Motivational Crowding: Experimental Evidence from Tanzania' *Ecological Economics*, (117): 270-282.
- Kesby, M. & F. Gwanzura-Ottmoller (2007) 'Researching Sexual Health: Two Participatory Action Research Projects in Zimbabwe' in: Kindon, S., R. Pain & M. Kesby (Eds.) *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place* London and New York, Routledge: 71-79.

- Kindon, S., R. Pain & M. Kesby (2007a) 'Introduction: Connecting People, Participation and Place' in: Kindon, S., R. Pain & M. Kesby (Eds.) *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place* London and New York, Routledge: 1-5.
- Kindon, S., R. Pain & M. Kesby (2007b) 'Participatory Action Research: Origins, Approaches and Methods' (Eds.) *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place* London and New York, Routledge: 9-18.
- Lansing, J.S. (2003) 'The Cognitive Machinery of Power: Reflections on Valeri's *The Forest of Taboos*' *American Ethnologist*, 30(3): 372-380.
- Leuteritz, T. & S. Rioux Paquette (2008) 'Astrochelys radiata' IUCN Red List, retrieved from: <http://www.iucnredlist.org/details/full/9014/0>, 02-08-2018.
- Leuteritz, T.E.J., T. Lamb & J.C. Limberaza (2005) 'Distribution, Status, and Conservation of Radiated Tortoises (*Geochelone radiata*) in Madagascar' *Biological Conservation*, (124): 451-561.
- Lingard, M., N.Raharison, E. Rabakonandrianina, J.A. Rakotoarisoa & T. Elmqvist (2003) 'The Role of Local Taboos in Conservation and Management of Species: The Radiated Tortoise in Southern Madagascar' *Conservation and Society*, 1(2): 223-246.
- Liu, T. M. (2017) 'Unexpected Threat from Conservation to Endangered Species: Reflections from the Front-Line Staff on Sea Turtle Conservation' *Journal of Environmental Planning and Management*, 60(12): 2255-2271.
- McGuire, S.M. (2011) 'Creating Conservation Champions for Madagascar's Critically Endangered Radiated Tortoise (*Astrochelys radiata*) Through Local and Global Education Programs' *Turtle Survival Alliance Magazine*, (2011): 75-77.
- Mittermeier, R.A., A.G.J. Rhodin, H. Randriamahazo, R.E. Lewis, P.P. van Dijk, R. Hudson & S.R. Paquette (2013) 'Vision Sokartra Gasy – Madagascar Turtle Vision' in: C.M. Castellano, A.G.J. Rhodin, M. Ogle, R.A. Mittermeier, H. Randriamahazo, R. Hudson & R.E. Lewis (Eds.) 'Turtles on the Brink in Madagascar: Proceedings of Two Workshops on the Status, Conservation, and Biology of Malagasy Tortoises and Freshwater Turtles' *Chelonian Research Monographs*, (6): 37-39.
- Montenegro, S. (2018) 'Sense of Community among Muslims in the Brazil-Paraguay Border: Narratives of Belonging and General Differences' *Journal of Contemporary Religion*, 33(3): 509-526.
- Moros, L., M.A. Vélez & E. Corbera (2017) 'Payments for Ecosystem Services and Motivational Crowding in Colombia's Amazon Piedmont' *Ecological Economics* [in press corrected proof].
- Müller, R., L. Zhai & A. Wang (2017) 'Governance and Governmentality in Projects: Profiles and Relationships with Success' *International Journal of Project Management*, (35): 378-392.
- Munya, H. & C. Stilwell (2010) 'A Mixed Qualitative-Quantitative-Participatory Methodology: A Study of the Agricultural Knowledge and Information System (AKIS) of Small-Scale Farmers in Kirinyaga District, Kenya' *Library Management*, 31(1/2): 5-18.
- Narloch, U., U. Pascual & A.G. Drucker (2012) 'Collective Action Dynamics under External Rewards: Experimental Insights from Andean Farming Communities' *World Development*, 40(10): 2096-2107.
- Netherlands Commission for Environmental Assessment (n.d) *Brochure Strategic Environmental Assessment – Implementation Step by Step!* [brochure] Ministry of Environment and Physical Planning of the Republic of Macedonia & Netherlands Commission for Environmental Assessment.
- Neumann, R.P. (2004) 'Moral and Discursive Geographies in the War for Biodiversity in Africa' *Political Geography*, (23): 813-837.

- Ogunniyi, M.B. (2011) 'Exploring Science Educators' Cosmological Worldviews Through the Binoculars of an Argumentation Framework' *South African Journal of Higher Education*, 25(3): 542-553.
- Paquette, S. R. & F.J. Lapointe (2007) 'The Use of Shell Morphometrics for the Management of the Endangered Malagasy Radiated Tortoise (*Geochelone Radiata*)' *Biological Conservation*, (134): 31-39.
- Perdersen, K.P. (2015) 'Religious Ethics and the Environment; A Review Essay' *Journal of Religious Ethics*, 43(3): 558-585.
- Pritchard, P.C.H. (2013) 'Madagascar: Island Continent of Tortoises Great and Small' in: C.M. Castellano, A.G.J. Rhodin, M. Ogle, R.A. Mittermeier, H. Randriamahazo, R. Hudson & R.E. Lewis (Eds.) 'Turtles on the Brink in Madagascar: Proceedings of Two Workshops on the Status, Conservation, and Biology of Malagasy Tortoises and Freshwater Turtles' *Chelonian Research Monographs*, (6): 17-24.
- Rafeliasoa, T.H. (2009) 'Preliminary results of community based monitoring of the Radiated Tortoise at Lavavolo Classified Forest, Madagascar' *Turtle Survival Alliance Magazine*, (2009): 76-77.
- Randriamahazo, H., A. Curryflow, R. Hudson & C. Castellano (2014) 'Mobilizing TSA's Confiscation to Reintroduction Strategy for Radiated Tortoises' *Turtle Survival Alliance Magazine*, (2014): 34-37.
- Randriamahazo, H., R. Hudson & C. Castellano (2012) 'TSA Madagascar Leads Fight to Conserve Imperiled Radiated Tortoise' *Turtle Survival Alliance Magazine*, (2012): 24-27.
- Randriamahazo, H., R. Hudson & C. Castellano (2013) 'Rise in Tortoise Confiscations Underscores Need for New TSA Triage Centers' *Turtle Survival Alliance Magazine*, (2013): 28-29.
- Randriamahazo, H., R. Hudson, S. Mahazotahy & S. Randrianjafizanaka (2011) 'Radiated Tortoises and the Fading Taboo' *Turtle Survival Alliance Magazine*, (2011): 63-68.
- Randrianandrianina, F.H., P.A. Racey & R.K.B. Jenkins (2010) 'Hunting and Consumption of Mammals and Birds by People in Urban Areas of Western Madagascar' *Fauna & Flora International*, 44(3):411-415.
- Rode, J. E. Gómez-Baggethun & T. Krause (2014) 'Motivation Crowding by Economic Incentives in Conservation Policy: A Review of the Empirical Evidence' *Ecological Economics*, (117): 270-282.
- Rose, G. (2011) *Visual Methodologies: An Introduction to Researching with Visual Methods* London, Sage Publications Ltd.
- Runhovde, S.R. (2017) 'Comparing Discourse to Offer Perceptions: The Problems of War and Militarization in Wildlife Crime Enforcement' *Critical Criminology*, (25): 275-291.
- Ruud, J. (1960) *Taboo: A Study of the Malagasy Fady* Oslo, Oslo University Press.
- Salami, B., J. Salma, K. Hegadoren, S. Meherali, T. Kolawole & E. Diaz (2019) 'Sense of Community Belonging Among Immigrants: Perspective of Immigrant Service Providers' *Public Health*, (167): 28-33.
- Shackeroff, J.M. & L.M. Campbell (2007) 'Traditional Ecological Knowledge in Conservation Research Problems and Prospects for their Constructive Engagement' *Conservation & Society*, 5(3): 343-360.
- Sipa, M. (n.d.) 'Tribes of Madagascar', retrieved from: <https://www.madamagazine.com/en/volksgruppen-madagaskars/>, 02-08-2019.
- Swartz, R. (2018) 'Civilisation and Colonial Education: Natal and Western Australia in the 1860s in Comparative Perspective' *History of Education*, 47(3): 368-383.

- Tanaka, K., L. Davidson & T.J. Craig (2018) 'Sense of Clubhouse Community Belonging and Empowerment' *Social Psychiatry*, 64(3): 276 – 285.
- Tengö, M., K. Johansson, F. Rakotodrasoa, J. Lundberg, J.A. Andriamaherilala, J.A. Rakotoarisoa & T. Elmqvist (2007) 'Taboos and Forest Governance: Informal Protection of Hot Spot Dry Forest in Southern Madagascar' *Ambio*, 36(8): 683-691.
- Tolia-Kelly, D.P. (2007) 'Participatory Art: Capturing Spatial Vocabularies in a Collaborative Visual Methodology with Melanie Carvalho and South Asian Women in London, UK' in: Kindon, S., R. Pain & M. Kesby (Eds.) *Participatory Action Research Approaches and Methods: Connecting People, Participation and Place* London and New York, Routledge.
- Travers, H., T. Clements, A. Keane & E.J. Milner-Gulland (2011) 'Incentives for Cooperation: The Effects of Institutional Controls on Common Pool Resource Extraction in Cambodia' *Ecological Economics*, (71): 151-161.
- Turnhout, E., J.H. Behagel, F. Ferranti, & R. Beunen, (2015) 'The Construction of Legitimacy in European Nature Policy: Expertise and Participation in the Service of Cost-Effectiveness' *Environmental Politics*, (24): 461-480.
- Walker, R.C.J. & T.H. Rafeliasoa (2012) 'Distributions of Radiated Tortoise (*Astrochelys radiata*) Bush Meat Poaching Effort' *Chelonian Conservation and Biology*, 11(2): 223-226.
- Warnier, J.P. (2008) 'Foucault in Africa: The Microphysics of a Contemporary Monarchy' *International Social Science Journal*, 59(191): 95-104.
- Waterton, C., (2002) 'From Field to Fantasy: Classifying Nature, Constructing Europe' *Social Studies of Science*, 32(2): 177-204.
- Wiersum, K.F., B. Arts & J. van Laar (2013) 'From Practice Science to a Practice Based Approach: A Short History of Forest Policy Studies' in: B. Arts, J. Behagel, S. van Bommel, J. de Koning & E. Turnhout (eds.) *Forest and Nature Governance: A Practice Based Approach* Dordrecht, Springer: 23-48.
- Wilfred, P. (2017) 'A Community Perspective on Participatory Conservation in Western Tanzania' *European Journal of Wildlife Research*, 63(56): 1-8.
- World Bank (2014) *Face of Poverty in Madagascar; Poverty, Gender and Inequality Assessment* Poverty Reduction and Economic Management (PREM) Africa Region, Report No. 78131-MG.
- World Bank Group (2001) 'Madagascar; Rural Poverty Headcount Ratio at National Poverty Lines (% of Rural Population)', retrieved from: <https://data.worldbank.org/indicator/SI.POV.RUHC?end=2001&locations=MG&start=2001&view=bar>, 02-26-2019.
- World Bank Group (2012) 'Madagascar; Poverty Headcount Ratio at National Poverty Lines (% of Population)', retrieved from: <https://data.worldbank.org/indicator/SI.POV.NAHC?locations=MG>, 02-26-2019.

Appendices

Appendix 1: Interview guide

(questions marked in red are included later in the interview process; in bold it has been indicated whether they relate to knowledge or practices)

- a) Location:
- b) Tribe:
- c) Clan:
- d) Name:
- e) Gender:
- f) Age:
- g) Profession:

* Introduction *

Naomi; student; research for studies (forest and nature conservation)

Interested in the working of the tortoise taboo and the role of tortoises and the taboo in daily life

Information presented anonymous; not shared with third parties

Permission recording (only for own reference, not shared)

- 1. Have you seen tortoises around here? **(Knowledge)**
- 2. What do you know about them? **(Knowledge)**
 - o Where they live, where/what they eat, what they do
- 3. What conflicts occur between tortoises and people here? **(Practice)**
- 4. What does a tortoise mean to you? **(Knowledge)**
- 5. What do you think when you see a tortoise? **(Knowledge)**
- 6. What do you do when you see a tortoise? **(Practice)**

- 7. Is there any taboo or *fady* belief related to tortoises? **(Knowledge)**
 - o Which ones?
 - Stories
 - Taboos
 - Religious practices
 - Common beliefs
 - o Why those ones? Where does it come from?

- 8. What influence does this taboo/do these taboos have on you?
 - o **Knowledge:**
 - Influence on what you think when you see a tortoise
 - o **Practice:**
 - Influence on what you do when you see a tortoise
 - o Why does it have this influence/no influence?
 - Income
 - Social pressure
 - Religious implications
 - ...

- 9. What influence do you think it has on the other people in your community?
 - o **Knowledge:**
 - Influence on what people generally think when they see a tortoise
 - o **Practice:**
 - Influence on what people generally do when they see a tortoise

- Why does it have this influence/no influence do you think?
 - Income
 - Social pressure
 - Religious implications
 - ...
10. What happens when someone from the community breaks the taboo? **(Practice)**
 - Did this change? Why?
 11. How often did someone from the community break the taboo? **(Practice)**
 - Did this change? Why?
 12. What happens when someone from outside the community breaks the taboo? **(Practice)**
 - Did this change? Why?
 13. How often did someone from outside the community break the taboo? **(Practice)**
 - Did this change? Why?
14. Are there any other taboos and how strong are they compared to the tortoise taboo?
(Knowledge – added from respondent 69, Fokontany Befehe)
 15. What would you think if there wouldn't be any tortoises in this area anymore?
(Knowledge –added from respondent 69, Fokontany Befehe)
 16. What would you think if there would be substantially more tortoises in this area than there are now?
(Knowledge – added from respondent 135, Fokontany Imongy II Rebeke)
 17. What reasons, do you think, do other people have for collecting tortoises?
(Knowledge/practice – added from respondent 78, Fokontany Soamanitse II Marokely)
 18. What do you think would diminish the use/collection of tortoises in the future? (Why this in particular?)
(Knowledge/practice - added from respondent 78, Fokontany Soamanitse II Marokely)
19. Is there anything you would like to add related to the tortoises, the taboo, the tortoise collection, etc.?

Appendix 2: Coding categories in Excel, with the connected question(s) in the questionnaire (categories marked orange indicate those that result from analysis of the category they connect to, indicated with the same number)

Nr.	Category	Connected question in questionnaire
1	Date	-
2	Respondent nr.	-
3	District	a
4a	Commune	
4b	Commune merged (defined research sites)	
5	Fokontany	
6	Tribe	b
7	Clan	c
8	Gender	e
9a	Age (exact)	f
9b	Age (group)	
10a	Profession (mentioned)	g
10b	Profession (merged in categories)	
11a	Conflicts (types)	3
11b	Conflicts (yes/no)	
12	Taboo content (descriptive - what beliefs and activities are mentioned to be connected to the taboo)	7; 8; 9; 10
13	Taboo origin (descriptive - story told about the start of the taboo)	7
14	Taboo respected within the community (yes/no + explanation when given)	9
15a	Measures within community (descriptive - the measures taken when the taboo is broken by someone within the community)	10
15b	Remedy mentioned that can undo all effects of the taboo (yes/no/unclear)	
15c	Sacrifice mentioned as a measure (yes/no)	
15d	Person is believed to be negatively affected in any way when the taboo is broken (yes/no/doesn't know)	
16a	Taboo broken within community in the past (descriptive - number of times + example/story when given)	11
16b	Taboo broken within community in the past (yes/no)	
17a	Measures non-community members (descriptive - the measures taken when the taboo is broken by someone within the community)	12
17b	Clear action mentioned when poachers come (yes/no) - 'Yes' includes: authorities warned/caught/punished/fined/sacrifice/stopped and not allowed to enter the village - 'No' includes: doesn't know/warned/not allowed to use their dishes/asked to leave the village (but don't care about what poachers do elsewhere)/accepted when tortoises are not killed in the village	
17c	Any action mentioned when poachers come (yes/no – where 'no' only refers to: doesn't know/no measures taken)	
18a	Taboo broken by non-community members in the past (descriptive - number of times + example/story when given)	13
18b	Taboo broken by non-community members in the past (yes/no/doesn't know)	
19	Mentioning curse of bad life/loss good fortune connected to tortoises (yes/no)	entire interview
20	Mentioning good fortune/good trip connected to tortoises (yes/no)	entire interview
21	Mentioning protection from diseases connected to tortoises (yes/no)	entire interview
22	Mentioning rain connected to tortoises (yes/no)	entire interview
23	Mentioning blessings connected to tortoises (yes/no)	entire interview
24a	Tortoise taboo has the same strength as other taboos (yes/no + stronger/same/weaker)	14
24b	Tortoise taboo is the strongest taboo (yes/no)	
25a	Feelings/effects when there would be no tortoises anymore (descriptive)	15
25b	Expresses worries/mentions negative effects when there would be no tortoises anymore (yes/no)	
26a	Feelings/effects when there would be considerably more tortoises (descriptive)	16
26b	Expresses worries/mentions negative effects when there would be considerably more tortoises (yes/no)	
27	Reasons for people to poach (descriptive)	17
28	Possible solutions for poaching (descriptive)	18

Appendix 3: Schematic overview of the overarching aims, the connecting key aims and their indicators, and the policy objectives and their normalized ranges of impact per indicator

Overarching aims	Key aims	Indicators	Policy objective	Normalized ranges of impact	
Adherence of community members to the taboo	1) Existence of a fear of repercussions when the taboo is broken	<ul style="list-style-type: none"> % of respondents in location X indicating the offender to be negatively affected when the taboo is broken 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%	
		<ul style="list-style-type: none"> % of respondents in location X connecting a curse to the taboo 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%	
		<ul style="list-style-type: none"> % of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions 	≤ 30%	1. Very high = ≤ 10% 2. High = 11% - 30% 3. Moderate = 31% - 50% 4. Low = 51% - 70% 5. Very low = > 70%	
		<ul style="list-style-type: none"> % of respondents in location X indicating nothing can undo all results from breaking the taboo 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%	
		<ul style="list-style-type: none"> % of respondents in location X indicating the tortoise taboo to be the strongest taboo 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%	
	2) No community members breaking the taboo	<ul style="list-style-type: none"> % of respondents in location X indicating the taboo has been broken within the community in the past 	≤ 30%	1. Very high = ≤ 10% 2. High = 11% - 30% 3. Moderate = 31% - 50% 4. Low = 51% - 70% 5. Very low = > 70%	
	3) Existence of a fear of losing connection with the community	<ul style="list-style-type: none"> Respondents' level of a sense of connection with the community as reflected throughout the interview (not really quantifiable, more a general impression perceived during the interview) 	At least high	1. Very high = self-definition as a community, expressing that all community members are the same, high dependence on community members, highly localized lifestyle 2. High = 3. Moderate = 4. Low = 5. Very low =	
	4) Existence of a fear of losing the goodwill of the ancestors	<ul style="list-style-type: none"> Respondents' level of respect for the ancestors as reflected throughout the interview (not really quantifiable, more a general impression perceived during the interview) 	At least high	1. Very high = frequent mentioning of the ancestors, expressing high adherence to the taboo because the ancestors said to do so, expressing a fear for repercussions coming from the ancestors 2. High = 3. Moderate = 4. Low = 5. Very low =	
	Protective sentiments among community members	5) Existence of a fear of losing positive influences of tortoises	<ul style="list-style-type: none"> % of respondents in location X expressing concerns when the tortoises would be gone 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%
			<ul style="list-style-type: none"> % of respondents in location X connecting rain to tortoises 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%
<ul style="list-style-type: none"> % of respondents in location X connecting blessings to tortoises 			≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%	

	<ul style="list-style-type: none"> % of respondents in location X connecting good fortune/ a good trip to tortoises 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%
	<ul style="list-style-type: none"> % of respondents in location X connecting protection from diseases to tortoises 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%
6) Existence of a feeling of responsibility for protecting tortoises	<ul style="list-style-type: none"> % of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises 	≤ 30%	1. Very high = ≤ 10% 2. High = 11% - 30% 3. Moderate = 31% - 50% 4. Low = 51% - 70% 5. Very low = > 70%
7) Existence of a reactive attitude towards poachers	<ul style="list-style-type: none"> % of respondents in location X indicating to take action when poachers come in or near the village for tortoises 	≥ 30%	1. Very high = > 70% 2. High = 51% - 70% 3. Moderate = 31% - 50% 4. Low = 11% - 30% 5. Very low = ≤ 10%
8) No negative sentiments connected to tortoises	<ul style="list-style-type: none"> % of respondents in location X that mentions the existence of human-tortoise conflicts 	≤ 30%	1. Very high = ≤ 10% 2. High = 11% - 30% 3. Moderate = 31% - 50% 4. Low = 51% - 70% 5. Very low = > 70%
	<ul style="list-style-type: none"> % of respondents in location X that expresses concern in the case the number of tortoises would increase 	≤ 30%	1. Very high = ≤ 10% 2. High = 11% - 30% 3. Moderate = 31% - 50% 4. Low = 51% - 70% 5. Very low = > 70%
9) No poachers coming to the area to the village for tortoises	<ul style="list-style-type: none"> % of respondents in location X indicating that poachers came to the village in for tortoises in the past 	≤ 30%	1. Very high = ≤ 10% 2. High = 11% - 30% 3. Moderate = 31% - 50% 4. Low = 51% - 70% 5. Very low = > 70%

Appendix 4: Schematic overview of the exact percentages per indicator per site

Overarching aims	Key aims	Indicators	1. Nikoly	2. Marovato	3. Tranovaho East	4. Tranovaho West & Ampanihy	5. Imongy & Ankilivalo	6. Antanimora	7. Ejeda	8. Androka & Kaikarivo	9. Itampolo
Adherence of community members to the taboo	1) Existence of a fear of repercussions when the taboo is broken	• % of respondents in location X indicating the offender to be negatively affected when the taboo is broken	86	95	93	95	94	97	100	96	100
		• % of respondents in location X connecting a curse to the taboo	19	25	53	68	29	32	60	80	80
		• % of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions	30	70	57	68	40	37	53	72	84
		• % of respondents in location X indicating nothing can undo all results from breaking the taboo	62	33	37	41	63	66	60	32	36
		• % of respondents in location X indicating the tortoise taboo to be the strongest taboo	/	/	57	49	43	34	73	52	52
	2) No community members breaking the taboo	• % of respondents in location X indicating the taboo has been broken within the community in the past	19	18	20	16	17	16	27	48	52
	3) Existence of a fear of losing connection with the community	▪ Respondents' level of a sense of connection with the community as reflected throughout the interview (general impression)	/	/	/	/	/	/	/	/	/
4) Existence of a fear of losing the goodwill of the ancestors	▪ Respondents' level of respect for the ancestors as reflected throughout the interview (general impression)	/	/	/	/	/	/	/	/	/	
Protective sentiments among community members	5) Existence of a fear of losing positive influences of tortoises	▪ % of respondents in location X expressing concerns when the tortoises would be gone	/	/	70	89	71	71	93	92	96
		▪ % of respondents in location X connecting rain to tortoises	11	15	43	81	60	50	60	84	80
		▪ % of respondents in location X connecting blessings to tortoises	68	43	47	62	54	61	7	68	56
		▪ % of respondents in location X connecting good fortune/ a good trip to tortoises	5	8	20	24	3	18	33	16	32
		▪ % of respondents in location X connecting protection from diseases to tortoises	0	3	30	3	6	5	0	8	20
	6) Existence of a feeling of responsibility for protecting tortoises	▪ % of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises	41	13	20	30	23	13	47	12	24
	7) Existence of a reactive attitude towards poachers	▪ % of respondents in location X indicating to take action when poachers come in or near the village for tortoises	41	85	77	41	46	63	13	44	16
	8) No negative sentiments connected to tortoises	▪ % of respondents in location X that mentions the existence of human-tortoise conflicts	65	70	50	68	69	34	47	72	88
		▪ % of respondents in location X that expresses concern in the case the number of tortoises would increase	/	/	/	/	47 (5 missing)	11	20	0	4
9) No poachers coming to the area to the village for tortoises	▪ % of respondents in location X indicating that poachers came to the village in for tortoises in the past	35	21	37	49	63	76	87	84	88	

Appendix 5: Ranking for multiple correspondence analysis

Protective sentiments – missing excluded									
Criteria		1	2	3	4	5	6	7	8
		% of respondents in location X connecting rain to tortoises	% of respondents in location X connecting blessings to tortoises	% of respondents in location X connecting good fortune/ a good trip to tortoises	% of respondents in location X connecting protection from diseases to tortoises	% of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises	% of respondents in location X indicating to take action when poachers come in or near the village for tortoises	% of respondents in location X that mentions the existence of human-tortoise conflicts	% of respondents in location X indicating that poachers came to the village for tortoises in the past
1	% of respondents in location X connecting rain to tortoises		1	1	1	1	6	1	1
2	% of respondents in location X connecting blessings to tortoises			2	2	5	6	2	2
3	% of respondents in location X connecting good fortune/ a good trip to tortoises				3	5	6	3	3
4	% of respondents in location X connecting protection from diseases to tortoises					5	6	7	4
5	% of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises						5	5	5
6	% of respondents in location X indicating to take action when poachers come in or near the village for tortoises							6	6
7	% of respondents in location X that mentions the existence of human-tortoise conflicts								7
8	% of respondents in location X indicating that poachers came to the village for tortoises in the past								

Taboo adherence – missing excluded								
Criteria		1	2	3	4	5	6	7
		% of respondents in location X indicating the offender to be negatively affected when the taboo is broken	% of respondents in location X connecting a curse to the taboo	% of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions	% of respondents in location X indicating nothing can undo all results from breaking the taboo	% of respondents in location X indicating the taboo has been broken within the community in the past	Respondents' level of a sense of connection with the community as reflected throughout the interview (general impression)	Respondents' level of respect for the ancestors as reflected throughout the interview (general impression)
1	% of respondents in location X indicating the offender to be negatively affected when the taboo is broken		1	3	4	1	6	7
2	% of respondents in location X connecting a curse to the taboo			2	4	2	6	7
3	% of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions				4	3	6	7
4	% of respondents in location X indicating nothing can undo all results from breaking the taboo					4	6	7
5	% of respondents in location X indicating the taboo has been broken within the community in the past						6	7
6	Respondents' level of a sense of connection with the community as reflected throughout the interview (general impression)							7
7	Respondents' level of respect for the ancestors as reflected throughout the interview (general impression)							

Appendix 6: Final rankings and corresponding weights – missing excluded

Protective sentiments – missing excluded			
No	Criteria	Rank	Weight
1	% of respondents in location X connecting rain to tortoises	1	0.22
2	% of respondents in location X connecting blessings to tortoises	3	0.15
3	% of respondents in location X connecting good fortune/ a good trip to tortoises	4	0.11
4	% of respondents in location X connecting protection from diseases to tortoises	6	0.04
5	% of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises	1	0.22
6	% of respondents in location X indicating to take action when poachers come in or near the village for tortoises	2	0.19
7	% of respondents in location X that mentions the existence of human-tortoise conflicts	5	0.07
8	% of respondents in location X indicating that poachers came to the village for tortoises in the past	7	0.00

Taboo adherence – missing excluded			
No	Criteria	Rank	Weight
1	% of respondents in location X indicating the offender to be negatively affected when the taboo is broken	4	0.10
2	% of respondents in location X connecting a curse to the taboo	4	0.10
3	% of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions	4	0.10
4	% of respondents in location X indicating nothing can undo all results from breaking the taboo	3	0.19
5	% of respondents in location X indicating the taboo has been broken within the community in the past	7	0.00
6	Respondents' level of a sense of connection with the community as reflected throughout the interview (general impression)	2	0.24
7	Respondents' level of respect for the ancestors as reflected throughout the interview (general impression)	1	0.29

Appendix 7: Final rankings and corresponding weights – missing included

Protective sentiments – missing included			
No	Criteria	Rank	Weight
1	% of respondents in location X expressing concerns when the tortoises would be gone	1	0.19
2	% of respondents in location X connecting rain to tortoises	4	0.12
3	% of respondents in location X connecting blessings to tortoises	5	0.09
4	% of respondents in location X connecting good fortune/ a good trip to tortoises	6	0.07
5	% of respondents in location X connecting protection from diseases to tortoises	7	0.02
6	% of respondents in location X clearly stating to not care when poachers come in or near the village for tortoises	1	0.19
7	% of respondents in location X indicating to take action when poachers come in or near the village for tortoises	2	0.16
8	% of respondents in location X that mentions the existence of human-tortoise conflicts	7	0.02
9	% of respondents in location X that expresses concern in the case the number of tortoises would increase	3	0.14
10	% of respondents in location X indicating that poachers came to the village for tortoises in the past	9	0.00

Taboo adherence – missing included			
No	Criteria	Rank	Weight
1	% of respondents in location X indicating the offender to be negatively affected when the taboo is broken	4	0.11
2	% of respondents in location X connecting a curse to the taboo	4	0.11
3	% of respondents in location X indicating a sacrifice can be done to undo at least part of taboo-related repercussions	4	0.11
4	% of respondents in location X indicating nothing can undo all results from breaking the taboo	3	0.18
5	% of respondents in location X indicating the tortoise taboo to be the strongest taboo	7	0.04
6	% of respondents in location X indicating the taboo has been broken within the community in the past	8	0.00
7	Respondents' level of a sense of connection with the community as reflected throughout the interview (general impression)	2	0.21
8	Respondents' level of respect for the ancestors as reflected throughout the interview (general impression)	1	0.25

Appendix 8: Final scores per site

Protective sentiments – missing excluded										
No. criterion	Weight	Policy options								
		1. Niko ly	2. Marov ato	3. Tranova ho East	4. Tranova ho West & Ampani hy	5. Imongy & Ankiliv alo	6. Antanim ora	7. Eje da	8. Androk a & Kaikari vo	9. Itamp olo
1	0.22	0.44	0.44	0.67	1.11	0.89	0.67	0.89	1.11	1.11
2	0.15	0.59	0.44	0.44	0.59	0.59	0.59	0.15	0.59	0.59
3	0.11	0.11	0.11	0.22	0.22	0.11	0.22	0.33	0.22	0.33
4	0.04	0.04	0.04	0.11	0.04	0.04	0.04	0.04	0.04	0.07
5	0.22	0.67	0.89	0.89	0.89	0.89	0.89	0.67	0.89	0.89
6	0.19	0.56	0.93	0.93	0.56	0.56	0.74	0.37	0.56	0.37
7	0.07	0.15	0.15	0.22	0.15	0.15	0.22	0.22	0.07	0.07
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total score	1.00	2.56	3.00	3.48	3.56	3.22	3.37	2.67	3.48	3.44

Taboo adherence – missing excluded										
No. criterion	Weight	Policy options								
		1. Niko ly	2. Marov ato	3. Tranova ho East	4. Tranova ho West & Ampani hy	5. Imongy & Ankiliv alo	6. Antanim ora	7. Eje da	8. Androk a & Kaikari vo	9. Itamp olo
1	0.10	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
2	0.10	0.19	0.19	0.38	0.38	0.19	0.29	0.38	0.48	0.48
3	0.10	0.38	0.10	0.19	0.19	0.29	0.29	0.19	0.10	0.10
4	0.19	0.76	0.57	0.57	0.57	0.76	0.76	0.76	0.57	0.57
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.24	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
7	0.29	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
Total score	1.00	4.43	3.95	4.24	4.24	4.33	4.43	4.43	4.24	4.24

Appendix 9 (next page): Opportunities and threats per component of taboo adherence and protective sentiments, and related recommendations per research site.

Site	Aim	Final valuation	Opportunities	Threats	Recommendations
1. Nikoly	Taboo adherence	++	<ul style="list-style-type: none"> - Repercussions: very high mentioning of negative effects when breaking the taboo - Revocability repercussions: Low revocability with a low mentioning of a sacrifice undoing taboo-related repercussions and high indication of no cure at all. 	<ul style="list-style-type: none"> - Repercussions: Low connection of tortoises with a curse 	<ul style="list-style-type: none"> - Promote and provide information on the cultural and ecological values of tortoises in the future Community Outreach Center (COC), in a way that is attractive to the target group (e.g. with storytelling and pictures), to: <ul style="list-style-type: none"> • Further strengthen the cultural value of tortoises as a means to obtain blessings • Further introduce and strengthen the other cultural values of tortoises, especially as bringers of rain • Increase awareness on the ecological value of tortoises and develop environmentality • Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Provide information on methods protecting crops from tortoises (and provide the means when proven necessary) in the future COC, to: <ul style="list-style-type: none"> • Decrease human-tortoise conflicts • Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> • Increase accessibility to law enforcers to facilitate simple and easy reporting of violations • Further increase awareness and implementation of the Lilintane • Increase a reactive attitude
	Protective sentiments	-	<ul style="list-style-type: none"> - Positive attributes: high connection of tortoises to blessings 	<ul style="list-style-type: none"> - Positive attributes: low to very low connection of tortoises to rain, good fortune/a good trip, and protection from diseases - Responsibility: relatively low (moderate) feeling of responsibility reflected in stating to not care about poachers - Reactive attitude: relatively low (moderate) frequency of an attitude of actively taking action against poachers - Negative sentiments: high negative sentiments due to human-tortoise conflicts 	
2. Marovato	Taboo adherence	+/-	<ul style="list-style-type: none"> - Repercussions: very high mentioning of negative effects when breaking the taboo 	<ul style="list-style-type: none"> - Revocability repercussions: very high to moderate revocability with a very high mentioning of a sacrifice undoing taboo-related repercussions and moderate indication of no cure at all - Repercussions: Low connection of tortoises to a curse 	<ul style="list-style-type: none"> - Promote and provide information on the cultural and ecological values of tortoises in the future COC, in a way that is attractive to the target group (e.g. with storytelling and pictures), to: <ul style="list-style-type: none"> • Further introduce and strengthen the cultural values of tortoises, especially as means to obtain blessings and as bringers of rain • Increase awareness on the ecological value of tortoises and develop environmentality • Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Provide information on methods protecting crops from tortoises (and provide the means when proven necessary) in the future COC, to: <ul style="list-style-type: none"> • Decrease human-tortoise conflicts • Decrease negative sentiments
	Protective sentiments	+/-	<ul style="list-style-type: none"> - Responsibility: high feeling of responsibility reflected in the low percentage stating to not care about poachers - Reactive attitude: very high frequency of an attitude of actively taking action against poachers 	<ul style="list-style-type: none"> - Positive attributes: low to very low connection of tortoises to rain, blessings, good fortune/a good trip, and protection from diseases - Negative sentiments: high negative sentiments due to human-tortoise conflicts 	

			- Occurrence: low noted occurrence of poaching		- Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> • Increase accessibility to law enforcers to facilitate simple and easy reporting of violations • Further increase awareness and implementation of the Lilintane • Maintain and increase a reactive attitude
3. Tranovaho East	Taboo adherence	+	- Repercussions: very high mentioning of negative effects when breaking the taboo, high connection of a curse to the taboo, and high indication of the taboo being the strongest	- Revocability repercussions: high to moderate revocability with a high mentioning of a sacrifice undoing taboo-related repercussions and moderate indication of no cure at all	- Promote and provide information on the cultural and ecological values of tortoises with awareness campaigns, in a way that is attractive to the target group (e.g. with storytelling, pictures and events), to: <ul style="list-style-type: none"> • Further introduce and strengthen the cultural values of tortoises, especially as means to obtain blessings and as bringers of rain • Increase awareness on the ecological value of tortoises and develop environmentalty • Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Spread information on methods protecting crops from tortoises (and provide the means when proven necessary), to: <ul style="list-style-type: none"> • Decrease human-tortoise conflicts • Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> • Increase accessibility to law enforcers to facilitate simple and easy reporting of violations • Further increase awareness and implementation of the Lilintane • Maintain and increase a reactive attitude
	Protective sentiments	+	- Responsibility: high feeling of responsibility reflected in the low percentage stating to not care about poachers - Reactive attitude: very high frequency of an attitude of actively taking action against poachers	- Positive attributes: low to moderate connection of tortoises to rain, blessings, good fortune/a good trip, and protection from diseases - Negative sentiments: moderate negative sentiments due to human-tortoise conflicts	
4. Tranovaho West & Ampanihy	Taboo adherence	+	- Repercussions: very high mentioning of negative effects when breaking the taboo and high connection of a curse to the taboo	- Revocability repercussions: high to moderate revocability with a high mentioning of a sacrifice undoing taboo-related repercussions and moderate indication of no cure at all	- Promote and provide information on the cultural and ecological values of tortoises with awareness campaigns, in a way that is attractive to the target group (e.g. with storytelling, pictures and events), to: <ul style="list-style-type: none"> • Further strengthen the cultural values of tortoises, especially as means to obtain blessings and as bringers of rain • Increase awareness on the ecological value of tortoises and develop environmentalty • Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Spread information on methods protecting crops from tortoises (and provide the means when proven necessary), to: <ul style="list-style-type: none"> • Decrease human-tortoise conflicts
	Protective sentiments	+	- Positive attributes: very high to high connection of tortoises to rain and blessings - Responsibility: high feeling of responsibility reflected in the low percentage stating to not care about poachers	- Positive attributes: very low to low connection of tortoises to good fortune/good trip and protection from diseases - Reactive attitude: relatively low (moderate) frequency of an attitude of actively taking action against poachers	

				- Negative sentiments: high negative sentiments due to human-tortoise conflicts	<ul style="list-style-type: none"> Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> Increase accessibility to law enforcers to facilitate simple and easy reporting of violations Further increase awareness and implementation of the Lilintane Increase a reactive attitude
5. Imongy & Ankilivalo	Taboo adherence	+	<ul style="list-style-type: none"> Repercussions: very high mentioning of negative effects when breaking the taboo Revocability repercussions: moderate to low revocability with a moderate mentioning of a sacrifice undoing taboo-related repercussions and high indication of no cure at all 	- Repercussions: Low connection of a curse to the taboo	- Promote and provide information on the cultural and ecological values of tortoises with awareness campaigns, in a way that is attractive to the target group (e.g. with storytelling, pictures and events), to: <ul style="list-style-type: none"> Further strengthen the cultural values of tortoises, especially as means to obtain blessings and as bringers of rain Increase awareness on the ecological value of tortoises and develop environmentality Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Spread information on methods protecting crops from tortoises (and provide the means when proven necessary), to: <ul style="list-style-type: none"> Decrease human-tortoise conflicts Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> Increase accessibility to law enforcers to facilitate simple and easy reporting of violations Further increase awareness and implementation of the Lilintane Increase a reactive attitude
	Protective sentiments	+/-	<ul style="list-style-type: none"> Positive attributes: high connection of tortoises to rain and blessings Responsibility: high feeling of responsibility reflected in the low percentage stating to not care about poachers Reactive attitude: high frequency of an attitude of actively taking action against poachers 	<ul style="list-style-type: none"> Positive attributes: very low connection of tortoises to good fortune/good trip and protection from diseases Concern: moderate concern in case of an increased tortoise population Negative sentiments: high negative sentiments due to human-tortoise conflicts Occurrence: high noted occurrence of poaching 	
6. Antanimora	Taboo adherence	++	<ul style="list-style-type: none"> Repercussions: very high mentioning of negative effects when breaking the taboo Revocability repercussions: moderate to low revocability with a moderate mentioning of a sacrifice undoing taboo-related repercussions and high indication of no cure at all 	- Repercussions: moderate connection of a curse to the taboo and moderate indication of the taboo being the strongest	- Promote and provide information on the cultural and ecological values of tortoises with awareness campaigns, in a way that is attractive to the target group (e.g. with storytelling, pictures and events), to: <ul style="list-style-type: none"> Further strengthen the cultural values of tortoises, especially as means to obtain blessings and as bringers of rain Increase awareness on the ecological value of tortoises and develop environmentality Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Spread information on methods protecting crops from tortoises (and provide the means when proven necessary), to: <ul style="list-style-type: none"> Decrease human-tortoise conflicts
	Protective sentiments	+/-	<ul style="list-style-type: none"> Positive attributes: high connection of tortoises to blessings 	- Positive attributes: moderate to very low connection of tortoises to rain, good fortune/good trip, and protection from diseases	

			<ul style="list-style-type: none"> - Responsibility: high feeling of responsibility reflected in the low percentage stating to not care about poachers - Concern: low concern in case of an increased tortoise population 	<ul style="list-style-type: none"> - Negative sentiments: moderate negative sentiments due to human-tortoise conflicts - Occurrence: very high noted occurrence of poaching 	<ul style="list-style-type: none"> • Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> • Increase accessibility to law enforcers to facilitate simple and easy reporting of violations • Further increase awareness and implementation of the Lilintane • Increase a reactive attitude
7. Ejeda	Taboo adherence	++	<ul style="list-style-type: none"> - Repercussions: very high mentioning of negative effects when breaking the taboo, high connection of a curse to the taboo, and very high indication of the taboo being the strongest - Revocability repercussions: high indication of no cure at all 	<ul style="list-style-type: none"> - Revocability repercussions: high mentioning of a sacrifice undoing taboo-related repercussions 	<ul style="list-style-type: none"> - Promote and provide information on the cultural and ecological values of tortoises with awareness campaigns, in a way that is attractive to the target group (e.g. with storytelling, pictures and events), to: <ul style="list-style-type: none"> • Further strengthen the cultural values of tortoises, especially as means to obtain blessings and as bringers of rain • Increase awareness on the ecological value of tortoises and develop environmentality • Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Spread information on methods protecting crops from tortoises (and provide the means when proven necessary), to: <ul style="list-style-type: none"> • Decrease human-tortoise conflicts • Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> • Increase accessibility to law enforcers to facilitate simple and easy reporting of violations • Further increase awareness and implementation of the Lilintane • Increase a reactive attitude
	Protective sentiments	-	<ul style="list-style-type: none"> - Positive attributes: high connection of tortoises to rain - Concern: low concern in case of an increased tortoise population 	<ul style="list-style-type: none"> - Positive attributes: very low to moderate connection of tortoises to blessings, good fortune/good trip, and protection from diseases - Repercussions: Low connection of tortoises with a curse - Responsibility: relatively low (moderate) feeling of responsibility reflected in stating to not care about poachers - Reactive attitude: low frequency of an attitude of actively taking action against poachers - Negative sentiments: moderate negative sentiments due to human-tortoise conflicts - Occurrence: very high noted occurrence of poaching 	
8. Androka & Kaikarivo	Taboo adherence	+	<ul style="list-style-type: none"> - Repercussions: very high mentioning of negative effects when breaking the taboo, very high connection of a curse to the taboo, and a high indication of the taboo being the strongest 	<ul style="list-style-type: none"> - Revocability repercussions: very low to moderate revocability with a very high mentioning of a sacrifice undoing taboo-related repercussions and moderate indication of no cure at all - Occurrence: moderate noted occurrence of the taboo being broken 	<ul style="list-style-type: none"> - Promote and provide information on the cultural and ecological values of the tortoise in a way that is attractive to the target group (e.g. with storytelling and pictures), in a place comparable to the COC (e.g. with possible further collaboration with DREAM school or development of a COC near the TRC in Lavavolo), to:

	Protective sentiments	+	<ul style="list-style-type: none"> - Positive attributes: very high to high connection of tortoises to rain and blessings - Responsibility: high feeling of responsibility reflected in the low percentage stating to not care about poachers - Concern: very low concern in case of an increased tortoise population 	<ul style="list-style-type: none"> - Positive attributes: very low to low connection of tortoises to good fortune/good trip and protection from diseases - Reactive attitude: moderate frequency of an attitude of actively taking action against poachers - Negative sentiments: very high negative sentiments due to human-tortoise conflicts - Occurrence: very high noted occurrence of poaching 	<ul style="list-style-type: none"> • Further introduce and strengthen the other cultural values of tortoises, especially as bringers of rain • Increase awareness on the ecological value of tortoises and develop environmentality • Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Provide information on methods protecting crops from tortoises (and provide the means when proven necessary) in a place comparable to the COC, to: <ul style="list-style-type: none"> • Decrease human-tortoise conflicts • Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> • Increase accessibility to law enforcers to facilitate simple and easy reporting of violations • Further increase awareness and implementation of the Lilintane • Increase a reactive attitude
9. Itampolo	Taboo adherence	+	<ul style="list-style-type: none"> - Repercussions: very high mentioning of negative effects when breaking the taboo, high connection of a curse to the taboo, and a high indication of the taboo being the strongest 	<ul style="list-style-type: none"> - Revocability repercussions: very low to moderate revocability with a very high mentioning of a sacrifice undoing taboo-related repercussions and moderate indication of no cure at all - Occurrence: moderate noted occurrence of the taboo being broken 	<ul style="list-style-type: none"> - Promote and provide information on the cultural and ecological values of the tortoise in a way that is attractive to the target group (e.g. with storytelling and pictures), from a place comparable to the COC (e.g. with possible further collaboration with DREAM school or development of a COC near the TRC in Lavavolo), to: <ul style="list-style-type: none"> • Further introduce and strengthen the other cultural values of tortoises, especially as bringers of rain • Increase awareness on the ecological value of tortoises and develop environmentality • Further stress the repercussions when the taboo is broken and/or tortoises would disappear - Provide information on methods protecting crops from tortoises (and provide the means when proven necessary) in a place comparable to the COC, to: <ul style="list-style-type: none"> • Decrease human-tortoise conflicts • Decrease negative sentiments - Increase presence and visibility of law enforcers, including TSA staff, to: <ul style="list-style-type: none"> • Increase accessibility to law enforcers to facilitate simple and easy reporting of violations • Further increase awareness and implementation of the Lilintane • Increase a reactive attitude
	Protective sentiments	+/-	<ul style="list-style-type: none"> - Responsibility: high feeling of responsibility reflected in the low percentage stating to not care about poachers - Concern: very low concern in case of an increased tortoise population 	<ul style="list-style-type: none"> - Positive attributes: low to moderate connection of tortoises to good fortune/good trip and protection from diseases - Reactive attitude: low frequency of an attitude of actively taking action against poachers - Negative sentiments: very high negative sentiments due to human-tortoise conflicts - Occurrence: very high noted occurrence of poaching 	

