2020

COOPERATION AND CONFLICT IN THE 'LIFEWORLD' OF PASTORAL AND FARMER COMMUNITIES IN THE BOÉ, GUINEA-BISSAU

A CASE STUDY WITH IMPLICATIONS FOR COMMUNITY NATURAL RESOURCE MANAGEMENT

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March, 2020

ABSTRACT

This case study focusses on the interaction between pastoral and farmer communities, and how this affect community natural resource management via traditional institutions in the Boé, Guinea-Bissau. This study was the first scientific examination of the pastoral community in the Boé, Guinea-Bissau. Limited availability of and diverse interests in natural resources affects cooperation and can spark conflict between communities. Current scientific literature on pastoralists and farmers in West-African countries focusses on violent conflict and leaves cooperation and non-violent conflict unaddressed. Subsequently, little information exists on how cooperation and conflict affects traditional institutions managing natural resources. The study applies critical institutionalism as an overarching theory, while including institutional bricolage and elements of conflict theory applied from the conceptual perspective of the lifeworld. Critical institutionalism and bricolage are used to examine the dynamic interaction, either between institutions or the natural environment. Elements of conflict theory were used to analyse drivers of tension and conflict escalation. The pastoral lifeworld depends on the integration in the farmer communities' lifeworld, because farmers allocate land to pastoralists and pastoralists can integrate farmer institutional elements into their own. Similarities in social structure, ethnicity and religion create a foundation for cooperation. While differences in lifeworld practices and valuation create barriers. Those barriers can be overcome by face-to-face communication and the development of shared norms and values. The institutional bricolage processes of aggregation and alternation are essential here. The institutional bricolage process of articulation or no face-to-face communication decreases the chance on cooperation. Institutional bricolage is accompanied by tensions over different reciprocal norms and results in non-violent conflict when there are disputes over crop damage. Conflict escalated when villagers did not feel the moral legitimacy to conform their own norm and when a mediating third party was absent. Escalated conflict decreases face-to-face contact, hence inhibits future cooperation. Pastoral practices affected agricultural land by crop damage and soil fertilization, and the savanna land by shortening grass, which decreased the chance on conflagrations and increased bush land. Sacred forests were exposed to pastoral practices if pastoralists did not integrate norms and beliefs of farmer communities regarding those sacred forests. The effect on community natural resource management via traditional institutions will be affected if there is a lack of cooperation between the two communities. Conflict or no communication ensures that communities will act according to their own institution and that pastoralists will not take into account existing traditional institutions managing natural resources. The role of reciprocity in conflict and the establishment of symbiotic relations gives conservation projects insights to shift their focus on cooperation rather than conflict prevention. The pastoral and farmer communities in the Boé can establish symbiotic relations, but they first need to communicate solutions and problems with each other.

ACKNOWLEDGMENTS

First of all, I like to thank all the pastoralists and famers I spoke to. Everyone was hospitable and kindly shared their knowledge with us. I hope this study can contribute to some problems they experienced in the Boé. I also like to thank the local staff of CHIMBO for assisting us wherever necessary. Special thanks to my research assistant Bucari Camara and Anouk Puijk. Camara always accompanied me during fieldtrips, helped me to understand the farmer culture and for all the field preparations he did. He became a good friend, who I would like to visit in the near future. Puijk helped me to adjust, reflect and gave advice based on her experience in the Boé. She also became a good friend and I appreciate the evenings we spend together. Furthermore, I like to thank Piet Wit and Annemarie Goedmakers, founders of CHIMBO, for facilitating students in the Boé so they can conduct research. I wrote this thesis based on their concerns regarding the pastoral community in the Boé. Moreover, I like to thank my supervisor Bas Verschuuren for assisting me throughout the whole writing period of this thesis. He has given me essential input and advice, which I am grateful for. At last, I like to thank Sem van Loon for accompanying me to the Boé and for all the fun we had together. She conducted her own study, but we helped each other where we could. We shared our experiences, which advanced our knowledge regarding the beautiful and interesting Boé culture. The four months I spend in the Boé were wonderful, fascinating and filled with a lot of fun.

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10 March, 2020

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1 INTRODUCTION

Sustainable use of natural resources is of foremost importance for rural communities, who directly depend on them and other ecosystem services for their livelihood. Traditional communities developed mechanisms to manage local natural resources, which includes local knowledge, spiritual beliefs and community restrictions to exploit resources (OECD, 2001). The overall term Community Natural Resource Management (CNRM) is widely used to refer to those community mechanisms (Kellert, et al., 2000). CNRM has become a major strategy of development and conservation agencies (Blaikie, 2006). Criticism on CNRM describe that urbanization and capitalisation alter traditional lifestyles, resulting in less sustainable ones (Goodland, et al., 1990; Worster, 1993). However, when communities live in relative isolation, those mechanisms are preserved. If demand for natural resources is higher than provision, or if another traditional community joins interests over common natural resources, CNRM becomes more challenging and can result in conflict (Berger, 2003; Ofem & Bassey, 2014). In this study, I focussed on herder migration in Eastern Guinea-Bissau, in a sector called the Boé. Herder migration affects natural resources in the Boé and traditional CNRM mechanisms of local farmer communities. So far, no scientific studies have focussed on the herder community in the Boé or Guinea-Bissau. Most literature concerning herder and farmer relations examines violent conflict in West-African dry land, particularly in the Sahel region[1] (Bassett & Boutrais, 2000). In the Sahel, land productivity is limited as it is dominated by water shortage and poor soil conditions (Stoller, 1998; Turner, 2004). The Boé is different from existing literature, as it cannot be classified as West-African dry land, although land productivity is restricted by poor soil conditions and high seasonality, and herder–farmer relations are relatively recently established compared to the long-standing relations between herder and farmers in the Sahel region. First, I will examine herder-farmer relations in West-Africa based on existing literature, before I will describe the case study.

1.1 PASTORAL – FARMER RELATIONS

Struggles over natural resources between herders and farmers in West-Africa is a relatively new, but highly debated topic. Herder-farmer conflicts were considered as isolated disputes between communities and therefore did not receive the necessary attention by science (Lind & Sturman, 2002; Chabal, et al., 2005). At present, violent conflicts endure in countries like Burkina Faso, Niger and Nigeria. Literature centres around those conflicts, attributing sources of political inequality and limited resources (Bassett, 1988; Braukämper, 2000). Turner (2004) describes that conflict has deeper socio-environmental causes than superficial struggles over natural resources. Differences in interests how to use resources or unequal distribution of limited resources can spark discussions, but it often constitutes multiple causes (Lo, et al., 1996). Tensions are often caused by structural economic or social marginalisation, ethnic or religious differences and climate change (Brockhaus, 2005). In West-Africa, we can define causes related to post-colonialism, political instability, population growth and desertification requiring migration to more fertile areas (Ferreira, 2004; Brockhaus, 2005). The main objective elicited from literature concerning (predominantly violent-) conflict is to solve it in order to safeguard human lives and livelihoods. Paradoxically, it seems that there is less attention in literature on the consequences of conflict on CNRM, while this constitute as one of the prime causes for putting human lives and livelihoods at risk.

Herders and farmers in many African regions, have longstanding symbiotic relationships including gift giving and exchange of services (Burnham, 1980). Naturally, good relationships are essential in conflict resolution or prevention. How these relations have evolved and are maintained depend on the historical context (Moritz, 2010). Herders traditionally do not permanently tenure land due to their nomadic existence. Pastoralist, rather than herder (referring to the person actively herding cattle, a shepherd), refers to a livelihood dependent on cattle husbandry by ranging on grasslands (FAO, 2001). West-African dryland restricts long-term settlement as it cannot sustain extensive grazing of cattle all year around. By adopting a nomadic existence, pastoralists can

[1] The Sahel region is located South of the Sahara desert and North or the tropical region in Africa, it is literally a transition region characterised by limited, but seasonally available resources.

increase livestock numbers (FAO, 2001). Pastoralist often have fixed routes based on seasonal availability of pastures and disease avoidance. This is called transhumant pastoralism. Settled farmers operate as hosts towards nomadic or transhumant pastoralists (Bassett, 1988). Transhumant pastoralists, have different relations with hosting communities then herders exploring new areas for foraging ground. The search for new foraging ground is an ongoing phenomena seen in Southern coastal countries in West-Africa, like Ghana, Ivory Coast, Benin and Togo for the last thirty years (Tonah, 2006; Bassett & Turner, 2006). Bassett and Turner (2006) describe that pastoral migration is primarily induced by droughts in the Sahel region towards the Southern Sudanian and Sudano-Guinean bioclimatic zones from the 1970s onwards. Environmental conditions, but also political, economic and social conditions can constrain or drive migration patterns (Blench, 1994). Social conditions in the form of shared social norms and values enhances the possibility of collective action and the absence of those can withhold migration (Ostrom, 1990; Bassett & Turner, 2006). Another phenomena, is sedentarization. Sedentarization is the discontinuance of a nomadic lifestyle and the integration within a more spatially fixed social and natural environment (Galaty, et al., 1980). Sedentarization is often accompanied by agropastoralism, where families cultivate land and often hold land use rights (FAO, 2001). Agropastoralists hold strong relations with farming communities, but become more independent as they do not longer depend on the exchange of resources (Dyson-Hudson & Dyson-Hudson, 1980).

In this study, I differentiated a) nomadic pastoralists, those who do not tenure land nor have a fixed migration pattern and did not establish social relations; b) transhumant pastoralists, those who do not tenure land, but do have fixed migration patterns and established social relations with villagers; and c) agropastoralists who have tenured land, cultivate land and established social relations.

1.2 BACKGROUND: THE BOÉ

The Boé is a remote, rural region and larger than 3,000 km^2 in surface (Stichting CHIMBO, N.D.)(see figure 1). The Boé consist of a subset of habits, main categories are (edaphic) savanna, bush land and gallery forest. The gallery forest surround rivers and water springs. The Corubal river circumvents the sector from the North and West side. The area is excluded from national markets and inhabitants are therefore directly dependent on natural resources. Local inhabitants identify themselves with the Fula ethnicity, but are mixed with some other ethnicities as the Bambara and Soussou. Yet, they all speak the language Fula.

Figure 1 ; Location of Boé in Guinea-Bissau (Goedmakers, 2017)

Their livelihood is based on small-scale agriculture and resource gathering in the nearby forest. Local inhabitants traditionally do not own cattle, but inherit land and manage natural resources located on them. Poor soil conditions make agricultural practices challenging and not very profitable (Goedmakers, 2019). The local inhabitants, or farmers, have to maintain a rotation system of at least seven years to allow fallow land to recover. Fallow land is being cleared with fire in the dry season. This causes conflagrations which sparks burnings in other areas, like forests and bushland. These conflagrations affect wildlife as it decreases food availability and opens-up the priory closed gallery forests. Additionally, they can be dangerous for surrounding villages and agricultural fields. The farmers are financially poor due to the low-soil productivity and further exclusion from markets. Some community members migrate to the larger cities to increase their revenue (Wit, 2019). Isolation has ensured that the community has maintained a large extent of their cultural traditions. Some traditions are characterised by their conservative nature in regard to some of the gallery forests. The farming community regards certain forest patches as sacred, particularly those around fresh water springs (Ramachandra, 2017). They may not be entered or exploited without consent of the person responsible. By disobeying the forest specific rules, the spirits or demons inside them will harm you.

The Boé is partly located in the Dulombi-Boé national park and receives (inter)national attention as it is home to the critically endangered Western-Chimpanzee (*Pan troglodytes versus*) (Humle, et al., 2016). The Dutch NGO CHIMBO[2] sets its focus on protecting this population of chimpanzees, including their habitat (and other biodiversity) via a community-based conservation programme (Goedmakers, 2017). Village Vigilance Committees (CVV) have been established in 30 out of 85 villages in the Boé to acquire wildlife observations in the remote regions and control against poaching (Goedmakers, 2018). CHIMBO stimulates the local economy by employing local inhabitants, having sustainable tourism and promoting education. Moreover, they try to minimize late fires in the area causing conflagrations and actively promote farmers to burn the area early in the dry season (before January).

In 1989, there was no pastoralism in the area (Wit & Reintjes, 1989). CHIMBO signalled the phenomena of pastoral immigration to the Boé. According to CHIMBO, pastoral practices conflicted with farmers and nature conservation in the area. For example, in order to prevent cattle predation, they may poison predatory species and poach other sorts of wildlife (Wit, 2019). Moreover, uncontrolled cattle grazing in the area affects agricultural crops and disturbs sacred forests. Other possible conflicting practices are burning of dry grasslands to increase availability of regrowth of grass for cattle in the dry season (Goedmakers, 2019). This increases the chance on uncontrolled forest fires. CHIMBO also noticed that there were disputes over crop damage between the two communities. Additionally, the arrival of pastoralists in the area may gradually alter CNRM of farmers in the Boé, which affects nature conservation in the area. This study was done in close cooperation with CHIMBO. Their concerns and a general lack of basic knowledge on pastoralism in the Boé formed the basis for this research. They acted as a facilitator to perform fieldwork, including arranging my research partner and cooperation with villagers via CVVs.

[2] CHIMBO has been founded by Annemarie Goedmakers and Piet Wit in 2007 with the objective *to "further the conservation of chimpanzees in the remote south eastern part of Guinea Bissau*."

2 THEORETICAL FRAMEWORK

In this study, I used a critical institutionalism approach within the context of life world theory. The framework is enhanced by fundamental elements from the field of conflict theory. Conflict theory gives us insights in drivers of conflict. Using solely conflict theory, would be too restricting as this case study is an empirical examination of pastoral communities in the Boé in relation with nature and the farming community. Conflict theory predominantly focusses on the interplay between communities and includes some externalities, such as the natural and political environment, which may cause conflict. But it lacks the dynamic processes between communities and the environment: how the community affects the environment and how this again affects the community. Before I turn to the theories described above, I want to introduce some of the essential concepts of this case study, like the definition of a community and basic elements of institutionalism.

2.1 COMMUNITIES & COOPERATION

Traditionally, policies and projects concerning development or nature conservation refer to a community as a group of actors sharing the same geographic place (Ojha, et al., 2016). Considering communities as fixed spatial units is in the case of among other the Boé, highly inept. Even though we can differentiate farmer villages from pastoral settlements, individuals often mingle and interact. Moreover, pastoralists traditionally form small family groups and maintain a nomadic lifestyle. Another way to differentiate communities is based on their social structure, including livelihood, language and religion (Agrawal & Gibson, 1999). Yet again, this is a challenging concept to work with, since both communities speak the Fula language and are affiliated with the Islam. Livelihoods can often not be strictly separated. Young farmers, for example, are sometimes employed by pastoralists to herd their cattle and some farmers start to have their own cattle to increase their revenue. Pastoralist may cultivate land or occupy other professions, such as tailor, Koran teacher or driver. Referring to pastoralists or famers is then by itself unsuitable, as not everyone occupies that particular profession. Nevertheless, these overarching terms refer to traditional livelihoods, which lead to different beliefs and interests. Those beliefs and interests over natural resources are the foundation for what creates a community, as they grew from shared characteristics (Agrawal & Gibson, 1999). The spatial unit then becomes less relevant as multiple communities can live within the same spatial unit.

The interaction communities have with the natural environment can be understood by the institutional approach of Ostrom (1986). An institution is made up of values, beliefs, norms and rules, which guides human behaviour and ensures collective action - or cooperation - for CNRM. Ostrom (1997) explains how internal valuations, positive or negative, create norms. Norms are learned via trial-and-error processes and help an individual to take particular types of action within a situation. A norm can result in a rule, which obliges individuals to take that actions in a situation. If individuals do not conform to the rules, they can be sanctioned by officials or other community members (Ostrom, 1997). A norm which is essential for collective action between actors, is the norm of reciprocity. The norm of reciprocity guides actors to return favours or gifts to actors which have favoured them previously (Gouldner, 1960; Cosmides & Tooby, 1992). By reciprocating actors establish a positive reputation, which creates trust among actors and eventually high levels of cooperation (Ostrom, 1997). Collective action or cooperation increases the net benefit of actors. Ostrom (1997) illustrates ‘a simple scenario’, see figure 2, to explain how cooperation is developed and how it depends on face-to-face communication to develop shared norms. In communities where families are co-dependent, actors are more likely to reciprocate towards non-kin to increase their survival rate (Hamilton, 1964; Ostrom, 1997). In the Boé, I assume that farmer communities are more co-dependent of each other. If one family has a bad harvest, they can rely on another family to take care of them. Moreover, they may share seasonal agricultural workload by having different seasonal crops. So, farmers are more likely to reciprocate towards non-kin.

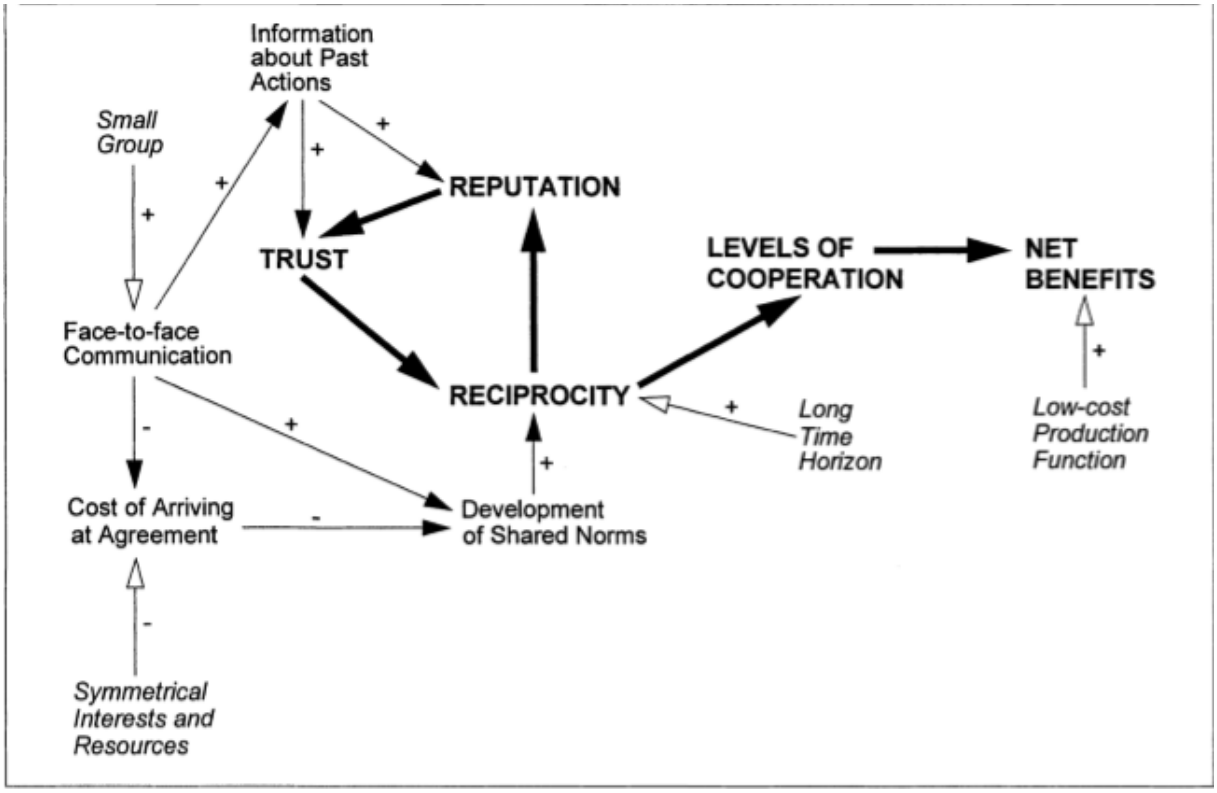

Figure 2 ; A simple Scenario of Reciprocity (Ostrom, 1997)

Institutions guide social practice - the actual doings of actors - while leaving space for individual practices within this set of rules and norms (Arts, et al., 2013). Institutionalism is therefore an effective model to simplify and predict community behaviour. Yet, it assumes institutions are stable and fixed entities and it lacks the inclusion of evolvement over time, the interplay between institutions and the natural environment. Cleaver (2012) furthers institutional thinking with critical institutionalism. Critical institutionalism recognises the complexity of everyday human life, historical formations and the interaction between different institutions. These interactions between different institutions are important in this case study as we are dealing with multiple. In addition, by including the historical and natural environment we create interconnectivity (Cleaver & de Koning, 2015). Meaning that institutions guide behaviour, but actors can furtherly shape institutions (Cleaver, 2002). Critical institutionalism embraces the concept of institutional bricolage, which I discuss further in the next section. However, I will first focus on the concept of the lifeworld, which is a way to understand the relations between any cultural group or community and its environment in which institutions are shaped.

2.1.1 THE LIFEWORLD

The conceptualisation of a community as a group of individuals sharing similar beliefs and interest, is grounded in a natural resource management approach. Meaning that it is developed in order to improve policies and projects related to nature conservation and development (Agrawal & Gibson, 1999). By focusing on those beliefs and interests over natural resources by a community, we direct our focus on drivers of human behaviour rather than the behaviour itself. By first comprehending beliefs and interest of a community, we may understand why they take particular types of action. These beliefs and interest relate to the ontological perspective of a community. How they perceive and describe the world affects their interaction with it. Taking a multiculturalism perspective, we assume that there are multiple ways to perceive the world as we know it (Latour, 2011). However, this perspective still makes a dualistic differentiation between nature and culture. It assumes that there is one nature or reality and different ways to perceive it, thus different cultures. From this perspective, nature is valued either as a resource or as something we intrinsically value (van Koppen, 2000; Worster, 1985). There is a vast line of literature aiming to disentangle the culture – nature differentiation. These authors adopted the term

of a lifeworld to point out the dynamics between the two (Bernstein, 1971; Nicolini, et al., 2003; Leis, 1972). The concept emphasizes the interfluent relation between culture and nature experienced by a society (Schutz & Luckmann, 1973). So, instead of examining nature as something fixed we can value, it becomes something dynamic which is produced and experienced by a community. The interplay between actors and their materialistic lifeworld produce intrinsic values, which again influences the interaction (van Koppen, 2000). In practice then, we need to focus on how nature is experienced in everyday life and how that has developed over longer periods of time. Different values regarding different parts of the lifeworld result in different human behaviour. The lifeworld is important in this case study as we aim to understand the interaction communities have with their lifeworld and how those differences can affect the lifeworld and vice versa.

2.1.2 INSTITUTIONAL BRICOLAGE

Dynamics between the lifeworld and communities prove to be important as it may drive migration and force new institutions to be established. Fula migration was for example induced by droughts, forcing pastoralists to establish new relations with hosting communities elsewhere (Bassett & Turner, 2006; Blench, 1994). When actors from different communities meet and interact, bricolage occurs. Cleaver (2002) describes institutional bricolage as the interaction between actors from different institutions resulting in the reshaping of current institutions or the creation of new ones. Bricolage is a messy, sometimes unconscious process whereby different elements of institutions are transformed and adapted to fit in the new current situation (Cleaver, 2002). Literature concerning institutional bricolage frequently focuses on bricolage between formal institutions being introduced to informal institutions (de Koning, 2011). However, bricolage can also occur between two informal institutions (I prefer the term traditional over informal, as traditional African communities create their own legal systems and sometimes overrule formal institutions (Myers & Fridy, 2017; Osei-Tutu, et al., 2015)). It is essential for the development of new social relations between communities. It helps to create frameworks and mechanisms for cooperation, management of natural resources and conflict prevention.

De Koning (2011) describes three processes of institutional bricolage where bureaucratic institutions bricolage forest practices. The processes describe a mostly one-way bricolage affect: that on forest practices. Only the process of alternation is described as a two-way interaction. If we consider a one-way interaction, the bureaucratic institution, or simply the external institutions, will become static. In this framework it is important to acknowledge a two-way affect. Our external institution, among other the pastoral community, has just as a dynamic institution as that of the farmer community. The external institution affects the internal and vice-versa. The first process of institutional bricolage as described by de Koning (2011) is aggregation, the recombination of institutional elements. Norms, values, beliefs and rules can be simply adopted by an institution. Pastoral migrants may adopt existing rules of farming communities. The other way around, farmers can adopt existing mechanisms to prevent crop damage of pastoral communities. The second process, alteration, is the reshaping of institutional elements in order to fit local circumstances. Alteration can be done consciously using negotiations. Pastoralist and farmers can for example discuss problematics and aim for a fitting solution to prevent crop damage. At last, the processes of articulation, whereby own institutional elements are emphasized in a way to show disagreement. To illustrate, farmers can actively disagree with a solution proposed by pastoralists based on their belief that it is not their tradition doing so. The adaption to external institutional elements can alter CNRM. So, in order to conserve CNRM, external institutions need to adapt to the local institutions instead of vice versa.

The bricolage processes of aggregation and alternation are therefore of main importance to ensure cooperation over natural resources. Institutional elements can become legitimate if rules, norms, and beliefs are embedded in the institution. Scott (2001) defines three types of legitimacy based on the integration of rules, norms and beliefs. If all three are integrated, we talk about cultural legitimacy. If rules and norms are integrated, we have moral legitimacy. If only rules are embedded, actors do not feel the moral or cultural legitimacy to conform the rules, resulting in authoritative legitimacy (Scott, 2001; de Koning, 2011). As a result, actors can either comply with rules, while staying critical, or disobey. Where rule enforcement is minimal, actors are more likely to

disobey, since there are minimal or no negative consequences of trespassing. The further bricolage outcomes are embedded in an institution, the higher the chances of collective action. Articulation is often an expression of disagreement with external institutions and will therefore result in non-cooperation, leading to tension or conflict.

2.2 ELEMENTS OF CONFLICT THEORY

Prior to conflict is tension or friction, which is described as: "*the awkward, unequal unstable, and creative qualities of interconnection across difference*" (Tsing, 2005). Tension can occur between two or more actors, being individuals, institutions or communities (Rambotsman, et al., 2011), and results from a dispute: a difference in interest over a certain topic (Dredge, 2010). Farmer-herder disputes often concern cattle eating or trampling agricultural crops, or land accessibility. The subsequent actions of individuals or communities regarding disputes can lead to conflict. Pellis (2019), drawing on Luhmann's (1995) social systems theory, emphasises that conflicts are nothing more than a form of communication. The way and dynamics of communication, including verbal and non-verbal forms, are just as (if not more) important as the visible causes of conflict. Here, Pellis states: *"A conflict is a conflict when it is an operationalized contradiction, not a latent one"* (Pellis, 2019; Luhmann, 1995). This statement is important in order to understand how a conflict evolves. An individual, hostile message, cannot be interpreted as a conflict as it is not 'operationalized'. Only if the receiving actors acts upon the hostile message, be it by direct confrontation or exclusion, it becomes a conflict, because it is operationalized. Whereas we often associate conflict with violence, it can also manifest itself verbally (Brockhaus, 2005). Non-violent conflicts are considered as normal and necessary for social change, constituted in a dynamic society (Bernshausen & Bonacker, 2011). However, this does not indicate that non-violent conflict is harmless. By not comprehending conflicts, they can easily escalate.

Moritz (2010) defines conflict escalation as: "*the transformation of a disagreement, argument, or dispute between a single herder and a single farmer, for example over crop damage, into a widespread violence between communities that results in multiple fatalities*". He examines variables causing escalation of conflict and argues: *"Structural variables are necessary to explain the causes of conflict, while processual variables explain the outcomes of conflict*". Structural variables are a foundation for conflict and refer to variables such as limited resources and a poor political environment. Limited resources could be in the form of low-land productivity and scarce water availability. Further pressure on those resources, such as crop damage, may accelerate conflict escalation. The political environment may become challenging if formal and traditional institutions diverge and/or are ineffective (Osei-Tutu, et al., 2015; Helmke & Levitsky, 2004). Structural variables create a challenging environment, yet do not immediately lead to violent conflict. Processual variables refer to factors which drive conflict escalation. Processual variables which can drive conflict escalation are a) crowd formation, where individuals become cohesive; b) face-to-face contact, particularly when an actor is confronted with the conflicting practice; c) lack of involvement of a mediating third party; and d) differences in culture (Moritz, 2010). Differences in culture relate back to misinterpretation. Pellis (2010) argues that misinterpretation of communicated messages contributes significantly to the emergence of conflict. Levels of misinterpretation will increase when societies have different practices and the meaning of certain practices will be interpreted differently, or in other words: differences in culture will increase the chance on misinterpretation. Although face-to-face communication increases conflict escalation it also decreases the chance of miscommunication and allows communities to develop shared norms and values, which in turn increases the likelihood of cooperation (Moritz, 2010; Harsanyi & Reinhard, 1988).

3 RESEARCH QUESTIONS

The case study of the Boé forms an exception to most of the literature regarding herder-farmer conflicts in West-Africa which concern violent conflict situations (Turner, 2004; Bassett, 1988; Braukämper, 2000; Brockhaus, 2005; Moritz, 2010; Ofem & Bassey, 2014; Tonah, 2006; Hagberg, 1998). In most of those regions, herders and farmers have had longstanding interdependent relationships (De Haan, et al., 1990). Whereas some pastoralists have lived in Boé for many years, there has been considerable migration to the area. Shared norms and rules between community members may be already in place, but could also be in the process of being established. This allows us to examine the processes of institutional bricolage and the result of those processes. Moreover, literature identifies limited natural resources as one of the drivers of conflict (Moritz, 2006; Turner, 2004), but it never examines the effect of conflict on CNRM. Additionally, by examining the lifeworld instead of a materialistic, natural resources, we incorporate culture including aesthetic valuation, beliefs and practice. As such, this case study gives a novel insight in conflict theory by using critical institutionalism. This is relevant as pastoralists are expanding terrain and come into contact with new communities (Tonah, 2006; Hagberg, 1998), as is the case in the Boé. Cooperation is difficult where communities are newly introduced and by examining the dynamics between communities we may comprehend the effect on CNRM. Besides the above, this case study gives basic insights in pastoral communities and their interaction with the lifeworld, hence contributes to current literature regarding pastoral communities in West-Africa. Prior to this study, there was no literature focussing on pastoral communities in Guinea-Bissau. The main research question is:

- *How does the interaction between pastoral and farmer communities affect community natural resource management via traditional institutions in the Boé?*

Because this is the first scientific study of the pastoral community in the Boé, the first sub-question aims to understand characteristics of their lifeworld. This includes a review of the historic and daily interaction with the environment and cultural characteristics as social structure, ethnicity and livelihood. Farming communities have been studied prior to this case study and an examination of their lifeworld is therefore redundant. Data collection (see chapter 'Methodology' for more information) will be done using participant observations. The second sub-question aims at cooperation between pastoralists and farmers using the critical institutionalism approach and elements of conflict theory. Data will be collected using semi-structured interviews, focus group sessions and supplemented with participant observations. The last sub-questions examines pastoral effects on the farmers' lifeworld, which will be answered using participant observations and focus group sessions in villages to examine historical affects.

1. What are the characteristics of the lifeworld of pastoral community in the Boé, Guinea-Bissau?
2. What are strengths and barriers for cooperation between pastoralists and farmers in the Boé, Guinea-Bissau?
3. How do pastoral practices affect the lifeworld of farmers in the Boé, Guinea-Bissau?

4 METHODOLOGY

This is an empirical case study of an explorative nature, taking place in a relatively information poor environment. The study deploys qualitative research methods gathering in-depth information regarding norms, values, unwritten rules, traditions and perceptions (Bernard, 2006). An iterative approach was taken to allow flexibility in adjusting theory and methods based on the analysis of initial data (Bernard, 2006).

The main focus lied on the pastoral community, but later on I adjusted my focus, because I lacked input of farmer communities. **Snowball sampling** was used to identify settlements and areas where many pastoralists reside. This is an appropriate method to locate respondents using references of prior respondents (Bernard, 2006). In this case study, we were unaware of the location of pastoralists. To observe and understand practices, I used the broader method **participant observations**. This methods allows the researcher to involve itself in the daily lives of participants. Additionally, data was gathered **using focus group** sessions and **semi-structured interviews**. Data was gathered from August till mid-December in the Boé at the end of the rainy season, beginning of the dry season. There were four fieldwork periods of between one-and-a-half to two weeks, covering four different areas. In total, I observed and/or interviewed twenty-one pastoralists and had interviews/focus group sessions in nine villages, plus at the veterinarian station in Gabú. Fieldwork was highly limited by the remoteness of the Boé and climate conditions. Villages and settlements were visited by bike and occasionally heavy rainfall obstructed our visits. Data collection methods and actualities will be further discussed in the next section 'Data collection'. The **software Atlas.Ti** was used to help store, organize and analyse transcripts based on coding. This will be further discussed in the section 'Data analysis'.

4.1 DATA COLLECTION

4.1.1 PARTICIPANT OBSERVATIONS

I observed participants to examine key characteristics of pastoralists families, settlement structures, like size and housing, and daily activities. Furthermore, I participated with pastoralists to engage myself with interesting activities to learn more from them. Interesting activities where for example fetching cows back from the bush, selling of cattle to farmers and pastoralists visiting nearby villages. This technique enabled me to ask questions during activities, gather more detailed information and clarify observed practices. Conversations which were held were not recorded. Descriptions of activities, including involved individuals, attitudes and whereabouts were noted down asap. Participant observations could only be done if respondents allowed us to join them during their activities.

The same technique was used to get a better understanding of farmers. Our basecamp was located in the village of Béli and I had interactions with the people living in Béli on a daily basis. During fieldwork, we also visited villages. If I had the time, I participated with activities, I learned from their work and interaction with their lifeworld. For example, I went multiple times with people to the field to clean the field, harvest and process harvested products.

4.1.2 INTERVIEWS

During visits to settlements or villages, I conducted interviews and focus group sessions. On settlements, I always interviewed the leader of the settlement if present at the time being. If they were not present, I interviewed the subsequent eldest men on the settlement. This was often a brother or cousin. Interviews were semi-structured and formulated as open as possible in response to prior answers. Topics covered in pastoral interviews were: reasons of migration, social relations, problems in the Boé (including social problems), solutions for problems and if those solutions were implemented, preferred habitat, influence of pastoralists and farmers on nature, and knowledge regarding sacred sites. Prior to the interview, the prepared topics were aligned in more detail to the respondent to be interviewed. The interviews were recorded with consent of the respondent.

4.1.3 FOCUS GROUPS

Focus groups are efficient in gathering data of multiple respondents and they can give an indication of the social environment within a group (Krueger & Casey, 2000). Focus groups were only conducted in villages, because pastoral leaders were in charge of their settlement and assumed to be aware of important activities. In villages, CVV members (Village Vigilance Committees, project of CHIMBO) were always present during focus group sessions. They were responsible for gathering other villagers to participate. Even though we informed the local CVV members about preferred group size (3 to 6), we often got larger groups. As a result, not all participants joined group discussions. None of the respondents ever showed dissent with what was said within sessions, as it is a form of disrespect.

4.1.4 ACTUALITIES AND CHOICE OF AREAS

In the first two weeks in the Boé, I had some explorative interviews in Béli, the administrative 'capital' of the Boé. These interviews included CHIMBO staff and some elders in the village, among other the administrator and a quarter chief (an elder responsible of a part of the village). The first fieldwork period was conducted in the vicinity of Béli. This area was chosen, because Camará was acquaint with the pastoralists and the location of their settlements. Five settlements were visited and one village. For the second fieldwork period, we choose an area where many pastoralists resided according to respondents. In this fieldwork period, we visited six pastoral settlements and two villages. Based on pastoral respondents and the focus group sessions in the villages, I decided it would be interesting to revisit one of the two villages. Respondents of fieldwork period 2 and the quarter chief of Béli, both identified problems between pastoralists and farmers of that village. Therefore, I had a short revisit to this village and conducted another focus group and three interviews with random farmers which were in the village. Unfortunately, we could not visit pastoralists in this area, because villagers were unfamiliar with their whereabouts. They denied pastoralists access to the area, but pastoralists still settled in remote areas or across the border in Guinea. Instead, we visited two settlements between this village and Béli.

After fieldwork period 3, we made a trip to Gabú, the nearest largest and more modernized city, to interview the veterinarian station. Back in the Boé, we organized a last fieldtrip across the second-largest river in the Boé, called the Fefine. This area was frequently alluded by respondents as it is one of the border regions where many pastoralists enter Guinea-Bissau. So far, it was impossible to visit the area as it was unsafe to cross the river due to the strong current. The beginning of the dry season, lowered the river current, but also sparked seasonal migration by pastoralists. Grasses started to dry and there was no regrowth of grass, so when pastures were overgrazed, pastoralists had to search elsewhere for grasses. This made it harder to locate settlements and we noticed that pastoralists were often too busy for interviews as cattle was harder to control as they dispersed in order to find food. This was convenient at the time being, as I noticed I lacked input of farmers. Therefore, I visited more villages and held more focus group sessions in village. During fieldwork period 4, I interviewed and briefly observed seven pastoralists on their settlement, and interviewed another pastoralist in a village we visited. I had four focus group sessions in four different villages and two individual interviews with the local police and the community chief in another. This village did not have a CVV to retrieve farmers from their fields. At last, during this fieldtrip I went to Foulamory, a city across the border of Guinea. We were not allowed by law to actually conduct interviews, but I was allowed to do some general observations.

CVV members where highly valued as they arranged respondents in villages and they assisted us in finding the pastoral settlements. During the last fieldtrip, they often joint us during interviews with pastoralists. Out of respect we did not send them away. I was afraid they would influence responses, however most pastoralists still shared problematics. I could not verify whether pastoralists withheld information, like complains, due to the presence of CVV members.

4.2 DATA ANALYSIS

The iterative approach allowed me to modify the methodology based on initial analyses. Initial analyses was done using reflections based on the priory collected data. Brief reflections were done on a daily basis during fieldwork periods and more extensive ones after fieldwork. I reflected alone and during fieldwork periods with my research assistant Bucari Camará assigned to me by CHIMBO. He himself is from origin a farmer and he contributed my reflections by sharing his personal opinion and farmers perspective. After fieldwork periods, I reflected with my peers and manager Anouk Puijk. Puijk has lived in the Boé for almost three years and aided my reflection by sharing her experiences from a Western perspective. During a visit to Bissau, I had the opportunity to contact my supervisor Bas Verschuuren from the Netherlands and reflect with him on the progress and directions of my study.

Gathered data together with reflections, existing material, including scientific literature and student reports of CHIMBO, and informal data based on conversations with acquaints in the Boé, were compared to verify thoughts. For example, respondents were less likely to admit their own wrong doings or that of other community members. Accusations on both sides, together with descriptions of problematics from other villagers or CHIMBO staff, personal observations and literature regarding drivers of conflict helped me to verify data. This is a form of **data triangulation**.

Interviews and focus group sessions which were recorded were transcribed using **verbatim style**. Spoken Fula is not written down, so transcriptions only contain respondent translations done by Camará. Language was a limitation, as the local language Fula cannot be translated directly to English. Consequently, questions were sometimes specified and answers reformulated and complemented were necessary. Transcribed interviews and focus groups were entered in Atlas.TI. This program is developed for the analyses of qualitive data. All transcriptions were perused and responses were systematically coded based on emerging themes.

4.2.1 REFERING TO INTERVIEWS, OBSERVATIONS AND SETTLEMENTS

In the result section, I refer to settlements, observations and interviews of fieldwork periods. I like to clarify the coding system I use to refer to those observations and interviews. A pastoralists code is based on the fieldwork period (F) + the number of the fieldwork period, referring to a general location as described in 'Actualities and choice of area', and an identification of the pastoral classification + number of settlement of the fieldwork period. The pastoral classification is either agropastoralists (SP), transhumant (TH) or nomadic (N). So, a pastoralists code could be F2TH4, referring to fieldwork period 2, the 4th visited settlement in fieldwork period 2, which was a transhumant pastoralists. See Appendix I for more detailed information regarding characteristics of the respondents.

To refer to interviews or focus groups in villages, I constructed the code based on the number of visited village (V), the method applied, either focus group (FG) or interview (I), and if necessary the number of that interview. So, a code could look like V4I2, meaning it was the fourth visited village and the second interview in that village.

4.3 ETHICS

For this thesis, I worked in close cooperation with CHIMBO and I worked under a memorandum of understanding. During visits, my research assistant always introduced us and clarified the objectives of our study. We made clear we work with CHIMBO, if necessary we explained the objectives of the NGO.

Only with their consent we were allowed to observe, participate with or interview them. I noticed a general misunderstanding of pastoralists who I interviewed, as they thought I was there to help to improve their situation as I was asking about their problems. We tried to explain that we were there to examine their problems, but we were not there to arrange solutions. Nevertheless, to contribute respondents with my research I wrote a small

recommendation for the pastoralists and farmers in the area which can be communicated via CHIMBO, see Appendix II. A general recommendation for CHIMBO is included in the chapter 'Conclusion'.

During visits, we asked about problematics between communities and nature conservation. Initially, pastoralists gave brief answers and seemed doubtful in sharing information. Yet, the longer we stayed with pastoralists, the more open-hearted they became. They shared their problems and complained more freely about farmer practices. After a while, we started to inform pastoralists about the priory visited settlements. Respondents became more trustful knowing that other, respected pastoralists accepted us. Generally, pastoralists welcomed us on their settlement and did not hesitate to share problematics. Occasionally, we even received invitations for visits. Nevertheless, the sharing of problems between villages and/or individuals is sensitive data. My research assistant and I do not wish the spread of this information, which may spark conflict. By merely asking respondents about problematics may already have set a discourse. We were conscious of this and tried to minimise our influence by not asking direct questions related to problematics mentioned by prior respondents nor share other findings with villagers. In order to avoid the circulation of data and the interference of external actors, data is confidential. The data is available for CHIMBO, but I ask CHIMBO not to actively share data or this report with people in the Boé, including staff members, with exception of the recommendation in Appendix II.

Some stories which are used to illustrate problematics can be easily linked back to existing problems between the communities by locals. Circulation of this data can spark conflict.

5 RESULTS

This chapter is composed of three main sections based on the sub-research questions. Starting with an examination of the pastoral community's lifeworld. The second section aims at strengths and barriers between pastoralists and farmers, including institutional arrangements and the implementation of those. At last, an analysis is given of the effect of pastoral practices' on the farmers' lifeworld.

5.1 RQ1. AN EMPIRICAL EXAMINATION OF THE PASTORAL LIFEWORLD

5.1.1 DRIVERS OF MIGRATION

Pastoral migration to the Boé started after the independence war of Guinea-Bissau in 1974 [F3AP1], although literature suggests there was no pastoralism in 1986 (Wit & Reintjes, 1989). In took some years before progressively pastoralists migrated to the area. It is too uncertain to say when migration peaked exactly. Migration was sparked by a lack of pasture and water to feed cattle due to a high amount of pastoralists in the neighbouring country Guinea. One pastoralists originated from Piche, Guinea-Bissau and experienced the same problematics [F4N6]. A high amount of pastoralists sparked so called 'cattle stealing' between pastoralists [F2TH1, F2TH4, F3AP1, F4N6, F4TH7]. Cattle stealing in the Boé was occasionally mentioned, but was mainly identified as a problem outside the Boé. 'Safety' was therefore identified as a benefit of the Boé. High amounts of toxic leaves (mainly in Téliré area, Guinea) was also identified as a problem by respondents [F1TH3, F2TH1, F2N2, F2TH4, F3AP1, F4TH7]. The toxic leaves were mainly problematic in the dry season time as cattle is more likely to eat toxic leaves as there are insufficient resources. Consequently, most migration by nomadic pastoralists took place to Guinea-Bissau during the dry season.

Pastoralist migration was abstained in the past, because the Boé was known as a disease prone area affecting cattle production [F1TH2, F1TH3, F1TH5, F2N2, F3AP1, F4TH1, F4TH2, F4N3, F4TH7]. Some of those diseases are caused by high amounts of insects, both mosquitos and tsetse flies, which are more abundant in the rainy season. Cattle acclimatisation and the development of preventive medication made the Boé a less hostile environment [F1AP1, F1TH3, F2TH4, F3AP1, F3AP2, F4TH1]. Yet, still some diseases are problematic for pastoralists in the rainy season, particularly for those pastoralists who are relatively new in the area [F1TH2, F1TH5, F2N2, F4TH2, F4N3, F4TH7]. The availability of medication may have helped cattle survival in the Boé, however pastoralists complained about the accessibility of them and other veterinarian services [F1AP1, F2TH1, F2TH3, F3AP1, F3AP2, F4TH1, F4TH2, F4N6, F4TH7]. The veterinarian clinic, stationed in the nearest largest city Gabu organises a medical campaign once a year. During this campaign, they visit pastoral settlements and hand out two obligatory cattle vaccinations [VET, all AP & TH]. They additionally sell drugs like antibiotics. This campaign, organised at the start of the dry season, is too late for pastoralists as most diseases occur during rainy season and cattle disperses over the area in search for food and water in the dry season. As a result not all cattle gets a vaccination. Pastoralists have to travel to Gabu, Guinea or even Senegal to acquire the necessary medication.

5.1.2 PASTORAL FAMILIES IN THE BOÉ

I identified three agropastoralists families. They owned a permanent house, constructed out of brick, on their own land, given to them by the community [F1AP1, F3AP1, F3AP2]. The agropastoralists family leaders had the largest families (three to six wives, not including those who died or divorced, and a minimum of ten children) compared to both farmers and other pastoralists. The agropastoralists were well known by transhumant pastoralists as they were rich, had large, brick houses and tied through intermarriages. They were also regarded by transhumant pastoralists as community representatives, meaning they were entrusted with problematics and organize assemblages. Eleven pastoralists were identified as transhumant, borrowing land from the community and seasonally having agricultural land [F1AP1, F1TH2, F1TH3, F1TH4, F1TH5, F2TH1, F2TH3, F2TH4, F2TH6, F4TH1, F4TH2, F4TH7]. Transhumant respondents regulated a seasonal short-distance migratory scheme within one or two village territories to ensure they had sufficient resources and to avoid crop damage. Throughout dry

season time, they migrated every two to three months to a new area when the current one was overgrazed. During rainy season time, they returned to areas where they previously had settlements. Six pastoralists were identified as nomadic, they had settled in the Boé for less than a year [F2N2, F2N5, F4N3, F4N4, F4N5, F4N6, F4TH7]. All mentioned they wished to stay in both seasons and no longer migrate back. However, this depended on habituation of the cows. One pastoralist explained half of his herd went back to Guinea, as they probably disliked the area [F4N3]. He could not tell why the cows disliked the area. The nomadic pastoralists borrowed the land from farmers for an undetermined duration and did not have agricultural land. All nomadic pastoralists were unsure where they would settle in the near future, this was up to Allah [F2N5, F4N3, F4N4, F4N5, F4N6].

The pastoralists have similar social structures compared to farmer communities. Both communities speak the Fula language and have a similar ethnical background. Pastoralist identify themselves as Fula Boé, meaning Fula of the savanna. Farmers identify themselves with Fula, although they are often a mix of different ethnicities. Polygyny is very common in both cultures, although, based on general observations, pastoral family sizes seem larger. Farmer men had one to maximum three wives. Pastoralist (only including family leaders) had on average three wives, although this ranged between one to six (see Appendix I for more detailed information). The amount of children varied between one to twenty, yet most did not know exactly how many children they had. Moreover, wives and children which were not on the settlement were often not included, including those who had died or wives who divorced [V1I1, F1TH3, F1TH5, F4N4, F3AP1, F3AP2]. On average, sixteen family members lived on a settlement.

The eldest man on the settlement was always the family leader. He owned most cattle and his sons and other related men assisted him in herding the cows, as I will describe later in the section 'livelihood'. Occasionally, the family leaders lived together with younger brothers or cousins [F1TH5, F2N2]. Those brothers have their own cow mark, but not necessarily their own kraal. Still, the eldest was appointed as leader and dealt with most problems related to crop damage if he was present on the settlement. If the leader was not present, such matters were handled by other men. Sons which still lived on the settlement, herded the cows of their father. Sons who wished to live separately from their father, can inherit some cows and live elsewhere [F1AP1, F1TH2, F1TH5, F2TH1, F2N2, F2TH3, F2TH4, F2TH6, F3AP1, F4TH2, F4N3, F4N4, F4N6]. The share a son gets depends on the amount of wives the family leader has. Each wife gets her share and can divide this among her sons. Sons can choose to adopt the cow mark of their father or add an extra element [F1AP1, F1TH2, F1TH3, F1TH4, F1TH5, F2N2, F2TH3, F2TH4, F2TH6, F3AP1, F4N3, F4N5, F4N6]. Rarely, sons create an entirely new cow mark. Once, I noticed that an adult grandson which lived on the settlement of his grandfather had his own kraal and cow mark (grandfathers mark plus an extra element) [F2TH4]. The family leader explained that it was not a direct son and therefore he had to manage his own cows. When a family leader dies, the wives inherit cows rather than the sons. Widows often live together with one of their sons [F1AP1, F1TH3, F1TH4, F2TH1, F2N2, F2N5, F4TH1, F4TH7]. Younger brothers from family leaders can offer widows to re-marry them, in order to take care of them [F1TH4, F2TH4, RA]. Most often, marriages are arranged by parents [F1AP1, F1TH2, F1TH5, F2TH1, F2TH4, F2TH6]. The men have to offer the parents and their future wife gifts. The women move to the settlement where their new spouse lives.

All settlements where cattle was kept, was located at least half an hour biking distance from the nearest village, to avoid crop damage. The distance between settlements varied, but there was at least 20 minutes biking distance between them. This was done to avoid mixing of herds and to avoid quick overgrazing of pasture. Even though family leaders visit each other on a daily basis, families live in relative isolation. They form small villages on their own, but general cultural characteristics where similar among pastoral families. Hospitality and gift giving where key characteristics of pastoral cultures. They always welcomed strangers. Food and a place to rest was always offered to ease a travellers journey. A chicken, goat, or a cow could be killed and served in respect of the guest. If there was no space for guests to sleep, they gave up their own bed.

5.1.3 PASTORAL LIVELIHOOD

All family leaders were mainly occupied by the managing of cattle. Pastoralist mainly own cows of the N'dama breed, but sometimes they also kept small herds (<30) of sheep and goats. Sheep and goats were kept in the vicinity of the settlement and required little attention. On average pastoralists owned 130 cows, ranging between 10 and 600[3]. See figure 3 for an overview of the number of owned cows classified per pastoral lifestyle. The agropastoralists owned most cows, ranging between 300 and 600 cows. Herds larger than 300 in size were separated to ensure they could be effectively managed [F1AP1, F3AP1, F3AP2, F4TH2, F4N3]. An area cannot sustain such large herds for long periods (>1 to 2 months) and large herds are also hard to control. Generally, herds were controlled during the day and retrieved in the evening. At night, cows were locked in kraals or individuals were tied to objects like trees. Never were all cows tied or retrieved, because sometimes cows 'hide' in the bush or refuse to return to the settlement. However, scavenging individuals often return to the herd at night [F1AP1, F2TH3, F2TH4]. Although, sometimes multiple individuals wandered off and formed their own herd. Those small herds had to be retrieved another day by actively searching and chasing them [F1TH3, F1TH5, F2TH1, F2N2, F2TH6]. Agropastoralists did not herd cows during the day. Younger brothers and cousins were employed with this task, although they did help releasing and retrieving them from the bush. Half of the transhumant [F1TH5, F2TH1, F2N2, F2N5, F2TH6, F4TH2] and all nomadic family leaders helped herding cows during the day. Although, the intensity of cow herding varied substantially. Some cow herds were accompanied all day [F1TH5, F2N2, F2N5], while others were merely checked on a regular basis [F2TH1, F2TH6, F4TH2]. Once my respondent explained he had to go to another village (about an hour biking distance) to collect a group of cows that had wandered off [F2TH6]. Family leaders checked cows which were on the settlement and inserted medication if necessary each morning [F1AP1, F1TH2, F1TH3, F1TH5, F2N2, F2TH4, F4TH1, F4TH2]. About every two weeks in rainy season, they offered cows salt by mixing it with water and mud in small 'baths' [F1AP1, F2TH4, F4N3]. Once, I observed the men marking young cows [F2TH4].

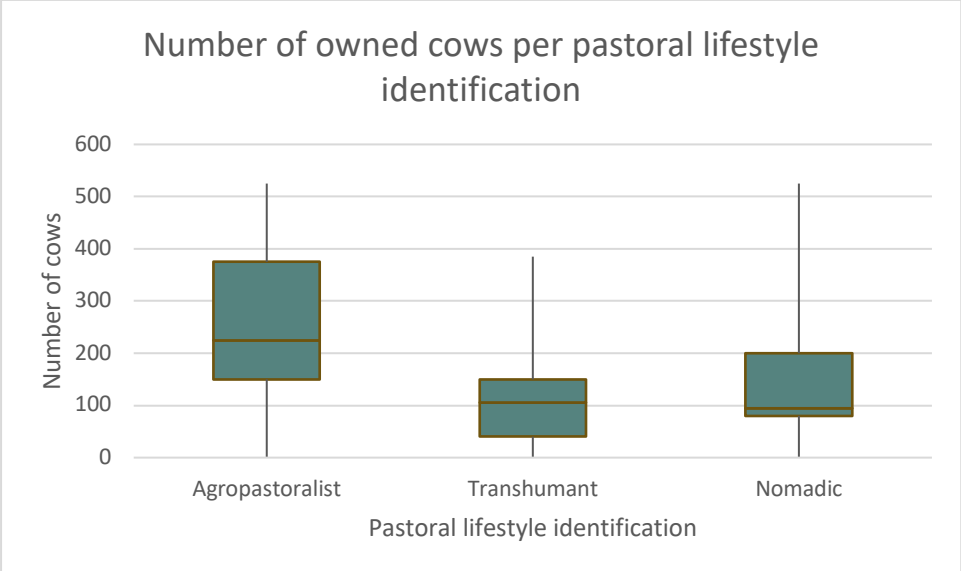

Figure 3 : Number of maximum owned cows per pastoral lifestyle identification. Maximum number based on personal observations and numbers mentioned by respondents.

[3] These numbers are estimations given by the herders themselves. It was often impossible to do a proper counting of the cows as they were not present on the settlement. Also the veterinarian station did not have any numbers regarding cows in the Boé or the Gabú district.

The women had a daily task of milking cows, see figure 4, and they helped the men release the cows in the morning [all settlements]. When cows were released, the women cleaned kraals by collecting faeces. Faeces were dumped on a large pile in the vicinity of the settlement. If the settlement was in the vicinity of a village and there was sufficient milk, some of the women and/or other female relatives present on the settlement took milk to the nearby village to sell [F1AP1, F1TH2, F1TH3, F1TH4, F1TH5, F2N2, F2TH3, F2TH4, F2N5, F3AP2, F4TH1, F4TH2]. Women had to walk at least 40 minutes, up to three hours to reach a village [F4N4]. During the day, women on the settlement were occupied with cooking and taking care of children. If the family owned agricultural field, they helped harvesting rice and horticulture crops like okra, pumpkin, potatoes, peppers and leaves of several crops [F1TH2, F1TH5, F2N2, F2TH4, F2TH6, F3AP1, F3AP2, F4TH2, F4TH7]. During my time in the Boé, it was rice harvesting season. After harvesting, rice has to be dried, cooked, peeled and dried again. Peeling of rice is an extensive task, which was imposed on the pastoralists women. If the family leader had multiple wives, the tasks were divided among cowives which reduced the workload.

Figure 4 : Pastoral woman milking cows in a kraal (de Leng, 2019)

During the day, the family leaders which did not help herding cows were either on their settlement or visiting friends and/or family on other settlements or in villages. On a weekly basis, respondents went to villages to buy supplies, simply meet friends or to go to the mosque [all AP and TH]. Farmers and other pastoralists which crossed settlements took a rest and enjoyed the company of others [all AP, F1TH2, F1TH3, F1TH5, F2N2, F2TH3, F2TH4, F2N5, F4N3, F4N4]. Due to the upcoming elections, politics were a hot topic. The comparison to the more developed Guinea was frequently made [F1AP1, F1TH3, F1TH5, F2N2, F2TH3, F2TH4, F2N5, F3AP1, F3AP1, F4TH1]. Other local matters were also discussed, like rituals or matters of the mosque [F1AP1, F1TH2, F1TH3, F1TH4, F2TH1, F2N2, F2TH3, F2TH4, F3AP1, F3AP2]. Once, I witnessed the selling of a goat to another pastoralist [F2TH4]. Four other pastoralists joined this assembly, which seemed like a gathering of friends rather than a transaction. Two respondents also taught children the Koran [F2TH1, F2N5].

Pastoralists only occasionally sold a cow. Farmers generally lack the financial resources to buy a cow. However, sometimes they would buy a cow, but employ the pastoralists with the task to take care of it [F1AP1, F1TH2, F1TH4, F1TH5, F2TH3, F2TH4]. If the cow would reproduce, the calve would be owned by the farmers. The farmer can request the cow any time if there is for example a ceremony. But generally, pastoralists have to export cow(s) to benefit financially. Exporting a cow is not an easy task in a remote area like the Boé. The only truck transporting goods into the Boé happens to be owned by an agropastoralist. Once, two agropastoralists went with this truck

to the capital of Guinea-Bissau to sell about 30 cows. Their wealth is immense compared to farmers. Ascertain that one cow can be sold for about €310 and that 90% of the farmer community lives from less than €1 a day (Stichting CHIMBO, w.d.). Pastoralist have little fixed expenses as they borrow or get land for free. They only pay an annual contribution for cow vaccinations, which is less then €0.40 per cow, and wages of extra herd boys. Naturally, they have other expenses for food, medication and supplies. The wealthiest people in the Boé are pastoralists, some who are regarded as celebrities by others. Agropastoralists owned some of the most well maintained, modern looking houses and again; a truck to import goods. Another transhumant pastoralist was well known for his travel to Mecca, by airplane. In seven settlements, I observed pastoralists using solar panels to charge their devices [F1AP1, F2TH4, F2TH6, F3AP1, F3AP2, F4N6, F4TH7]. All pastoralists owned cell phones and motor(s). Family members of one of one settlement were using three upmarket smartphones during my visit [F4N3].

5.1.4 THE DAILY INTERACTION WITH THE LIFEWORLD

Transhumant and nomadic pastoralists live in the '*brûhe*', or bush. Their settlements are remote and pastoralists explain that they see the bush as their home, something required to sustain themselves. All transhumant and nomadic pastoralists lived in temporal huts made from wood, clay and dry grass. During my last fieldwork period, I visited temporal settlements of respondents [F4TH2, F4N3, F4N4, F4N5]. They just settled on an area and they only had their necessary equipment with them. This included their technical devices, plastic sheets, blankets, small mats, mosquito nets, cooking equipment and sometimes small, wooden stools. They had not (yet) constructed a hut and literally carved out a spot in a bush of bamboo or other woody materials to put their belongings and to sleep in, see figure 5. If the area was good enough, they would stay on the spot for about two to three months before moving on. Then, they would construct a small, temporal hut.

Figure 5 : Pastoral nomadic settlement: traveling with only necessary equipment (de Leng, 2019)

During the rainy season, pastoralists search high lands to ensure there is a water runoff [F1TH2, F1TH3, F1TH5, F2TH1, F2N2, F2TH3, F2N5, F2TH6, F3AP1, F3AP2, F4TH1, F4N3, F4TH7]. This to avoid ponding on the settlement. Respondents explained cows are reluctant to enter muddy or uncleaned kraals and they are more likely to get infections between the toes [F1AP1, F1TH3, F1TH5, F4N3, F4TH7]. Settlements in the dry season, require areas where there is still sufficient grass to feed cattle for two to three months [F1TH2, F1TH3, F2TH4, F2TH6, F4TH1, F4N3, F4N6]. Also, there should be a permanent water source nearby such as rivers and springs. Some

respondents explained that they preferred areas called '*bufond*', which are wetlands drying up later in the dry season [F2TH1, F2TH3, F2TH4, F2TH6, F3AP1, F4TH1, F4TH2, F4N3, F4N4, F4TH7]. Early fires will not burn those wetlands, as they are still too wet. The grasses dry up later in the dry season, which can be used to feed cattle. When areas are burnt, there will be a small amount of regrowth of fresh grass of some types of grasses. Pastoralists explained that these grasses cannot sustain a herd of cows and that cows can and need to adjust to dry grasses [F1TH2, F1TH3, F1TH4, F2TH1, F2TH4, F3AP2, F4TH1, F4N3, F4N6, F4TH7]. They preferred to burn early, as late fires are uncontrollable and destructive. I helped two pastoralists burn their surroundings in November and December [F2TH6, F4N3] and during my last fieldtrip in December, most areas surrounding settlements were already burnt.

Thirteen pastoralists mentioned they had problems with wildlife, mainly snakes [F1AP1, F1TH2, F1TH3, F1TH4, F1TH5, F2TH1, F2TH3, F2TH4, F2TH6, F3AP1, F4TH7] and leopards [F1AP1, F1TH2, F1TH5, F2TH1, F2TH6, F3AP1, F3AP2, F4TH2, F4N3, F4N4]. The Fula use the word '*boothory*' to refer to feline species in general, this includes leopards, wild cats, caracal and serval [F1TH3, F2TH4, F3AP2, F4TH7]. Lions were also relatively frequently mentioned, but this was only at the other side of the river the Fefine [F1AP1, F1TH5, F2N5, F3AP1, F4TH2, F4N3, F4N4]. Occasionally, respondents mentioned jackals [F2TH3, F4TH7], wild dogs [F1TH5, F3AP1, F4N3] (in the past) and hyena's [F1TH5, F4TH2, F4TH7]. Snakes were killed if pastoralists crossed one [F2TH4, F2TH6, F4TH7]. Three pastoralists admitted they or their sons hunted wildlife [F1TH2, F1TH3, F2TH6]. All the others mentioned that hunting is a business on its own and it requires skills which they did not have. One pastoralists residing in the Boé for over 30 to 40 years, explained that some pastoralists used to poison predators to protect cattle. Currently, it is not allowed by the authority and since then, he did not observed the practice any longer [F3AP1]. This was verified by villagers. Three villages brought the concern up [V2FG, V4FG1, V6FG], but two refuted it as it was no longer allowed by the authority. All pastoralists used traditional magic to protect their cattle, which they kept secret. Knowledge regarding traditional magic, or '*giri giri*', is passed on within families. My research assistant Camará explained farmers are generally aware of the existence of pastoral *giri giri*, but do not know the content. Another way to protect cattle, is active herding of cows to scare off predators.

5.2 RQ2. LEVELS OF COOPERATION AND CONFLICT BETWEEN COMMUNITIES

Similar cultural backgrounds like ethnicity, language and religion create a foundation for understanding and cooperation, because communities share some norms and values. However, as I will illustrate in this chapter, divergent interactions with the lifeworld create barriers for cooperation. I will first briefly explain some institutional elements of farmer families before turning to the barriers of cooperation.

5.2.1 FARMER COMMUNITIES AND INITIAL COOPERATION

Based on my observations, I noticed that farmer communities highly appreciated gift giving and cooperation. I observed farmers giving small gifts to guests, friends and family in in the form of meals, peanuts, corn or *Warga* (similar to Turkish tea, involves the custom to gather people and relax) on a daily basis. Naturally, those gifts are seasonally and I do not know what kind of gifts where given in less productive seasons, such as in mid and late dry season. Helping each other in any sorts of activity is very common. I mostly observed this in the form of easing the workload of others during production time. Individuals from different households sometimes helped relatives or friends on the field. Processing of agricultural crops like peanuts and rice was frequently done together with neighbours and friends. As such, those tasks became group activities which sped up the process and reduced the work load.

If pastoralists arrive in an area, they are required to inquire the local village for the availability of land [All V, AP & TH]. Communities can choose to prohibit pastoralists to settle in the area, but they have little resources to actually enforce regulations. The government of Guinea-Bissau allows migration, so communities have little governmental power to fall back on. Moreover, it is highly unlikely that farmers will actually deny land which is available for pastoralists, because of their norms and values to share and cooperate. Only once, I spoke with a

pastoralists who was denied land as there was no space for him [F4N8]. Farmers expected similar inputs of pastoralists in regard to cooperation and gift giving. If they were asked to describe a balanced relationship between pastoralists and farmers, they described the following characteristics: gift giving, attendance of ceremonial events, forgiveness and mutual cooperation. Ten pastoralists explained that they would grant farmer communities cattle for rituals or ceremonies, like the opening of a new mosque or a wedding [F1AP1, F1TH3, F2N2, F2TH3, F2TH4, F3AP1, F3AP2, F4TH1, F4TH2, F4TH7]. They would give the community one or two cows to celebrate the reunion, which is regarded as a highly appreciated gift. Few farmers can actually afford such a gift, but guests expect the host to serve a goat, a cows or other sorts of livestock. The low number of pastoralists who reciprocated, frustrated farmers. Farmers complained about pastoralists not benefiting the community, they just caused problems [V4I2, V6FG, V8FG]. These problems concerned foremost crop damage.

5.2.2 DISPUTES OVER CROP DAMAGE

We can distinguish three time periods where crop damage occurs: rice production season (wet season: June – December), horticulture crop production (beginning of dry season: December - May) and cashew collection seasons (end of dry season: March - May). Cattle eats the cashew fruits and they can damage new cashew seedlings. Controlling cattle to prevent crop damage is particularly difficult for herders in dry season. Limited or low-quality resources make cows scavenge. They are hard to control as they disperse in search for food [F1TH2, F1TH3, F2TH4, F2TH4, F2TH6, F4TH1, F4N6]. Additionally, agricultural fields are often located on water spots [F1AP1, F2N2, F2TH6, F3AP1, F3AP2]. Cows in search for water, will cross those fields and crop damage is then almost unpreventable [F1AP1, F1TH3, F1TH4, F1TH5, F2TH4, F2TH6, F3AP1, F3AP2]. This was particularly problematic with cashew, as cashew gardens are scattered throughout the region. Land use zoning is impossible, since gardens are already planted and there is no annual rotation. Horticulture fields are not that common yet. Pastoralists mentioned that they would normally free their cows between rice and cashew production time, but horticulture fields inhibit that [F1TH3, F1TH4, F2TH4, F2TH6, F3AP1, F3AP2, .

When crop damage happens, the farmer has to inform the pastoralists regarding the damage. Farmers never asked for compensation after a first incident, they said they would forgive the owner of the cows. When crop damage repeatedly happened, they would ask for compensation [V2FG, V3FG, V5FG, V7FG, V6FG]. In one village, farmers said to rarely ask for compensation as otherwise the pastoralists would regard them as unreasonable [V4FG1, V4FG2, V4I1, V4I2]. When farmers ask for a compensation, farmer and pastoralist would negotiate about a price. If they do not come to an agreement, they have to consult the village chief [V1I1, V1I3, V3FG, V4FG1, V9I1, V5FG, V7FG, V8FG, F1TH2, F1TH3, F2TH1, F2TH4, F4N6]. Pastoral respondents explained that when the community chief was involved, they paid the price set by the chief [F1TH2, F1TH3, F2TH1, F2N2, F2TH4, F4N6]. They did not question the set price, because the community chief was regarded as a fair third party. Conversely, including the police is been regarded by both farmers and pastoralists to provoke the relation. The pastoralists get frustrated, because often prices are raised as the police wants to have their share [F1AP1, F1TH2, F1TH3, F2TH1, F2TH6, F3AP1, F4TH2, F4N4].

In some villages, respondents mentioned that they rather had seasonal migration, to avoid crop damage. They prefer pastoralists in the dry season, as there is no or little crop production [V9I23, V5FG, V8FG]. When pastoralists stay in the rainy season, crop damage occurs more frequently. However, several communities explained that this is not a solution, since they do not have the power to withhold migration [V4I1, V4I2, V5FG, V6FG]. Discussions concerning crop damage were a major stimulus for a large meeting held in January 2019 between pastoralists and farmers:

1. Pastoralists have to control their cattle during rice and cashew production to prevent crop damage (88% farmers [V1I2, V3FG, V9I2, V6FG, V7FG, V8FG] and 76% pastoralists [F1TH2, F1TH3, F1TH4, F1TH5, F2TH1, F2N2, F2TH3, F2TH4, F2TH6, F3AP1, F3AP2, F4TH1, F4TH2, F4N3, F4N4, F4N6, F4TH7]) ;
2. Land use zoning, whereby farmers have their annual rice field (farmers maintain a rotation system of about seven years) in one particular region, so the other side is left for pastoralists (88% farmers [V1I2,

V1I3, V4FG1, V3FG, V4I1, V5FG] and 62% pastoralists [F1AP1, F1TH3, F1TH4, F2N2, F2TH3, F2TH4, F2TH6, F3AP1, F4TH1, F4TH2, F4N4, F4N6, F4TH7]) ;

3. Seasonal migration, were pastoralists have to move 'far away' to prevent crop damage (25% farmers [V4I1, V4I2, V6FG] and 57% pastoralists [F1TH2, F1TH3, F1TH4, F2TH6, F3AP2, F4TH1, F4TH2, F4N3, F4N4, F4N6, F4TH7]) ;
4. Pastoralists have to put their cattle in kraals during night time during rice and cashew production to prevent cattle scavenging at night (63% farmers [V3FG, V6FG, V9I1, V7FG, V8FG] and 24% pastoralists [F1TH3, F1TH4, F2N2, F2TH3, F4TH2]) ;
5. Cashew collectors have to help chase cows from cashew fields during the day, since they are in their field (50% farmers [V3FG, V4I2, V9I2, V6FG, V7FG] and 33% pastoralists [F1TH3, F1TH4, F1TH5, F2TH3, F2TH6, F3AP2, F4TH2]) ;
6. Horticultural lands need to be fenced, so cattle can be freed between rice and cashew season (50% farmers [V4I2, V9I2, V6FG, V7FG] and 19% pastoralists [F1TH3, F2TH4, F2TH6, F3AP2]).

Awareness regarding solutions offered in the meeting varied substantially between villages and pastoralists, see figure 6. Presumably local arrangements and individual solutions were mixed with the solutions discussed during the meeting. Besides the above solutions, respondents mentioned that pastoralists have to acknowledge their damage [V1I2, V2FG, V4FG1, V3FG, V6FG, V8FG, F2TH1, F2N2, F4N6] and farmers have to ask for a fair price [V9I1, V5FG, V7FG, F2TH1, F2TH3]. In all visited regions, respondents mentioned crop damage still occurred. Damage on rice fields occurred between zero to three times per pastoralist per rice production season.

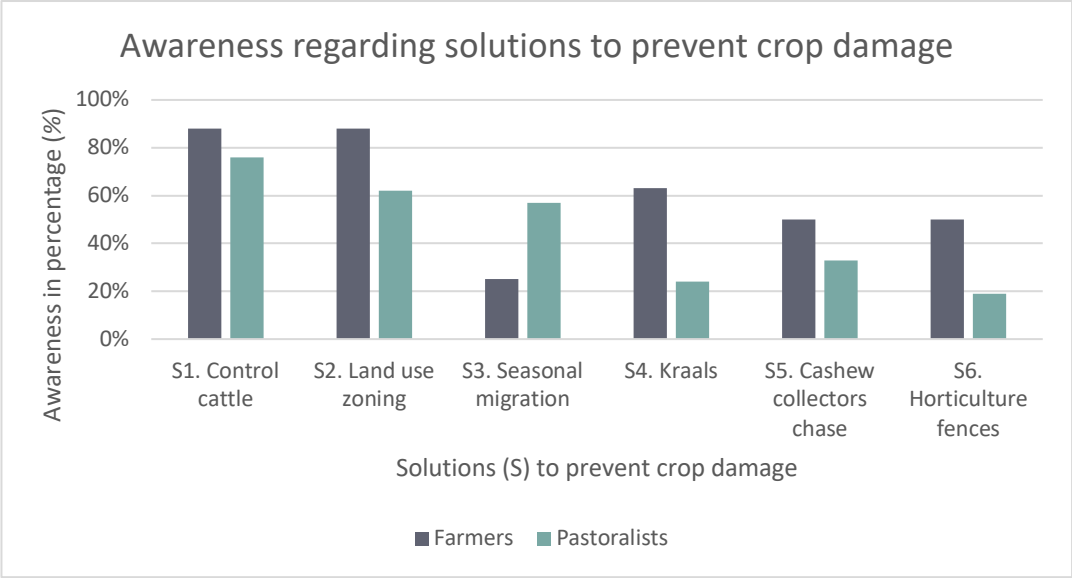

Figure 6 : Awareness regarding solutions to prevent crop damage according to pastoralists and farmers in the Boé, Guinea-Bissau.

TENSIONS RELATED TO CROP DAMAGE

Where the above solutions were implemented effectively, there was little tension between the two communities [V1, V5FG]. In some areas, there was knowledge regarding the solutions, but implemented ineffectively [V4FG2, V4I1, V4I2, V7FG, V8FG, F1AP1, F1TH5, F1TH3, F2TH4, F3AP1, F3AP2, F4TH1, F4TH2]. Ineffective implementations and the lack of preventive measurements led to more tensions between communities. Crop damage itself was not identified as the main problem, rather the practices leading to and resulting of, were. In all villages, farmers devoted crop damage to pastoralists not controlling their cows enough. In five of the nine villages, I detected conflict concerning crop damage between communities. I classified those as conflicts, because disputes were not settled, but farmers complained about pastoralists not respecting local rules [V4FG2, V4I1,

V4I2, V7FG, V8FG], not acknowledging damage and late or no payment for this damage [V2FG, V4FG1, V3FG, V6FG, V8FG].

In the village where farmers claimed they never asked for crop damage compensation. In this particular village I sensed most tension. Farmers were frustrated, disliked having pastoralists in the area and thus did not allow them to settle. By disallowing pastoralists to settle, they operationalized their tensions into conflict. According to the farmers, the pastoralists disregarded their authority and settled just across the border in Guinea. Their cattle, not restricted to political borders, grazed in the village territory. Nomadic pastoralists migrated through the area, without asking permission beforehand to villagers. Crop damage occurred frequently, yet farmers said to be powerless as the pastoralists resided on the other side of the border or the pastoralists were unknown. Therefore, even the police could not intervene. Conflict even escalated, as one farmer got arrested for a physical fight with a pastoralist whose cows damaged crops for a third time. A pastoralist living in the adjacent village territory described multiple violent incidents with community members. His agricultural field, house and belongings were burnt as the village claimed this land was theirs. He also explained how he was involved in the process were multiple cows were shot by angry farmers of this particular village. The cows entered a field of a farmer and got shot in the leg. Indirectly, one of the villagers complained about the lack of action of the government:

"No, no alternative for that, because we will not kill the cows. We will not shoot them. We will not shoot them, we will not kill them." [V4I1]

In other villages, farmers operationalized tension by going to the police to complain about pastoralists denying damage [V2FG, V8FG]. In three others, villagers complained but did not bring overdue payments to the police [V4FG1, V3FG, V6FG]. Three village focus groups disputed pastoralists for ignoring their authority and refuted to cooperate with the community [V3FG, V7FG, V8FG]. In two villages, the farmers complained about the pastoralists having their own agricultural fields, without asking permission of the community [V2FG, V8FG]. As a result, they could no longer exchange products. Farmer communities sought for explanations to explain each other's behaviour. One group of villagers responded:

".. They feel like superman, because they still have a lot of money or cows." [F2.C]

Pastoralists on the other hand, blamed farmers for asking unfair prices for crop damage [F1AP1, F1TH2, F1TH3, F1TH5, F2TH1, F2N2, F2TH4, F3AP2, F4TH2], asking payment unfairly (no damage or damage made by others) [F1TH3, F1TH5, F2TH1, F3AP1, F3AP2, F4TH2], lack of communication about problematics [F2TH6, F3AP1, F4N4], and lack of active preventive measurements or disobeying the solutions which were brought up in the January 2019 meeting [F1AP1, F1TH3, F1TH5, F4TH2], like land use zoning. Two pastoralists mentioned that some farmers deliberately created late fires to chase pastoralists away, so that they had to search for food elsewhere [F1AP1, F4TH1]. Lack of resources due to fire was mentioned by five other pastoralists, although they were not as mistrustful. Three of them accused farmers for it, but for the sole reason to clear their land [F1TH2, F1TH5, F2TH4]. Others blamed illegal hunters and honey collectors for late fires, since they wanted to dry meat in the bush or smoke out bees [F1TH3, F3AP1]. None of the pastoralists admitted directly to refuse damage, although they did explain that sometimes it was unfair, because the damage was not theirs or the price was set too high. One respondent mentioned villagers wanted him to pay for damage that was made by wild hogs [F1TH5]. Two respondents explained they had to pay for damage made by cows owned by different pastoralists [F2TH1, F3AP2]. Three others complained about farmers asking for payment without actual damage [F1TH3, F1TH5, F4TH2]. Unfair prices were most common, nine pastoralists complained about it:

"... Normally per day they can collect four bags of cashew. It means, today they just have a small bucket of cashew. So, three bags of cashew, cows already eat it. And then, the owner of the cow has to pay it... But the truth is, in between when you kill, or you decide to kill that cow to check the belly. You will not see the cashews, nothing." [F3AP1]

Some pastoralists clarified that these practices originate from inequality in resources [F1AP1, F2N2, F4TH2] or because they are regarded as strangers [F2TH1, F2N2]. One farmer mentioned that some young farmers asked high prices from pastoralists to communicate their disapproval of having pastoralists in the area [V1I3]. One pastoralist mentioned some pastoralists do not control their cattle on purpose, to make damage on fields [F3AP1].

5.3 RQ3. AFFECTING THE FARMERS' LIFEWORLD

Farmers and pastoralists do not directly share the same spatial area, because pastoralists are allocated on currently unused land. This land has a low or no value for farmers, since it has little agricultural or spiritual value. Lands which are prioritized by farmers are current agricultural fields and sacred forests surrounding fresh water springs. Yet, pastoralists and their cattle are not restricted to the areas and they frequently relocate in search for pasture and water. As a result, they do enter agricultural fields and sacred forests. To avoid the entrance of sacred forests and to avoid cows entering agricultural fields nearby fresh water springs, four pastoralists recommended water stations for cows to drink from in the dry season [F1TH5, F2TH1, F3AP1, F3AP2]. During the small fieldtrip to Guinea, I saw several water stations. The water stations were deep wells, with a gutter for cattle to drink.

The influence of pastoral practices on their relation with farmers via crop damage, was discussed in the above section. Besides the direct impact of crop damage, pastoralists indirectly affected farmer communities practices by sparking land use zoning. If land use zoning was done effectively, it created areas free of agricultural land. In addition, two communities started herding own cattle to acquire similarly prosperous lives [V8FG, V9I2]. Those, relatively small (20 – 40 individuals) herds lived nearby villages. Those villagers owning cows complained that their herds were small in size. We can probably relate this back to spatial fixedness. As a result, the village surroundings were grass free and gardens were properly fenced within the village. There were no tensions or conflicts between villagers owning cows and other farmers. Crop damage occurred, but was solved without conflicts. Unexpectedly, this created a distance between pastoralists and farmers as farmers felt more independent. They felt they did not need pastoralists in the area, as they would only give problems. The pastoralist living in the village territory, thought it was a good practice, as the villagers did not longer ask for his contribution during ceremonies and rituals [F4SN7].

Respondents from two villages explained that when cows enter springs in sacred forests to drink, they can destroy the permanent water supply [V4FG1, V4I2, V6FG]. Farmers regard those forest as sacred, as ancestors and other spirits reside in them. Specific rules apply here. Some forest may for example not be entered without consent of the responsible person and resource gathering is often restricted. Interestingly, farmers were not concerned about the impact of pastoralists nor their cattle on the forests, except for respondents of one focus group [V4FG1]. The respondents from this focus group were concerned that cattle foraging would open up the forests. Respondents from four villages thought pastoralists would not enter, since demons live inside of dark forests [V1I1, V1I3, V2FG, V3FG, V5FG]. Nine pastoralists were aware of sacred sites, although their knowledge was generally limited to the existence of them [F1AP1, F1TH3, F1TH4, F1TH5, F2TH1, F2TH3, F3AP1, F3AP2, F4TH1, F4TH7]. None of the pastoralists being aware of their existence entered sacred sites. Four pastoralists actively avoided sacred sites as they were afraid for devils or spirits inside [F1TH3, F1TH5, F2TH1, F2TH3]. Two of the four believers mentioned it was no problem for cows to enter [F1AP1, F1TH5, F2TH1, F2TH4]. Two pastoralists being aware of sacred forests, said not to enter them as they were too far [F1TH4, F4TH1]. Another one mentioned it was a place where wild animals reside and therefore avoided it [F4TH7]. During fieldtrips, we occasionally trespassed sacred forests, which were in the vicinity (<10 km) of pastoral settlements.

Even though farmers have little value over land where pastoralists directly reside, they did notice the influence pastoralists had. When travelling through the Boé, it is clearly visible where pastoralists settled. Besides the high amount of flies in the vicinity of settlements, grasses were considerably shorter if not absent in particularly the dry forest / bush land. This was noticed by all villagers and it was regarded as a benefit, because short grass

prevents conflagrations. The burning of grassland is an extensive job which needs to be done early in the season to be able to control fire. During dry season time, burning of grasslands is easier as fire spreads quickly. As a result, it spreads uncontrollably to fields and in forests. Lack of grasses inside those dry forests and bush land prevents the transfer of fire and thus conflagrations. In four villages, farmers blamed pastoralists for creating late fires to increase a regrowth of fresh grass [V2FG, V4I1, V4I2, V9I2]. However, in one villages farmers admitted that they actually did not know who created the late fires, so they blamed pastoralists [V9I2]. Yet, as I explained earlier, pastoralists said they disliked late fires as it actually decreases food availability on the long run. My research partner noted the increase in bushland compared to a prior visit the past decade. Moreover, cows would fertilize the soil while grazing and stimulating regeneration [V2FG, V3FG, V4I1, V5FG, V7FG, V8FG]. This is beneficial for fallow land. In four villages respondents mentioned that cows would forage on weeds inside cashew gardens, which aids farmers as they spend less time weeding [V1I3, V5FG, V7FG, V8FG]. In one of those villages, respondents did not want pastoralists to know of this effect, because then pastoralists would have bargain material [V8FG]. Contrarily, respondents from one village mentioned they had more weeds on their fields, due to soil fertilization [V4FG1].

6 ANALYSIS & DISCUSSION

In this section, I combine the analysis of the found results with a comparison and discussion of current literature.

6.1 RQ1. THE PASTORAL LIFEWORLD

The pastoralists community in the Boé originates foremost from Guinea. Migration is a recent phenomenon that started after 1986 (Bassett & Turner, 2006; Bukari, 2017; De Haan, et al., 1990; Wit & Reintjes, 1989). A study conducted in 1995, describes 41% of the livestock in Guinea, an estimated one million N'dama cattle, was herded under a low-input system in Moyenne Guinea (Unger & Münstermann, 2004). This region is adjacent to the Boé in Guinea-Bissau. The high number of pastoralists in Moyenne Guinea is in line with what respondents described as drivers of migration: too many pastoralists in Guinea and a lack of resources to feed cattle. Bassett & Turner (2006) point out that environmental variables were foremost drivers of migration. Respondents describe that in the past, insects, including tsetse flies, were a main problem for them as they carried diseases to their cattle. Respondents believe that the frequency and intensity of diseases declined, because cattle acclimatised and preventive medication became available. The herded N'dama cattle is known as a species which is most resistant compared to other cattle breeds, to the tsetse fly parasite *trypanosiasis* (Bosso, et al., 1991). Literature additionally suggests that harsh droughts pushed the tsetse fly's ecological barrier further South, allowing pastoralists to migrate to wetter, disease-prone areas which were previously avoided (Delgado & Staatz, 1980; Bassett & Turner, 2006). Disease decline and the relative absence of other pastoralists made the Boé a suitable area for long-term settlement, because foraging resources were widely available. The more densely populated an area gets, the higher the pressure on pasture, the higher the necessity for pastoralist to migrate (FAO, 2001).

A traditional pastoralist's lifeworld is fully adapted to its cows. Interestingly, traditional pastoralist in the Boé seemed to have little economic interest with their herd. A minimal amount of cow-derived products were sold, mostly milk. Naturally, farmers have insufficient resources to purchase a cow, but few pastoralist made effort to increase their revenue on the national market. Only two agropastoralists had capitalistic practices by selling cattle on the national market and investing in more spatially fixed resources, like permanent houses. The agropastoralists were able to settle permanently, because cattle was not located on their land, but herded elsewhere by relatives. Davies & Hatfield (2007) emphasize first of all, that pastoralist aim at life cattle-products, like milk and off-spring, rather than products derived from slaughtered animals. Secondly, they argue that a pastoralist's lifestyle is an adaptation to a harsh environment, because pastoralist and their herds are less dependent on short-term land productivity (Denève, 1994; Davies & Hatfield, 2007). Therefore, we could argue that a traditional pastoralist lifeworld is not based on economic productivity, but on a strategy to increase long-term survival (Behnke, 1987). This lifestyle requires mobility, because pastures can only sustain a herd of cows for a limited amount of time (FAO, 2001)(see figure 7). To avoid crop damage and quick overgrazing of pasture, settlements were located far from villages and other settlements. Large families of pastoralist may have been an easy adjustment for living in relative isolation and having a high daily workload, particularly for women. This adjustment was made by all pastoralists, nomadic and agropastoralists. Literature suggests that children of the first two wives of pastoral polygynous marriages are more likely to be underdeveloped, because the mothers have symptoms related to chronic energy deficiency (Sellen, 1998). Therefore, it may be in the pastoralists wife's best interest to be involved in a polygyny marriage. Pastoral women shared the workload with cowives rather than with village women, this includes taking care of and raising children. Both communities were very hospitable and generous to strangers. Yet, I only observed small gift giving on a daily basis between farming families. In pastoral communities, everything was foremost shared among close kin. This suggests higher forms reciprocity among close kin in pastoral families, whereas farmers developed reciprocity towards individuals who are not directly related. This difference in priority for reciprocity within a community between pastoralists and farmers is in line with Ostrom (1997), who suggests farmer communities developed reciprocity among non-kin.

A nomadic lifestyle affects the interaction an individual has with its lifeworld. Pastoralist directly live in the bush and regard it as their 'home'. They actively shape their surroundings by herding their cattle over pasture and

bushland. Good grazing pastures varies seasonally and annually due to burnings and allocation of agricultural fields. Therefore, pastoralists value spatially fixed resources little, except for permanent water spots such as rivers and wells. This is line with Turner (2004), who further notes that the accessibility of good pasture depends on the social relations a pastoralists establishes. The lifeworld then depends on the hosting farmer community as they allocate land to pastoralists. Additionally, if pastoralists integrate in the farmer community they adopt characteristics of the farmers' lifeworld. An important aspect of the farmers' lifeworld are the sacred forests. This aspect is highly appreciated by CHIMBO, because those sacred forests are hotspots for wildlife and therefore acquires extra attention.

Figure 7 : The pastoral lifeworld is adapted to the herd and its mobility (de Leng, 2019)

Some pastoralists integrated institutional elements regarding sacred forests. We can differentiate the institutional bricolage processes of aggregation (adopting and mixing external institutional elements), alternation (altering external institutional elements to fit the local context) and articulation (expressing internal institutional elements). The process of institutional aggregation occurred were pastoralists were aware and believed in spirits residing in sacred forests. They conformed rules regarding sacred forests, because they understood why they were not allowed to enter. This is a form of cultural legitimacy. The bricolage process of alternation occurred, where pastoralists said not to enter sacred forests, because they were aware of local beliefs and because they thought they were dangerous due to possible predators or slippery stones. Those pastoralists being aware of local beliefs and who respected local norms and rules, had moral legitimacy. The bricolage process of articulation occurred if pastoralists were aware of local beliefs, but simply did not care and entered sacred sites. However, none of the pastoralists disrespected local norms and rules if they were aware of the beliefs regarding sacred forests. The process of bricolage did not occur, if pastoralists were not aware about the beliefs regarding sacred forests.

6.2 RQ2. COOPERATION OR CONFLICT?

Similarities in existing norms and values of different communities create a foundation for cooperation. Those similar norms and values relate back to cultural characteristics such as ethnicity, religion and language. The Boé farmers and pastoralists have different ethical backgrounds, but they both identify with the Fula ethnicity, thus create solidarity. Moreover, farmers and partially pastoralists acknowledged that crop damage was a problem,

which lead to the January 2019 meeting. So, crop damage lead to the development of a shared norm to prevent crop damage.

New migration patterns challenge pastoralists to acquire land, because they need to establish social relations (Bukari, 2017; Hagberg, 1998). I now discus the challenges for the establishment of those social relations by reconsidering the function of reciprocity. Traditional pastoralists did not only have higher forms of reciprocity among close kin, they also value different aspects of the lifeworld. Farmers value land parcels more than pastoralists, as they own them and depend on it for their livelihood. In addition, pastoralists experience crop damage as a minor problem, as the damage affects a small fraction of land required to sustain their livelihood (Turner, 2004). Crop damage is often forgiven by farmers without the request for compensation, here, forgiving is a form of reciprocity, which is quite a substantial gift for poor farmers. Moreover, the first gift granted by farmers is the allocation of land to pastoralists. Pastoralists did not directly recognize grazing land as a gift. If pastoralists gave gifts, it was merely to benefit the community. In Sub-Saharan countries, pastoralist generally regard pasture and water sources as a public resource and only agricultural land is recognized as private land (Galaty, et al., 1980). In the Boé, the farmer community owns all the land. Pastoralist are allocated on fallow land or on savannas. Both gifts are valuated more by farmers compared to pastoralists, pastoralists need to give more to farmers in order to satisfy reciprocal norms of farmers. In some cases, pastoralists adhered to this norm and granted the community cows during rituals or ceremonies, or supported the community by financing a truck to import goods. Those pastoralists developed strong social relations, acquired land and eventually more wealth. Within a community, actors normally exchange favours and gifts which are equally valuable from an economic perspective (Nelson, 2000). Literature regarding pastoralists and farmers suggest that communities have both equal as non-equivalent exchanges (Burnham, 1980; Dafinger & Pelican, 2006; Moritz, 2010). Equally valued exchange could be milk for vegetables or animal entrustments for building of huts. However, equal exchange is fairly absent between pastoralists and farmers in the Boé, as many pastoralists have been given a permit by a village chief to use land for agriculture or they merely buy rice or vegetables. Non-equivalent exchange between pastoralists and farmers in Cameroon, consisted of for example, manioc or maize for bicycles, radios and calves (Burnham, 1980). Where pastoralists reciprocated, farmers did not complain about pastoralists within their territory. In one village, pastoralists did not actively reciprocate, but farmers accepted this, because they needed pastoralists to fertilized fallow land. The establishment of symbiotic relations is essential for future cooperation between communities. Pastoralists could reciprocate with pastoral low value gifts, like active herding of cattle over fallow land (something which is currently done unwarily). Active manuring has become an indispensable part of symbiotic relations between pastoralists and herders in other West-African countries, like Burkina Faso and Ghana (Breusers, et al., 1998; Davies & Hatfield, 2007; Diallo, 2001; Tonah, 2006; Davidheiser & Luna, 2008).

The adaption to the farmers' norm of reciprocity is a form of bricolage, for the most part the process of alternation. Aggregation and alternation also took place in the acceptance of farmers' community chiefs. Pastoralist mentioned they accepted the price of damage when the community chief was involved. In order for bricolage to occur, communities need to have a minimal amount of face-to-face contact. This does not necessarily mean that nomadic pastoralists do not respect rules of hosting communities, but they are more likely to act rationally, according to their own institutions. Sedentarization allows an increase in face-to-face contact over longer periods of time. Bricolage processes of aggregation and alternation then allow pastoralists to adopt hosting community's norms and occasionally beliefs, like the pastoralists who actually believed that spirits reside in sacred forests. A lack of communication concerning norms and rules highly affected practices of both communities in regard to crop damage prevention and resolution, as I will demonstrate in the next section '6.2.1 Resulting in conflict'.

6.2.1 RESULTING IN CONFLICT

Literature emphasises that conflict is normal within societies and necessary for structural change (Brockhaus, 2005). Hence, we can regard the observed tensions and conflict as normal, as a process where communities become familiar with each other's norms and beliefs. Or in other words, where the processes of bricolage occurs.

Tension was present when pastoralist did not reciprocate to farmers. Tension resulted in conflict, when there was a dispute over crop damage. In only one village, I observed conflict which escalated. In this village, aversion towards pastoralists was included in social practices and seemingly routine behaviour. All community members expressed their disgust and dislike of having pastoralists in the area and eventually the conflict became violent. If we link conflict prevention or escalation back to literature, there are a few variables which come forward in this study: presence of a third mediating party and misinterpretation (Moritz, 2010). As described, community chiefs are frequently involved during discussions regarding crop damage. Community chiefs are respected and regarded as an impartial actor. On the contrary involving the police was regarded by both parties as provocative. In Ostrom's (1997) framework of reciprocity, she includes 'information about past actions' as a variable affecting reputation and trust (see figure 2). Stepping to the police, would diminish the reputation of an actor and thus the level of trust he/she receives. The operationalization of tension therefore matches the variable 'information about past actions'. However, authorities were included to settle violent practices, which may have prevented further escalation. This is highly in line with Moritz (2010). If actors intervene, conflicts are more likely to escalate. Secondly, both farmers and pastoralists occasionally accused each other of malpractices. A lack of face-to-face communication whereby those malpractices were discussed, guaranteed tension and mistrust. Direct communication between actors would help to establish understanding and the establishment of shared norms or rules to guide future behaviour.

Yet, why did conflict escalate in one village and not in others? I point out the basic, structural variables. The primary difference between the village where conflict escalated and the other villages, was the practice of forgiveness. Villagers had the norm to always forgive pastoralists when there was crop damage. While in other villages, farmers asked for a refunding after multiple damages or a big damage. Those villages, adopted new mechanisms to tackle problems related to crop damage. In other words, those villages altered their own norm of forgiveness to deal with crop damage. While in this particular village, farmers articulated their own norm, because asking for compensation was considered unfair. The already marginalized farmers became frustrated, they said to dislike pastoralists, because they only brought problems to the area. Farmers were agonised by the presence of pastoralists in the area. Thus, the institution became weak, farmers did not feel the moral legitimacy to conform their own norm (Scott, 2001; de Koning, 2011). They disallowed pastoralists to settle in the area, but according respondents, the pastoralists disobeyed their authority. Probably, the pastoralists did not legitimize norms and rules, because there was no communication. Instead of adopting a more accepted mechanism, farmers took matters in their own hands. There were violent incidents, like a fight between a pastoralist and farmer, and according to a respondent a farmer shot a cow. These incidents restrained communication further. As explained previously, there is a need of face-to-face contact in order for institutional bricolage to occur. Violent conflicts inhibits contact, and thus institutional bricolage and cooperation.

6.3 RQ3. DIRECT AND INDIRECT EFFECTS OF PASTORAL PRACTICES

6.3.1 DIRECT EFFECTS OF PASTORAL PRACTICES

Pastoral practices directly impact agricultural fields, savannas and the forested area's surrounding springs, whereof some are regarded as sacred. This is mostly due to the foraging practices of cattle directed by herders. Literature concerning pastoral effects on their surrounding mostly aim at decrease of mammal diversity (Du Toit & Cumming, 1999) and vegetation alteration (Belsky, 1995). Overgrazing and uncontrolled burning by pastoralists results in environmental degradation and savanna desertification (Bassett & Boutrais, 2000). Several case studies contrarily indicate pastoralists burn earlier compared to farmers and hunters. This together with selective grazing of cattle, promotes shrub generation on savanna lands (Bourdieu, 1977; Scholes & Walker, 1993). This is in line with the findings of this study. Pastoralist preferred early fires and in one occasion my research partner noted expansion of bushland. Vegetation alteration affects wildlife diversity and abundancy. Moreover, pastoralism may disturb wildlife by merely being present in the area. Even though forests are inapt for cattle raising, cattle can cross forests to graze and browse particularly during dry season. Wildlife disturbance highly depends on the

species. Literature notes that predators fear humans and are more easily disturbed by human presence (Smith, et al., 2017). Yet, the presence of merely cattle may also benefit predators as they serve as prey. Hunting is likely to have a bigger effect on wildlife abundancy compared to pastoralism (Wallgren, et al., 2009). While pastoralists dislike predators as their cattle is an easy prey, few pastoralists admitted they hunted. The FAO (2001) states that pastoralists rarely adopt hunting practices and farmers are more likely to be involved with the activity.

Besides the disturbance of the gallery forests, cattle can pollute and increase sedimentation in fresh water springs (Line, 2003; Davies-Coley, et al., 2010). Particularly, when there is a high pressure on streams, due to a high amount of cattle entering a relative small stream, cattle can trample stream banks (Conroy, et al., 2016; Terry, et al., 2014). Water points proposed by several pastoralist, could decrease pressure on natural water sources and prevent cattle access to sacred forests. Touré (2004) describes how the implementation of water points were essential in conflict prevention between farmers and herders in Guinea. Natural water points were surrounded by dry season crops and a high amount of crop damage led to violent conflict. However, water points could also have deteriorating effects (Riesman, 1984; Baxter, 2001; Swift, 1977; Galaty, et al., 1980). Galaty (2004) explains how transhumant pastoralists traditionally postpone migration to wetter areas as long as possible, to reserve the grasses for in the dry season. The implementation of water points, like wells, increased land claims made by pastoralists and overgrazing of surrounding pastures. Therefore, I do not recommend the implementation of wells, because we are unsure what the effect is on conflict.

6.3.2 INDIRECT EFFECTS VIA THE FARMING COMMUNITY

First of all, if farmers adopt regulation to collectively prevent crop damage, farmers change norms and rules by for example building fences around horticulture fields and implement land use zoning systems. Secondly, two villages started herding cows themselves in order to become as prosperous as pastoralists. This may have a similar direct impact on the environment, although villagers were spatially fixed and there were no problems between farmers and the villagers owning cows, because they shared the same norms and values. Less visible alterations in farmers' institutions concern sacred forests, this brings us to the third indirect effect. Sacred forests are conserved by communities, by the belief that spirits reside in them, which will harm you if you access or harvest resources. Consequently, this beliefs of farmers conserves dense patches of forests with thick understory layers at the edge. Forests are hotspots for wildlife, including predatory species such as leopards. This sense of inaccessibility and danger within forest, spark the belief that the forests are spooky and mystical. Illustrating the idea of interconnectivity between nature and culture. The absence of similar beliefs in pastoral communities is not surprising, yet the lack of communication regarding them is. Three scenarios can unfold here, which I will discuss below.

First, where pastoralists adopted institutional norms and beliefs regarding sacred forests, pastoralists were not likely to enter them. Cows on the other hand, where still allowed to enter, but herders did not follow. Because sacred forests are hotspots for wildlife, cattle is more likely to be predated. Particularly, if cattle is uncontrolled, since predators are being disturbed by humans (Smith, et al., 2017). If pastoralists notice that cattle is more likely to be predated inside sacred forests, they are more likely to guide cattle around sacred forests. Some pastoral respondents mentioned they avoided sacred forests, because they knew it was a place where wild animals reside. Consequently, the effect of grazing practices is limited. Secondly, if there is limited predation or pastoralists do not notice the effect of predation, there are less changes herders will actively guide cattle in different directions. Even though forests are inapt for cattle grazing, during dry season time cattle can scavenge on the forest understory. These thick understories are part of the obstruction of the spooky and mystical forests. By removing understory layers, forests become more open and may alter the farmers' beliefs regarding sacred forests. Open forests are more vulnerable for late fires, which accelerates the opening-up of forests (Wit, 2019). At last, if pastoralists are unaware or simply do not respect local norms and rules, they may enter sacred forests. This minimizes the chances of predation, because humans scare off predators, and together with grazing practices, this increases the chances of losing the idea concerning mystical sacred forests.

However, the above discussed scenarios are not proven and as the name implies, are scenario's. The adoption of beliefs and norms regarding sacred sites is essential for sustaining the traditional institution and the conservation as this particularly niche within the farmers' lifeworld.

At last, the isolated existence of communities in the Boé helped to preserve traditional CNRM lifestyles. The two agropastoralists who used a truck to sell cattle on the national market, adopted a more capitalistic lifestyle. Critics on CNRM, argue that traditional practices erode due to urbanisation and capitalisation (Goodland, et al., 1990; Worster, 1993). The truck owned by the pastoralist benefits the community in the Boé as more goods are becoming available for them and they are getting less isolated from the rest of the country. However, this isolation ensured they maintained traditional CNRM and the loss of these traditions can make their practices less desirable from a nature conservation perspective.

7 CONCLUSION

To conclude, I first like to summarize the findings which answer my three sub-research questions. Secondly, I will answer my main research question. At last, I like to finish this thesis with a brief recommendation for CHIMBO based on the findings of this study.

RQ1. What are characteristics of the lifeworld of the pastoral community in the Boé, Guinea-Bissau?

The pastoral lifeworld depends on the hosting farmer community, because farmers allocate land to pastoralists and pastoralists can integrate elements from the farmers' lifeworld. No or limited contact with the hosting community, ensures pastoralists maintain a traditional nomadic lifestyle. This lifestyle characterises itself by being independent from short-term land productivity, high mobility and cultural adaptations like large families and low reciprocity among non-kin. Transhumant pastoralists have fixed migration patterns and have increased face-to-face contact with communities along those migration routes. Increased contact with farmer communities ensures that transhumant pastoralists can legitimize farmer communities rules and norms. Pastoralists who reciprocated towards their hosting farmers, altered their own norm of reciprocity and established strong symbiotic relations with the farmer community. This increases the chances of pastoralists acquiring property rights over land and further sedentarization. Sedentarization is accompanied by the integration of more farmer institutional elements, like beliefs and norms regarding sacred forests.

RQ2. What are strengths and barriers for cooperation between pastoralists and farmers in the Boé, Guinea-Bissau?

Community similarities which relate back to cultural characteristics form a foundation for cooperation between communities. Communities can benefit each other if they reciprocate and develop symbiotic relations whereby equivalent and non-equivalent gifts are exchanged. Barriers for cooperation are the differences in lifeworld, as they affect beliefs and norms communities have over natural resources. In addition, face-to-face communication is essential for cooperation, so communities can develop shared norms. Hereby communities have to adopt external norms or adapt their own. Articulation of internal norms have a general negative effect on cooperation. The barriers for cooperation also inhibit legitimization of rules, norms and beliefs. Disobeying to norms and rules can spark tension. This tension is operationalized when there are disputes over natural resources, like crop damage. In addition, conflict escalation obstructs face-to-face contact, preventing aggregation and alternation of institutional elements, hence the likeliness of future cooperation.

RQ3. How do pastoral practices affect the lifeworld of farmers in the Boé, Guinea-Bissau?

Pastoralist can have a positive and negative impact on the farmers' lifeworld. Soil fertilization and a lower chance on conflagrations were identified as positive effects, while crop damage and disturbance of sacred forests were identified as negative effects. Farmers can also adopt practices of the pastoralists' lifeworld, by starting their own cow herd. Villagers owning cows then have similar effects as pastoralists on their surroundings, although a lesser impact on sacred forests. When pastoralists legitimized farmers' beliefs regarding sacred forests, they minimize their impact on forests. If pastoralists do not legitimize norms and rules regarding sacred sites, they can alter sacred forests and this affects farmers' institutions, because culture and nature are intertwined.

Based on the above findings, we can answer the main research question:

Main RQ. How does the interaction between pastoral and farmer communities affect community natural resource management via traditional institutions in the Boé?

If there is a cooperative interaction between pastoral and farmer communities, there is a high chance pastoralists legitimize rules, norms and sometimes beliefs of farmer communities. Resultingly, there are high chances CNRM via traditional institutions is preserved. Farmer communities will adopt new mechanisms to avoid crop damage,

but maintain beliefs regarding sacred sites. If there is a non-cooperative interaction, resulting in conflict, between pastoral and farmer communities, there is no or to a lesser extent legitimization, hence pastoralists will not cooperate in natural resource management via traditional farmer institutions. On top of that, pastoralists may alter the farmers' lifeworld and subsequently CNRM via farmers' beliefs over sacred forests.

This thesis gave basic knowledge regarding the pastoral community in the Boé, Guinea-Bissau, hence contributed to our general understanding of pastoral communities and their relation with hosting communities. By linking back tensions related to unequal reciprocal norms and values, it gave a novel insight in conflict theory. Furthermore, by examining how communities can affect each other's practices to manage natural resources through cooperation and conflict, it gives us new directions for conservation via community based projects. Conservation focus should shift to the integration of external communities into a local community, if this local community has desired traditional institutions. Encouraging communication and the establishment of symbiotic relations can aid CNRM and livelihoods. CHIMBO can stimulate cooperation between pastoralists and farmers by inspiring farmers to communicate their norms and beliefs, particularly regarding sacred forests, and allowing pastoralists to integrate in farmer communities. Communities can cooperate by exchanging agricultural products for pastoral products, which can benefit both communities. If pastoralists are aware of sacred forests, they are more likely to conform to norms and rules concerning those forest. Moreover, pastoralists are less likely to act rationally, because they feel a moral legitimacy. Additionally, CHIMBO could try to find shared interests and establish a symbiotic relation with pastoralists. The government of Guinea-Bissau allows migration, so it cannot be withhold. Pastoralist have a vast amount of traditional ecological knowledge, beyond what is described in this thesis, which can aid conservation in the area.

7.1 LIMITATIONS & FURTHER RESEARCH

This thesis formed the first empirical examination of the pastoral community in the Boé and identified knowledge gaps that could result in follow-up studies. Several observations have to be verified, such as family and ethnical characteristics, long-term environmental and social impacts, and cattle counting's. The numbers concerning cattle given in this thesis were based on general observations or numbers given by respondents. These numbers are not reliable, as most pastoralists were uneducated. Cattle numbers based on observations are underestimations, because never all cattle returned to the settlement. Moreover, only relatively few village territories (9 out of 85) and settlements (21, unknown total) have been visited in the Boé. Estimations regarding cattle number throughout the Boé cannot be done, because numbers varied substantially per area. Other counting techniques have to be applied for reliable estimations. These techniques could involve analysis using remote sensing of areal photo's or new techniques using high-resolution satellite imagery. Furthermore, this thesis was conducted during relatively productive seasons and circumstances may be different during dry season time. Moreover, I aimed at areas where many pastoralists reside, because I had limited time to visit all areas and settlements within an area. Therefore, we cannot draw conclusions for the whole Boé as populated areas are more likely to have problems between communities. Women are understudied in this thesis, while they could play an essential role in cooperation and conflict. Gender could further play a role, because the Fula is a masculine culture and the men may have behaved differently towards me if I was a man. Currently, there are no female translators, but they can give us an entirely new perspective on this topic and many others. The political environment in this thesis played a small role, but should be examined further in order to properly understand how national affairs affect practices of farmers and pastoralists. By examining long-term effects, the political environment, seasonality and women, we could further contribute to understanding the development of social relations and the evolvement of conflict between pastoral and farmer communities in West-Africa.

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APPENDIX I : PASTORAL SETTLEMENTS CHARACTERISTICS

Table 1 ; Pastoral settlement characteristics

Whereby Terr = village territory, SETTLEMENT: Agro. = pastoralists owns agricultural land yes/no, #Adult men = number of adult men on a settlement owning livestock, #people = total amount of people living on a settlement based on interviewee response, FAMILY LEADER: #sett. = number of owned settlements the family leader owns, #wife = number of wives the family leader has, #Kid = number of children the family leader has, NUMBER OF COWS: #obs. = number observed cows on settlement, #Ment. = number mentioned cows by respondent (including those on different settlements), #Max = maximum amount of cows based on observations and mentioned by respondent.

		Settlement		Family leader			Number of cows		
Code	**Terr.**	**Agro.**	**#People**	**#sett.**	**#Wife**	**#Kid**	**#Obs.**	**#Ment.**	**#Max**
F1AP1	V1	Yes	20	2	3	15	*80*	*150*	150
F1TH2	V1	Yes	4	1	1	1	*40*	*40*	40
F1TH3	-	Yes	24	1	3	20	*70*	*150*	150
F1TH4	V2	Yes	15	1	2	5	*130*	*80*	130
F1TH5	V2	Yes	8	1	2	5	*100*	*110*	110
F2TH1	V3	Yes	16	1	2	7	-	*100*	100
F2N2	V3	No	16	1	3	7	*200*	*150*	200
F2TH3	V3	Yes	6	1	2	3	*130*	*130*	130
F2TH4	-	Yes	30	1	4	17	*290*	*260*	290
F2N5	-	No	13	1	2	4	-	*120*	120
F2TH6	V3	Yes	20	1	2	5	-	*120*	120
F3AP1	V1	Yes	27	6	6	20	-	*600*	600
F3AP2	V1	Yes	17	2	3	13	-	*300*	300
F4TH1	V5	Yes	12	1	2	9	-	*200*	200
F4TH2	V5	Yes	31	3	2	8	-	*410*	410
F4N3	V6	No	12	2	3	8	-	*600*	600
F4N4	V6	Yes	20	1	3	8	-	*300*	300
F4N5	V6	No	3	1	2	1	*80*	*50*	80
F4N6	V7	No	16	1	2	5	-	*140*	140
F4TH7	V8	Yes	13	1	2	7	-	*80*	80
F4N8	V8	No	20	1	3	11	-	*80*	80
		Average	***16***	***1***	***3***	***9***	***124***	***199***	***206***

APPENDIX II : RECOMMENDATION PASTORALIST AND FARMERS IN THE BOÉ

First of all, I like to thank all pastoralists and farmers who helped me during my time in the Boé. I have learned a lot and acquired many experiences, I am grateful for that. My study examined the cow owner community in the Boé and their interaction with the local farmer community and the natural environment. Based on the conversations I had, I identified two main problems. I like to share those and my personal advice based on my study.

CROP DAMAGE

Crop damage occurs frequently and if it is not dealt with properly, it sparked some unease between pastoralists and farmers. I noticed that the knowledge and implementation of solutions which were offered in the meeting between pastoralists and farmers in Beli, January 2019, varied substantially. The solutions which were mentioned were:

- Land use zoning, whereby farmers have their annual rice field at one side of the village territory, so pastoralists can herd their cows at the other side of the village territory;
- Horticulture lands of farmers should be fenced, so pastoralists can free their cows between rice production and cashew collection season;
- During rice season and cashew collection season, cows should be herded by day and locked in kraals during the night (this can also help to prevent cattle predation by feline species);
- During cashew collection season, it may be hard to control cows, so farmers can help herders by chasing cows of their fields during the day;

Sometimes, people brought up the solution of wired fences to protect agricultural fields. Wired fences, however are expensive and dangerous for cattle and wildlife. Animals can get stuck in those wires and hurt themselves.

In some villages, the solutions which were offered in the January 2019 meeting were communicated and implemented effectively. Of course, sometimes it is not possible to implement those general solutions. I highly recommend local solutions, but those should be communicated properly to both pastoralists and farmers. Propper communication is not only necessary for the implementation of rules regarding crop prevention, but also for other community norms and rules. These could concern sacred forests and permitting pastoralists to have agricultural land or not. If there are difficulties, pastoralists and farmers should discuss those and think of ways how to overcome them. Again, those solutions may diverge from the general solutions offered in the January 2019 meeting. Frequently, people proposed to have another large meeting. However, in my personal opinion those large meetings are not always effective and they are not very time efficient. Hence, I recommend small meetings with pastoralists and farmers who reside in the area, so the general solutions can be altered were necessary so they can fit the local context.

At last, I like to spend some words on crop damage compensation. In many villages, farmers asked for compensation after several crop damage events or they did not ask compensation at all. If there is a damage, I advise farmers to ask a fair compensation and pastoralists to pay it as soon as possible. Farmers depend on the productivity of their land to feed their family and this should be respected in any case. If pastoralists do not have money to compensate farmers, payment could perhaps be done with pastoral products like milk and butter.

LACK OF VETERINARIAN SERVICES

Many pastoralists complained to me about the veterinarian service in the Boé. The annual campaign whereby the veterinarian station in Gabú comes and visit settlements is too late in the dry season. In the dry season, cows are hard to control and as a result some do not get their vaccination. We talked to a representative of the veterinarian station in Gabú, who had limited knowledge of the actual situation in the Boé concerning problems

pastoralists had with the veterinarian station. They said it is impossible for them to come earlier in the season, because it is hard to access all area's in the Boé. Moreover, they lack personal to visit settlements in the Boé throughout seasons.

It may be wise to arrange a small meeting with the veterinarian station in Gabú to see what the possibilities are. The pastoral community in the Boé has grown and there is a need for a better veterinarian service. There are several pastoral representatives in the Boé, which are aware of most of the problems pastoralists have. I recommend those representatives to arrange a meeting with people from the veterinarian station in Gabú.