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**Multispecies relations in rural Sierra Leone: Dwelling, livelihoods, and
more-than-human health after Ebola**

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Thesis submitted for the degree of Doctor of Philosophy

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Table of Contents

List of Figures	i
Abstract.....	iii
Declaration.....	v
Statement of Copyright.....	vi
Acknowledgement	vii
Chapter 1. Introduction.....	1
The idea of Dwelling.....	7
Dwelling in the domestic space of the house	12
Dwelling beyond the domestic space of the house	15
Dwelling as a multispecies endeavour	19
Implications of ideas of multispecies dwelling for medical anthropology	20
Outline of thesis chapters	23
Chapter 2. Background and Social Context of the study	29
People of <i>Nyayetahun</i>	32
Chapter 3. Methods of ethnographic engagement.....	34
Community entry strategy: traditional courtesies and informed consent	36
Meeting with the <i>Ŋɔ Mahei</i> (paramount Chief).....	37
Meeting with the <i>Taa Mahei</i> and villagers in <i>Nyayetahun</i>	39
Participant observation	42
Experiences and challenges	46
Challenges	48
Ethical permission and dilemmas	50
Confidentiality and informed consent	50
Respecting confidentiality.....	52
Field notes, photos and audio recordings.....	52
Data management, protection, and analysis	53
Chapter 4. Dwelling within multiple spaces.....	55
Sites of dwelling: The house.....	58
Sites of dwelling beyond the house: The Village	62
Dwelling in the farm.....	65
<i>Gadihun</i> (in the garden)	73

<i>Waalihun</i>	74
Conclusion	76
Chapter 5. Multispecies dwelling through animal domestication	80
The idea of Domestication	82
Domestication as a process of multiple species dwelling.....	87
Fencing of houses.....	90
Animal confinement.....	93
Conflicts over animal incursions	97
The goat that is a thief	100
The goat chief.....	105
Affinal status of animals and the moral order of multispecies dwelling	108
Conclusion	112
Chapter 6. The multiple worlds of animals in <i>Nyayetahun</i>	115
Dogs as participants in economic and social worlds.....	121
Beyond their master's household	125
Dogs as mediators with the spirit world	130
Other animals as mediators with the spirit realm	132
Personification of spirits and implication on human-animal relations.....	136
Conclusion	140
Chapter 7. Re-thinking human-animal relations in public health	143
Multispecies health in history	145
One Health	146
Public health interventions for zoonotic and vector borne diseases in <i>Nyayetahun</i>	150
Problematic experiences of human-animal relations beyond mosquitoes.....	153
Problematic experiences of people with bedbugs.....	154
Problematic experiences of people with rats	157
Spillover? Rethinking forms of human-animal contact.....	161
Conclusion: From multispecies ethnography to critical public health?.....	167
Chapter 8. General Conclusion	170
Towards an anthropology of multispecies dwelling	171
Appendices	177
Appendix 1: Research authorization from Njala University Institutional Review Board ...	177
Bibliography	178

List of Figures

Figure 1. Daddy digging a rodent burrow, while Munda is fixing the hunting net.....	3
Figure 2. Yankuba cutting <i>Ndɔgbɔ yeyei</i> – Plant fibre used as rope meant for the reconstruction of their pig pen.....	3
Figure 3. Map of Sierra Leone Showing Bo district.....	31
Figure 4. Map of Bo district showing the chiefdom where study site is located.....	33
Figure 5. Showing videos and photos taken in the field to my hosts for their approval before leaving the field.....	52
Figures 6 and 7. Mud houses in <i>Nyayetahun</i>	58
Figure 8. Palm leaflets that villagers use as mattress placed outside for sunning.....	62
Figure 8. Woman picking bedbugs from her cloths and bed linings.....	62
Figure 9. A pot with water and a basket in which cloths and bed linings are steamed to treat bedbugs.....	62
Figure 10. Men crushing boiled oil palm fruit.....	65
Figure 11. A woman winnowing rice in the company of chickens.....	65
Figure 12. Black soap making with a chicken trying to pick something from the bucket.....	65
Figure 13. Two young adult men making a mat.....	65
Figure 14. Farmhouses on two different farm sites.....	72
Figure 15. A section of the internal space of a farmhouse, showing a set of firestones with a drying rack hanging over it, and with other cooking accessories on the floor – unwashed dishes, plates, cups and mortars used for grinding and crushing substances.....	72
Figure 16. Eating <i>Kɔndei</i> (workers lunch) with villagers in a <i>Waalihun</i> next to <i>Masunday's</i> farm.....	76

Figure 18. A house fenced with lattice sticks to establish spatial boundaries between animals and the house.....93

Figure 19. A pig pen built with tree branches, bamboo and timber waste.....97

Figure 20. Pen for sheep and goats constructed with support from a non-governmental organisation.....97

Figure 21. A goat caught on a snare trap around someone’s garden.....102

Figure 22. A *fofoi* (red weevil) attached to a palm leaf straw.....162

Figure 23. An adult male villager holding a snake with his bare hand and trying to discover its genitals.....166

Figure 24. Bruises sustained by a farmer hunter while trying to kill a grass cutter with his foot.....166

Abstract

This thesis is an ethnographic study of multispecies relations in Sierra Leone in the post 2014-2016 Ebola context. The study is based upon five months of ethnographic fieldwork carried out in a rural village, southern Sierra Leone. It focuses on the dwelling activities of villagers as a window to explore the ways that people live and interact with their environment and how these practices influence human-animal encounters. Using a multispecies approach that focuses on the entangled lives of humans and animals as both biological and social actors, this study follows the ways that people dwell across different spaces – within and outside the built structure of the home. It describes how processes of dwelling are intimately bound up in relationship with the natural surroundings, and how this closeness consequently makes people inseparably connected to other nonhuman organisms. It shows that dwelling in this rural community is a quintessentially multispecies activity, where villagers and animals intimately participate in each other's worlds.

The main argument of this thesis is that human interactions with animals go beyond the narrow concerns of economics, food, and property relations. Human-animal relations are multidimensional, involving economic, social, moral, political, and spiritual dimensions, and these relationships and practices are embedded in the dwelling activities of people. People's modes of existence and ways of living in the world brings them into intimate relations with other nonhuman beings. This study illustrates these relations by showing how villagers and animals share the same moral and political worlds, how animals participate in mediating spiritual relations among people, and the ways in which animals help humans to understand and navigate their world. Following the multi-layered and complex nature of these interactions and how they are produced and shaped by the everyday living activities of people, this study also demonstrates the implications of these encounters on health and wellbeing, engaging in dialogue with existing scholarship in medical anthropology that is concerned with the different ways that multispecies interfaces produce and influence health outcomes. Contrary to public health approaches to zoonosis in the post-Ebola period that often focus on a narrow selection of animal species and interactions in relation to concerns about viral 'spill-over', this thesis brings into view other forms of human-animal contact and species as issues of human-animal wellbeing that are not reflected in the current public health

agenda. The thesis proposes that issues of human-animal health and wellbeing cannot be fully understood as separate from people's modes of existence and the different ways that they live and interact with their environment. The study contends that, any attempt to understand these relations whether in the context of livelihood, food and economic security, or health, should begin with a broader conceptualisation of the kinds of dwelling practices that prevail among people.

Declaration

I declare that no part of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or institute of learning.

Statement of Copyright

The copyright of this thesis rests with the author. No quotation from this work should be published without the author's prior written consent and information derived from it should be acknowledged.

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Chapter 1. Introduction

A group of people of different ages were gathered on the veranda of a house in a village in rural Sierra Leone. They were discussing the devastation that wild animals (particularly grass cutters) were causing to their farm crops. These people were concerned about the impact of wildlife crop predation on their food supply, as farming is their main source of food subsistence. At the same time, *Sadi* (a young adult woman) was struggling to prevent chickens and pigs from feeding on a pile of palm kernel nut seeds that she was cracking on a flat rock laid on the floor. Frustrated by the difficulty of keeping these animals at bay, she asked the kids to chase them out of the veranda. Upon that request, the children obliged not only to chase the animals from the veranda, but pursued them around the village, whipping them with palm branch and other objects, and laughing as the animals fled in various directions.

Moments later, *Yankuba* asked *Daddy and Munda* (boys of 7 to 9 years old) to follow him with the hunting net to the forest as he was going to harvest *Ndɔgbɔ yeyei* (a plant fibre used as rope), in order to rebuild the family's pig pen. The *Taa Mahei* (town chief) had recently reminded villagers that a monetary fine would be levied on any animal found guilty of crop or property damage. They took the hunting net with them in case they encountered a wild animal in the forest during their foraging trip.

In the forest, *Yanguba* extracted some *Ndɔgbɔ yeyei*, and then began digging bush yam (wild yam), but to his disappointment the yam was rotten and not edible. Then, *Daddy*, who was eating a piece of cassava tuber that he had plucked from a cassava plant growing wild in the bush, called *Munda's* attention to a rodent burrow, saying, 'Here is the burrow of a Gambian pouch rat, come and let us dig it up' (*Kiwei lowei gbe, wa mu mbɔ*). *Daddy* collected some of the soil from the burrow using the tip of his machete, he smelled the soil and informed *Munda* that the animal was in the burrow. *Munda*, who was already fixing the hunting net

around the burrow to prevent the suspected prey from escaping, also collected some of the soil and smelled it to confirm whether the *Kiwei* was in the hole. Their excitement and effort to catch and take the suspected animal home was however quenched, when *Yanguba* declared that there was no rodent in the burrow. '*When a Kiwei is in a hole you can tell by the palm kernel nuts and stones you see at the entrance, as those palm kernel nuts and stones are what Kiweis use to close the hole so that snakes can't enter,*' he maintained.

As a participant observer, watching these kinds of interactions and practices triggered many questions: What does the frustration of villagers over crop damage by animals, and the pleasure that the children get in chasing animals around the village tell us about the place of animals in their everyday lives? Why do these kinds of practices of playing with animals persist in this village even though there are posters with public health messages that warn people to avoid contact with animals? How can the activity of an animal attract punitive measures that could motivate *Yanguba* and the other villagers to engage in rebuilding their animal pens? What do these kinds of effort that villagers make to rebuild their animal pens suggest about human co-existence with other nonhuman agents and about the status of animals in the local governance and political system of villagers? What does carrying a hunting-net on a journey ostensibly geared towards another goal (extracting fibre for rope) say about hunting in the broader livelihood endeavours of these people? How did *Yanguba* learn the behavioural pattern of another species, and what does the smell of the soil from a rodent burrow reveal about the nature of transspecies communication? What does the unsuccessful ending of this story (no *kiwei* found) imply about the contingencies of hunting? Finally, how do these forms of interactions with animals reflect on public health ideas and initiatives concerning human-animal health and wellbeing?

I chose to begin this thesis by reflecting on the above account in order to open a window onto how animals feature in the everyday lives of people in this rural village community that I call *Nyayetahun*, located in the South of Sierra Leone, some 24 kilometres from the regional city of Bo. In this village, the lives and livelihood activities of people largely depend on their interaction with the natural environment and cohabiting species, which include plants and animals. The food that they eat and materials they use for building houses and making certain

tools and furniture are largely acquired from the natural environment, and the practices involved in obtaining these resources such as hunting, fishing, farming, gardening, and gathering of wild plants keeps them intimately connected to the ecosystem. This engagement with the natural world brings the lives of these rural people (who I will also refer to in this thesis as ‘villagers,’ even though this is not a fixed and unchanging identity within this frequently mobile and interconnected community) into the world of a variety of other interacting beings. It also entangles the lives of these nonhuman beings with the world of people. Reflecting on these kinds of relationships is crucial in understanding what constitutes our being as humans in relation to animals and other beings around us.



Figure 1. Daddy digging a *Kiwei lowei*, while Munda is fixing the hunting net.



Figure 2. Yankuba cutting *Ndɔgbɔ yeyei* – Plant fibre used as rope meant for the reconstruction of their pig pen.

Conventionally, human-animal interactions are primarily conceived in terms of predator-prey, hunter-hunted, parasite-host, or property-ownership relations (e.g., Clutton-Brock, 2014, Bokonyi, 1974). These ideas however apply to only a small subset of the interactions that I witnessed, because the interactions that I observed villagers had with animals was more diverse, and extended way beyond food, property, and economics. In fact, what makes up the whole of how people live in *Nyayetahun* is inextricably entwined with their relations with many other kinds of nonhuman beings. Villagers’ world and their very mode of existence is entangled with nonhuman animals, and this includes both domesticated and wild animals. Though villagers’ intimacy with animals in a large extent involves food, economic and

livelihood subsistence, this issue of subsistence itself depends on other determinants and vital kinds of relations, such as the social and political arrangements that are intrinsic to people's ways of living and being in the world. This thesis argues that human-animal interactions are complex and multidimensional, involving economic, social, moral, political and spiritual relations, and these various forms of relationships are produced, reinforced and shaped by the various ways in which people dwell. As such, the idea of dwelling itself is a human-animal affair, and seeing dwelling as a multispecies process contrasts with narrower views of human-animal relationships, such as identifying the relations that people have with animals in terms of food, property-ownership, parasite-host or economic utility.

I experienced these multispecies entanglements myself in various ways before undertaking this thesis. As a Sierra Leonean who has lived in some of these village communities, I had prior lived experience of how people live and interact with animals. Next, as a research assistant working on project studying human-animal interactions at the time of the 2014 – 2016 Ebola epidemic, I was also able to observe the intimate ties that people have with animals, such as in the ways how villagers contravened the ban on hunting, sales and consumption of wild animal meat (see. Bonwitt et al., 2018). As a matter of fact, it was this experience of the inextricable relations between villagers and animals that triggered my interest and personal ethnographic journey that took me out again in this community to re-engage in activities that I was already partially familiar with.

From these experiences, I observed that the lives of villagers are so intimately tied up with their interactions with animals in terms of livelihood and in knowing their place in the world. People domesticate animals as a form of economic security and for spiritual wellbeing, and they hunt animals in one way or another for household consumption, to protect crops, or for trading purposes. Animals appear to be important actors in constructing and shaping the social, moral, political and spiritual lives of these people. Using a multispecies approach, focusing on the entangled lives of villagers and these nonhuman animals that they co-exist with, this study reveals how multispecies relations are constructed and influenced by people's modes of living and relating with their environment. Among other things, I explore the implications of these interactions on health and wellbeing.

Prior to my engagement with villagers in *Nyayetahun*, my interest was to explore the domestic architecture of villagers and how people and animals share domestic spaces within houses. Interestingly, once I began field work, I also ended up paying attention to human-animal interactions beyond the domestic spaces of the home. This is because while participating in the social, economic and livelihood activities of the people in this village (as I have begun to show in the ethnographic vignette) I noticed that many of the activities that make up their modes of existence like crop cultivation, animal husbandry, fishing and hunting, transcended the domestic spaces of the home into other domains within the local environment. I also realised that these living practices of villagers were intimately bound up in their relationships with the natural surroundings, and this consequently made them inextricably connected with other kinds of beings (including animals and spirits) that also inhabit these spaces. Such entanglement of villagers and animals within these multiple spaces cannot be sufficiently accounted for by focussing on the house alone which is just one domain of these encounters. However, the house remains important for understanding how humans live with other nonhuman beings. In this thesis, I therefore extend a conceptualisation of multispecies living as an activity that takes place primarily within and around human houses and farm areas, to develop a conceptualisation of 'multispecies dwelling' which focuses on wider home-making practices of both humans and animals. I argue that dwelling in *Nyayetahun* is a quintessentially multispecies activity, where villagers and animals participate in the world of the other, and these interactions extend beyond the limited scope of predator-prey, parasite-host, and property-ownership relations. I propose that, one useful way to explore and understand these human-animal relations and the different ways that they are connected to the dwelling practices of people is through real-world experiences of how these interactions play out in real life situations.

To demonstrate these rich forms of human-animal entanglements, this thesis is situated within three main bodies of literature. First as I have already indicated, it relates to ideas about dwelling, the environment and domestic spaces, developed in anthropology (Ingold, 2000) and philosophy (Heidegger, 1971), and it build on the insights of a number of commentators who have highlighted how human and nonhuman agents are embedded in landscapes, places, and environments (Seamon and Mugerauer, 2012, Cloke and Jones, 2001,

Macnaghten and Urry, 1998). The second body of literature is multispecies anthropology, which foregrounds the diverse organisms whose vitalities are entangled with human social worlds (Ingold, 2013, Kohn, 2013, Kirksey and Helmreich, 2010). Within this multispecies literature, I am particularly in dialogue with ideas that are concerned with the question of domestication and what it means to incorporate animals into human domains and to live together with them (Cassidy and Mullin, 2007). Third, this thesis engages with emerging literature in medical anthropology that draws out some of these issues of multispecies relations to think about their impact on health and wellbeing (e.g. Nading, 2013, Brown and Kelly, 2014), and more broadly with literature from critical public health that contests conventional representations of zoonotic disease. Focusing on these three bodies of literatures offers important insights that are helpful for exploring how human dwelling practices promote engagement with the environment, and the various ways that these interactions with the environment create opportunities for multispecies entanglements, which thus provides useful insights into multispecies disease pathways. In a sense, I begin with a focus on dwelling perspective since it forces a multispecies approach and a rethinking of ideas of domestication, and it also has implications for how we understand health and wellbeing across species.

Practically speaking, using the concept of dwelling as a conceptual tool in this thesis shows that the forest is not 'pristine' or 'wilderness.' Rather than seeing the forest as a nonhuman landscape, this study illuminates forests as human inhabited spaces. This is useful for triggering reflection on the inseparable connection between 'nature' and 'culture' in this rural world. Explaining such connections has been a focus of ethnographic enquiry in this region (e.g. Fairhead and Leach, 1996). Melissa Leach and James Fairhead (1996) for example, have underscored how attempts to understand local representations of forest environments in terms of modern western categorisation of 'nature and culture' can obscure and misrepresent inhabitants' own perspectives on social and ecological relations. While exploring dwelling offers opportunities to re-examine notions of society-nature duality – a philosophy that insists on a separation between humans and nature, setting humans above and apart from other non-human beings (Ingold and Palsson, 2013), it also more generally provides a vantage point for social and ecological analysis of human relations with the natural world across both

natural and cultural domains. Hence, this is fundamentally a different way of seeing the world and the relationships among entities in it.

In the section that follows, I go on to describe the concept of dwelling as an ongoing activity that entails living in the world. I am concerned especially with how this idea of dwelling accounts for human interactions with the environment and encounters with other organisms. Following this, I explore dwelling as a practice that takes place both in the domestic space and beyond the domestic space of the house. This approach helps not only to reveal dwelling as an activity of being in the world, but provides a lens to examine these human-animal relations from a wider point of view, as the dwelling perspective reveals how these relationships with animals take place in different spaces. Next, I turn to discuss the idea of dwelling as a multispecies endeavour. Paying attention to the intersection between ideas of dwelling and multispecies ethnography, I bring out insights that are useful in understanding various aspects of human interactions with other nonhuman beings. After this, I go on to discuss literatures concerned with the implications of these multispecies interactions on health and wellbeing, by focusing on the ways that medical anthropologists have approached issues of health from the perspective of our coexistence with other species. Taken together, this summary of the literature underpins the main argument of the thesis that is further elaborated in the ethnographic chapters that follow; that human-animal interactions involve social, economic, moral, political, and spiritual relationships, and these various forms of relationships are practices that are produced and shaped by peoples' mode of dwelling. Finally, I conclude this introduction with an outline of the thesis chapters, that describes what each chapter contains.

The idea of Dwelling

The concept of dwelling has its intellectual origin in the philosophical thinking of Martin Heidegger. In his essay "Building dwelling thinking", which was written in the context of the housing crisis of post-war Germany when houses were needed to accommodate refugees displaced by the war, Heidegger encourages us to look beyond building in order to see how it is grounded in dwelling (Heidegger, 1971). True to his philosophical proclivity, Heidegger framed the concept *Wohnungsfrage* (meaning 'dwelling question') – which is the term he used to describe the problem. He approached the discussions that this 'dwelling question'

engendered as essentially a misunderstanding of the problem, arguing that the issue of dwelling cannot be resolved through the instrumental application and appropriation of homes to people. To think about dwelling in such terms conceptualises dwelling as a means to an end, and this presents the act of building homes as a solution to the question of dwelling. For Heidegger, approaching the idea of dwelling in such terms blurs our view of the essential relations that dwelling constitutes, noting that if building is to play any role in dealing with the problem of dwelling then it must be done by properly addressing the question of what it means to dwell; for it is only by understanding what dwelling means that we can then engage in the question of how to build.

Although the idea of building appears to be crucial in human dwelling, Heidegger's work illustrates that building and dwelling are two sides of the same coin, noting that not only must we dwell in order to build but we must build in order to dwell. To dwell in this sense means to build, and building is one way that we constitute our dwelling. In this respect the question of dwelling precedes the idea of building or architecture. This argument also suggests that it is by means of dwelling that building arises, and with building, thinking also becomes possible. In effect our building and thinking (which includes knowing and learning about the things and the myriad of encounters and interactions that are part and parcel of daily life) are all products of the ways we dwell.

Dwelling does not designate a passive condition but a mode of human practice. As Mitch Rose (2012) suggests for example, dwelling establishes the foundation, the ground, and the base from which the question of building can be secondarily broached. This perspective implies that dwelling is a primary condition for building and for the different ways that all humans live and experience the world. The concept of dwelling is useful for understanding human-animal interactions in *Nyayetahun* because it is concerned with the various ways in which people live and engage with their environment, and which thus bring them into connections with other nonhuman beings. Rather than focusing on building (i.e., houses and other architecture in this village), which is just one aspect of dwelling, I use dwelling as the practical involvement of villagers in their world, involving various activities that they undertake to meet their survival needs. This includes their farming practices, harvesting of wild and cultivated crops, hunting and fishing, housing construction, and ways of inhabiting them, as well as their

religious practices, which are all activities that illuminate different aspects of the spatial, social, and ecological overlap between people, the environment, and other organisms.

The idea of dwelling used in this thesis is rooted in the evocation of a tangible relationship with the earth upon which one lives. This relationship with the earth however involves more than just living in a house and more even than simply living on the land one happened to be born on. It also involves relating to that land as a homeland or a dwelling place. A 'dwelling place' in the sense defined by Bidy Martin and Chandra Mohanty (1986) is a home or a place that feels culturally congruent and supportive of a secured, safe, familiar, protected, and homogenous identity. This insight is important for understanding how villagers identified themselves with their village. The ways that they interacted with the natural surroundings and with other beings and entities that were present within it, showed that they were socially connected and familiar with their environment. For instance, they knew exactly where to harvest different resources that supported their survival, and as opposed to the restrictions and possible fines they had to face when they attempted to farm beyond the boundaries of their domain, villagers demonstrated a sense of right to explore and utilise the landscape around their village and its available resources as indigenes of the land. Moreover, this was also evidenced in how villagers felt about their farm sites, where many people experienced a feeling of solace being in close contact with their crops and other resources, compared to being in the village (as explained in chapter 4). These kinds of feelings that villagers experienced when they were in their village and farm sites demonstrates what Heidegger calls 'homeliness,' because the person feels truly at home and hence becomes less at home whenever he finds himself in other places (Griffiths and Prozesky, 2010).

Other scholars taking Heidegger's ideas forward have noted that although dwelling is inseparably connected with the land, the act of dwelling is not merely a relation to a particular region or physical space but is interconnected with natural and cultural features that make up the notion of a place (Young, 2002). In this line of thinking, dwelling involves living with what Heidegger describes as the fourfold, which is made up of earth, sky, mortals, and divinities. From Young's (2002) point of view, this aspect of dwelling is to be cared for in the dwelling space, as well as to care for the things that one dwells with in a place. This he maintains entails living fully, authentically, meaningfully within the desired space. These

contributions push us to think critically about dwelling as not just about humans inhabiting a space but as sharing these spaces with other nonhuman entities such as animals, plants, and trees among others. In addition, we are made to think creatively that in the process of dwelling the human dweller also relates with other domains and bodies beyond the earth and physical space.

In this thesis, I take up these arguments about dwelling and place in my descriptions of the living practices of villagers, and I show that their ways of living are intimately entangled with their interactions with spirits and the souls of their dead ancestors and relatives. Though these spiritual entities exist in a distinct world that is located outside the physical environment, they form an important component in the lives and dwelling activities of villagers. As I show in chapter 6 of this thesis, the spirit of gods, divinities and the dead are active participants in the social worlds of these people and their interactions with these invisible beings also have implications on their relations with animals.

In order to better understand this logic of dwelling as an ongoing practice, let us turn to what Tim Ingold calls the 'dwelling perspective,' which is an extension of Heidegger's ideas about dwelling that provides a more holistic approach to dwelling as a way of being-in-the-world. Ingold's focus on dwelling as a way of being-in-the-world is a particularly useful way of thinking through human-animal relations because it entails the totality of life and living. Within this totality, all beings – both human and non-human are brought into a world that is inhabited by organisms of manifold kinds. This is because they are all seen as part of the experience of life (Ingold, 2000). The 'dwelling perspective' reminds us that human beings do not only dwell in society or on the other side of a boundary between society and nature as he puts it, but in the same world that is inhabited by creatures of all kinds, human and non-human (Ingold, 2005). Dwelling from Ingold's perspective is therefore a generative and creative engagement in the world we inhabit as humans and other creatures, and not a designate or passive condition. It is a mode of human practice, a practice that constitutes an inescapable and pre-requisite human condition of co-existence with worldly surroundings. In other words, the notion of dwelling viewed from this perspective is about the rich intimate ongoing togetherness of beings and things, which make up landscapes and places, binding together nature and culture over time (Cloke and Jones, 2001).

Advocating for the dwelling perspective as articulated by Ingold (1993), Macnaghten and Urry (1998) suggest that dwelling should be taken up as an appropriate theoretical concept for new approaches to landscape and nature. In this light, they argue that dwelling should imply a shift from seeing the relationship between people and the environment from merely a building perspective – where ideal human mental constructs are imposed on the world (as in architecture) – to ideas that consider all aspects of living in the world. According to Paul Cloke and Owain Jones (2001), the dwelling approach thus offers a conceptual characteristic that blurs the nature-culture divide and helps to account for the intimate, rich, intense, making of the world, where networks fold and form, and interact in formations, which include what we know as places. Adding to that, they however note that this richness and intensity of places are not in any way necessarily seen as moral, desirable, or authentic in traditional terms but can also be bitter, tragic, and contested in nature (Cloke and Jones, 2001).

In this thesis, such ambivalence around human dwelling is demonstrated in the ways that the living activities of villagers intersected with the activities of other creatures that are intimately bound to the spaces that people inhabit. Although villagers largely depended on these other creatures for food and in understanding their life world, their coexistence with other nonhuman beings is not entirely pleasant or harmonious. As for humans, the reliance of animals on people to meet some of their survival needs often creates tension and competition especially over food and other available resources. These encounters are sometimes detrimental to either or both species.

I situate my ethnographic material in dialogue with these ideas on dwelling. This enables me to conceptualise dwelling as a complex activity that is not just confined to landscapes, the home or built environment but involves the whole manner of ways that villagers inhabit their lifeworld. This includes the ways that people construct houses and other material infrastructures, how they live, work, cultivate crops, domesticate animals, produce, and create things. The ethnographic material presented in this thesis shows that all these activities that I have listed are what constitute people's modes of dwelling. These activities I demonstrate are not limited to one domain, say for instance to the domestic space of home but takes place in multiple sites beyond the built environment where the possibilities of co-existence between villagers and other living beings remain profound.

Dwelling in the domestic space of the house

Having discussed Heidegger's (1971) 'building perspective' and Ingold's (2000) 'dwelling perspective,' which help to reveal dwelling as both a place or a state of being and a process (Seamon and Mugerauer, 2012), I now turn to look at dwelling within the domestic space of the house. In what follows, the dwelling lens helps us to think about the built environment of the home differently, because building and dwelling in the home are multispecies activities. In a sense, multiple species are engaged in the processes of building and dwelling in domestic spaces. In this respect, I think about the domestic space of the house as not just a human domain; instead, I describe the house as a multispecies dwelling space that can provide habitat for both humans and other nonhuman beings. In this thesis, I show that the house as a domestic space is important not just for its practical use but because of its 'holding nature' to accommodate people and these other nonhuman organisms.

Buildings and household furniture are the material components of dwelling in domestic settings, and they are crucial elements in making a place into a home for one to live. The building as presented in Heideggerian dwelling for example, assembles a space with respect to itself and creates a boundary that separates what is inside from that which is supposed to be outside. In this case the building or house is like a container for human activities. Building transforms a place in which we exist into a personal world, a home or a domestic space for living. This means that the house is not merely a material or architectural element but a multi-dimensional space that controls access to all beings. The house generates movement, demarcates boundaries and hence provides protection, security and shelter, while serving as a space that accommodates and supports a host of other life activities of its inhabitants. However, houses in *Nyayetahun* are not exclusive human domains, they are often constructed and inhabited through networks and processes that involve humans and other nonhuman actants living interactively with each other. Houses in *Nyayetahun* afford opportunities for both humans and other nonhuman kinds. For example, rodents including rats create their nests and burrows within houses and live alongside humans. Despite the effort of people to keep houses exclusively human, their social and economic activities and the porosity of the boundaries that they erect promote and reinforce interspecies entanglement. Thus, encounters with animals makes these spaces not just human domains

but cohabited sites by both humans and animals who together influence and shape the environment and life of the other.

The ways that domestic spaces assume, reproduce and play host to other nonhuman organisms and how this forces us as humans to form relations of coexistence with them, has been an important issue particularly in medical anthropology that engages a multispecies lens. This is because these domestic spaces are primary sites of transmission for many emerging and re-emerging diseases. Alex Nading (2014) for example, illustrates how the domestic environment produces interspecies interaction between humans and other organisms. In what he describes as the 'more-than-human aspect of entanglement,' Nading draws our attention to infrastructure as an integral component of dwelling and helps us to understand that the physical infrastructures such as houses, water pipes, roads, sewers, and waste streams produce connections between people and other non-human organisms. In his ethnography, this is instanced in instances when uncontrolled garbage and sewage produce habitats for insects such as mosquitoes to breed and dwell with humans, and in the process producing other actors like pathogens that all form a web of human and nonhuman entanglement. In this way, Nading makes clear that disease (in this case dengue) control and intervention must consider local entanglements among humans, mosquitoes, virus serotypes and the material infrastructure, particularly the home, which is the most intimate space of dwelling.

In a like manner, Ann Kelly (2012) has shown us that both the materiality of the domestic spaces we inhabit as humans and the ways we inhabit them involves playing 'host' to other living organisms that force us to form relationships of co-existence. In her exploration of her experimental hut set up by researchers in sub-Saharan Africa to test ways of controlling malaria using architectural methods, Kelly helps us to reflect on the ways that physical features of the domestic space (i.e, how houses are constructed) and the ways people dwell in them provide room for co-habitation with other beings. She suggests that the modes of relationship or 'hospitable thinking' as she puts it, initiated by the experimental hut, offers an understanding of the corporality of dwelling as both an activity and a place that is constituted and undone through relations between bodies of humans and other organisms (Kelly, 2012). We know from public health research conducted in rural Sierra Leone that houses are similarly

dense sights of co-habitation. The presence of rodents in households is directly associated with housing characteristics and quality. Certain kinds of architecture facilitate an increased density of rodents within and around houses, and consequently creates conditions for contact between humans and rodents, and the possibility for disease spill over (Bonwitt et al., 2017b). In this line of reasoning, the house or built environment is seen as a domestic space inhabited by not only humans, but a home to many other non-human inhabitants dwelling alongside humans.

I draw on the multispecies encounters discussed in these literatures because they help us understand dwelling as both an activity and a place that is constituted through relations between organisms. I develop this approach in this thesis because it is useful in accounting for how villagers dwell within the domestic spaces of the house, and how the material infrastructure and domestic organisation of these spaces create and reinforce opportunities for entanglement with animals. I show that while the houses in the village are meant to provide shelter and protection for people, the designs and materials used for construction equally provide hiding and nesting places for nonhuman animals, including rodents and insects. This leads to close proximity between humans and these nonhuman animals. It also has implications for health, including through an increased possibility for interspecies disease infection.

While these ideas help to illustrate some of the ways that human-animal relations prevail within the domestic spaces of people's houses – which are the main dwelling sites for villagers, it is however just one sphere of the interactions that I explore. In fact, focusing on the house alone as I have stated earlier can only provide a partial view of interactions that are broad, complex and not confined to the house. Certainly, this approach can limit our understanding of the wider context in which human and nonhuman agencies contribute to the production of life in this kind of rural village setting. I therefore extend my focus on dwelling beyond the realm of domestic domain of the built environment to provide a bigger picture of the different ways that villagers and their nonhuman animal neighbours encounter each other.

Dwelling beyond the domestic space of the house

Dwelling is expansive; it is not an activity that is fixed or confined to the house, neither is it situated to a particular space or limited to a specific activity. It is an ongoing process that can occur across various spaces based upon human ways of engaging with the environment in the process of making a living. In describing the ways in which dwelling in *Nyayetahun* transcends the domestic spaces of the built structure of a home, I begin by reflecting on how Heidegger tackled the issue of 'what it means to dwell,' which provides a useful lens to understand dwelling as a kind of transcendental activity that exceeds the boundaries of the built infrastructure.

Heidegger approached the process of dwelling from its German etymology '*bauen*' meaning to build, which comes from the word '*ban*' which means 'to dwell'. *Bauen* also means to care for, to preserve, to cultivate, to till the soil, to construct and to make something (Ingold, 2000). In this respect, dwelling is seen as a dynamic and fluid activity that is not limited to one sphere of activity – say to domestic life as opposed to work, but rather encompasses a whole manner of life activities that one engages in as he or she lives on earth. Building on this perspective, David Seamon and Robert Mugerauer (2012, 1985) have maintained that dwelling is a recurring activity of being in the world and involves our inescapable immersion in the present spaces we occupy, and creates possibility of reaching out towards new places, experiences and ideas while leaving traces in previously inhabited spaces (Ingold, 2000). From the perspective of this thesis, the most important thing about dwelling as viewed in this way is that dwelling does not begin in one place and end in another, it is always ongoing. In a sense, dwelling can take place anywhere and everywhere – be it in the forest, in the city or in the village. The implication of this premise to this thesis is that it helps us to understand that dwelling is not tied to a specific location but is a continuous process with respect to human creative involvement of being in the world. This is useful for revealing the dwelling practices of villagers as an activity that takes place beyond the domestic realm of the home and built environment.

Drawing on Peter Wilson's (1991) account of how hunter-gatherers dwell for example, which epitomises the dwelling perspective as developed by Tim Ingold, Wilson observed that though

hunter-gatherers constructed architectural designs, the act of erecting shelter was just one part of their mode of adapting to the natural environment. There were many other activities like food-collection, cooking, tool making and repair, childminding and so on that also constituted their daily life (Wilson, 1991). In a sense, Wilson tries to distinguish the built architecture from other aspects of dwelling and draws attention to other kinds of lives activities that are accomplished outside the domestic space of the house. His account shows that even though hunter-gatherers engaged in building shelters as homes, many of their dwelling practices however went on beyond the built structure of the domestic space. Although it could be argued that the physical arrangement and formal properties of a hunter-gatherer ecampment may be different from permanent village settlements, Wilson's emphasis on the idea that many of their life activities took place beyond the built space exemplifies my elaboration of the idea of dwelling beyond the home.

In *Nyayetahun*, cooking, farming and crop cultivation, hunting and fishing are done in the open spaces of the village environment and in other domains beyond the village, like in the forest and farm sites. These kinds of dwelling practices often keep villagers closer to animals, and create areas of entanglements that have been described in comparative contexts as 'multispecies landscapes' or 'natureculture contact zones' (Haraway, 2003, Fuentes and Hockings, 2010), where different organisms including humans interact with each other to create and shape mutual ecologies (Parathian et al., 2018, Fuentes, 2010).

One approach to exploring these kinds of spatial and ecological overlap among species is under the rubric of niche construction, which has been used as a basis for understanding the biological and cultural evolution of humans and other organisms. The concept of niche construction is concerned with the ways that organisms through their behaviours, activities and choices bring about changes in their local environments and how in this process they modify the niche of other species and live interactively with them within mutual ecologies (Scott-Phillips et al., 2014). Agustín Fuentes (2010) for instance used the idea of niche construction to describe the entangled lives of humans and monkeys in the temples of Bali, Indonesia. He suggests that the notion of niche construction is helpful in understanding the interaction of organisms within mutual ecologies, i.e., how they co-construct each other's spaces in behavioural, ecological and physiological senses (Fuentes, 2010). According to

Fuentes (2010), mutual ecologies involve the interweaving of structural and social ecologies. Structural ecology can be understood as the study of the biotic landscape and physical environment in which human and other creatures live, while social ecology is interested in the ways that different organisms navigate and create social networks both within species lines and sometimes across species boundaries (Fuentes, 2010). I consider these insights from the niche construction perspective useful in this discussion about multispecies dwelling because, they help to explain how organisms create spaces in their process of adapting to their environment. This is important in accounting for the ways that human and animal lives intersect in processes of dwelling.

What is also crucial here is that the idea of niche construction draws our attention to the ways that organisms coproduce and co-construct each other's niches in behavioural, ecological and physiological senses (Odling-Smee et al., 2013). Niche construction theory presents both human and non-human animals as co-participants in inclusive ecosystems made of interacting niches, where they are actively involved in shaping their worlds in conditions that suit and support their survival needs (Rose, 2012, Ingold, 2005). Several examples of such organismal modification of the environment exist, ranging from earthworms changing soil structure and chemistry, to the effects of tree species whose roots grow in cracks on cliffs and thereby enhance the stability of mountain sides (Scott-Phillips et al., 2014). Other examples are that birds and termites create nests, rats create burrows, bees build hives, while human beings develop tools, machines, and construct buildings to creating shelters. Ultimately, in this process of fashioning their living, all these activities of different organisms influence the structure of evolutionary landscapes, and in one way or the other impact the lives and living conditions of each other (plants and animals). This consequently creates bonds of multispecies relations (Fuentes, 2016).

One important issue of concern illustrated by these kinds of interconnectedness and the development of mutual ecologies is the fact that interactions are integrative, shaped by the synergy of both humans and animals, who together build and negotiate their co-produced ecology (Fuentes, 2009). These kinds of co-constructed ecologies have been demonstrated in many different contexts. In Thailand for instance, Leslie Sponsel and colleagues have shown us how coconut picking macaques are integral members of the human communities in which

they live. The labour of macaques is shown to not only form a core part of local economies of people, but shifts the structural ecology of coconut picking, and creates a long-term multispecies bond with humans across economic and social lines (Sponsel et al., 2002). Likewise in Bali, it is observed that humans and long tailed macaques coexist and interact on daily basis within the social and structural ecological sites they share. This includes the villages and shrines in forested patches, and in temple complexes where they participate in the religious practices of people – acting as emissaries that transport ritual sacrifices from the human world into the spirit world of gods, spirits, and souls of the dead (Fuentes, 2010, Fuentes and Gamerl, 2005, Wheatley, 1999). Although both examples are insightful in our thinking about multispecies dwelling as an entanglement of mutual ecology between humans and other beings, the latter is particularly useful for expanding our knowledge of how dwelling transcends the home, and how it entails relations with other domains and entities beyond the physical space. Similarly, dwelling in *Nyayetahun* does not only transcend the spaces of the built structure of the home. Practices of dwelling also exceed the mundane world and entangle humans and animals in the spiritual world. Practices such fishing, clearing of the forest for food cultivation, hunting and even housing construction all involve transactions with spiritual agencies. These livelihood and religious practices are done with proper adherence to the spiritual realm, which are essential features of the ways that people engage with their world. As a matter of fact, to properly dwell and construct a meaningful life in the village, a person's activities must be in tune with these different aspects of the universe – the earth, sky and spirit world – and all these interactions entail practices that are not confined to the domestic space of the house.

As I describe in this thesis, the spatial and ecological overlap between people and other nonhuman beings in *Nyayetahun* is substantial. The daily life of villagers is inseparable from the social ecology of animals of different species, and interspecies mingling takes place across multiple sites within and outside the domestic spaces of the home. Moreover, not only are these shared spaces and the interactions that take place there ecological, but they are also physical or bodily, as well as spiritual. Focusing therefore on these various sites of multispecies interface and the daily practices of living (such as animal husbandry, swidden cultivation, gardening, hunting, and fishing) that leads to these mutual ecologies is a rich

arena for anthropological enquiry into the different types of relations that are shared by humans, animals, and the environment.

Dwelling as a multispecies endeavour

The approaches to thinking about dwelling that I have discussed, and which help us to see dwelling not merely as a human activity but involving interactions with other organisms and entities, sit within a wider intellectual endeavour that attempts to find new ways to think about human relations with animals and other nonhuman beings. This perspective, which is often referred to as multispecies ethnography (Kirksey and Helmreich, 2010), moves away from earlier scholarship that reflects an anthropocentric privileging of human impacts on nonhuman worlds. Multispecies perspective have emerged as an intellectual shift that critically reworks ideas of human exceptionalism by considering the non-human domain, and provides insights that consider the different ways through which both humans and animals actively participate in the coproduction of life for the other (Ingold, 2013, Kirksey and Helmreich, 2010, Kohn, 2007).

As argued by Eben S. Kirksey and Stefan Helmreich (2010), a multispecies approach seeks to remove animals from the anthropological margins and bring them into the foreground alongside humans, thus bringing them from the realm of *Zoe* or bare life (that which is killable or used as objects for human utility in the form of food, economics and symbols) – into the realm of the *bios* (having legible biological and political lives just as humans) (Agamben, 1998). This approach acknowledges the interconnections between humans and other creatures and the impact that they have on each other's existence. Such insights are important to this study because they provide ways to examine human beings and animals as subjects, and to account for the different aspects of dwelling in which the lives of people and animals are entangled.

This thesis shows that dwelling is a multispecies endeavour. It pursues this analytical focus by discussing practices that shed light on how people and animals engage in interactions through their processes of dwelling and describe how dwelling plays an important role in producing and shaping relationships, and various kinds of actions and encounters with other non-human beings. Previous work in anthropology taking a multispecies approach is useful in examining

different sites of human-animal relations, including the subjectivities of nonhuman beings as social agents and how their lives are connected to humans (Tsing, 2013, Fuentes, 2010, Haraway, 2008, Fuentes, 2006), how political ecology, structural powers and material conditions produce and influence multispecies entanglement (Nading, 2013, Paxson, 2008), and in understanding practices of hunting and the idea of semiosis, personhood and trans-species communication between humans and other organisms including spiritual entities (Kohn, 2013, Kohn, 2007, Willerslev, 2007, De Castro, 1998). However, this thesis suggests that all of these different kinds of multispecies interactions are relational categories that emerge from the various ways in which people dwell. With these ideas, this study opens up theoretical and methodological space for considering dwelling as a mode for understanding multispecies relations. A dwelling perspective identifies and offers ethnographic insight into a variety of everyday practical experiences of how people live and inhabit spaces, and the roles that these living activities play in providing opportunities for human relationships with other beings.

Implications of ideas of multispecies dwelling for medical anthropology

Taking together all these insights about dwelling as a multispecies activity, this study has important implications for thinking in medical anthropology. It also has practical implications for public health, particularly in the post Ebola context where there is increased attention to zoonoses. This is because even though humans and animals share intimate affinities that are often beneficial to each other's wellbeing (Haraway, 2008, Fuentes and Hockings, 2010, Kirksey and Helmreich, 2010), their close encounters also provide opportunities for unpleasant and problematic consequences that are often threatening to the welfare of humans, animals and their environments (Atlas and Maloy, 2014b, Nading, 2013, Brown and Nading, 2019). As such, having very good understanding of these various forms of multispecies relationships and how they are produced is pivotal in preventing and mitigating these problems of human-animal health and wellbeing.

Across sub-Saharan Africa for example, people are familiar with animal pests that infiltrate homes where they destroy reserved food grains and property. Animals are also known by people to raid farmlands and ravage crops. Rodent pests for instance are identified as a major

cause of food loss in farming communities in Africa, and rodent predation on crops either through direct consumption or spoilage threatens food security (Mulungu, 2017, Mulungu et al., 2003, Stenseth et al., 2003, Swanepoel et al., 2017). Other consequences of these encounters include injuries of humans and animals (Kioko et al., 2006, Ladan, 2014). All of these interactions in their different ways have serious implications for the issue of health and wellbeing across species boundaries.

As seen in recent times, there is increasing concern about the emergence and re-emergence of infectious diseases transmitted into the human population through contact with infected animal hosts. In fact, some of the most dreadful diseases affecting humanity today come from animals, such as the avian influenza, Lassa haemorrhagic fever, Ebola virus disease and the COVID-19 disease (Nading, 2013, Mackenzie et al., 2013, Saéz et al., 2015, Porter, 2019). Although research in medical anthropology has long examined theories of infectious diseases (Green, 1999), as well as investigating the social and cultural contexts within which diseases emerge (Hewlett and Amola, 2003, Farmer, 2001), there remains room for better understanding the alarming threat of these emerging and re-emerging infectious diseases of zoonotic origin. One reason for this is because public health knowledge of the local conditions of human-animal contacts and the processes through which these health risks emerge remains poor, and the establishment of sustained transmission from initial spillover events often involves the interplay of complex mechanisms that remain difficult to understand (Magouras et al., 2020). These complexities in understanding zoonoses have been for instance demonstrated by the ongoing coronavirus disease (COVID-19) pandemic, which resulted in not only an unprecedented global public health threat, but a social and economic crisis. As with the severe acute respiratory syndrome (SARS), highly pathogenic H5N1 avian influenza and Ebola, the COVID-19 pandemic reminds us that our humanity is still faced with the challenge to prevent and mitigate the problems of diseases originating from animals. These challenges in the public health response to these outbreaks show the importance of increased focus to examine or maybe re-examine different human-animal interfaces, to better identify and understand the potential sources that facilitate and create risks of pathogenic spill over for zoonotic disease emergence.

This thesis provides evidence of how these issues of human-animal health are entangled with peoples' modes dwelling. It shows that though there is popular concern interms of how direct and indirect contact with animals and their body fluids create opportunities for cross-species transmission of disease to humans, these contacts are not situated to a specific domain or activity. Because, many of the contacts and possible pathways that amplify zoonotic diseases appear to take place both in domestic settings of the home and outside the realms of the domestic space. In a sense, these multispecies contact zones are produced by the dwelling practices of people, and which consequently offer opportunities for various kinds of entanglements with animals. For instance, anthropological work on how people encounter multimammate mouse (*Mastomys natalensis*) – which is considered to be the reservoir for Lassa virus – suggests that the material construction and social organisation of domestic spaces including food storage practices and the use of everyday domestic objects and sleeping or resting arrangements create possibilities for risky encounters with mice (Brown et al., 2015, Bonwitt et al., 2017a). Other studies have drawn attention to the significance of socio-economic practices that are connected to farming and hunting in producing risky contacts between humans and wildlife species (Marí Saéz et al., 2015, Wang and Crameri, 2014, Subramanian, 2012). All these practices are constitutive of the ways that people live and interact with their environment. Therefore, approaching them from the dwelling lens can provide a broader view of understanding zoonotic pathways in a manner that exceed the narrow focus of public health.

A final contribution of this thesis to human-animal health is in broadening out narrow public health framings of risk. For example, public health policies and responses to zoonotic diseases are usually skewed towards a few animal species, such as mosquitoes for malaria, multimammate rats for Lassa fever, dogs for rabies, and bats and monkeys for Ebola. In fact, control measures are often biologically framed around disease-specific approaches, and are implemented through strategies that largely target humans, such as vaccine development, surveillance systems and drug stockpiles to combat diseases once pathogens have emerged (Porter, 2013, Wolfe et al., 2005). Moreover, the idea of separation has often been the hallmark of transmission control (Porter, 2019, Bonwitt et al., 2018), based on the conviction that keeping humans and animals apart can break the risk of disease transmission from animals to humans. These approaches often lose sight of the wide range of relations that

people have with animals and lack understanding about how these interactions are embedded in people's socio-cultural practices, their local economies and livelihood activities. These kinds of limitations have in many instances undermined public health intervention efforts. A good example in the context of this study reflects in global health response to the 2013-2016 Ebola outbreak in West Africa, where early response to the epidemic included problematic messages, like the one that restricted people from hunting and eating wild animal meat. This approach threatened the relations that people and animals shared, and consequently undermined disease control (Bonwitt et al., 2018, Seytre, 2016, Wilkinson and Leach, 2014).

In this study, I provide insights into some of the various ways in which people interact animals, and I broaden the scope of conceiving human-animal relationships, and forms of contacts with animals that are not often reflected in public health purview. This study shows that human-animal relationships are related to the dwelling processes of people, and building on these ideas, it helps to remind us that the achievement of health and wellbeing cannot be kept separate from issues of livelihood and food subsistence. This affords us useful information to remember that when thinking about zoonosis from our biological relations with animals, we should also consider it within frameworks that are developed around broader understanding of the various forms of contacts and socio-economic practices within which these human-animal interfaces take place. I suggest that such an approach requires a strong focus on how people inhabit spaces and how they make use of natural resources, as it is these practices of dwelling that create opportunities for different dimensions of multispecies entanglements.

In the next section, I provide an outline of the subsequent thesis chapters, giving a brief description of what each chapter contains.

Outline of thesis chapters

Chapter 2 describes the local context of the study, beginning with some background about the country and then going ahead to focus on the people that this study is about. This is important because with knowledge of the background of the study site, we can begin to have

a clear picture of the modes of existence of the people who live there. By this I mean, their way of life, their livelihood, and economic activities. Taking these ideas together, this chapter sets a backdrop against which to understand subsequent discussions concerning why these rural people are in intimate relations with the natural environment and with other nonhuman beings and entities.

After this background information about the study site, I proceed to present the methods that I used to conduct this research. Chapter 3 begins by describing my community entry strategies. This includes the observance of traditional courtesies, seeking clearance from the political and traditional leaders, and informed consent from the locals. I go on to discuss the specific activities that I undertook to understand these human-animal interactions in this village community. This is followed by my experiences and challenges, ethical considerations and dilemmas faced in the field. I then conclude by describing the strategy of data management and analysis.

In Chapter 4, I conceptualise the domestic space of the house as a sphere of dwelling, and I describe the village environment which is a key site for dwelling for villagers. I discuss the housing architecture, how houses are built, and the ways people live in them. I argue that an understanding of the materiality of the houses, their organisation and how people inhabit them is crucial for recognising how dwelling transcends them. This idea is also helpful in understanding the many ways that houses are multispecies dwelling sites. With these reflections, I then develop the idea of dwelling as an activity that is not confined to the built architecture of the house, but an ongoing process that can take place both within and outside the domestic spaces of the home.

Focusing on these kinds of dwelling and how they transcend the home, I then illustrate how dwelling among villagers occurs in multiple sites – the village, forest, and farm sites. I describe how these spaces are organised and how villagers inhabit them. With this, I show that dwelling among villagers is neither confined to the village or house nor to forest but takes place across multiple spaces though in somehow different ways. Following the kinds of activities that take place in these different locations (the house, village and forest), and how they are entangled with those of other species, I show that dwelling among villagers is

quintessentially a multispecies activity. I suggest that these processes of multispecies dwelling are products of an intersection of ecological, material, social, economic, and spiritual activities.

Chapter 5 discusses the interactions between villagers and animals under the rubric of domestication. I use the idea of domestication as part of the process of dwelling, and with this, domestication becomes a vehicle to examine and understand the practices of rural subsistence and more so to account for the various dimensions of relations that people have with animals that they try to incorporate into their world. In this chapter, I show that the relationship that villagers have with animals goes beyond the narrow idea of economics and property that have often characterised classical discussions about human-animal relations. With ethnographic accounts of the various approaches that villagers adopt in coexisting with animals – including fencing, confinement, trapping, chiefs, and by-laws – I pursue the idea of domestication as a difficult and unfinished ongoing human effort in trying to keep animals in human environments. I argue that domestication of animals involves bringing animals into human social, moral, and political worlds.

Chapter 6 takes a step further to reveal another layer of the relationship between humans and animals in ways that transcend physical interactions and the mundane world, and extend into the spiritual dimensions. It begins by demonstrating that although the domestic spaces of the home and village are often considered to be separate from the wild and spiritual domains, they are not totally distinct spaces. Providing ethnographic evidence, I show that houses in *Nyayetahun* and the village environment itself, are both material and spiritual domains. Even though the physical and the spirit realms are two separate worlds, they are closely linked. In other words, they are two distinct worlds, but they share most of the same spaces.

A particular focus of chapter 6 is the importance of dogs and some other animals in demonstrating ways how nonhuman animals mediate relations between the village and the wild, and between the physical environment and the spirit world. I focus particularly on dogs because of their role in hunting, as hunting is one major activity through which villagers interact with the forest and with other agencies that reside in the wild. With this, I bring into

view the intertwined lives of villagers, animals, and spiritual entities, which helps us to understand that human-animal relations are not just physical but also characterised with spiritual dimension.

The overall analysis in this chapter together shows the intimate ties that exist between villagers and animals, and the ways that these relations are entangled with people's modes of dwelling. It allows for more serious considerations of how animals participate in different aspects of the human world, and challenges the idea that society is strictly under the purview of human activities. It reminds us that the issue of life and existence is not just a human affair, but influenced and shaped by other life forms who are part and parcel of the process of living.

In Chapter 7, I turn attention to the public health implications of the multispecies entanglements that I discuss in this thesis. I begin by discussing various forms of multispecies encounters that are of public health concern. I demonstrate how the ethnographic material I present in this thesis contrasts with current public health messages about the ways that people encounter animals. I argue that measures for zoonotic control and prevention have often narrowly focussed on a few numbers of animal species like dogs, mosquitoes, monkeys, and bats. Moreover, only certain kinds of contacts have been considered, like hunting, food preparation and carrying of animal carcass. In this chapter I suggest that these approaches are too narrow, as they lose sight of the broader scope of human-animal relationships and the varied dimensions of these interactions. I describe other forms of contacts with animals that include touching and playing with animals, and I go on to show how this human-animal interface is linked to people's socio-economic practices. I discuss the role of food and economic security as a central knot in the interspecies connections that I consider in this study. I show that it is largely around food and livelihood subsistence that the lives of villagers and animals as well as their health intersect.

This chapter does not just look at animals as a source of food for humans but considers humans and their activities as a source of food for animals (for example, human blood as source of food for mosquitoes and bedbugs). I pay attention to crop predation by animals, and how the storage of harvested grains, fruits, and vegetables in houses contribute to the abundance of rodents in the homes. This promotes contact with humans and spoilage of food,

which consequently undermines food security and health. I also pay attention to relevant but somehow neglected human contact with bedbugs, as it is also crucial in better understanding and conceptualising the complexities of these relationships that humans and animals share, and their implications on health.

The discussions in this chapter remind us of the fact that the idea of health and wellbeing is bigger than public health concerns around single diseases and focussed on just a few animal species. Health, I argue, is implicated in people's social and livelihood practices and should be therefore approached in a manner that includes economic prosperity and food security. I suggest that paying attention to these issues of economic and food security are crucial components that contribute to the inseparable entanglement between villagers and animals, and it is a key factor that connects their health and wellbeing.

Chapter 8 offers the overall conclusion of the thesis by reasserting the complex and multidimensional relations that humans and animal share. This research expands the purview of human-animal interactions beyond classical representations of these relations in terms of economics, food and property relations. While acknowledging the importance of food and economics in keeping humans and animals connected, this thesis argues that there are social, moral, political, spiritual dimensions of the relationships between humans and animals. As such, we need to consider these different kinds of relations to really understand how people and animals become entangled.

In this era of emerging and re-emerging zoonotic disease threat, this concluding chapter also reminds us of how humans and animals can be entangled in terms of their health and wellbeing. It contends conventional public health focus on few animal species and interspecies contacts and reinforces the importance of expanding attention to other kinds of animals and forms of human-animal contacts, as this is very important for understanding zoonotic disease ecology. Through an exploration of dwelling as a process that takes place within and beyond bounded spaces, this study shows that one significant way of exploring the multiple relations between humans and animals is through the processes of dwelling. It argues that dwelling is a process of multiple species becoming, because it is a process that involves continual encounter with other species. As such, this thesis contributes to

multispecies medical anthropology by arguing that dwelling is a useful methodological tool to examine and better understand multispecies relations in health and wellbeing.

Chapter 2. Background and Social Context of the study

This study is conducted in *Nyayetahun* (given a pseudonym to maintain anonymity), a rural village in the Bo district of the southern province of Sierra Leone. Since this study is about humans and animals, I want to start by noting here that the name and social history of Sierra Leone cannot be complete without imagining or mentioning animals. This is because, the name of the country (Sierra Leone) is rooted on imaginations of an animal (precisely a Lion), by a Portuguese explorer Pedro da Sintra, who upon his visit to this West African coastland in 1462 perceived the mountainous coastal peninsula mountains over the now capital Freetown as the shape of a Lion. Da Sintra thus named it 'Serra de Leoa' or 'Sierra Leoa,' which in Portuguese means 'Lion Mountains,' which was later adapted as Sierra Leone (Taylor, 2014, Fyle, 2006, Alie, 1990). While this story provides a scope to think about the place of animals in the establishment and naming of settlements in Sierra Leone, as evident in very many accounts about the founding of present towns such as Bo Town and Matru Jong, which are towns that originated out of the killing of an Elephant and a Buffalo respectively (Little, 2013), this narrative at the same time exemplifies early Western or European thoughts about Africa as a wilderness or a space full of wild beasts.

The republic of Sierra Leone as it is officially called, and informally *Salone*, is situated on the West coast of West Africa. It is bordered by the Republic of Liberia towards the southeast and the Republic of Guinea in the north and east, and by the Atlantic Ocean to the west and South (Alie, 1990). Archaeological evidence suggests that Sierra Leone has been inhabited continuously for at least 2,500 years (Taylor, 2014). During that period, according to Bankole Kamara Taylor (2014), the country had numerous politically independent native groups, and with several different languages spoken, like the Bullom and the Sherbro.

In 1808 the country's capital Freetown was founded as a colony to accommodate liberated Africans and freed slaves after the abolition of the slave trade in 1807. The country later evolved into a British protectorate that reached much farther inland in 1896 and had its independence from British colonial rule in 1961 (Taylor, 2014, Alie, 1990). However, vestiges of colonialism remain in Sierra Leone's economic, political and governance system, with the

country's strong dependency on its former colonial rulers and on foreign aid for economic and donor support.

Sierra Leone has a population of approximately 7 million people (Leone, 2015), with a tropical climate and diverse environment, ranging from savannah to rainforests, and with a total area of 71,740 km² (27,699 sq mi). The country is divided into five administrative regions, which are subdivided into sixteen districts with Freetown the capital and largest city. There is a total of about 16 ethnic groups, the largest of these are the Temne, found predominantly in the north and central part of the country and the Mende, who are largely found in the southern and eastern regions. Together, these two tribes, the Temne and Mende make up about 60 percent of the total population. The country's history is marked by a dreadful civil war from 1991 to 2002, which accounted for more than 50,000 deaths and left many families displaced (Keen, 2005, Richards et al., 1996). Just when the country was on the path of recovery, it was again hit by the Ebola epidemic of 2014 to 2016. This epidemic further hindered Sierra Leone's economic development and exacerbated the already existing social, economic and political inequalities among the local population (Wilkinson and Leach, 2014).

Though it had negative impact on the social and economic lives of people, the 2014 – 2016 Ebola outbreak was not however just a devastating epidemic but had a lasting effect on public health knowledge. Concerns about the kinds of human-animal interactions and their possible implications have been in the foreground since the epidemic. The Ebola epidemic influenced my interest to engage in this study and helped to shape my fieldwork, more so given that this study was conducted during the COVID-19 pandemic, which also caused some delay in the start of my field work. Response to the COVID-19 pandemic in Sierra Leone was characterised by public health experiences drawn from the Ebola outbreak, such as the restriction on human mobility between towns and villages. However, my previous engagement with villagers during earlier public health campaigns and research conducted during Ebola was useful in navigating this community and in gaining local trust (as discussed in detailed in chapter 3).

In spite of its wealth in natural resources such as diamonds, iron ore, gold, rutile, bauxite as well as arable land for agriculture, there is little to show from all this wealth in the way of development for Sierra Leone's people. The vast majority of Sierra Leoneans live in abject

poverty, particularly in rural communities (Leone, 2015, Taylor, 2014), with lack of access to basic social amenities such as paved roads, piped water or good and affordable health care services. According to the 2015 population and housing census, Sierra Leone is dominantly an agrarian economy. 58 percent of the total number of households are agricultural households, and 86 percent of those households live in the rural areas where they are largely engaged in activities that include crop farming, exploitation of forest products, and with some proportion practicing animal husbandry and fishery. Despite the diversification of subsistence livelihoods in recent years, and with increased dependence of people on non-agricultural income generating activities such as artisanal gold and diamond mining, crop cultivation, hunting, animal husbandry, charcoal burning, and timber logging nonetheless remain a central means of livelihood among rural populations in Sierra Leone. In essence, a majority of Sierra Leone's population is directly dependent on the local environment for their livelihood support. This provides a hint as to the centrality of ecological resources including animals for the subsistence of a significant percentage of the population residing in rural communities; and the people of *Nyayetahun* are no exception.



Figure 3. Map of Sierra Leone Showing Bo district
([https://commons.wikimedia.org/wiki/file:Districts in Sierra Leone 2018.svg](https://commons.wikimedia.org/wiki/file:Districts_in_Sierra_Leone_2018.svg))

People of *Nyayetahun*

The people of *Nyayetahun* are *Kpaa* Mendes – one of three subgroups of the Mende ethnic group. *Kpaa* Mendes live predominantly in the Moyamba district in the south of Sierra Leone.

Generally, Mendes of Sierra Leone belong to a West African linguistic family called Mande, emanating from the same ancestral stock of the Mande speaking people of French Guinea. It is argued that the Mendes were originally located in the Liberian hinterland, from where they moved into Sierra Leone in the eighteenth century and established small groups of settlements based on hunting and subsistence farming (Alie, 1990). These initial settlers set a pattern of life that was dependent on their relationship with the natural environment; as it is still followed in *Nyayetahun*, where villagers rely heavily on their natural environment for their livelihood. The forest provides food from wild plants, animal meat, raw materials for housing construction and tools. Villagers also rely on the forest for medicines from plant leaves, roots, stems, and tree bark.

People living in *Nyayetahun* are primarily subsistence farmers of food crops, predominantly rice, which is the staple food, and cultivated by most farmers if not all. Farming systems are labour intensive, involving rigorous physical work and often for small yields, usually because of crop failure. Crop failures in this village result from various factors, including unfavourable weather conditions caused by climatic inconsistency, shorter fallow cycles which does not allow previously cultivated lands to regain soil nutrients and the lack of resources to buy seeds and to hire the required farm labour. Farm labour is largely provided by members of the same household, including women and children, who have a responsibility to contribute in diverse ways towards yields. Often, communal work groups are hired for farm labour, and this is usually on the bases of labour reciprocity. Farming systems are largely rain fed cultivation, however upland farms are supplemented with valley swamp cultivation for some households, and rice is complemented with other domestic food crops including cassava, sorghum, maize, beans, millet, groundnut and sweet potato (Sheriff and Massaquoi, 2012). Cocoa, coffee, pineapple, banana, and palm oil fruit constitute some of the major crops of economic importance.

In addition, hunting and livestock rearing of chickens, goat, sheep, and pigs are fundamental aspects of livelihood subsistence and economic security for these rural farmers. Wild animal meat also known as bushmeat provides affordable protein for household consumption, and a source of obtaining supplementary income. Livestock are largely kept for economic security. For instance, villagers rely on the sale of their chickens, goats, sheep, or pigs to settle economic needs in times of economic emergency, such as to buy staple food (rice), payment of debts, to cover their children’s school charges and medical bills, and to support their farming activities. This reminds us of the dependency of these people on the natural environment to satisfy multiple needs, and it shows that any threat on their relations with the natural environment and on the lives and wellbeing of their animals can gravely undermine their livelihood, food and economic security.

With this background information of the study site and people that this study explores, I now go on to discuss the method of engaging with these local people ethnographically.



Figure 4. Map of Bo district showing the chiefdom where study site is located.

Chapter 3. Methods of ethnographic engagement

In the *Semebu* (palava hut) – a hut located in the centre of his compound used for meetings and for settling disputes, *Ŋdo Mahei* (the paramount chief, who is the political and traditional head of the chiefdom), and his wife, who is also a teacher, were excited to receive me after a long time since I last went to that community together with other artists for a musical concert, which was aimed at raising public health awareness about the 2013-2016 Ebola epidemic. While I was delighted at such reception that I got from this family, I felt more honoured when I came to know that *Ŋdo Mahei* had delayed his breakfast – a special meal of wheat and ‘*mɔnki sup*’ (soup of monkey meat). The reason for that delay was because he wanted us to have breakfast together, as I had earlier informed him via phone conversation that I was on my way to the village that morning.

This experience is important, in that, on the first day of my official entry into the community I was welcomed with a meal of wild animal meat, and it is these kinds of multidimensional ways in which animals feature within expressions of human relatedness that this thesis seeks to explore.

In order to explore these issues of human animal interactions described in the introduction, I pursued ethnographic field work over a period of six months (from May 2020 to October 2020) in a remote rural village community in the Bo district, Southern province of Sierra Leone, which I refer to as *Nyayetahun*. *Nya ye tahun* is a phrase in Mende which means ‘my hometown,’ and the inspiration to use this as a pseudonym to replace the name of the village was drawn first from paramount chief’s wife, who each time I was leaving the house in the morning to engage in my one and a half mile walk to the village, would ask me in Mende ‘*Bia nar lima bi ye tahun?*’ (Are you now going to your village?). Likewise, upon my return in the evening, she would ask me again ‘*Gbeva bi ye tahun?*’ (How is your village?). Secondly, the way of life of villagers in *Nyayetahun* is like those of the people in my paternal hometown. Just like the people in my father’s village in Moyamba District, villagers in *Nyayetahun* as mentioned in the introduction are *Kpaa* Mendes.

I situated my study in *Nyayetahun* because of my previous work in some of the villages around that community, particularly in *Dambala*, the town's headquarter of the chiefdom. As a matter of fact, the inspiration for this study was drawn from that work. The time I spent in that community as a research assistant then, observing the embeddedness of animals in the lives of villagers triggered my interest in studies concerned with human-animal interactions. Moreover, through that study I had proved credible in the eyes of the *Ndo Mahei*, the *Lavai* (chiefdom speaker) and my research interlocutors, and I already had familiarisation with the environment. With this, in addition to my engagement as a musician in public health sensitisation around that same community, I knew that I already had a base that could make it easier for me to establish trust rather than going to a community where I was less familiar with the people.

In *Nyayetahun* I engaged in active participant observation, that involved bringing animals to the forefront squarely alongside their human companions with whom they co-exist. By this I mean that I observed the intersection between humans and animals as well as their shared environment. I examined the different ways that different species were implicated and participated in each other's worlds. I paid attention to how people came in contact with animals and how these encounters were embedded in other social processes.

Since dwelling practices within this village community took place in multiple sites, ranging from the village, the farm site and forest (as described in the introduction), I attended to the different sets of multispecies interactions in these different locations. In each of these sites, I focused on the moments of interaction and other points of contact among villagers and animals, and the various ways in which they related to one another. In the village, for example, I focused on how people and animals (wild and domesticated livestock) shared the environment. My key concerns became how they all related and coped with each other's actions.

I also was interested in how villagers organised their living spaces, and the ways their domestic and livelihood practices and the material infrastructure of their homes provides opportunities for interspecies co-habitation. With this, in addition to following the social, economic, spiritual, and political processes of villagers, I was able to explore a broader picture

of human-animal relations in ways that exceeded my initial limited knowledge of this relationship. In other words, this approach allowed me to explore these interactions from different axes, and to discover the numerous forms of connections between people and animals.

In the sections that follow, I describe my community entry strategies. They included the observance of traditional courtesies and seeking informed consent from the locals, and specific activities that I undertook to understand human-animal interactions. I also discuss my experiences, challenges, and ethical considerations and dilemmas that I faced in the field. I then conclude this chapter by describing my approach to data management and analysis.

Community entry strategy: traditional courtesies and informed consent

Prior to entering *Nyayetahun*, I had earlier engaged with veterinarians from the Ministry of Agriculture Forestry and Food security (MAFFS), who were involved in vaccination exercise of small ruminants in some selected villages in four chiefdoms in the Bo District. In that engagement with the veterinary team, I had observed how lack of local trust almost completely undermined efforts by those veterinarians to vaccinate livestock in some villages. In many of the villages we visited for example, it was only upon the intervention of the town chiefs who assured people about the safety of their animals, that many villagers brought their animals for vaccination. This experience reminded me that getting the permission of the gatekeepers such as political and religious leaders was key in establishing confidence and a good working relationship with other members of the host community. In that respect, my initial concern when entering *Nyayetahun* was to deal with the power dynamics that prevail within this community where my study is situated. One aspect of this was my engagement with the chiefs (who are the key source of authority in these rural village communities) and the observance of traditional courtesies.

In this section, I start by discussing my meeting with the *ŋɔ Mahei* (paramount chief) and then go on to explaining how I met with the *Taa mahei* (town chief) and the people of *Nyayetahun*. Discussing these community entry strategies that I used in this study is potentially relevant for other researchers, particularly ethnographers who will intend to study

in these kinds of rural communities where due consideration to power relations is crucial in gaining local trust and confidence.

Meeting with the *Ŋɔ Mahei* (paramount Chief)

For the entire course of my five months ethnography in *Nyayetahun*, I was lodged at the *Ŋɔ Mahei's* (Paramount Chief) compound in Dambala, which is the chiefdom headquarter town of the Selenga chiefdom. *Ŋɔ Mahei* is the political and traditional head of the chiefdom to whom other lower chiefs such as the *Lavai* (chiefdom speaker, who often acts as the vice to the Paramount Chief), *Patii Mahei* (section Chief) and *Taa mahei* (town Chief) are answerable.

Historically, chieftaincy as a traditional institution of governance in Sierra Leone, dates to pre-colonial days. During those eras, there were different kingdoms founded and governed by either popular warriors, farmers, or hunters, many of whom were referred to as kings and Queens (Conteh, 2013). While this suggests that these traditional leaders existed in the country long before the first contact with European colonialists in the 15th century, the contemporary chieftaincy status associated with paramount chiefs in rural Sierra Leone has its roots in an imposed system of customary and formal authority dating back to the British proclamation of the protectorate in 1896. During this period, colonial officers introduced administrative systems of indirect rule beyond Freetown and the coastal hinterlands (Parker et al., 2019).

Like in other parts across British West Africa, the system of indirect rule was viewed by colonial administrators as a strategy to maintain law and order and to decrease the cost of local government administration by keeping in place the existing local rulers and ruling through them (Acemoglu et al., 2014). During that time, paramount chiefs were appointed from a small pool of elite families charged with the responsibility to exercise authority over the local area. Despite the freedom they had to rule their people as they pleased, chiefs derived their legitimacy entirely from the colonial government and their rule was supported and supervision by the British officials to whom they were accountable. Subsequently, this system of selecting paramount chiefs evolved into a practice of election by a tribal authority

made up of local nobles, with candidates normally holding the position for life unless they were removed by colonial authorities (Jackson, 2007).

Since the end of colonial rule in 1961 when the country gained independence from the British, all successive governments have continued this practice of recognising paramount chieftaincy as a traditional institution (Conteh, 2013). In a similar way as in the colonial days, today, paramount chiefs are elected by chieftom councillors from hereditary families known as 'ruling houses' and they can only be removed from office in accordance with the law, otherwise they rule for life. Chiefs are supervised and accountable to the central government through the ministry of local government and are considered intermediaries between their subjects and the central government. They are responsible for ensuring that government policies are implemented at the local level, while they communicate local concerns to the central government. For instance, during the Ebola epidemic, their authority was crucial in collaboration with international and national Ebola responders in implementing public health mitigation measures and enforcing local compliance (see. Richards, 2016). Similarly, they played a significant role in implementing public health measures in response to the COVID-19 pandemic in these villages.

In my meeting with the paramount chief, as I have earlier mentioned in the ethnographic vignette above, I formally explained to him the nature of my project and its benefits to human and animal health and wellbeing. For transparency, I also informed him about my earlier visit and the discussions I had with the *Lavaii* (chieftom speaker) who upon my first visit accepted my request in the absence *Ŋdo Mahei*. Both *Ŋdo Mahei* and his wife consented to give me the enabling space and provided me with free lodging throughout my stay. As a demonstration of their commitment, they even began to inform me about some households that were renowned for hunting activities in the village, stating that I could work closely with them for my project. In fact, two of the farmer hunters that they mentioned became my key consultants about questions relating to communal net hunting with dogs.

At the end of that discussion, *Ŋdo Mahei* referred me to the *Taa Mahei* (town chief) who is the head of the village (*Nyayetahun*). The *Taa Mahei* oversees the protection of the lives of humans as well as non-human animals, crops, and property of his people. He mediates and

settles disputes among villagers, and between villagers and animals as well as between his people and those from other villagers. The consent of the residents of *Nyayetahun* to accommodate me in their village was critical to my project outcome. Many interventions and research efforts have failed because the ideas were imposed from higher authorities without the full consent of the locals. Even though the local people might have accepted me in their community because of not wanting to go against the instruction of their *Ŋɔ Mahei*, such situations can breed an atmosphere of suspicion, dissent, or hostility. Having that in mind, with the approval of the *Ŋɔ Mahei*, I convened a meeting with the villagers of *Nyayetahun* and in attendance was the *Taa mahei*, the *Ŋyanga Tigɔmui* (women's leader), and other village elders, men, women as well as children. The consent and participation of all these different categories of people was significant to the issues of human-animal interactions that this study explored.

Meeting with the *Taa Mahei* and villagers in *Nyayetahun*

Going to live in a Mende village community in Sierra Leone as a *hotei* (stranger or visitor) often requires the observance of the traditional rites of giving *fama loi* (greeting kola) (see. Ferme, 2001 p. 112 - 119) and *Ŋjalei* (libation in recognition of the ancestors and deities) if possible. As in many African societies and ethnic groups, the idea of *Ŋjalei* and sharing of *Toloi* or Kola nut are very important aspects of the Mende tradition, and of great social and cultural significance.

Kola nut is a fruit from the *Cola nitida* tree that grows in tropical forests in West Africa. It historically functioned as a currency and was used as a material expression of significant aspects of Mende sociality (Ferme, 2001). Its symbolic relevance is reflected in its role in mediating between visiting strangers and indigenous landlords, (Ferme, 2001, Brooks, 2019). Kola nut is often given as a symbol of respect, hospitality, and friendship. It is often offered to guests during weddings, funerals, and naming ceremonies, as well as for medical purposes as a token to a native doctor. *Ŋjalei* on the other hand is libation. It is a ritual of pouring liquid – preferably alcohol (such as gin) – as an offering to the souls of dead ancestors i.e., the *Ŋdeblaa* (those ancestors who are long since dead to whom immortality is attributed), the *Kɛkɛni* (those who have recently died and whose names are still within the living memory),

and to *Ŋgewɔ* (the supreme God) as a sign of reverence. The pouring of *Ŋjalei* is usually accompanied with some spoken words or speeches that invokes the names of the ancestors or deity to whom the offering is made. Tales of recent happenings in the village and purpose of the offering is expressed, followed with prayers and requests such as for protection, peace, and abundance of good things. The remainder of the water or alcohol (as the case may be) is drunk by those present. Some people may rub it on their forehead and other parts of their body in the belief that it attracts divine grace, protection, and fortune.

The tradition of giving *Toloi* or *fama loi* (which at the present time is given in the form of money) is a symbolic way of demonstrating respect to your host. There is no specific amount of money for *fama loi*. In fact, *fama loi* is usually a small amount of money which is supposed to be accepted with blessings; what is more important is the intention of establishing relationship. The acceptance of the *Toloi* and *Ŋjalei* by the host suggests that the host has a social, moral, and political responsibility to ensure that the visitor is safe and lives happily within the community.

During my meeting with villagers, I presented through the *Taa Mahei* a bottle of wine as *Ŋjalei* and a financial token of the sum of one hundred thousand Leones (about £ 10) as the 'greeting kola' or *fama loi*. This was expected to be distributed among the locals (authorities and elders) as a sign of respect, friendship, and a request for hospitality. The observance of these entry courtesies served as a demonstration of respect for the local traditions and a first step towards immersing myself into the community.

Following that presentation, I explained to them my purpose of being in their village. I told them about the main objectives of my project, its relevance, and the nature of data collection. I also informed them that even though the *Ŋɔ Mahei* had given me his approval, their consent was very important because they were the ones I was there to learn from, and that my learning could not be attained without their willingness to participate in the process. At this they all laughed. This I believe is because of the thought that it is absurd for me to learn from them since they already perceived me as a celebrity, being that outside academia, I am also a popular musician in Sierra Leone, more so in that part of the country (the Southern

region, Bo District to be specific). I play reggae music with content that speaks to a wide range of social issues, such as social inequality, gender and sexual violence, youth unemployment and human rights. I also use my music to create awareness on subjects related to civic and health education. For example, during the Ebola epidemic, one of my songs 'Ebola is real,' helped to create public health awareness about the epidemic, particularly in the Southern region. Similarly, 'Save the world' a song I recorded to create awareness about Coronavirus disease in the face of conspiracy theories during the early days of the pandemic, was widely aired on television and on radio in Sierra Leone. Certainly, my status as a musician played a critical role in making it easy to integrate myself into the community and to gain the trust and confidence of the locals in such a society where many researchers might find it difficult to gain local trust especially during a period of health emergency and when people were suspicious of strangers. This shows the kinds of creative methodological possibilities that things like music and other forms of arts can offer in our engagement and understanding of human societies.

Music is an important element in the social and cultural lives of villagers in *Nyayetahun*. Villagers use singing and dancing in their socialisation process, like to teach important morals to the young. They use music in performing spiritual rituals, to communicate with divinities and in their secret society initiation ceremonies of the *Sande*, *Poro*, and the *Wonde* society. Music is one way that villagers interact with their environment, and it is certainly part of their dwelling activities. For example, villagers sing and dance a lot during their farming activities. Activities like bush clearing, ploughing, and harvest are often accompanied by music to motivate workers to work together in achieving the common goal, while the singing of certain animals is seen to communicate important messages that they draw on to understand their world. To these villagers therefore, my stay in the village living and working with them was seen as an opportunity to have face-to-face and intimate interaction with someone that they knew as a musician and with whom many of them had previously interacted only through their radio sets or USB Bluetooth speakers or seen on stage performing. Although this is an aside to the main focus of this thesis, considering the important role music played in this ethnographic process, reminds us of the need to decolonise our thinking and try to explore other avenues such as the value of arts in research and rural community intervention.

In his response to my request, the *Taa mahei* (smiling) informed the other villagers that he was aware about my visit to their village, telling them that he was earlier informed by the *Ŋdo mahei*. He then presented the *Ŋjalei* and *fama loi* to them and asked for their consent, to which they unanimously expressed their willingness to accommodate me in their community. At that point, *Masunday* (a young adult male with a wife and three children) volunteered to be the first person to host me on his farm. In the ethnographic section of this thesis his name appears frequently, and this is because the rapport established between us since that first day made him my key consultant.

Participant observation

While in the field, I actively participated in the everyday activities of villagers. Since dwelling in this village community takes place in multiple sites, as established in the introduction, I engaged in observing the activities of villagers and animals both in the village and outside the village environment. I followed people to their farms and participated in different activities that took place in some other spaces in the forest. In essence, I basically took along the precept of Kirksey and Helmreich (2010), who suggested that in order to study animals in their natural environment multispecies ethnography must be multi-sited.

In the village, I helped villagers in some of their domestic activities. I particularly enjoyed joining the women to pick palm kernel seeds. This was important to me because it is one activity that promotes interspecies convergence especially between people, chickens and pigs. Moreover, it was also an opportunity to talk to these women about different issues of concern to them. Many of the things that they shared with me during those conversations were relevant to not only my thinking about human-animal relations but shaped the way I generally interacted in the village. For example, the petty gossip shared during those encounters provided hints that helped me to understand some of the problems in the village, and those problems that were of larger concern to them, such as the issue of bedbugs (see. Chapter 7).

Within the village, I also observed the architecture and domestic organisation of houses, including kitchens and store houses. I took note of the ways the houses were constructed and

inhabited by humans, and how they also played host to animals. Paying close attention to the activities of humans and nonhuman organisms within these spaces (the houses and outside the open layout of the village) and the ways that different species encountered each other helped me to realise the degree to which that these domestic spaces had to be considered as a multispecies domain.

On the farm sites, I participated in farming practices. Taking part in their farming processes from sowing until harvest gave me a deeper understanding of the different activities that villagers undertake during the course of the planting season. Apart from bush clearing and burning, which was already done before I commenced my field work, I was able to observe all the other stages of their farming process, including ploughing, weeding, fencing and crop protection. The farm site as I observed is one of the main contact zones where villagers and a wide range of other nonhuman species converge. My being on the farm with villagers gave me the opportunity to witness how frequently people encountered different kinds of animals. It allowed me to understand the prevailing factors that promote those entanglements and the strategies that people used in dealing with some of the contacts that they considered threatening and unwanted.

In addition to this, I accompanied people in communal net hunting, trap setting and fishing. My participation in each of these activities, particularly net hunting, allowed me to follow animals in the wild. This activity provided insights into how these practices are done and helped me to understand the forms of social relations that they constitute. Communal net hunting help reveal to me some the economic, social, spiritual and political dimensions of hunting in the lives of villagers. I was able to understand the gender issues in the hunting process in terms of participation and meat sharing, the leadership rotation and communication among humans, and between humans and hunting dogs, and the type of languages they used. In addition to helping me follow the role that dogs play in this process such as in helping people navigate the forest, these observations were all insightful opportunities for understanding the importance of dogs and the hunting process itself in ways that go beyond meat provision. This hence expanded my ideas as to why attempts to stop villagers from engaging in some of these practices are difficult and impossible.

Apart from participating in these livelihood practices, I took part in other social events including burial ceremonies, where I made my own financial contributions to burial rites just like other members of the community. This was important because it also contributed to establishing and reinforcing local trust.

In the process of participating in the activities I have discussed, I often shared food and palm wine, which is locally called *Tɔkpɔ loi* (an alcoholic beverage extracted from the sap of palm tree). Food and drink is an important element used by villagers to create and express bonds of relationship and affection. Mariane Ferme (2001 p. 180) has drawn attention to this by observing that sharing of food is the prime gesture of hospitality and trust between parties among the *Mende* people in this region. In a sense, the acceptance and sharing of food is built on (and reinforces) relationships of trust. On this note, the shared consumption of food and drinking of *Tɔkpɔ loi* with villagers (often rotationally from the same cup) was an expression of such acceptance. My being in the company of village men while they took breaks from their farm work to drink *Tɔkpɔ loi* (as a re-energizer) or sitting with them in the evening (in the village) around a gallon of *Kpɔkɔ gei* (portion for the evening) after their day's work, were often moments for chit-chat, fun and laughter. Villagers were usually more relaxed at this time especially after gulping a cup of fresh *Tɔkpɔ loi* accompanied with a cigarette or spliff. It was usually during those moments that they opened up about a wide range of issues, including their personal experiences. They also engaged in gossip about other villagers and events in their village as well as neighbouring villages. I therefore used those times to ask questions and to seek clarifications on relevant and sometimes sensitive issues, many of which they shared with me.

Participating in these activities gave me direct knowledge of the physical environment and helped me gain deep understanding about the subjective and primary realities of the activities of both humans and animals, and the kinds of social, economic, moral, political and spiritual connections that they share. I was able to observe how the people lived within these spaces, the conditions that promoted their everyday interspecies encounters, and the different ways that villagers tried to manage the different dimensions of commensality, competition, and aggression that often characterised these encounters. In short, with participant observation, I acquired a lived experience of the different dimensions of the multispecies interaction that

this study explored. It allowed me to identify gaps and links between what people told me during discussions and what I really witnessed. One example of these gaps is eating of rats. Though adult villagers attributed this practice to children (during discussions), through my observations, I realised that rats were also consumed by many adults.

With that said, my participant observation was more and less participatory depending on the context. By this I mean that, there were situations when my activities in the field was more about observing the issues, rather than really participating in them. For instance, my two weeks engagement with the Veterinary/livestock department of the Ministry of Agriculture, Forestry and Food Security (MAFFS) as they implemented a vaccination measure in their Peste des Petits Ruminants (PPR) inoculation campaign for goats and sheep in some communities in the Bo district as mentioned earlier, was less participatory. During the government-sponsored vaccination exercise which aimed at preventing infectious diseases among small ruminants, we rode together on motorbikes along dusty or muddy roads and traversed different villages where we encountered farmers (many of whom were already suspicious of such government interventions) and their infected livestock. I had the opportunity to observe how the veterinary team engaged with these communities, including the approaches that they used in entering villages and how they struggled to gain the trust of the locals. I also paid attention to what was done to the targeted animals as a form of disease control measure, and I observed the diverse ways that different communities responded to the vaccination exercise. For instance, the enthusiasm of villagers in *Gumahun* to get their animals vaccinated contrasted with the repulsive response of people in *Njalihun* and *Maiana* village, where despite frantic efforts by the head of the veterinary team to convince them, villagers still refused to make their animals available.

In each of the sites visited, I learned that intervention ideas developed at state policy arenas can be influenced and even undermined at the local level. For example, attention to the role of chiefs in effecting local compliance to the vaccination program, revealed how much villagers rely on the opinion of their local leaders to either trust or reject a stranger. Alongside this, observing the different ways that the activities of animals were controlled in some of these villages, helped to widen my knowledge that animals within these rural communities are not just biological beings or mere objects, but are politically implicated in the political

structures of people. In other words, their lives and activities are somehow regulated and protected by the same local political systems that govern villagers (as discussed in chapter 5). All these experiences gained while working with the veterinary team helped to frame my method of ethnographic engagement with villagers and their animals.

Following my engagement with the veterinary team, I also observed the distribution of mosquito treated beds nets to representatives of households at the *Nyimo* town community health post in Bo. Among other things, I discussed with the nurses about the reaction of people concerning the insecticide treated bed nets (ITNs), and I heard the perceptions of some of the recipients about the use of bed nets. This gave me insights into the experience of targeted communities and how some of their experiences conflicted with public health policy related issues and interest. As such, working with the state veterinary team and listening to different reactions of people about ITNs, revealed the limitations that could be involved in assuming that policies can be developed by outside experts and rolled out without consideration to the perceptions of the local for whom they are developed.

Experiences and challenges

My field work was in one way an exciting journey. As someone who enjoys being in the natural environment, my stay in *Nyayetahun* as an ethnographer was a moment of intense interaction with this natural world. Waking up early in the morning to the sound of the birds and cock crow, seeing the blossom crops (wild, and others cultivated for human consumption) and footprints of mammals and antelopes on the ground, viewing the activities of those crawling insects and reptiles that I crossed paths with in the forest, as well as the rivers I crossed along the gravelly road sandwiched with thick forests, provided opportunities to reflect on the idea of sociality from a broader scope. By seeing the ways villagers related with these different environmental bodies, such as the diverse mechanisms that they employed to maintain life in the face of climatic inconsistencies and the influence of spiritual agencies in their social and economic lives, were all important variables in shaping my thinking about human and nonhuman interaction in a manner that goes beyond the human.

Moreover, my ethnography in *Nyayetahun* was a moment of having a deeper understanding about my roots as a *kpa* mende. My late Father was a *Kpa* Mende as I have noted. Although I come from a different district, my studies in *Nyayetahun* gave me an opportunity to live with people whose way of life was not different from my own roots. Through this I was able to understand the reason behind some of the practices of my paternal relatives, and this gave me deeper insight into many of the things that seemed familiar to me, but I had not previously reflected on and had taken for granted. In essence, through this study I was able to better understand why my paternal grandparents and relatives live the way they do. For instance, although I had been visiting my grandmother in the village for holidays and joining her on the farm since I was a kid, it was during this ethnography that I realised that I lacked deep understanding of many of the practices that I was familiar with. For example, I was somehow able to better understand some of the reasons my grandmother shared her bedroom with her chickens and ducks. My familiarity with these kinds of practices, cultural, religious, and social norms made it easier for me to immerse myself into the community. Moreover, communication was made easier and smoother because of my fluency in speaking both Mende, which is the local language, and Krio which happens to be the lingua franca widely spoken in Sierra Leone.

Despite my study addressing a sensitive topic – both in relation to the COVID–19 pandemic (which in public health view is zoonotic but perceived locally as a ploy by the western powers to eliminate the black race), and in relation to the stiff restrictions by government and local authorities which reminded people of the Ebola days (about six years earlier) – there was a willingness on the part of villagers to share with me their personal experiences and allow me into their private spaces. Interestingly, it became a problem not so much about who I was visiting and talking to, but who I was NOT visiting. This is because many villagers from the surrounding villages were concerned about why I was not visiting their own communities, for which they invited me to their farmhouses and villages so that we could discuss the issues I was studying. All of these were made possible because of their desire to interact with me not necessarily as a researcher, but as a musician.

Challenges

Despite the exciting experience which I have explained above, my ethnographic journey was not free from challenges. Firstly, as per my original timeline, the intended duration for my fieldwork was six months and was supposed to last from January 2020 to June 2020. This was however affected by the COVID-19 pandemic and compounded by the late issuance of ethical clearance from Durham, particularly from the University's life sciences ethical review committee. I had intended a follow-up visit to develop a public health intervention, but again, COVID-19 made this unfeasible. Locally, there were stiff restrictions and control measures on the movement of people between districts and chiefdoms as a strategy to break the chain of transmission of the COVID-19 disease in Sierra Leone. This approach of restricting the movement of people I believe was drawn from lessons learnt in dealing with the 2014–2016 Ebola epidemic, when local leaders instituted byelaws that regulated local movement. Roads leading to towns and villages were blocked and people were checked before they were allowed entry into villages, as a way of enforcing the stay-at-home policy. The rule was that, nobody enters a village without the knowledge of the village or town chief, and if the chief did not know the person, that person was denied entering the village (see. Richards, 2016 p. 128).

These laws were not only applied to strangers, as there were also instances of indigenes being denied entry into villages because their long stay out of their village were considered to pose potential health risk to locals. Learning from those experiences of the restriction of movement/stay at home, and its impact in ending the Ebola epidemic, similar approaches were implemented in response to the COVID-19 pandemic. Roadblocks that were manned by local volunteers (village youths and young adults) were instituted. At those roadblocks, people were forced to sanitize their hands by washing hands with soap and water from buckets (placed at the side of the roadblocks) and encouraged to wear face masks before they were given passage. Moreover, any visitor entering the village was to be of the knowledge and approval of the chief before that visitor is granted a stay. Partly because of these restrictions, I was unable to start my field work until May 2020.

Secondly, travelling to *Nyayetahun* was difficult. Like many rural village terrains in Sierra Leone, the road infrastructure is deplorable. It is unpaved and with narrow bridges, dusty when it was dry and very muddy with lots of potholes of water when it rained. If it rained heavily, some parts of the road were often flooded, which made traveling to the village more challenging and riskier, more so when the major means of transportation within these communities is *Okada* (commercial Motor bike taxi). It is in fact because of the poor road conditions that I had a motor bike accident during one of my journeys from *Dambala* to *Nyayetahun*. Although I did not sustain a fracture, I received cuts and bruises on the palm of my right hand and knee which made it difficult for me to write my field notes and use my hand effectively for about a week.

Thirdly, navigating between different spaces like farm sites and households, and between farm sites, forest and the village was another challenge. There were times when different activities of interest to me went on simultaneously in different domains. Also, some villagers were jealous and complained that I was spending more time on some farm sites than others. I managed this by allocating two days to a farmhouse per week, and every week I targeted two farm sites according to a rota. Nonetheless, when there was something of interest to follow-up at a particular farm site, that farm site was prioritised.

Apart from this, another challenge I faced in the field was in relation to some of the economic demands of villagers. There were instances when villagers asked me for financial help for food and medication. Although I often took for them some cooking condiments such as pepper, seasoning (Maggi), salt and candy for the kids whenever I went back to the village from Bo, I usually felt guilty when I failed to honour their request. In two instances, I had to intervene to help them sell their livestock upon noticing their dire need for money. Such as in *Masunday's* case when he needed money to buy more rice grains to sow on his farm. As well as *Zaco* who was economically challenged to take his grandchild to the hospital. In both instances, I had to help them get buyers for their livestock by contacting my friends in Bo who bought the animals at prices that villagers were happy about. They were able to earn more money by selling their animals whole, unlike when they would have butchered and sold it in portions, which would have also taken them more time to travel with the meat to

neighbouring villages to sell. Besides that, the probability for other villagers and people visiting this community to buy the meat was often low.

Ethical permission and dilemmas

This study was approved by the Durham University Department of Anthropology Ethics Committee regarding the involvement of humans in this research. In addition, since animals were observed in this study, approval was also obtained from the University's Life Sciences Ethical Review Process Committee, upon concerns for the potential effect such as pain, suffering, distress and harm that this study could have on animals. Furthermore, permission was obtained from the Ethics Committee of the host University – the Njala University Institutional Review Board (see. Appendix 1). Throughout this project, I gave utmost consideration to those ethical guidelines, and worked in conformity with them. The safety and security of my research participants were of utmost concern to me. I ensured that my study did not in any way render either the research participants, or me as a researcher vulnerable to any potential harm or danger.

Although ethical guidelines demanded that I protect the privacy of my participants and ensure the protection of all individuals engaged in this project, I was however confronted with some ethical dilemmas. For instance, I was often involved in activities that were somehow against these ethical principles, such as being present in situations of hunting, killing, and slaughtering of animals. Even though these activities were considered contrary to animal welfare policies, my presence did not change them in any way. They were in line with the accepted social practices and moral tradition of the community and were therefore approached without any form of prejudice or contempt. In fact, those situations gave me an opportunity to better understand some of these social and economic practices, and the reasons for which they were done.

Confidentiality and informed consent

Ethical guidelines of professional associations such as American Anthropological Association (AAA) states in no uncertain terms that it is unethical not to inform hosts about your project (Robben and Sluka, 2012 p. 359). As James P. Spradley explicitly puts it, 'the informants have

a right to know the ethnographer's aim' (2016 p. 22). They must be duly informed about the research project and must have the right to refuse to participate or discontinue their participation at any point in anthropological enquiry (Robben and Sluka, 2012 p. 360 - 361).

With these ethical guidelines in mind, I was cognisant of the fact that as a social anthropologist I owed a responsibility to my research participants, including humans, animals, materials, and objects under investigation, as well as a responsibility to protect the integrity of the academic and researcher community. On that note, in this study I tried to uphold the ethical principles of a good research practice, and the guidelines of the Association of Social Anthropologists (ASA) (Robben and Sluka, 2012 p. 359). I ensured that the intellectual property rights of my participants were respected, and in that regard, data collected were not used for any other purpose rather than what they were intended for, which are contained in this document.

Research participants were informed about the purpose of my study and reminded of their rights and freedom to participate or not, and their right to discontinue their participation at any time in the information sharing exercise without any potential consequence. In addition, the consent of research participants was obtained throughout the study by way of dialogue (oral consent), which was recorded before undertaking interviews and voice recordings. I also asked for people's consent for all videos and photographs, and every video or photograph taken was shown to participants for their approval before it was considered valid by me. In the case of participants under the age of consent (*under 18 years of age*), assent was obtained from their parents regarding the willingness of the child to participate in the research. I was especially careful when working with children. For instance, I ensured that their parents were aware whenever I was going out with them for fishing or trap checking. In the event where I was requested to share my views with participants, I did that with honesty, trust and openness while respecting their perceptions and opinions about my perspectives.

At the end of my fieldwork, I again had a meeting with villagers just as I did upon my entering the village. During that meeting I shared some of my observations with them and asked for clarifications where necessary. Using my laptop, I played all the videos that I had recorded and showed them many of the photos that I took and asked for their approval to use those

photos and videos before leaving (see. Figure 5). I promised to give them copies of those photos and videos upon their request. This somehow suggests that the idea of consent is not just an individual activity that is embedded in a person's right – as often fantasised in the global north – but can also be a communal activity where permission can be collectively granted by a group of people.



Figure 5. Showing videos and photos taken in the field to my hosts, for their approval before leaving the field.

Respecting confidentiality

The confidentiality of research participants was protected at all stages of this study. As mentioned earlier, it is because of this that I used *Nyayetahun* in place of the original name of the village. Similarly, just as I did with the name of the village, which I replaced with a pseudonym, the identities of participants were also disguised by changes of letters in their names. Moreover, the eyes of research participants were blurred in some of the photos to avoid recognition.

Field notes, photos and audio recordings

In the field, I jotted field notes of events observed in my pocket diary, which I later wrote up in a more detailed description in the later hours of the evening of that day the event was observed. There were times when I had to stay 'home' (Paramount Chief's compound in

Dambala where I was lodged throughout the entire course of my five months ethnography) to write up my field notes while the ideas were fresh. Staying 'home' did not however stop me from continuing my observations at the Paramount chief's compound, which comprised a large extended family and with a deep human-animal assemblage. Besides, I also used the evening hours of those days spent at 'home' to talk to other villagers living in *Dambala*, like the two hunting dog owners that I mentioned in chapter 6.

In addition to the field notes, I also wrote my own personal experiences, feelings, and reflections on unfolding events in the field work setting. Thoughts related to the field work, mistakes, and plans for subsequent activities were also recorded in my personal diary. Some of these field notes, personal experiences and plans formed my weekly report, which were shared with my supervisors in Durham via email. These reports kept my supervisors updated about my progress, and with that they were able to make suggestions on interesting issues that required attention and probing.

With my mobile phone, I took photos and videos of scenes and events relevant to my project. I also used my phone to do audio recordings of some of the discussions, and informal interviews I deemed relevant.

Data management, protection, and analysis

I started managing my data in the field where I checked, reviewed, and reconciled my field notes immediately after interviews and observations for consistency and legibility. Discussions and interviews were all done in Mende, which is the language predominantly spoken in the study location and in Krio, which is the lingua franca widely spoken in Sierra Leone. Interviews were directly transcribed into English, and every data I collected was saved in my laptop and backed up in an external hard drive and on my iCloud and OneDrive account.

Data from observations, interviews and discussions were analysed concurrently and iteratively. Transcripts were read to identify similarities and differences, recurring themes, and categories. All these strategies together with the other activities that I have discussed in this chapter, were used to build the logical evidence of this study.

In the ethnographic chapters that follow, I move progressively outward from the village dwelling space to the farm and forest. I also move from consideration of economic and political status of animals to their roles as intermediaries or instantiations of the spirit world.

Chapter 4. Dwelling within multiple spaces

In this chapter, I give an ethnographic account of human-animal encounters in the domestic and living spaces of the people of *Nyayetahun*, who make a living primarily through their interaction with the natural ecology. To explore multispecies encounters in domestic contexts, I develop an argument about 'dwelling'. As earlier outlined in the introduction of this thesis, I use the concept of dwelling in its original meaning as developed by philosopher Martin Heidegger (1971) – understood in the context of how activities such as building, cultivation and construction belong to human dwelling in the world. Drawing on the work of Heidegger (1971), Tim Ingold (2000) has helped us to understand that the idea of dwelling is not confined to a specific sphere like occupying a house or an enclosed space, neither is it restricted to a particular activity that is situated in a specific domain, such as domestic life as opposed to work life or travel. Rather, he argues that dwelling consists of a whole manner of ways in which an individual or group of people live and inhabit the world. I take up the idea of dwelling in a sense that suggests the involved activities and practical engagement of villagers with their environment in their process of living. This includes their domestic, and livelihood activities. Such as their food production practices, which includes farming, animal husbandry, foraging, hunting, and fishing, their construction of houses, the environment and other material objects, and their religious and spiritual practices, which are all important aspects that constitute their mode of existence and interacting with the environment.

According to Ingold (2000), architecture is part of the dwelling practices of both human and non-human animal organisms, noting that it is for the purpose of dwelling and through its various activities that human beings for example build houses, while certain animals engage in the construction of nests and burrows. In this chapter, I focus both on architecture and building in the domestic setting of the village as key sites of dwelling. The ethnographic material I present in this Chapter shows that although dwelling is primarily a domestic practice, it is not limited to the domestic space of the house. Dwelling in *Nyayetahun* extends beyond the immediate boundaries of the home and the built environs, and occurs in multiple sites within the forest, where livelihood and other activities that support the life of villagers take place.

In this chapter I highlight some of the ways that dwelling activities are situated within and beyond domestic spaces of the home. In order to show how studying multispecies dwelling triggers a reconceptualization of the domestic space as a sphere of various practices, I look at these dwelling spaces both spatially and in terms of human-animal encounters. I begin with a description of the built environments in *Nyayetahun*, which are key sites for dwelling. I discuss the housing architecture including how homes are built, what they look like and how people live in them. I focus on understanding these domestic spaces, their materiality and organisation because they are essential in beginning to think about the ways in which dwelling is a multispecies activity. In that, they reveal more about how these practices of dwelling are shaped by human and animal relations. I.e., how humans and animals occupy these spaces and how they thrive to co-exist within them. In addition to that, an exploration of the materiality of the homes and how villagers live in them is useful in making us to see how dwelling goes beyond them.

Following this, I go on to look at dwelling practices within the village environment, and by this, I mean the open layout and shared spaces in the village, where many of the domestic activities of villagers are done. I describe the village environment and some of the ways that humans and animals encounter each other in those spaces. I then proceed to describe dwelling practices beyond the village and the built environment, and in this way, I bring into view other locations particularly within the forest, where similar activities take place but in slightly different ways. I discuss the kinds of activities that are done within these spaces and how those activities are produced and shaped by human relations with other non-human organisms such as plants and animals. Overall, in this chapter, my ethnographic material describes how multispecies dwelling is centred in homes but extends beyond the house and built environment of village settlements.

These sites are often multispecies spaces, because alongside humans, animals also engage in these dwelling activities, where they alter the environment in order to meet their basic needs to survive. The village environment, and internal spaces of the houses in the village are rarely free of free roaming animals that are often in the verandas, kitchens, or lie at the side of houses to take rest and seek covering from the sun or rain. For instance, pigs are usually found lying down very close to the foundations of the houses, particularly those houses that

are not plastered with cement, where they dig up burrows to prey on earth worms found in the mud, thus causing structural damage to the walls of the houses. Because of this damage, villagers are often faced with the responsibility of driving pigs from lying close to their houses. Sometimes they are pelted with stones or chased with sticks, and when I asked why the pigs were often chased away from the walls of these houses, *Hawa*, one of the women in the village responding to me saying in *Krio*:

'They dig up the house in search of the earth worms in the mud, that is why we chase them away each time we see them lying close to the walls of the houses. If you allow them, they will dig up the walls and create a passage through into the rooms.'

Explaining this further, *Komɛh* another village woman added that if the pigs' activities are ignored and they are given the opportunity to be continually lying very close to the houses, they can even break the walls, especially if the walls are not plastered with cement.

From my observations, all the houses in the village had pig burrows, including the ones plastered with cement, on which there were also traces of pig burrows along the base of their foundations. This character of digging burrows is a behavioural pattern of pigs not just because of food finding as explained by villagers, but to also get comfort, as it is usually when the sun is hot that the pigs will be lying close to the walls of the houses, and use those burrows dug around the houses to cool off from the heat of the sun. These activities of pigs are important to this discussion, because they clearly demonstrate the kinds of mutual ecologies (Fuentes, 2010) that villagers and animals share. This example of the relationship that pigs have with the houses in the village, along with other ethnographic examples that I show of how other animals share these spaces with humans, are useful in making us cognisant of the ways that the domestic and material spaces of the houses are important to both humans and to the non-human inhabitants of the environment. Drawing on these kinds of examples is particularly helpful in illustrating the kinds of ongoing multispecies dwelling that takes place in this village, and how animals like people in their diverse activities of living shape these shared dwelling spaces.

Sites of dwelling: The house

'Homes in *Nyayetahun*?'



Figure. 6 and 7. Mud houses in *Nyayetahun*

The structures in the above photos are houses, they are the main infrastructures for dwelling and are what villagers identify as homes. These structures are used for providing shelter, storage, and protection for household inhabitants. They are largely built with natural ecological materials collected from the environment, such as sticks, plant fibre and palm thatch from the forest. The designs and structure of the buildings are predominantly what is termed 'traditional.'

In rural Sierra Leone, 'traditional houses' are considered as houses that are constructed with earth mud walls and sticks and roofed with palm thatch. Although changes are happening (as has most certainly always been the case) and various processes are obviously having an impact on housing architecture given the active and responsive nature of dwelling to changes, these changes are not part of the same obvious trajectory everywhere. It is not all households in the village that do meet the economic cost of replacing mud bricks with concrete, or thatched roof with corrugated metal roofing sheet. The construction of 'modern' houses is expensive and in *Nyayetahun*, an economically poor community where subsistence farming is the main source of livelihood, the means for villagers to afford modern building materials remain a challenge. Therefore, largely because of this economic constraint housing

infrastructure in the village is typically consistent with the traditional housing pattern, with a reliance on the use of earth mud bricks, and wattle and daub building method of construction.

Wattle and daub is a traditional composite building method that involves the construction of walls of houses with woven sticks (wattle) tied with bush ropes (stems of plants and tree fibres which substitute for nails). The gaps on the woven lattice sticks are filled or daubed with sticky earth or mud often mixed with pebbles and plastered (von Seidlein et al., 2019). This method of housing construction utilizes resources and materials in the environment, such as tree trunks, sticks, ropes from plant and tree fibres, palm thatch and other resources like earth mud. All these materials are easily acquired from the surrounding area particularly from the forest and with little or no financial input required in accessing them. Nevertheless, these locally available building materials are in themselves an attraction for other non-human organisms such rodents and insect pests. The porous nature of the materials that villagers use for house construction means that houses are easily penetrated by animals and creates room for the harbouring of rodent and insect pests in homes. For instance, the palm thatch used to roof houses is rodent friendly, it provides an enabling environment for climbing rats to hide and build their nests in the roofs of houses from where they can access the internal spaces of these structures and cause structural damage, food contamination and spoilage, emotional stress, and the increased risk of disease transmission to household inhabitants. While this does not suggest that metal roof houses are free from being raided and inhabited by animals, traditional mud-wall and thatch roof houses are known to promote and increase the possibility of attracting and harbouring animals in households as compared to houses made from cement bricks and with metal roofs (Bonner et al., 2007, Tusting et al., 2017).

Generally, houses in *Nyayetatun* have open eaves with an alignment of branches of sticks. In some cases, locally made mats from plant fibres such as palm straws are crossed over the ceilings, and the internal spaces between the ceiling and the roof are used as storage spaces for rarely used household items and food grains. This certainly is a common attractant for rats and mice movement into these spaces. Doors and windows are made from unpolished wood and are not firmly held to the frames. Many of the doors and windows are infested with wood boring insects, so too are the tree trunks used as pillars in the walls. The doors and windows

have openings at their construction joints and there are also openings towards the lintels and at the threshold of the doors, all of which are pathways for animals to slip in.

The interiors of the houses have limited spaces for occupants, and with poor ventilation, which consequently affects healthy airflow. Rooms and corridors are often dark, and even when the windows are open in the afternoon there is still limited light inside the houses. The walls are rough and provide hidings for bed bugs and a variety of crawling insects, while the floors are pounded with earth mud and hence making the interior of the houses very dusty, meaning that they can be easily penetrated by rats to create burrows. On the other hand, houses paved with cement have cracks on them, and between those cracks black ants can usually be found, whose bites often cause severe pain to children as well as adults.

Household furniture is predominantly made with unpolished wooden materials, it includes long wooden benches and tree logs which are always in the verandas of houses. Wooden chairs and old metal chair frames on which boards are tied with ropes are used to provide seating. The gaps and joints of wooden tables, benches and chairs have traces of wood bugs and provide harbourage for bed bugs and other insect pests as well. Interestingly, chairs and tables are often moved between households, which demonstrates a kind of communal use of these materials. For instance, if there is a guest in the next household, it is common for a chair to be moved to that house for the guest to sit. This communal utility of benches, tables and chairs makes the movement of insects harboured by those furniture possible, as the furniture becomes a vehicle through which they are inadvertently transported between households.

Inside the houses, many people sleep on the floor and on palm leaflets used as a mattress, which are often covered with old bed linings and worn-out clothes. Bed frames are old and weak, built with a blend of unpolished board and timber wastes and with dried branches harvested from the forest used as the bed base on which the palm leaflets are spread. All these materials for sleeping are usually infested with bedbugs, and as such provide an interactive zone for people to have contact with bedbugs. Because of that, taking palm leaflets and beddings outside to spread on the floor when the sun is hot is part of the daily routine of people (*see fig. 8 and 9*). In some cases, beddings are even steamed in a basket placed on top of a pot of boiling water (*see fig. 10*), and with bed frames sprayed with hot

water as a way of dealing with the discomfort that bedbugs pose when people go to bed at night. This process of bedbug control, which is seen as being part of their domestic routine shows how the co-existence of villagers with animals interfere and influence the timeline for their daily livelihood activities.

Farming tools and cooking utensils such as mortars, pots, plates, and spoons – which are usually left unwashed until they are reused are kept inside the houses (together with leftover foods) specifically in the bedrooms to be eaten the following morning. Similarly, chicken coops are also kept inside the houses either at the corridor or in the same living rooms with humans, and this is usually done to protect chickens from theft, snake bites and poor weather conditions. This in its own way demonstrates the forms of multispecies dwelling practices and the centrality of the material environment in these processes of dwelling among villagers.

As my ethnographic description is revealing, the house is a multispecies space. Though a property of its human inhabitants, it is also associated with the activities of non-human animals to whom it is as well important for their dwelling. During these interactive processes, animals alter these infrastructures by creating their own niches within the existing structures. In the event, they often cause structural damage thereby giving villagers the responsibility to keep their houses continually under repair. Consequently, in response to the circumstances resulting from the actions of interference by their non-human neighbours, more burden is placed on the time and resources of people for other productive activities.

But that notwithstanding, if we say that construction is part of dwelling (Ingold, 2000, Heidegger, 1971), and dwelling as I have argued is a multispecies activity that involves interactions with other beings within the environment in which one lives, then it is right to say that these infrastructural alterations caused by animals and the repeated engagement of villagers in repairing these structures in reaction to the activities of animals are all constituent processes of their ways of dwelling with others. Having said that it is however important to note that the process of multispecies dwelling is not exclusively contained by these material infrastructures, nor is it limited around them. The diversity of the processes of dwelling in *Nyayetahun* is something more expansive, as it includes other parts of the village and natural

environment like the shared and open areas of the village, as well as sites within the forest, and which from an outsider's view could be described as a non-human inhabited space.



Figure 8. Palm leaflets that villagers use as mattress placed outside for sunning.



Figure 9. Woman picking bedbugs from her cloths and bed linings.



Figure 10. A pot with water and a basket in which cloths and bed linings are steamed to treat bedbugs.

Sites of dwelling beyond the house: The Village

Even though dwelling in *Nyayetahun* takes place in multiple sites, the village remains the main location of residence and it is a reference point for other kinds of dwelling. In the village, many of the domestic activities take place outside the built or material infrastructure of the houses.

Cooking and other domestic activities are done around the houses and in the shared open spaces of the village, such as in the backyard and the open areas between houses (*see figs. 10, 11, 12 and 13*), where people and animals repeatedly encounter each other. The houses, which are the main residential structures remain specifically for sleeping and as storage for keeping things.

Cooking for instance is often done in separate structures (use as kitchens) from the main house. Kitchens are constructed with ecological materials such as sticks, plant fibres and palm thatch, and are often located at either the back, the side or at the frontage of houses. These structures, though meant for cooking are often inhabited by goats, sheep, pigs, and chickens for shelter and to sleep at night. As such, kitchens are always characterised with the movement of animals, their burrows, fur, faeces, and the pungent smell of animal urine. It is also usual for people to cook in the verandas and inside the houses during the rainy season. They do this to protect themselves from getting wet or from the cold weather, even though smoke from burning woods cause toxic air pollutants within houses and causes damage to clothing hung out and exposed to the smoke.

Villagers cook on an open fire on the ground and often between three or five stones (locally called *Gunde Ŋgɔti* – meaning fire stone), which are arranged in a way that the set-up provides opportunity to hold two cooking pots simultaneously. Likewise, the verandas of store houses, which are also built away from the main house (with wattle and daube, and roof with palm thatch) are also used as kitchens, especially after harvest, when rice grains are stored up in the space between the roof and the ceiling. This practice of cooking inside the store house is a strategy to further keep rice grains stored on the ceiling dry (by the heat from the fire), making it easier for the rice to be dehusked. Moreover, the heat and smoke while cooking in the store house is considered useful for the control of weevils and other food grain insects.

Like the store houses and kitchens, latrines are also located away from the main houses and are very close to the bush. However, many people and particularly children use the surrounding bushes to defecate. Consequently, these human faeces form part of the food web for certain animals like pigs and dogs in their search for food. In this respect, humans become a source of food for animals not only through their food production activities, and

the garbage (especially rice husk, cassava peels and food leftovers) that they openly dispose of in garbage site and on the ground on the out limit of the village, but also in the faeces that they introduce in the environment.

Although animal pens to keep goats, sheep, and pigs confined form part of the village infrastructure, constructed with sticks and timber wastes at the back and side spaces of the houses and with some located very close to the bush, livestock are rarely found inside the pens. This is because of the free roaming animal rearing pattern that villagers practice, which involves allowing animals to scavenge for themselves. Such practice therefore creates an environment of humans and animals constantly crisscrossing within the same spaces in the village and the surrounding environment, such as the bushes, shrubs, forest, as well as on garbage sites, where these animals search for edible substances from the domestic wastes, and usually in the company of children playing in the filth. As a result of that, cooking and other domestic activities like palm oil processing, palm kernel crushing and dehusking of rice grains within the village, are often accompanied with people's attention to the activities of these free roaming animals who are always ready to pick-up anything that catches their attention.

These kinds of interactions within and around the open spaces of the village provides an excellent example of the ways that dwelling exceeds the material infrastructure of the house, and the multispecies relations that constitute dwelling within these spaces. It shows the ways that peoples dwelling practices are interconnected with the environment and how this connects them with animals who equally appear as agents in shaping these practices.

At this point, having described ways in which domestic spaces are quintessentially multispecies spaces, and shown dwelling as a process of transcendent activity that exceeds material spaces, in the examples of how cooking and food preparation takes place outside the built structures of the homes, and how these spaces are cohabited by other non-human species, I will now go on to talk about other sites where we can see similar patterns of practices but in slightly different ways. These features help to further demonstrate how these multispecies practices of dwelling extend beyond the village and its material infrastructure.



Figures 10, 11, 12 and 13. Some domestic activities taking place in the open layout of the village. Going clockwise: Men crushing boiled oil palm fruit, a woman winnowing rice in the company of chickens, black soap making with a chicken trying to pick something from the bucket, and two young adult men making a mat.

Dwelling in the farm

As in the village, similar forms of human activities prevail in other living spaces that villagers establish in the forest. These spaces are a form of peripheral domestic sphere where people also live to undertake farming activities. Although these sites constitute temporary forms of dwelling, nonetheless, the kinds of activities that take place there have many similar features as the permanent homes in the village. Therefore, an understanding of these spaces and the practices that go on within them are useful in providing examples of ways in which dwelling

extends beyond the village. Considering the kinds of human-animal encounters that take place in these dwelling spaces – particularly in the *Kpaahun* (farm site), where food availability is a key element that keeps humans, animals and plants connected, can help us to delve more clearly into this subject of multispecies dwelling, and the ways that these interactions are promoted and reinforced by the economic and livelihood activities of villagers.

The *Kpaahun* or farm site, is the main agricultural site where food crops especially rice (the staple food) is cultivated, interspersed with other crops ranging from quick ripening crops like maize, legumes such as beans, and drought resistance crops such as cassava. Generally, this system of plant diversification is a common feature of the farming practice among farmers in village communities in Sierra Leone. The practice of mixed cropping enables farmers to minimize the risks of complete crop failure and the uncertainties of good harvest (Waha et al., 2013). This is because, by planting several crops or different species of the same crop on a single plot, farmers are assured of improving food security and the provision of diverse dietary options from a variety of food crops including fruits, and vegetables.

In addition to that, the practice of plant diversification provides other significant benefits among farmers in adapting to changes in weather conditions and in reducing the effect of pests and diseases. For instance, the biodiverse farming practice of a wide variety of plants such as drought resistance crops, nitrogen fixing and nutrient enriching plants, pollinators and insect predators, serve different ecological functions (Richards, 1985, Altieri and Koohafkan, 2008). Nitrogen fixing plants such as peanuts, beans, peas, and other leguminous crops for example, contribute to improving soil fertility by fixing the nitrogen nutrient in the soil, which is absorbed from the air and eventually transferred to the plant roots and often beneficial for the prospect of other plants that lack the ability to absorb nitrogen from the air. Although these are all important benefits from the diversification of crops to these villagers, the idea of mixed cropping is specifically to minimise the risk and stress associated with crop failure and to meet their food needs. The main reason for crop cultivation is to feed one's family, even though surplus is sometimes sold to buyers who visit these communities, and in other cases is taken to the local markets to be sold in order to provide income for the family to meet other household needs.

Fundamentally, the practice of mixed cropping by farmers assures the availability of a variety of food for livelihood sustenance and food security. Green vegetables for instance are cultivated because they are used to prepare soup to eat as relish with the main staple rice, while millet is usually mixed with rice as a strategy to manage and reduce the amount of rice consumed by a family. On the other hand, cassava tubers serve as an alternative and substitute for rice especially in the farming season during which households often find it challenging to afford the cost of buying rice. Also, fruit crops such as corn and cucumber are a source of food, sometimes eaten as snacks. Cucumber for instance is usually prepared as fruit porridge to supplement while waiting for the main meal.

However, despite all the benefits that farmers derived from the system of mixed cropping as a livelihood assurance strategy, from my observations and discussions with locals, it was clear that multiple crops on farms served the survival needs of animals as well as farmers. Diverse crops on farms met the food needs of a variety of animals, and hence attracted different animal species into these spaces to feed on crops. In other words, the system of mixed cropping produced interspecies entanglement and certainly transformed farm sites into a kind of 'multispecies landscapes' (Fuentes, 2010), that was characterised with recursive interactions between humans, animals, and plants. The plants here interconnected people and animals and provided an arena for them to interact. This is therefore the reason why discussing the kind of farming practices of villagers is considered pivotal in understanding some of the ways that these multispecies interactions are situated within the livelihood and economic activities of people.

Another way of seeing this is to say that both humans and animals adapted to this complex environmental 'niche' that extended across spaces. As a matter of fact, the nature of the farming environments with scattered fields of cultivated farmlands within the forest contributed significantly to promoting and sustaining an endless assemblage of humans and animals. The practice of shifting cultivation for example, where farmers undertake slashing and burning of a piece of land from a forest patch, which they cultivate for a farming season until harvesting before moving to another forest patch the following planting season to allow the previously cultivated field to regenerate its soil fertility (Aweto, 2012), interferes with the natural habitat of other organisms. In the process, certain animals like bushbuck (otherwise

known as deer) are dislodged and attracted to the cultivated fields for their survival advantage. The shrubs around the farms also provide harbourage for cane rats (popularly referred to as grass cutters), porcupines and other kinds of rodents, who also take advantage of the farm site for available food. Grass cutters for example feed on the stems of rice plants, while porcupines feed both on rice and as well as cassava plant stems and sometimes dig up and feed on the cassava tubers. Bushbucks are especially interested in feeding on the green leaves of cassava, okra and other vegetable plants, and this affects the growth of the crops. Bush duikers (Maxwell duikers) are also very common around farm fields, but according to villagers, *Tuawii* as they are called in Mende do not pose any significant threat to their crops like the other animals listed, as they only come around the farms to feed on leaves and shoots of wild bush plants and on the pods of shrubs. All this creates opportunities for dense multiple species convergence.

Although these human-animal encounters are often considered undesirable, for reasons such as the exposure of people to animal bites and the devastating effects of animals to the growth of plants – and which is of larger concern to villagers because of the effect of crop damage on their food security – on the other hand, these social-ecological conditions of human-animal assemblage on the farm sites are opportunities for villagers to easily harvest wild animal meat as they engage in the process of protecting crops. Crop protection is commonly done through trapping (with the use of snare and metal spring traps), communal net hunting, animal poisoning, and the construction of fences with lattice sticks and palm thatch around the cultivated plot, to prevent animals from invading farm sites. These practices suggests how animals also contribute to the construction of the farming environment.

Game from traps, communal net hunting and animal poisoning around farm sites is usually kept for household protein consumption, but in some cases, it is sold to get money to meet other household needs. All these forms of interactions underline some of the dynamism of multispecies dwelling within the farm site and shows how these kinds of co-existence are often produced and sustained because of mutual benefits of survival that both humans and animals derive from living together.

Villagers undertake many of their daily activities on the farm, especially during the farming season (May-October), when there is much cultivation work to be done. That notwithstanding, during the day and even when there may not be much work to be done on the farm, many villagers prefer to be on their farm sites. Since this keeps them in much more close contact with their crops and resources in the natural environment, which are their main sources of subsistence. This has also been demonstrated by Paul Richards (2016), who also provides anthropological evidence of the importance of farmhouses among rural households in Sierra Leone. In his work 'Ebola: how a people's science helped end an epidemic,' Richards explains that during the EVD epidemic in Sierra Leone, many rural people preferred to organise the isolation of Ebola patients in shelters built near to the farmhouses rather than in the local schools, as required by the outbreak response teams (2016 p. 110). The preference of having quarantine sites close to the farm was largely because of its proximity to good sources of livelihood support such as food and fuel (firewood and palm nut chaff), which could be easily accessed on the farm site. These views expressed by villagers in Richard's account about the critical role of the farm site in preventing people from evading or violating quarantine measures, also helps us to understand the importance of the farm site to the dwelling process and livelihood of villagers.

Apart from the economic benefits derived from being on the farm, farm sites are perceived as safe domains and an environment of peace and solace. Therefore, to some villagers, being on the farm is considered a way of saving themselves from any potential quarrel or trouble in the village. This suggests that the farm site contributes to meeting not only the livelihood needs of villagers but also provides security and emotional support and could be therefore described as their second home after the village, where they co-exist with other animal beings who are also attracted to these spaces.

Like the village, farm sites have built structures that villagers call *Kpwɛh* (farmhouse or homestead). They are used as living, domestic, and storage spaces. However, unlike the houses in the village, farmhouses are simpler and more temporary structures with a triangular house shape. They are built with tree trunks used as pillars to hold a skeleton of woven sticks, which are tied with plant fibres used as ropes, and with a steeply pitched palm thatch roof often sweeping the ground. The walls are built with lattice sticks and palm thatch to control

air flow, and with doorways on both ends of the structure, which are usually closed with palm thatch (*fig. 14*).

Though farmhouses are constructed to accommodate human activities, they are however cohabited by both humans and other species. The materials used for construction and the space within these structures also provides harbourage for animals such as the *Tɔndwei* (*R. Rattus* or the black rat), which as I have mentioned earlier often builds its nests in the palm thatch roof of houses. As such, to villagers, particularly the children, the dismantling of farmhouses is often an opportunity to chase and kill dislodged rats to supplement their protein intake. Snakes on the other hand take advantage of those rat harbourages to raid farmhouses for their prey, which are continuously available because of the proliferation of rodents and toads within and around farmhouses. Because of this interspecies interaction between snakes and other animals including chickens, which are also often bitten or eaten by snakes, the presence of snakes around farmhouses and the farming environment is always a matter of concern to villagers because of the risk that they pose in biting people and their livestock.

I remember during my second week in the village for instance, I was trying to help a boy who was collecting and passing palm leaves from a pile of palm thatch on the ground to a male adult villager called *Zaco* who was roofing a farmhouse, when this adult male told me to be very mindful while collecting the palm thatch, stating that there are often snakes under the piles of palm thatch waiting to prey on rats and toads. As a way of confirming that to me, the following day I was informed that a snake was killed under one of the piles of palm thatch after I had left. These ideas all together highlights the kinds of deep multispecies entanglement that take place within these living spaces. It shows the increased mutual vulnerability in this collective world building, and the beneficial and precarious side of these encounters.

Similar to the houses in the village, many of the farmhouses have ceilings created with aligned sticks and tree branches to provide a lower boundary under the roof, which is used as storage for material objects and accessories. That notwithstanding, ceilings in farmhouses are created specifically to store harvested rice grains, and this is done especially if the farm site is far from

the village or located in places where it is difficult for people to transport harvested bundles of rice grains to the village. This also significantly promotes and reinforces the presence of rodents, and consequently attracts snakes. Despite the risk that snakes pose, I was intrigued to learn that stored grains and other items that people keep in their farmhouses as well as farm crops are usually protected from theft with snake charms that celebrated the capacities of this animal. This charm is often in the form of a rope or stick that is enchanted with the ability to magically shapeshift into a snake, to attack, chase and even bite a thief, unless the stolen item is returned or dropped in the farm. Such beliefs and practices are also important, as they in some way shed some light on the multispecies nature of these dwelling spaces of villagers, and how these interactions extend into the supernatural realm – something that I will return to in chapter 6.

The interiors of farmhouses have tree trunks placed along the edges, forming a square or rectangular shape around the inside floor used for seating. In the centre of the farmhouse are firestones used for cooking. Over the fire stones usually hangs a drying rack often held by a rope from plant fibre or metal wire tied to a stick on the ceiling. The drying rack is used for smoking fish and meat; this equipment is one of the main forms of meat preservation by villagers (*fig. 15*). The woven sticks forming the frame that holds the palm thatch roof are used as tenterhooks to hang cloths, while the spaces between the woven sticks and palm thatch roof are used as storage spaces where farmers attach accessories such as knives, spoons, drinking cups, salt cellars typically of plastic bottles and other items they deem fit to keep in there. Basically, cooking utensils such as mortars, pots, plates, and spoons are also kept at the farmhouse, and they are usually left unwashed until there is need to use them. Furthermore, food leftovers in pots are often left at the farmhouse or hidden under shrubs around the farmhouse to be eaten the following morning. Garbage, which is often largely composed of rice husks, cassava peel and other food waste is disposed of openly about one to two meters from the farmhouse, and this contributes to attracting rats and other creatures within and around these dwelling spaces. This contributes to making these spaces continually inhabited by these other organisms' particularly rodents, snakes, and larger mammals from the wild such as deer, who also lodge in the farmhouse in the absence of humans. As such, the inside spaces of farmhouses are often shared with wild as well as domestic animals like chickens that usually move between people picking up food droplets on the ground, while

dogs and cats find resting at the edges of the farmhouse because of the cool temperature that it affords when the sun is hot, and to seek covering during the cool raining season.

Though all these interactions between humans, animals, and plants that I have discussed highlight conditions of multispecies dwelling and sociality, I want to however reiterate that just as these practices of dwelling go beyond the built environment of the village, so are they not limited to the farm site. As I will show, they also occur in other similar spaces within the forest like the *Gadihun* (garden) and the *Waalihun* (meaning resting place), both of which constitute other living and domestic spaces outside of the village.



Figure. 14. Farmhouses on two different farm sites



Figure 15. A section of the internal space of a farmhouse, showing the firestones with a drying rack hanging over it, and other cooking accessories on the floor – unwashed dishes, plates, cups and mortars used for grinding and crushing substances.

Gadahun (in the garden)

Gadahun in Mende means ‘in the garden,’ and it is the cash crop plantation site. It usually has a variety of cultivated cash crops and often separate from the main farm site. Just like in the main agricultural field, a system of mixed cropping is practiced in the *Gadahun*, where there is normally a main crop such as palm oil fruit or cacao, and with some other fruit crops like coconut, kola nut, pineapple or banana plant cultivated alongside the main crop. The reason for this system of mixed cropping is also to assure the availability of different variety of fruit crops on the same plot. Since each of these crops take varying periods to ripen, farmers are assured of having crops to harvest at different times to support their economic needs and livelihood sustenance.

Like the farm sites, gardens are also multispecies spaces. They are often characterised by the activities of other animals, as the fruit crops that villagers cultivate do not just support the livelihood of people, they are also available food source for certain animals like tree rats, and squirrels. Snakes are also common within the gardens in search of prey, and in their own way, they help villagers to deal with the problem of rat infestation within these spaces. This was demonstrated in a discussion with one farmer hunter in one of the neighbouring villages about the presence of snakes on his pineapple garden.

‘...I like it when the snakes are in my garden, snakes do not eat pineapple, they come around to lie in ambush for the rats that raid the gardens to feed on these crops, and by that the snakes help us protect the crops from those rodent predators’ he said.

This kind of idea about snakes, which goes contrary to my initial view that snakes are often common around pineapple gardens because of the fruits, brings into view some aspects of the mutuality of co-existence that humans and animals share. The role that snakes play in dealing with the problem of rodent pests as expressed in the above account, draws attention to some aspects of the economic and livelihood importance of certain animals in ways that are beyond consumption or sale of animals. Unlike around the farmhouse and the village environment for example, where people are repulsed by snakes because of their poisonous threat to people and livestock, in this context, snakes appear as important actors in the

protection of plants from crop raiding animals. They are seen in this situation as co-participants in shaping their shared spaces with humans in the process of making a living, rather than just harmful and poisonous creatures living alongside humans. This account in some way shows how human interactions with animals can vary with respect to individual needs, perception, and the context of interaction.

As in the farm site, gardens often have a built structure that is also built with sticks and roof with palm thatch. This material infrastructure is use for living and domestic activities like cooking, and for storing things like harvested crops, tools and cooking utensils. From my observation, many of the gardens were once farm sites that have been transformed into cash crop gardens, and this draws attention to the transitional nature of these spaces with respect to the kinds of activities that takes place within them in meeting the livelihood and dwelling needs of villagers.

Waalihun

In addition to the farm site and *Gadahun*, the third domain that villagers often inhabit for dwelling is the *Waalihun* – the name that villagers use to describe this space, meaning resting place. Indeed, from my ethnography, the kinds of activities that I witnessed in the spaces called *Waalihun* often reflected moments of resting or breaks from laborious works. *Waalihun* is a kind of worker's camp. For instance, a space cleared within the forest used by a farmer and his family as a temporal living space around his farm site until he constructs a farmhouse is referred to by villagers as *Waalihun* (see fig 16).

The *Waalihun* is often not too far away from the village, and they are created for several reasons. One is to stay away from the village to work; though they could as well do their domestic work in the village, being in the *Waalihun* however keeps people away from intruders when they are busy. In other words, it is a way of being a little bit conservative, since in some instances people do not want visitors who come around the village to know exactly what they are doing.

Secondly, instead of moving rice grains or palm oil fruit to the village for processing, taking it to the *Waalihun* is often shorter. Moreover, the water that people drink and use for cooking and other domestic work are often in the shady part of the forest, and it is often around these locations that *Waalihuns* are established. In that respect, working in the *Waalihun* gives people easier access to their source of water. Above all, there is also a health factor, as being under the trees provides shade from the sun. When the breeze blows, the forest provides fresh air, and when cooking, the surroundings do not trap smoke as when they cook inside the farmhouse or in huts used as kitchens. In short, the *Waalihun* gives people the convenience of being able to work very close to the natural resources, have their rest, and at the same time stay away from intruders who may come to visit them in the village. As such, it is the desire to meet these social and emotional comfort as they engage in the processing of different types of food after harvest or towards the tail end of harvest season that brings them into intimate commensality with nonhuman animals who also rely on several types of human activities for food.

As with the other dwelling spaces that I have discussed, the *Waalihun* is similarly an attractive site to nonhuman animal inhabitants like rats who are always perceived as a serious threat to their food, squirrels, ants, and snakes who take advantage of the proliferation of their prey within these spaces, and other tree crawlers who equally invade these spaces as they engage in similar programme of dwelling, but in their own different ways of living and conceptions of being. Therefore, as villagers engage in their process of dwelling in the *Waalihun*, attention to the activities of these other nonhuman beings is always an issue of concern. These rural farmers are conscious of the fact that they do not live in isolation, but in the company of other beings.

Unlike the farm site and garden, there is no built structure like huts in the *Waalihun*. Chairs are made from tree trunks and logs, and benches constructed with sticks are used to sit on. Household materials such as cooking pots, dishes, and spoons are kept underneath shrubs to conceal them from intruders, while clothes and other belongings are hung on tree branches, and these are all mediums for contacts with animals. Garbage (notably rice husk, cassava peel, and palm kernel shell) is openly thrown on the ground. This in addition to palm kernel nuts

often left in the open to dry, all of which constitute some of the livelihood practices that attract animals into the *Waalihun*, and thus brings them into close contact with humans.

As I have illustrated, the houses, the open layout of the village environment, farm sites, *Gaadihun* and *Waalihun* are all individual units of places for living that are in their respective ways designed to accommodate the living activities of villagers. As such, they are dwelling spaces in their own respect. The kinds of food production, building and environmental construction, and livelihood activities that take place in these different spaces, help us to understand ways in which the practice of dwelling exceeds the container of the domestic space of the house, and this extends our conceptualisation of dwelling and understanding of the domestic space beyond ideas that restrict these activities to physical infrastructure of the home.



Figure 16. Eating *Kɔndeɪ* (workers lunch) with villagers in a *Waalihun* next to *Masunday's* farm

Conclusion

What I have shown in this chapter is the transcendent and multispecies nature of dwelling in *Nyayetahun*. I have shown that dwelling is a process that is not contained by a specific sphere, such as the built domestic environment of people's houses. Even though dwelling often takes place within the domestic spaces of the architectural environment, the dwelling practices of villagers go beyond the home and can take place in multiple settings including the forest.

Considering these kinds of possibilities for humans to dwell in places that are often seen as non-human habitat and beleaguered spaces, orientates or maybe reorientates understanding of dwelling as a process that is not bound to the built environment.

Undoubtedly, the material space is an important part of the process, in respect of its role as part of an adaptive strategy that establishes a border-like container separating its inhabitants from the outside environment and assuring them of shelter and security. However, these practices are not just about these material spaces. Rather, they are about human endeavour to make a living and meeting the needs of existence. This entails people's engagement with every aspect of the environment such as landscapes, places, plants and animals that are considered relevant in affording them these opportunities of making a living. Consequently, these practices intersect with the activities of other beings, and brings people and animals into continual interactions as they all live within these shared spaces.

In fact, whether these practices take place within or out of the material infrastructure they are constituted by interspecies relations in a kind of collective world building between humans, animals as well as other beings. Like humans, these other nonhuman beings are not just passive agents, but active creatures in shaping and modifying these processes as well as the spaces that accommodate them, and this is done in their respective ways of living. Recognising these kinds of mutual ecology that villagers share with other nonhumans is helpful in framing our thinking of dwelling as a multispecies affair that is produced and maintained by an entangled landscape of multiple beings. In this process, both people and animals are constantly engaged in learning to live with the other and managing the responsibility to deal with the beneficial and precarious consequences of their co-existence.

As I have shown, this multispecies entanglement is multidimensionally produced and sustained through social and economic factors and relationships that are largely products of the environmental arrangements, modes of living and livelihood activities of people. This includes the ways that the material spaces are constructed, the materials used to construct them and how people live in them. For instance, the porosity of ecological resources used for housing construction such as palm thatch, earth mud and tree branches, contributes significantly to keeping humans and animals intimately entwined. And just as these resources

to make these structures come from outside – from the bush, so too there is a constant form of movement of people and animals in and out of the bush, and between the village and other locations in the environment.

The multispecies interface resulting from these forms of engagement can be understood as what Agustin Fuentes (2010) describes as a ‘nature-culture co-constructed niche,’ – a site where human beings and animals co-exist as active agents and participants involved in sharing and shaping mutual ecologies in their processes of living. While I acknowledge the fact that houses are key sites for multispecies entanglements, the ethnographic evidence that I have presented in this chapter go much beyond ethnographies in multispecies medical anthropology that looks at human-animal entanglements in bounded spaces and with focus on just one or a couple of animal species (e.g. Nading, 2014, Kelly, 2012). By paying attention to other settings outside of the home where humans and animals also become entangled, this chapter brings to view the kinds of constant state of becoming that humans and a wide range animal species can be engaged in as they try to inhabit the world.

This chapter shows the fluidity and porousness of the domestic and wild categories that are often described as mutually exclusive domains, and demonstrates how these spaces are linked, hence leads us towards a more nuanced understanding of the society and natural world. This analysis pushes us to see the domestic in a much broader sense, in a way that does not limit our mode of conception to activities of living that is contained in the four walls of a structure or take place within the physical and material world, or neither see dwelling as a human centric activity (where other species are seen as just part of the context of dwelling activities rather than actors in these processes). Instead, it helps us to conceive the domestic as something that can go on beyond built environment in other domains, and that it consists of activities that are entangled with those of other organisms as actors.

Certainly, these social processes that I have discussed force us to think about humans and their diverse activities of living in the world as emergent through the contingent relations of becoming with multiple beings and entities. To further help us to see and understand these practices of dwelling as multispecies issues, in the next chapter I cast my ethnographic lens

to the ways that villagers live and share their environment with animals through processes of incorporation.

Chapter 5. Multispecies dwelling through animal domestication

Sounds of crowing, clucking, growling, and cackling noise of chickens, bleating goats and sheep, and oinking pigs form part of the noisy rhythm of daily life in the village of *Nyayetahun*. The smell of animal excreta is sensed upon every breath, and uncontrolled animal faeces litters every space accessible by animals, including the verandas of houses and kitchens. Even the internal spaces of houses are rarely free of animal droppings, as animal presence forms part of the lifestyle of people in this rural community, where animal rearing largely takes place within and around residences, and with villagers and animals living together and sharing the same living and domestic spaces.

In this chapter, I explore the kinds of interactions that occur between villagers and domesticated animals, by trying to understand how people incorporate animals into domestic spaces and social relations. Focusing on the proximate intimacies and sharing of spaces within and around the village environment, I examine what these everyday encounters reveal about the status of domesticated animals in the lives of rural people, and how understanding of these interactions can shape our thinking about dwelling as a process of multispecies co-existence. I argue that domestication is part of dwelling. It is a process of bringing animals into human social, economic, moral, and political community, where animals participate in influencing and shaping these various processes of living.

In *Nyayetahun*, villagers keep animals for a variety of reasons, such as for their contribution to household sustenance in the provision of nutrition, and for their cultural and religious relevance. For example, livestock, specifically sheep and chickens, are kept by individuals and households for symbolic ritual sacrifice, since they are active agents in connecting people and the spirit world. These animals are used as gifts to spirits for divine protection, good fortune and to forestall calamity. Owning livestock in *Nyayetahun* is also a source of income that can support households in times of emergencies. Farmers usually sell their livestock for payment of debts, to support their farming activities, and to pay their children's school-fees or to take care of their health.

People in *Nyayetahun* like to have chickens at hand to be given as gifts to visitors and as a sign of appreciation and recompense to people for a praiseworthy act. For instance, one afternoon after a microfinance meeting held in the veranda of the town chief's house, villagers gave a large red cock to the two guests with whom they had the meeting as a demonstration of gratitude. Similarly, on the day I bid farewell after completing my field work, I was given two large chickens in addition to some '*Mbaninei*' (new rice) and '*Ndeuei*' (rice flakes) tied in plastic bags. For these economic and socio-cultural reasons, in addition to the use of animals as predators, such as the keeping of cats to ward off rats in houses and the use of dogs for hunting activities, animals are integral to the livelihood subsistence and social life of villagers. Animals are part and parcel of every household and every member of the household including father, mother and children has a responsibility for their welfare and safety. At the community level, animals are active agents in inter-human relations between individuals and groups of individuals from different households, and they form part of the village community.

To better understand the relationships between villagers and their domesticated animals, in this chapter I put ideas of dwelling in dialogue with the literature on domestication. The idea of domestication has long been a scholarly concern within and outside of anthropology, and particularly in the fields of archaeology, geography, environmental sciences, and history, where the cultivation of plants and domestication of animals has been seen as a vehicle to understand relationships between humans and other non-human organisms and the environment. That notwithstanding, in older and recent writings, domestication remains contentious, problematic, and imprecise, and has been pursued in varied trajectories. The two major contending views lie between scholars who have placed emphasis on human dominion and control over animals (Clutton-Brock, 2014, Ducos, 1978, Bokonyi, 1974), and those that stress mutualism between animals and humans (Budiansky, 1992, O'Connor, 1997, Zeuner, 1963, Fuentes, 2010). But amidst this contention, what is however common in the works of many of these scholars across various disciplines is that domestication has been seen as a process – either ongoing or largely completed – of integrating tamed animals into human society. Here, I take forward the idea of domestication through a dwelling lens, as being a process that contains aspects of economics and ownership but which goes beyond these concerns, combined with an approach that draws on mutualism between humans and

animals. Drawing on my ethnographic work in *Nyayetahun* and its neighbouring villages, where I observed the practical challenges raised by living with animals, and how animals are being governed in moral and political terms of villagers, I suggest that animal domestication is a process that involves incorporating animals into the social, economic, moral and political worlds of people, and by this way animals become not merely economic capital and property to humans, but integral components and participants in the moral and political context of human dwelling practices.

In thinking about the idea domestication in the context of dwelling, this does not only mean we need to think about domestication as an unfinished, ongoing process that is also bi-directional, and which goes beyond the 'home' as a physical boundary. Instead, we also need new ways of thinking about the unfolding relations with non-human animals in domestic spaces and how these relations make new kinds of social worlds. In this chapter, I argue that extending ideas about domestication to the literature on biopower, which is concerned with how humans and animals are governed in political regimes (Porter, 2013, Pandian, 2008), and to literature on kinship that is interested in relatedness (Sahlins, 2013, Carsten, 2013) into multispecies dimensions, is one way of making this move. These ideas are important because they allow us to focus more on the kinds of relationships and practices that constitute multispecies domestics and multispecies domestication, just as the literature on relatedness for instance helps us to understand kinship as an ongoing set of practices and activities, and not a predefined set of fixed relations and obligations.

In this endeavour, I first turn to discuss some of the different perspectives of domestication and their relevant contributions in helping us understand the intimate and complex interactions that exist between villagers and animals, before developing my own dwelling-based approach to domestication that borrows insights from literature on bio-politics and relatedness.

The idea of Domestication

The etymological root of domestication is the Latin word *domesticus*, which means 'belonging to the house' or 'entry into the *domus*,' referring to the household (see. e.g., Hurn, 2012 pg.

55). But in this thesis, this relationship is not restricted to the built structure of the house. Because, as I have shown in the previous chapters, the domestic space is not confined to the material infrastructure of a house, as there are other locations outside the house like open spaces within the environment and the farm site where villagers dwell, and where these relationships with domesticated animals equally prevail. Therefore, rather than looking at the idea of domestication just within the context of the *domus* or house, I analyse domestication in a much broader sense as bringing animals into the human domain, a domain that extends far beyond the walls of a house into other locations where the activities of dwelling take place.

In the traditional evolutionary viewpoint, domestication is seen as an event of social transition in human interaction with the environment and it is represented as a form of ecological domination of man over plants and animals. This applies for example to Lewis Henry Morgan's conception that there were three stages of human progress from 'savagery' through 'barbarism' to 'civilisation' (Morgan, 1877). The transition from 'upper savagery' to 'barbarism' was marked for Morgan by the domestication of animals and the cultivation of plants, which he argued made possible key shifts in the relationships between humans and the environment. One such relational 'shift' was the replacement of communal appropriation of plants and animals with a system of private property ownership to reproduce and multiply, thus produced new kinds of inequality and social differentiation, which had crucial implication for the transformation of the basic structures of human society. We also see evidence of these evolutionary paradigms in the work of scholars of political economy, as for instance seen in the ideas presented in the writings of Friedrich Engels on the development of the family, where Engels viewed domestication as key to the creation of wealth, private property ownership and new forms of social relations and inheritance systems (Engels, 1972).

Other scholars, including environmental historians and geographers, have identified domestication as a fundamental cause for food production, growth in human population (O'Connor, 1997, McNeill, 2001) and an advancement in human knowledge and development of a 'civilised state of mind' (Anderson, 1997 p, 467). In this line of thought, agriculture appears to have given people the possibility of increased control over a variety of plant species as food crops, while with the advent of animal domestication, people acquired the

means to access readily available meat supply, and gained greater muscle power and mechanical energy efficiency that allowed them to transport goods and to plough heavy soils (McNeill, 2001). For instance, in societies where the domestication of larger animals such as camels, horses and oxen were made possible, ploughshares drawn by animals promoted the extension of cultivation of much wider range of fields, allowing for an expansion of food possibilities. These conditions which some of these authors describe as a possible prerequisite for the development of human societies, highlights the significant role of domestication in influencing and shaping human growth and processes of living or being in the world.

One influential theorisation of domestication comes from archaeologist Juliet Clutton-Brock (2014, 1999), who defined domesticated animals as animals bred in captivity for the purpose of subsistence and economic benefit to human communities. Building on the ideas of Pierre Ducos (1978), Clutton-Brock (2014) sees domestication as the practice of incorporating animals into human societies and social organisations as objects of ownership and household possessions, that could be inherited and used as commodity of purchase and exchange. Her position shares much in common with the ideas of Sandor Bokonyi (1974), who had previously described animal domestication as the process by which animals were removed from their natural environment because of specific behavioural characteristics and held under controlled breeding conditions for mutual benefits. Although in the last phrase of this definition Bokonyi mentions mutuality for both humans and animals, there is however more emphasis on the human side of his approach. Moreover, his ideas largely reflect an anthropocentric view that sees domestication as a socio-cultural and biological activity that can only take place when animals are incorporated into human social structure as property (Clutton-Brock, 2014). Taking all these perspectives together, they basically view domesticated animals as breeds in captivity, whose husbandry is exclusively utilitarian, with people exercising dominion over their protection, movement, feeding and breeding. Such thinking presents animals as passive agents and place emphasis on the notion of human mastery and control over the domesticated creature. From my ethnography, this approach reveals a narrow account of this interaction, and if we tend to pursue the issue of human-animal relationship in just this trajectory, it can limit us from paying attention to the other dimensions of the complex relations that constitutes human-animal interactions.

Certainly, the economic utility of animals remains evidently crucial in the lives of village people, however, there is more to people's relationships with these nonhuman animal beings that exceeds the subject of property and economic importance that Clutton-Brock and others project. Because in the world of villagers in *Nyayetahun*, animals are not passive beings living among humans, rather they are active players and integral components in the social, economic, moral, religious, and spiritual lives of people. Animals participate in producing and shaping various dimensions of the everyday existence of villagers. Hence, in order to really account for this relationship as one of multispecies dwelling, rather than absolute differences or hierarchy between humans and animals, I turn to the mutualistic perspective, which is an alternative view that sees domestication as one of mutualism or symbiotic relationship involving two parties – human beings and animals. Such ideas are relevant in giving me a much broader scope to reflect and frame my understanding of how different kinds of interspecies interactions and relationships can be formed in the process domestication.

The mutualistic view of domestication de-emphasizes the notion of total human influence and dominion over animals in consideration of symmetrical relations that involve the different roles of non-human animal participants in the domestication process (Cassidy and Mullin, 2020, O'Connor, 1997, Budiansky, 1992, Morey, 1994). In his contribution to this perspective, Steven Budiansky (1992) for instance has considered animal domestication as a willing partnership between humans and animals. Suggesting that in this process, certain animal species saw the need to voluntarily associate themselves with humans as a means of survival (Budiansky, 1992). His argument suggests that it is through this form of 'voluntary symbiotic association' (Zeuner, 1963) or 'behavioural co-evolution' (O'Connor, 1997), that commensal and mutualistic relationships emerged between humans and other nonhuman animals, and with benefit derived by either both parties, or by one party and neutral to the other.

In this line of thought, we are made to understand that the need for humans and animals to enter into relationship is not just a human desire, but also the choice of some animals who may have considered human settlements as attractive and suitable options for their survival, unlike the wild habitat where they had to be in competition with other animals (O'Connor, 1997). A classic example of this is the domestic dog (*Canis familiaris*), which is believed to

have entered into mutualistic relationship with humans through scavenging from human debris. Similarly, goat and sheep are believed to have been attracted to the human domain under similar conditions of 'voluntary symbiotic association' (Zeuner, 1963). Although Zeuner (1963) sees this relation as a special kind of symbiotic relationship, because of the ways in which human beings influence animals by exerting control over the breeding, feeding and movement of animals, that notwithstanding, animals are also seen as active agents playing an essential part in producing, reinforcing and shaping the domestication process.

Even though in *Nyayetahun* the status of animals and humans is unequal in terms of social hierarchy, their lives however evolve through a kind of mutualistic association. By this I mean that both people and animals are able to meet certain important aspects of their survival needs through their close association and interactions with each other. This was observed in the previous chapter where I shared the ways animals depend on human dwelling spaces for easier access to food and shelter, to the extent of co-habiting these human spaces and living alongside people, while villagers on the other hand rely on animals for food, income, medicine, and as aids that help them understand and interact with their environment (a subject that will be discussed in the next chapter). In their own way, animals provide protection, healing, and they support the wellbeing of villagers. The importance of such ideas in this discussion is that it underscores the kinds of relationalities that can emerge through the process of domestication and contends the human centred view of domestication that assume human beings as the only active participants in these interactions.

As I show in this chapter, domestication is a process of interspecies dependency between two different species that are intimately entangled in complex ways, and this kind of thinking widens the scope of conceiving human and animal relationship as one of mutuality, co-constitution and co-becoming. All these ideas have close bearing to the multispecies perspective that I take in this thesis, which helps us to understand domestication as a process of multispecies dwelling.

Domestication as a process of multiple species dwelling

Domestication in *Nyayetahun* is a process of multispecies dwelling, where humans and animals live in close association with each other, participating and sharing important social, economic, spiritual, moral, and political connections that are essential for their living. In approaching such relational possibilities that domestication offers from a multispecies perspective, it is important to focus on the kinds of connections between humans and other non-human animals in the domestication process. Moreover, it is useful to pay attention to the everyday living and existence of all species in the interaction, and not just to one party (Kirksey and Helmreich, 2010). In his 'anthropology beyond humanity,' Tim Ingold (2013) for instance has explained the entanglements between humans and non-human animals by illustrating how life unfolds through the dynamic interrelationships among species, and how humans and animals together develop mutual ecologies through the constitutive mutuality of dwelling and cohabitation. Like Ingold and other anthropologists who have followed this multispecies line of thought to reflect on this subject of human-animal mutuality in processes of co-becoming (Haraway, 2008, Kohn, 2007), I pursue this analytical focus by describing some practices that engage villagers and animals, to shed light on how different human-animal relational categories can emerge through their interactions. I propose an approach that is aimed at resituating the idea of domestication in such a way that sees the non-human life as one that cannot be narrowly subjugated to its economic, and property utility, but sees animals as active players in different aspects of human society.

The multispecies approach to domestication that I develop accords to non-human species of all kinds an agency that is understood to play a crucial role in constituting worlds jointly configured by the activity of human and non-human animal lives. In his ethnoprimate project in Bali, Indonesia, Augustin Fuentes (2010) for example has demonstrated a comparable situation by showing us the ability of monkeys to exploit and adapt to human constructed spaces. He explores the complex ecological and social interface between people and macaque monkeys in the temples of Bali and how their interaction produces mutual benefits for both parties. Fuentes notes that by being in human spaces the monkeys received food and protection, while the resident islanders gained culturally and economically from the presence of the monkeys, as the monkeys draw tourists to the temples. From this account,

human engagement with animals (in this case temple monkeys) is not to kill for food, or to tame them as pets, or for labour, but creates a 'cultural niche' in which the monkeys are fed as well as protected. This sort of 'covenant' (Budiansky, 1992) between humans and animals where each depend on and benefits from the other, helps us to understand domestication from the perspective of mutual co-existence between the domesticator and domesticated.

It is however important to note that multispecies dwelling is not always smooth and positive. It can be marked with disgust and tension especially when animals exhibit certain expected behavioural traits that undermine the social expectations binding the interaction (Philo and Wilbert, 2000). In *Nyayetahun*, such transgressions were for instance visible in the behaviour of goats, sheep and pigs raiding farm sites to feed on crops, and dipping their snouts into cooking pots and dishes, and carting away food. These actions of animals often caused irritation to villagers, and sometimes it resulted in violence, pain and suffering that they inflict on each other.

A very good example of this is the story of *Dayfo's* father, who I was told got bitten by one of his pigs and he is believed to have eventually died because of the infection. According to the town chief and other villagers, *Dayfo's* father used to jokingly scare the pigs and enjoyed seeing the animals in flight of fear. One day, in his usual attempt to scare the animals, one of the pigs rushed at him and bit him on his right foot. This act of retaliation by the pig constituted a deviant behaviour – a breach of the social and moral standards of the domestication process – for which the pig was instantly slaughtered as a penalty for contravening the social expectation. As time went by, *Dayfo's* father fell sick and the cause of his illness and eventual death was linked to the injury he sustained from the bite of the animal. Whether or not the actions of the animals in these examples were intended to cause frustration to their owners, the lesson from this as in many other cases of such relational ebbs and flows between villagers and animals, exemplify how animals can inject their own agency into the domestic scene by transgressing spatial boundaries, and even resisting human control, which often causes disharmony in the relationship (Philo and Wilbert, 2000). Moreover, such tragic incidents remind us of the unfinished nature of domestication, by showing that no matter how close animals are to us, in situations of distress, conflict, competition, and human violence, their aggressive nature can prevail.

Such unforeseen consequences of 'good and ill' in the interaction between humans and animals are some of the concerns that mark recent engagement that has sought to rethink conceptions of domestication (Cassidy and Mullin, 2020, Clark, 2020). While focusing on the idea of human-animal mutuality in terms of benefits, attention is growing to the uncontrolled slippages that occur when humans, animals and things are in close interaction. In this line of reasoning, it is proposed that human-animal encounters are not always beneficial to humans, and neither are they consciously determined by both parties, but can have risky outcomes with great consequences on either one or both parties (Clark, 2020). A very good example of this, and which is also of global and public health interest, is the threat of spillover of zoonotic pathogens or animal related diseases into human population, which are attributed to the practices of animal domestication and the rise of sedentary lifestyles (Nading, 2013, Crosby, 2004, Barrett et al., 1998). For instance, the pathogenic H5N1 (avian influenza) virus strains found in human bodies in Southeast Asia, is believed by public health experts to have developed from close-knit industrial poultry operations of domestic birds, such as household chickens and ducks, from where it spilled over into humans as a result of direct exposure to domestic poultry (Porter, 2019, Davey, 2007). Similarly, outbreaks of bovine spongiform encephalitis, or "mad cow disease" as well as foot and mouth disease (FMD) in Japan, Taiwan, South Korea and the United Kingdom (Law, 2006), constitute the risky consequences that characterise the precarious interspecies connection brought about by animal domestication. This evidence illustrates how the domestication of animals, though a milestone in human evolution, carries with it the cost of unintended consequences including the risk of disease exchange, which is a topic that I discuss in more detail in chapter 7.

As I have stated earlier, in this chapter I draw on my ethnographic experience of the complex efforts of villagers in keeping animals within their dwelling spaces, and by this way, I show that the idea of domestication is an unfinished process that involves ongoing multi-dimensional social negotiation that stretches beyond economic models of human control over animals. Domestication is a more complex and problematic social encounter with other nonhuman animals in shared social spaces, and this process has profound impact on the environment, human social relationships, and even the social, moral, and political structure of the society.

In the writing that follows, I also highlight how animal domestication goes beyond practices of bringing animals into the physical space of the home. I demonstrate that human-animal relations under domestication is also a matter of moral, political, and spiritual relationships between human beings and animals. These different forms of human-animal relationships are hedged around the behavioural traits and survival needs of animals and are constituent parts of the daily livelihood activities of villagers. In other words, it is part of their various ways of living and interacting with their environment. As such, I suggest that domestication is one of the ways of dwelling, and I show that people do not just live through animals as food or property, but dwell with animals and in the process come to be with them. I illustrate my argument by using ethnographic accounts of some of the specific animal domestication practices that villagers adopt in trying to keep animals in human-controlled spaces. These approaches include fencing of houses, animal confinement, trapping and the role of by-laws and chiefs as mechanisms and agents of human-animal coexistence within the village community. These strategies each highlight different ways that make us to see domestication as a process of multispecies dwelling. They provide evidence that shows how the process of domestication can be challenging, unsuccessful and sometimes unaffordable. Towards the end of the chapter, I will argue that thinking about these processes in relation to anthropological literature on biopolitics and relatedness is one way to better understand these processes of domestication.

Fencing of houses

Animal domestication is an ongoing and difficult challenge, as it brings humans and animals into close contacts that can sometimes be undesirable. One of the ways that people try to meet some of these challenges is by using fencing as a barrier system and a way of demarcating boundaries with animals. This strategy of controlling animals is not limited to farm sites, where farmers build fences around their farms to prevent wild animals from raiding crops. Rather, fencing serves other important function in human-animal relations within the village environment. For instance, it is a way in which people establish physically marked boundaries around houses, for ordering and managing the movement of domesticated animals, and for separating animals from the internal spaces of their houses, which are the main sites for dwelling.

As witnessed in one of the villages that I visited during my fieldwork, I observed that every house in the village had a fence around it that was built with lattice sticks, of about three to four feet high (*fig. 18*). The fences were meant to serve as spatial barriers in preventing livestock from having access to the internal spaces of the houses, and by so doing, the houses were relatively free from livestock intrusion. Such physical infrastructural innovation that villagers practice, reminds us of how the process of dwelling keeps the environment under construction. While this idea remains consistent with Heidegger's conception about the importance of material infrastructure in the process of dwelling (Heidegger, 2006, 1971), it also brings into view the crucial role of material objects, physical infrastructure, and technology in ordering and regulating movement in the process of human-animal coexistence. This reflects the argument of Bjørkdahl and Druglitrø (2016), that the things that human beings do with animals and to animals often depend on physical infrastructures. This is because material objects are essential in establishing boundaries and in the ordering of interspecies relations, with the capacity to influence judgement and shape the behaviours of both humans and animals.

In discussing these kinds of infrastructural arrangements in establishing boundaries among living organisms, Reveil Netz (2004) sees fences as topological objects that create an inside and an outside, and make motion inconvenient. In his book 'Barbed wire: An ecology of modernity,' Netz (2004) expounds on the use of barbed wire as a technology and material barrier in the regulation of motion for humans as well as non-human animals. He maps out a history that shows how animal domestication influenced the invention of the barbed wire as an ingenious way to deal with the problems of controlling cattle by farmers in the Great Plains of America in the 1870's. Similarly, Alan Krell (2006) observes that the barbed wire served as a constant counterforce to keep animals at bay, and from which it became adopted as a mechanized warfare tool in the control of humans. Just like with the use of the barbed wire in the control of motion for both human and non-human animals, so are the fences built with latticed sticks from tree branches help villagers to regulate the activities of animals and keep them in defined spaces.

It should be however noted that the practice of fencing houses for animal intrusion does not mean that villagers see animals as less important, nor is it an attempt by villagers to totally

exclude animals from the social space, or to do away with relations that they have with animals. Instead, fences are modes of reordering their interactions with domesticated animals. It is one way in which people reduce the chances of close contacts with animals by altering the environment into one that accommodates all of them (humans and animals), and in such a way that is suitable for living alongside each other. In other words, this practice of constructing fences that villagers engage in is a process of dwelling with other nonhuman animal beings. It is a creative effort that demonstrates what Morten Axel Pedersen (2014) in his article 'The fetish of connectivity' describes as 'labour of division,' which is a purposeful attempt to craft interruptions and distances, and pushing apart relations with others that would be otherwise seen as too close. Such deliberate and sudden undoing of relations according to Brown and Marí Sáez (2021), involves radical reorganisation and reconfiguring of closeness and distance within human social worlds and reordering the possibilities of interacting with others.

Although the fences that villagers construct could not induce similar physical pain as with the blade of the barb wire (Netz, 2004), which inflicts bodily injury upon contact with the flesh of an organism to stimulate response, it is nonetheless an important relational tool used by villagers to organise the complexities of multispecies dwelling and in directing human-animal interactions in a desire trajectory of living with other beings. Villagers have the pragmatic knowledge that by constructing fences around the houses, it saves them from the responsibility of chasing animals out of the internal spaces of their houses. This is done on the belief that the fences have the capacity to act on the knowledge and judgement of sentient animals, and that they can influence the behaviour of animals in the absence of humans, even though these spatial boundaries of separation only reduce contact with certain animals. Reason for this is that they are porous for smaller animals such as chickens, which by virtue of their sizes and their ability to fly over fences often evade this social ordering. This thus shows the limitations of this strategy in the control of certain categories of animal species, and it exposes the difficulties and challenges in achieving full control with these animal control measures. Besides that, the maintenance practice of rebuilding the fences by villagers to ensure that the boundaries are maintained underlines the ways that the boundaries takes constant work to keep in place, and this further shows the complexities of domestication.

In spite of these challenges, the use of these artefacts in defining spaces shows that though the fences are material objects, they are not just passive or neutral objects, nor are they fixed, static or without agency as could be assumed (Latour, 2005). Essentially, the fences are much more than just physical elements. They are modes of separation or detachment, and at the same time promote human-animal co-existence, and forms part of the wider network of social relations that keeps humans and nonhuman animals constitutively connected.

In sum, these physical infrastructures that villagers construct are complex nodes in the politics and practice of multispecies dwelling and not mere matter. In fact, since construction is an important aspect of dwelling, and constructing fences is one of the strategies that villagers use in trying to co-exist with animals in their shared dwelling spaces, then this analysis is crucially important in showing how the practice of domestication is part of dwelling.



Figure 18. A house fenced with lattice sticks to mark spatial boundaries between animals and the house.

Animal confinement

Another way that villagers use material objects to incorporate animals into their domain is by creating special spaces in the form of animal pens within their dwelling spaces. Discussing this strategy is also useful in showing the difficulty of domestication as a process of multispecies dwelling.

In *Nyayetahun*, animal pens form part of the village infrastructure (see figs. 19 and 20). Next to every house in the village about two to three meters at the back or the side of the houses is an animal pen constructed with strips of sticks and timber wastes, for either goats, sheep or pigs depending on the animal species domesticated by the household, while chicken coops made with plant fibre are used to keep chickens. These different kinds of animal pens are means of providing housing for animals and for incorporating them into the dwelling space as members of the community. This practice also helps villagers to control the movement of animals and protect them from potential adverse conditions and threat such as theft or predation. But more importantly, animals are kept subjugated from posing social and environmental threat especially to human food security.

Although domestication is frequently talked about in the literature as something that was done in the past, the activities of animals in *Nyayetahun* shows that animal domestication is a kind of incomplete, unfinished, and sometimes unsuccessful activity. The act of stalling animals in pens, cages, and the use of ropes to tie animals are among the common approaches and responsibilities of farmers in keeping animals in defined spaces, although animals often frustrate these human efforts and designs. In fact, in some cases, allowing animals to range freely is the only feasible arrangement for villagers.

Certainly, when animals are kept in pens or cages or tied with ropes, villagers have greater control over their activities compared to when they are left relatively free to eat, drink and move about the village on their own initiative. In confinement, their time of feeding and what they eat is determined by villagers, and their movement is also checked. Under these circumstances there is often limited unwanted human-animal encounters, and the social unrest caused by free roaming animals is also relatively reduced. As I observed however, the practice of animal confinement has its own challenges and often does not work. This is because, it is sometimes unaffordable for villagers to keep animals in continuous confinement due to their socio-economic status. Raising animals in confinement requires economic input for the provision of supplementary foodstuffs (Thomas et al., 2013), which resource poor farmers can often barely afford. To these farmers, feeding and taking care of animals in permanent confinement is an additional workload to the labour and time needed for their domestic and farm work, as villagers give keen attention to crop cultivation which is their

main source of subsistence. As such, they are often faced with the trouble of dividing their time and labour between farming and other activities like feeding, protecting, and controlling animals.

According to villagers, allowing their animals to move about freely and to have access to the wider environment eases the burden of providing supplementary food for their animals, because it allows the animals to pursue their own means of survival by fetching food for themselves, and thus prevents animals from prolonged periods of hunger. Pigs for instance are believed by villagers to be very difficult to feed when they are confined, and as noted by Jensen (2002), food availability is essential in pig domestication. Confinement impedes pigs' growth because of the lack of basic requirements of appropriate and adequate food, and such considerations therefore make the process of continuous confinement an impossible endeavour. Instead, the practice of caging animals often serves as a temporary control measure that is mostly utilised during the planting season to prevent animals from raiding crops, and in some cases, caging is utilised to particularly regulate the activities of animals that are identified as posing greater social unrest in the village.

In this situation, the act of animal confinement is undertaken as a punitive measure against an animal for being transgressive. For example, *Masunday*, a young male adult with a wife and three children, who often divided his time between his farm, the village, and the neighbouring village to see his intended second wife, had to keep two of his pigs in an unfinished building in order to save himself from the troubles he had with other villagers as a result of the actions of his pigs. *Masunday's* pig pen had collapsed, and he had no time to reconstruct it because of his farm work. He therefore decided to keep the pigs in an unfinished building owned by their extended family. The pigs were confined to one of the rooms in the said building until when he was done with planting on his farm and that was when he engaged in the reconstruction of his animal pen, where the pigs were later transferred upon completion. Similarly, it was after planting that other male villagers including the town chief became more active in reconstructing their animal pens to keep their animals enclosed.

From my observations, the main intent of engaging in such activities after planting was to prevent animals from crop raiding, which implies that crop protection is a significant factor

for which domesticated animals are more likely to be confined by villagers. As such, though animal domestication is distinct from crop cultivation, it however appears here as an activity that is connected to the farming practices of villagers, and which all together form constituent practices of their dwelling processes.

Apart from crop protection, the act of confinement is also utilised when a new animal is brought into the village. In this case, animal confinement aims to introduce an animal into its new environment, and to make sure that it does not revert to his former place. Like *Geogi* for example, who I observed came home with a goat tied at the back of his motor bike one evening. The goat had been given to him by a relative living in the neighbouring village (*Maseka*) so that he could raise it for him. *Geogi* kept the animal on a leash for about three days before it was released into the community. At that time, he and his family were sure that the goat was safe to be left free in the village environment after feeding the animal with salt in addition to vegetable fodder (cassava leaves). The reason for giving salt to the goat *Geogi* explained, is one way of establishing intimate connections with animals. A similar reason that I heard in the accounts of other villagers about how the practice of feeding their pigs with salty food keeps the pigs connected to them (their owners) and to the village environment even when they are left freely to pursue their own food needs.¹

In the process of often preferring to leave animals unrestricted – which villagers believed better aids the growth of animals as opposed to keeping them in confined places with limited access to food – contact between humans and animals becomes closer. In other words, the practice of free-roaming animal rearing systems keeps villagers and animals in an intimate web of interspecies relationship, wherein both people and animals continually shape and co-shape one another in trajectories of commensality and conflict, and with the responsibility of getting on together in a shared environment.

¹ This reflects in the earlier writings of ZEUNER, F. E. 1963. A history of domesticated animals. *A history of domesticated animals*. on domestication, noting the importance of salt-licks in attracting reindeer into human camps and how wild gaur also called Indian bison, are allured by salt-licks placed by people in a suitable locality.



Figure 19. A pig pen built with tree branches, bamboo and timber waste.



Figure 20. Pen for sheep and goats constructed with support from a non-governmental organisation.

Conflicts over animal incursions

In the system of allowing animals to free range, the intensive labour and economic input of keeping animals is low, and this gives these subsistence rural farmers the ability to keep livestock without much labour and financial pressure for animal food supply. However, the conditions of leaving animals to free range has its downsides, as it creates a lot of difficulties for villagers. For instance, through this process animals are exposed to the living and other domestic spaces of villagers, and there is an increase in competition with humans over

livelihood resources. Livestock raid farm sites and can cause devastation to crops which undermines crop productivity and threatens food security. In addition to that, free ranging exposes domestic livestock to the wider environments that surround the village setting while scavenging, where they sometimes fall into traps, often leading to physical injury if not death, and this also affects the economic security of households.

I observed that the destruction caused by domesticated animals on food and property was a common cause for contention among villagers especially during the planting season, due to their ruinous impact on farm crops. With the kinds of incidents of tension over animal incursions that characterise life in this village, animals seemed to present themselves as key players in inter-human conflict. Nonetheless, these conflicts often came along with reminders about people taking responsibility to control the activities of their animals, and failure on the part of a person to keep the activities of his/her animal regulated is considered by other villagers as irresponsible and reckless. In a sense, this was not necessarily a scornful abusive remark that was aimed at attacking a person's personality, but a way of questioning the conduct of their neighbours about training their animals to live well in the society, since the animals were viewed as an extension of their owners. Moreover, these conflicts were often resolved on the grounds of social cooperation. By this I mean that, the awareness among villagers that they all owned animals, and that these animals could cause problems to their neighbours, guided them in their decisions and actions towards the animals owned by others. Therefore, despite the level of frustrations a villager might experience on account of the activities of a neighbour's livestock, the need for compromise often took precedence. In a sense, the very fact that they co-existed with these animals promoted a sense of communal cooperation and participation in the domestication process (Cassidy and Mullin, 2020).

That notwithstanding, bickering over accusations and counter accusations of animals raiding farms sites, foraging on crops, and even destroying property, remained evident in the daily life of villagers. For instance, complaints about animals eating food and stealing substances they consider edible such as bathing and laundry soap were part of the everyday incidences of the nuisance of free roaming animals. Similarly, domesticated animals were frequently being chased with sticks and stones to make them drop food or other things they carried in their mouth. Often, the remainders of food left by animals after dipping their snout into a

cooking pot or dish were eaten by villagers, which was also a possible pathway for disease transmission through food contamination. One evening for example, I observed an elderly woman complaining about a pig entering her house and eating a lump of steamed wild animal meat she had in her cooking pot, for which she demonstrated her frustration openly to other villagers. While directing her utterances to the owner of the suspected pig, this woman chastised the owner of the pig for failing to control his animal, and this consequently resulted to some kind of altercation. Surely, if it were the woman's own pig that had eaten her meat, it would just be a matter between the woman and her pig, but when it is another person's pig, it became a source of tension between her and the other person to whom the pig is like an extension. Such incidents demonstrate how inter-human relationships can be drawn into human-animal relationships.

I particularly singled out pigs in this example because of their notoriety in causing greater problems than other domesticated animals, and I consider this act of species identification also important because it makes sense of the diversity of villagers' experiences with animals in terms of species type, which is helpful in shaping our understanding of the kinds of encounters that people have with different animals. Compared to goats, sheep and chickens, pigs cause more strains on human relationships. They inflict greater devastation not only on farm crops, but also destroy property including the digging up of mud houses as I have described in the previous chapter of this thesis. Villagers refer to pigs as dirty because of their behaviour of wallowing in mud and their filthy scavenging lifestyle especially their habit of feeding on human faeces. For these reasons, people demonstrate a greater vigilance and aggression in keeping distance with pigs as compared to other animals, and this is also one reason for their lower status with respect to social preference and edibility among many people. Haven said that the egregious distress that pigs and other animals pose is usually seen as a nuisance in this community. However, these experiences are part of the texture of daily life that villagers continually live with. It is the kind of environment that people and animals share; a dwelling space that is marked with intimacy, competition, and breach in relationships between humans and animals that are all central to the experiences of multispecies dwelling.

These interactions are often characterised with a wide range of emotions, from mild stress, annoyance, bickering and disgust, to more contentious, antagonistic, and violent interaction

that sometimes cause acute stress and pain. These processes echo much of what Haraway (2013) has referred to as 'becoming with'. Donna Haraway helps us to understand that living with domesticated animals as 'companion species' is a complex form of interaction that is not limited to control or subjugation, but rather constitutes a process of learning to live with the benefits as well as the discomfort, pain, and difficulties of the co-presence of other species. These complexities are evident in the ways that the activities of domesticated animals threaten not only the physical environment, but also undermine the food security of these rural subsistence farmers. This in addition to the ripple effect that this process of co-existing with animals pose on the social relationships of villagers and with other members of the community who are part of the broader network of the interspecies entanglement, all together clearly shows how unfinished, problematic, and challenging the idea of animal domestication is.

In the next section, I continue to show this ambivalence of domestication through some other approaches that villagers adopt in the process of living with animals, including trapping and the use of byelaws. In their respective ways, each of these approaches also help us to understand the ways in which domestication is part of peoples dwelling practices, and as case studies they provide evidence that show how the process of domestication somehow keeps humans and animals in the same moral and political order, bringing animals into the more-than-human processes of biopolitics.

The goat that is a thief

"In the context of increased interspecies competition for space and other resources, humans are growing frustrated and pursuing more aggressive means of dealing with this conflict..."(Nadal, 2020, p. 143)

Generally, the act of setting traps is one of the common approaches that people use to hunt wild animals – either for consumption, sale or to protect crops from wild animal predation. Interestingly, trapping remains a component of the measures that people take in responding to their frustrations and conflict with domesticated animals. Villagers adopt trapping as an approach to protect crops from domesticated animals especially when the activities of free

roaming animals tend to pose a significant threat to the growth of their crops. The adoption of this practice by villagers is however complex and characterised with moral and political implications. In this respect, paying attention to the dynamics of the use of trapping for crop protection is important in helping us to see domestication as also a moral and political process, and not just a practice of claiming ownership over animals. An entry from my field notes illustrates some of these dynamics:

One afternoon, *Masunday* and I were trekking to a neighbouring village which is about two miles from *Nyayetahun*, to see his fiancée that he intended to make his second wife. As we arrived close to the village, I saw a young boy gazing at a goat that had been caught on a snare trap set around a garden (*fig. 21*). I felt sorry for the animal, and considering the economic importance of livestock to villagers, I thought that we could save the animal from dying. But to my surprise, I realised that *Masunday* was not really bothered about the goat. Instead, he pointed at a man standing at about fifty meters under a tree by the side of the road, and turning to me he said:

'The man standing there has set this trap, he is the owner of this garden, and he is watching to see if any one of us will save the goat from the trap',

As the goat continued to bleat in pain, and with the knotted trap rope gripping both her neck and left foot bound together, *Masunday* continued,

'...if anybody saves this goat besides the owner of the trap or the person who owns the goat, that person will be summoned and fined by the town chief'.

I was intrigued by this explanation of leaving a goat on a trap, and I asked him why the goat should be left to suffer. He responded saying:

'...this particular trap is not for wild animals, it is constructed for the animals that people keep in the village, the owner of this garden must have been disturbed by the animals in the village, for which he [referring to the owner of the trap] must have been making complaints to the chief about animals raiding his crops and had informed the chief that he was going to protect his crops, for which he has been given permission to do so. So now that this goat has been caught by this trap, it is

going to stay there and die and the owner will come and pick it up, butcher it and give one of the legs to the person that owns this garden. ...the reason for that is because the goat is a thief that had been caught on somebody's property and once the person who sets this trap had informed the chief that he was going to protect his crops and the announcement was made in the village, the owner of the trap has the right to do so,' he concluded.



Figure 21. A goat caught on a snare trap around someone's garden.

This ethnographic vignette paints a picture of the kinds of complexities that characterise human-animal interactions in processes of domestication. It is useful in arousing an understanding of the inconsistencies and moral considerations that people make in the handling of different categories of animals, and how the process of domestication is bounded by moral and political relationships between humans and animals that we can think of as more-than-human biopolitics.

It shows that unlike in the case of hunting animals in the wild, the act of setting traps for domesticated animals is approached differently. Notwithstanding the fact that the same technical strategies are involved in setting these traps and the act itself looks the same for both domesticated and wild animals, in the case of domesticated animals however, villagers follow certain societal normative considerations before adopting trapping as an animal

management strategy. For instance, whereas a farmer does not need the consent of a local authority to set traps for wild animals around his farm, in the case of domesticated animals, it behoves a villager to seek the permission of the town chief before engaging in trap setting. Such permissions are usually granted when there are persistent complaints of animals foraging on crops due to failure on the part of villagers to control their livestock following a series of warnings from the local authority. Albeit with the approval of the chief, a public announcement is made through the town crier informing villagers about the permission granted to certain people to protect their crops with traps, and the need for villagers to control and save their livestock from the deleterious consequences of those traps. The reasons for all these procedures are to ensure that people are reminded of their responsibilities to keep the activities of their animals under control, considering the implications of losing a livestock. These practices shows that domesticated animals within these communities exist within a moral context and the process of animal domestication itself is accompanied with a moral and political baggage that involves integrating animals into the moral and political worlds of people.

Such interactions in some way exemplifies Michel Foucault's concepts of biopolitics and biopower: seen generally as powers 'over life' (Asdal et al., 2016), and which scholars like Natalie Porter (2013), and Anand Pandian (2008) have developed to take into account the ways that humans and animals are governed in normative and moral terms. Tracing its root, Michel Foucault formulated the concept of biopower to describe the systems of knowledge and strategies for intervention that is focused on optimizing the vitality of human species (Foucault 1990:139). Drawing on Foucault, Porter (2013) explains that the idea of biopower moves between two poles, i.e., 'anotomo-politics' that maximizes the force of human bodies through disciplinary actions, and a 'biopolitics' that administers the population via regulations on birth, morbidity, and death. And as Porter (2013) argues, extending biopower to include nonhuman animals addresses the transspecies concept in anthropology, which moves beyond the human to examine emergent relationships among species (Kohn, 2007). In other words, though animals and humans are distinct groups, the anthropology of biopower brings humans and animals into new forms of social relationships, that foster the governance and protection of animal lives in political terms.

In the context of *Nyayetahun*, this notion of biopolitics and biopower is brought to bear in the ways that the population of human and non-human organisms dwell together as a set of natural processes that are defined, controlled, and governed by normative actions. This is demonstrated by the ways villagers handle domesticated animals by somehow applying the moral knowledge and consideration in the management of humans to animals. Such practices shows that the process of animal domestication is also a moral and political relationship by which the activities of animals as well as the actions of people towards animals are guided by normative principles. This viewpoint contradicts the classical narrative of domestication that tends to see this process largely in terms of property-ownership or predatory-prey relations.

In incorporating animals into the village community, villagers are expected to keep the behaviour of animals subjugated to certain moral conduct, by teaching animals how to live the right way, and so that the animals can conform to not only the interest of their owners but behave in line with certain expected societal norms. Therefore, when the conduct of an animal is perceived to be a threat to the community, like ravaging crops, destroying property, biting people or preying on another domesticated animal, such actions of an animal is considered as breach of the domestication process. As illustrated in the case of the goat on the trap in the ethnographic vignette, by foraging on somebody's farm, the goat is considered transgressive and contravening the moral contract of the process of co-existence. For that reason, it deserved to be punished or rather eliminated from the community. In a different context, Chris Philo and Chris Wilbert (2000) have illustrated these kinds of complex moral relations in which humans and animals can be entangled. Their study elucidated the actions of domesticated cats bringing dead rats into people's homes in the United Kingdom, and they argued that by such actions, the cat is a polluter of the domestic space and therefore is breaking the boundary between nature and culture, or breaching the domestication boundary (Philo and Wilbert, 2000). Likewise in the United Kingdom, if a dog bites a human being, then that dog is violating the social norms of living alongside humans and therefore should be euthanized. All of these are examples that show the kinds of moral order in which animals become entangled in the process of their incorporation into human society.

In the section that follows this one, I present other ethnographic accounts that provide further evidence of the crucial role of local political governance systems in the management of human-animal relations in the process of domestication.

The goat chief

As I have argued, animal domestication brings animals into the political realm of human society. The mutual ties between villagers and domesticated animals as partners sharing the same dwelling spaces, gives animals a stake in the local political governance system that regulates not only the behaviour of humans, but also that of the animals that they co-exist or dwell with.

In *Nyayetahun*, the role of the town chief is integral in the animal domestication process, and this could be said to be the same for many rural villages in Sierra Leone. Although there may be variations in the kinds of locally formulated legal approaches with respect to the kinds of laws and sanctions that governs animals in different villages, what certainly remains common is that in addition to the local technological methods that people adopt in their animal management and control systems, the societal political structures that are headed by chiefs do play a crucial role in shaping human-animal coexistence and in guiding the domestication processes in these rural communities.

Chiefs as I have earlier discussed, are the local authorities and representatives of the central government at the village level (Jackson, 2007). They have political authority to evoke sacred and customary powers in their villages and towns. Chiefs in rural villages in Sierra Leone are linked to national political authority through the operative central government, and they are recognised by legislation as enshrined in the 1991 Constitution of Sierra Leone (Albrecht, 2015). This gives them powers as custodians of the land to settle disputes, introduce byelaws in their communities and enforced compliance in the bid of protecting the lives and property of their subjects and to mitigate potential threat to their community and its resources. The status of chiefs as the main source of authority and custodians of law and order at the village level makes these local authorities integral in the animal management system in this rural village community of *Nyayetahun*. The authority of the town chief runs through shaping the

way villagers handle animals, protecting domesticated animals, and in resolving animal related disputes, such as animals foraging on crops, destroying property, animal theft or death of an animal caused by someone. Having said that, my experience in one of the villages that I visited during my ethnographic fieldwork provides an interesting account that can further help to demonstrate ways how the play of politics orients the lives and behaviours of animals among villagers.

In this village that I visited, I was surprised to notice that apart from the town chief, there was also a sub-chief who had the sole responsibility of governing the activities of domesticated animals. People referred to him as '*ŋjei mahei*'. '*ŋjei*' in mende means goat, and '*mahei*' refers to a chief. '*ŋjei mahei*' therefore means 'goat chief'. The '*ŋjei mahei*' in that village presided and mediated over all cases that are related to the activities of domesticated animals in the village. For instance, if a goat raids someone's farm instead of going to the town chief, such complaints are directed to the '*ŋjei mahei*' for his arbitration. *ŋjei mahei* has the authority to arrest and detain animals considered to be contravening animal laws in the village, and one of such laws is that no goat or sheep should be found roaming in the village when night falls. Any animal that is seen outside at night is considered transgressing the social norm of the village, it will be therefore caught and detained in a kind of metaphorical incarceration at the house of the '*ŋjei mahei*'. Upon 'arrest,' as rightly described by the *ŋjei mahei* during our discussion, the animal will remain in detention until it is retrieved on payment of a financial fine by its owner.

This practice underlines my earlier claim that under domestication, there are ways in which animals are expected to conduct themselves. The *ŋjei mahei* is clearly seen here engaged in teaching the animals how to behave by enforcing rules that for instance regulates the movement of animals and determining the time that animals have a right to be roaming outside the village environment. Since the activities and behaviours of animals are guided by the interest and actions of their owners, the authority of the *ŋjei mahei* plays a crucial role in ensuring that people subject their animals to the social and moral expectations of the village. Such strategy of having a *ŋjei mahei* as mechanism that manages human-animal interaction in the process of incorporation, shows the link between interspecies relations and political

power, and this is also crucial to the idea of ‘more than human’ biopolitics or biopower (Porter, 2013, Pandian, 2008).

In this context, animals are governed as humans, and with both animals and their owners an arena for the exercise of political power (with biopower acting on humans through their animals) that control and shape the conditions for their co-existence with other people in the village. Beyond that, this political governance also extends to their interactions with outsiders, like people who visit the village to buy livestock. For instance, economic transactions of buying a goat or sheep from someone in the village requires a kind of certificate of purchase from the *ŋjei mahei*. Without such a document to show that an animal has been sold through legal transactions, the animal will be impounded at security roadblocks when being transported. The reason for this is to protect animals from thieves who sometimes visit these village communities to steal animals, and all these practices entail aspects of biopower. However, while this shows how the governance systems that regulate and control relationships between people are being extended to animals, it at the same highlights the critical status of animals in participating and shaping the political structure of human society. Thus, contrary to ideas that sees domesticated animals as merely objects of property or food, the account of the *ŋjei mahei*’ in the control of animals at the village level presents animals as subjects in human moral community. This account reveals a broader view of animal domestication as not just a relationship between the human domesticator and domesticated, but it is rather an enduring interaction between animals, humans, and the moral and political processes of the society. These kinds of moral and political connections between villagers and animals are vital in opening-up our perspectives to see that the things we share with animals are not so much about property, food, and economic utility of animals but includes other social processes that shapes our social worlds and modes of co-existence. Moreover, since the traces of these moral and political engagements between villagers and animals are found within the everyday practices of how people live and interact with other beings and their environment, this suggests that attending to such practices and the circumstances under which they are exercised can offer a way of understanding human-animal interactions as a complex and multifaceted process that is constitutive of various forms of social relationships.

In fact, all the materials that I have presented here about the ways that animals feature in the moral and political worlds of villagers suggest that it might be apt to think about domestication through the lens of relatedness. In the section that follows, I will show that there is really a strong parallel between my descriptions of domestication as an ongoing and unfolding practical activity, and the anthropological literature on relatedness (e.g., Sahlins, 2013, Strathern, 1992, Carsten, 2013).

Affinal status of animals and the moral order of multispecies dwelling

Each time villagers talked about their relationships with domesticated animals, one thing I realised is that a shared sense of co-being and intimacy between them and their animals often emerged in their expressions. An important work in understanding these kinds of demonstration of relatedness with other nonhuman kinds is the new kinship theory (Strathern, 1992, Haraway, 1997), that sees kinship beyond the traditional view of social structure built on biological relatedness.

Drawing on sources like the 'queer theory,' which asserts the validity of 'other' kinds of family ties and relationships, as well as 'science studies,' in which scholars have demonstrated interest on the implications of new biological or reproductive technologies such as vitro fertilization, cloning and transgenic chimeras in creating new kinds of relationship (Russell, 2007), the new kinship theory brings into view other kinds of relations that are relevant to be incorporated in thinking about kinship. This perspective helps us to see kinship as a hybrid of biological and social relations. By arguing that biology alone is not a solid base for explaining kinship, as the idea of biological itself is said to be constructed and in part modelled on society (Russell, 2007). Therefore, the idea of kinship is a fact of society rooted in nature.

Certainly, the people we regard as kin are often persons we are either related to by blood or by marriage, which according to Marilyn Strathern (1992) is the outcome of, or prospect of procreation, and where the process of procreation is seen as belonging to the domain of nature. As such, kinship is seen to connect the two domains – society and nature, in a similar way that domestication connects nature and culture or society and the wild. In other words, domestication is an extension of kinship to other non-human animal species (Russell, 2020).

As a matter of fact, the idea of domestication is about bringing animals into human society, and this in a sense involves making kin with them, because animals are treated in ways that are somehow similar to that which exists among humankind. In Nyayetahun, the creation of kin-like relations with animals was most visible in the example of animal sacrifice, which kept villagers and animals intimately connected. Individuals and households often keep a sheep or chicken for the purpose of fulfilling certain spiritual or religious rituals. For instance, a person might keep a fowl for a religious sacrifice to bring good fortune, or a household might have a sheep kept as an act of atonement or symbol of protection. In this context, there were usually stronger emotional ties and mutuality of existence between people and the kinds of animals kept as ritual sacrifices, as their presence in the home is important not for their economic utility, but for the religious and spiritual wellbeing of the household. Thus, any form of harm that such animal experienced could equally affect the spiritual wellbeing and emotional state of its owner.

Similarly, people were often faced with emotional difficulties in killing certain animals particularly those with which they have strong ties – be it for economic, spiritual or religious purpose. In fact, generally, respect for the life of animals is a characteristic of the interaction between villagers and animals, and this was usually demonstrated when slaughtering an animal. Whether for food or religious rituals, it was a common practice for villagers to observe appropriate ritual respect, such as reciting a religious citation as a sign of penance before engaging in the act of slaughtering. This is because the act of slaughtering an animal is not just a simple activity but involves taking life and therefore must be done with respect, even though this respect often varies across different animal species, and between wild and domestic animals. For example, in a discussion with *Dayfo*, he told me that he does not like to slaughter animals that he has raised because of the close relationship he establishes with them as they grow. Therefore, he often asked other people to do the slaughtering for him whenever he wanted to slaughter his livestock for sale, and even by doing so, he still experienced some form of emotional pain for the loss. Similarly, such emotions and expression of grief were observed in the actions of some of the women in the village when they often found their chicks dead or being attacked and preyed on by a hawk. Though different, all these kinds of feelings expressed by villagers towards animals emerge because of the nature of connections that exist between both species, which are created and sustained through everyday practices of

interspecies engagement, care and support for each other's wellbeing, and these are some of the things that constitutes what Kinship does (Sahlins, 2013).

Kin, Marshall Sahlins (2013) helps us understand, participate intrinsically in each other's existence and share a mutuality of being, and they are members of one another. The quality of kinship Sahlins highlights is not tied to procreation or biology. Rather, kindred ties include other forms of social relations and processes which are captured by the idea of mutuality of being. However, it is important to note that kinship does not only emerge out of close or intimate relations, this is because, there are also important examples of the implications of difficult and distance relations in producing and shaping kinship ties (Carsten, 2013). Janet Carsten (2013) for example, has described kinship as a domain in which we can see the 'thinning' and 'rupture' of relations, as well as their 'thickening' and 'closeness'. Her analysis highlights ways in which kinship can entail the strengthening of social bonds and can also involve the dissolution of social relations through processes that entails separation. Reflecting on all of these ideas are relevant in accounting for the kinds of moral order in which villagers and animals dwell, where the activities of animals are regulated within the same moral regime as humans. This is also important in understanding the variations that exist in the ways that people treat animals based on the kinds of relationship they have with them (Leach, 1964, Meijboom and Stassen, 2016), and it useful in making sense of the whole range of villager's experience with domesticated animals in relation to the kinds of moral judgement surrounding the handling, and death of certain animals.

Therefore, reflecting on the kinds of considerations that people make in slaughtering animals, it is obvious that certain approaches such as trapping is not a prescribed method for killing domesticated animals. Trapping does not fall among the humane ways of handling animals that are considered as very close partners, and towards which villagers to a certain degree extend similar moral values that guides them in their inter-human interactions. Any deliberate attempt of killing livestock with a trap is against the normal practices of handling domesticated animals. It is considered a painful and cruel way of killing, often attracting backlash from family members and other villagers. In this respect, leaving the goat on the trap as narrated in the ethnographic vignette in the previous section, is a difficult and not just a simple sight, because the animal is seen to suffer more than it would when slaughtered with the throat slit in a

careful way and respectful manner. Analogously, killing somebody else's livestock is a grave offence, as it leaves an adverse impact on the emotional wellbeing and economic security of individuals and their households. In that respect, even when their activities may be of devastating effect to crops or property, it is not a justification to harm another person's livestock let alone killing one with a trap.

Considering all these moral codes in dealing with animals, the practice of seeking permission from the local authority to construct traps for crop raiding livestock is a way of claiming legitimacy and avoiding guilt. For it is only upon the approval of the local authority that a person has the right to use trapping as a control measure for domesticated animals. In this circumstance, the death of a domesticated animal with a trap could be described as a necessary evil. It is somehow a kind of thinning of relations (Carsten, 2013), that is meant to ensure that the activities of animals are controlled by their owners. Another way that villagers avoid such guilt is by emotionally reducing the domesticated animal to not only the status of wild animal pests, but metaphorically referring to it as a thief. Whereas the trap is framed as a legitimate strategy meant to catch a thief, and which happens to be the goat on the trap in this context. These practices resonates with the argument of Cassidy and Mullin (2020) of the tactics that people use to dismiss the guilt of slaughtering and eating animals that they have raised. They note that, people emotionally reduce the animal as inferior to both humans and their wild counterparts, and while they frame the act of slaughtering as a sacrifice (Cassidy and Mullin, 2020).

Having outlined these complex forms of more-than-human kinship, it should be however noted that this contrasting attitude of empathy and pragmatism in the attitude of villagers towards animals is part of their animal domestication practices and enfolded around their farming activities, which are their main source of socio-economic and livelihood support. Apart from that, this attitude of empathy towards domesticated animals is as well hedged around the mutuality of being that they share with their livestock, as seen in how the emotional and practical concerns for the intimacy and social ties that they have with these domesticated animals remain vital in employing certain domestication practices. Which suggests that whilst these practices of domestication are in some ways 'beyond' economics they are also underpinned by the economic and subsistence needs of people.

What is crucial in the analysis that I have presented here is that it shows how multispecies dwelling shapes people's social behaviour towards animals. For instance, the critical normative evaluation and care of villagers in ensuring that societal expectations in the way domesticated animals are to be treated are not flouted, points to how animal domestication practices involve concerns of not only human-animal relationships but also entail the moral and political climate within which those interactions are established. In addition to that, the extension of the moral principles and local politics that governs human beings to the lives of non-human animals, shows that the moral and political processes of human differences can be inherently constitutive of the broader network of human-animal relationships. While all these examples are important in making us understand the kinds of relationships that can emerge between humans and animals in the process of domestication, they are also helpful in directing our attention to the ways how people think about animal welfare and governance.

Conclusion

In this chapter, I have explored the practice of incorporating animals into the human domain under the rubric of dwelling. I have unfolded an argument that shows that domestication is part of dwelling.

By illustrating how domesticated animals form part and parcel of human social, moral and political communities, and how their interactions with humans involve a wide range of networks that constitute social, economic, material, and environmental assemblages, I have offered new insight into domestication as a process of multispecies dwelling. The type of entanglement between humans and animals that I have articulated here, encompasses conflict, caring, monitoring, control, communal collaboration, negotiation and compromise between animals, humans, and the wider community. This is important in understanding that human-animal relations under domestication is a more complex, difficult, ongoing, and unfinished encounter between humans, animals and other environmental elements and social organizations that we as humans often establish for ourselves.

The relationship between villagers and animals as I have shown is shaped by the way of life of people. By this I mean their use of agriculture as a primary mode of subsistence and the

mutuality of existence between them and their animals, where animals participate intrinsically in the existence of people. Using ethnographic accounts of some of the strategies that villagers adopt in the control of animals as mechanisms of domestication, I have illustrated how these practices of co-existence shape both the architectural infrastructure of villages and the social structures of people's lives.

In examining the act of fencing as a mechanism of animal control for example, I have revealed the agency of material objects in mediating human-animal relations, showing how villagers use ecological materials such as sticks and ropes from plant fibre to demarcate boundaries and define spaces between animals and human living spaces. This example provides an understanding of how the process of incorporating animals into human environments shapes people's use of architectural infrastructure in a bid to reduce closeness, or rather 'thinning' relations (Carsten, 2013) with animals. In other words, fencing shows the crucial role of material objects in regulating multispecies relations, and at the same time highlights ways in which the presence of animals shapes domestic spaces. In a sense, we can learn from this that the domestic spaces are also material spaces that form part of the broader network of the relationship between humans and other nonhuman beings.

Although these approaches that villagers adopt are helpful in incorporating animals into the domestic environment and in dealing with the challenges of living with them, they also have their own challenges. For example, keeping animals in continuous confinement conflicts with the livelihood activities of villagers. This as I have shown is because, providing supplementary food stuff for animals in confinement is usually unaffordable by resource poor farmers, which thus makes the act of confinement often unachievable. This means villagers often prefer to leave their animals freely to feed for themselves, and this consequently poses further social and environmental problems for people, with animals imposing their agency within the domestic space.

Extending an ethnographic lens to other strategies that people adopt to deal with some of the problems of conflict over animal incursions helps us to view domestication as a political and relational process too, and not just about bringing animals into the physical spaces of the home. The practice of trapping and the role of local authorities as mediators of human-animal

relations, have both allowed us to see the idea of domestication as a process that also involves moral and political relations, through which animals like humans are governed and controlled in moral and political terms. Suggesting that animals are not passive beings or having what Giorgio Agamben (1998) calls 'bare life' that renders them just killable. Rather, they are integral parts of human political world, and with a life that is governed and regulated through political structures and processes.

To summarize, living with animals is a complex form of interaction involving practices that have social, moral and political content. As such these relations with animals cannot be properly understood by thinking about domestication in a narrow human-centric framework. Instead, broader understanding of these relations requires focus on the context of different dimensions that forms the processes of these interactions.

Beyond the examples I have discussed in this chapter, other ways to think about this might include the ways in which these processes of human-animal interactions extend to inter-human relations between individuals and between households, as well as how these relations go beyond domestic and physical domains into the supernatural realm. The latter is a topic that I will turn to in the next chapter, where I will show how animals mediate between different worlds, and how they promote and shape interactions between the mundane and profane.

Chapter 6. The multiple worlds of animals in *Nyayetahun*

While braiding *Hawa's* hair, with *Hawa* seated on the floor and her head on *Musu's* lap, *Musu* asked in Mende; *Who again is going to die?* Raising her head, *Hawa* looked her in the face and asked; *why?* *Musu* responded; *did you not hear the Ndoɔin?* Both listened attentively, and after about a minute, they looked at each other, shook their heads in regret and continued braiding.

In my quest to know what the sound of the bird suggests, I was informed by these women that anytime that sound of the *Ndoɔin* is heard, it foretells death. In a sense, the sound of the bird serves the function of announcing to villagers about the death of a person that they know or are related to.

This discussion between *Hawa* and *Musu* about the sound of the *Ndoɔin*, which is a sign bird that announces to villagers a message that has to do with death, draws attention to how animals span multiple worlds – bridging the physical and the supernatural domain. The conversation between these two village women suggests that human interactions with animals can create new spaces of possibilities for humans to understand and connect with other domains beyond the physical human community. As it appears in this context, the bird is seen to help *Hawa* and *Musu* to foretell future occurrence of death. Reflecting critically on these kinds of possibilities for communication that nonhuman animal beings afford to humans – even though their ability for language is constantly questioned – is important because, it brings into view another dimension of the complex relationship that people and animals share. This is useful in expanding on our knowledge about the multiple sides of human-animal relationship in ways that go beyond the limited scope of economic utility. It is also helpful in showing that multispecies interactions are relational practices that are maintained through different ways that people try to understand and relate with their surroundings, as modes of dwelling in the world.

In this chapter, I describe the intertwined lives of humans, animals, and spirits, and I use ethnographic material to show how this way of understanding multispecies worlds undermines Cartesian and other categorisations based on the separation and opposition of

society and nature. I show that in *Nyayetahun*, animals mediate between different domains of human and non-human sociality. They mediate relations between the realms of the domestic and the wild and between the physical and the spiritual. I use the term 'wild' here to refer to the realms beyond the domestic and the physical domain of the village, such as the biotic world of the forest or bush, inhabited by '*ferus*' – a Latin word used to describe untamed animals. Wild is also used here to denote the realm perceived by villagers as spiritual or supernatural.

During my field work, I found that villagers' ideas about the forest were inextricably connected with notions of spirits, with the connotation of mystery or invisible powers. The forest was seen as a spiritual space containing innumerable dangers including evil spirits. It was also a source of potency and regeneration. In fact, certain acts such as sexual intercourse in the forest constitute a grave offence. This is because villagers consider such practice a desecration of the land, as sex defiles its fertility and inhibits crop productivity. Thus, culprits are often required to ritually cleanse the forest.

Apart from farming, hunting, and harvesting of natural resources like wood and timber, there are other important social and cultural practices that the forest accommodates. For example, secret society initiations of the *Sandei* for women and the *Poro* and *Wondei* for men take place in the forest. These social and political institutions which are in themselves marked with some form of spiritual relations, are crucial to the functioning of the community. They instil important moral values and skills into initiates, such as how to hunt animals or fish. Initiates are also taught a sense of responsibility to the community, and how to take care, defend and protect the environment. All these practices contribute to shape the ways that villagers relate with one another and with other beings and entities while they inhabit their world.

The forest's status as both as a physical and economic space of plant and animal resources and a spiritual domain is also demonstrated by rituals performed by villagers prior to cultivating a forest patch. Transforming wild forest patch into a cultivated farmland in *Nyayetahun* is not just a physical activity but involves transactions with the mysterious realm of ancestral spirits of the dead, sorcery, witchcraft, and magical powers. These are all entities that are perceived by villagers as active agencies that influence their social, spiritual, and

economic life. As such, villagers often try to be in harmony with them and seek protection from their calamity as they engage in different aspects of their living process. To start cultivating a forest for instance, farmers *ŋjalei wu* (pour libations) to ancestral spirits and deities believed to co-exist with them. This ritual is done as a sign of reverence to these invisible beings to seek their help for crop productivity and protection from other mystical agents and evil spirits believed to dwell in the forest.

Although the spirit world is more closely linked to the forest, it is also connected to the village. As a matter of fact, the village environment, and the domestic spaces within the infrastructures of the houses in the village are also both material and spiritual spaces. They are built on ritual foundations to spirits. Just as with the cultivation of previously wild spaces into farm sites, building a house in the village involves negotiations with spiritual entities. Before a house is constructed, it is a common practice for villagers to also pour libations to the spirits of the dead and deities. Often, a ritual sacrifice involving the slaughtering of an animal (usually a sheep) is done on the site of a new building as it is under construction. This practice is done as a way of attracting blessings, luck and to ensure the productivity of people who will inhabit the house.

For the sacrifice to be accepted by the divinity it must be accompanied by the observance of procedures that must be followed in the process of doing the sacrifice. For example, during sacrificial slaughtering of a sheep, the animal is laid with the left side on the floor and with head placed towards the east, because it is the direction where the sun rises. The throat of the animal is slit, while the blood, which is an important part of the offering is allowed to run out on the ground where the house is to be erected. This is believed to expel any ill spirit that may be dwelling in that location and attract good spirit and favour. After slaughtering, the right side of the animal is shared among neighbours in the village, and the left side, which is towards the floor is eaten by the family that made the sacrifice.

Based on research in different cultures particularly in South Asia about the symbolic relevance of animal sacrifices, Margo DeMello (2012) observes that through these kinds of ritual practices of animal sacrifice, the sacrificed animal is transmuted from a living breathing creature into a symbol or a device that connects the sacred and profane or the physical and

spirit worlds. She further notes that the animal may even be temporarily transformed into god itself, and by consuming the meat of the sacrificed animal, ritual participants achieve a communion or oneness with god. In *Nyayetahun*, the sacrificed animal on a construction site is an offering to the god, spirit or deity that is invoked. By being sacrificed, the sheep pays the price for the household, and in this way mediates relations between the family and the supernatural. Failure to observe these kinds of rituals is considered by villagers a threat to the wellbeing of the potential inhabitants of the house. It can undermine their relationship with the spirit world, and consequently expose them to evil attacks and misfortune. People do not just live in houses but do the best they can to ensure that they build them in negotiations with spirits. In other words, housing construction is both a technical and a spiritual project. Science and spirits of the dead and divinities are integral to it.

Apart from the practice of ritual sacrifice of animals, which many people cannot afford considering its economic implication, there are other ways that villagers try to live in harmony with spirits and prevent spiritual problems in a house. For example, by tying a piece of white cloth on a stick and placing it at a construction site, villagers promote peaceful co-existence among the inhabitants of the building and between them and their neighbours. In addition to that, charms are often hung at the lintels of doors and windows, as well as in the ceiling, or buried within these infrastructures to ward off witchcraft and other evil forces from the home. Extending our focus to some of these other practices is important to help us fully understand dwelling as not just a human affair, but an activity that involves the gathering of different material objects and entities – mortals, animals and spirits, which are all integral to the process of dwelling.

All these ritual practices of people in their engagement in housing construction suggest that the material infrastructures of the village are not just human domains, they are also spiritual spaces that are co-habited by humans, animals and spirit beings, living alongside each other in their respective ways of existence. In essence, although the physical and spiritual realm are two separate worlds, in this context they are closely related – two worlds that share some of the same spaces. Just as villagers move in and out of the village and the forest, which are the two main domains where their dwelling activities are situated, so are spirits believed to roam between and around these two spaces. This thus keeps humans and these nonhuman beings

continually entangled in this rural world that they all share, and with the spirit beings said to be sometimes physically encountered by people, though in different forms (human and animal).

In this chapter, I develop my discussion about these more-than-human worlds through an enquiry into the status of dogs and some other animals that are perceived as existing in two worlds (the physical and spiritual), and who mediate relations between these worlds. I focus particularly on dogs because dogs are central in hunting, and hunting is a paradigmatic example of forms of human-animal dwelling through which villagers associate with the forest, and in the process, they come into close contact with other kinds of beings that make the forest their home.

In anthropology, the question of how animals feature in relationships between the human, wild and spirit world has been dealt with through various approaches. To help me explore these issues, I draw particularly on literature that explores human-animal 'entanglements' in different ways, and studies that focus on how animals mediate the human and spiritual realm, much of which has done so through a focus on hunting (e.g. Cauteren, 2020, Ingold, 2000, Morris, 2000). I also build on comparative anthropological literature, which has shown that in diverse contexts, hunting has been associated with relationships with the spirit world (Descola, 2013, Leach, 2000, Descola and Pálsson, 1996, Richards, 1939). In the literature on hunting, interactions between humans and animals are shown to be constitutive of social, symbolic, and spiritual constructions of reality. In this literature, we see that the observance of ritual obligations and negotiations with the supernatural elements of nature, such as ensuring proper relationship with the spirit world and with other members of the society, as well as shapeshifting (Leach, 2000, Leach, 1994) and mimetic acts (Willerslev, 2007) are all practices that appear to be fundamental for living. These ideas speak more widely to the literature on multispecies relations, where we see a number of concerns arising from sites where humans and other non-human beings are connected socially, materially, economically, ecologically and even symbolically in a sphere of 'entanglement' (Nading, 2013) and an unstable field of 'becoming' (Ingold, 2011, Kirksey and Helmreich, 2010, Haraway, 2008).

In this chapter, I use a multispecies lens to explore how in the context of *Nyayetahun*, humans, animals and spirits repeatedly constituted themselves and mutually engaged in each other's worlds. I borrow insights from Eduardo Kohn (2013) whose work in South America described a context where humans, animals, plants and spirits are immersed together in a socio-cosmic medium, where each being continuously constructs and shapes the life of the others. Kohn describes this form of entanglement as an 'ecology of selves.' Evidenced by his ethnography of the Avila Runa and the dynamism that constitutes their interrelationship with the forest and its non-human organisms, he proposes that human and other non-human subjectivities including plants and spirits are engaged with the world and with each other as beings that have a 'point of view' (Kohn, 2013, 2007). The ethnographic material presented in this chapter takes inspiration from the arguments that Kohn makes and shows that in *Nyayetahun*, spiritual relations are not separate from questions of people's ways of dwelling, because villagers' relationships with spiritual entities are hedged around their livelihood, economic, religious beliefs and every aspect of their everyday living practices. This therefore extends the sense of an 'ecological realm' in which humans, animals and spirits are entangled, to include these livelihood and economic domains.

This chapter therefore draws together the work of Kohn (2013) and others like Ingold (2000), who have explored how animals bridge human and spiritual realms, and with insights from Donna Haraway (2008) around 'lively capital' and the ways multispecies lives are embedded in different kinds of economic regime, to show that relationships between people, animals and spirits is a dynamic and involved social behaviour that is embedded in daily social life, and not restricted to specific events such as dreams, ritual acts, or during hunting. Moreover, I argue that the spiritual characteristics of animals are not fixed but change according to the context, and they are questions of hierarchy and degree. I.e., they are seen to be present in some animals more than others and exhibited in a manner that can sometimes outwit humans, which suggests that there are aspects of these relationships that are beyond human understanding. Consequently, this insight adds another dimension to my analysis of the way animals bridge worlds, showing the complex, multi-dimensional nature of these connections, and the ways in which animals can shift between roles relating to economic and spiritual, to the extent of sometimes blurring distinctions between the two.

In the first section of this chapter, I demonstrate these relationships by describing how dogs mediate social and economic relations among people, and how they afford humans the ability to understand events beyond the physical and to relate with the supernatural realm. I expand on each of these themes in turn, starting with the social and economic importance of dogs. I focus on dogs because an understanding of the predatory-prey relationships that permeate how villagers and their dogs interact with the forest, how dogs mediate social relations during hunting, and the moral obligations and ritual obligations involved in these hunting practices, are fundamentally important in expanding on our knowledge on the connections between human-animal relations with the spirit world.

In the second section, I describe how other animals including insects and reptiles also link humans to the spiritual. Subsequently, I describe the ways in which spirits are personified by villagers and the implication that this has for their interactions with animals. An exploration of how spirits are being personified by villagers helps to show the ways in which spirit beings symbolically construct and participate in different social and economic realities of people, and this is useful in understanding how their embeddedness in human social space blurs the boundary between the visible and invisible world.

In the conclusion I return to the main arguments of the chapter, where I highlight different ways that animals bridge multiple realms that transcends physical interactions. These analyses can all together broaden our anthropological knowledge that in addition to their economic function in providing food and economic security, animals also status as social actors in constructing and reinforcing social relationships among people and they are crucial in linking the physical and spirit world.

Dogs as participants in economic and social worlds

From my experience with villagers in *Nyayetahun*, dogs are important to people's hunting activity – to point, chase and kill animals. As such, their role in the subsistence of households remains crucial, whether in the form of crop protection, basic subsistence, or income generation through their role in supporting the trade of wild animal meat. Dogs contribute to providing meat for household protein consumption and are aids in assisting farmers to

ward off animals on their farm. It was the desire of every male farmer and young boy that I spoke with in *Nyayetahun* to own a dog that could be trained for the purpose of hunting.

Hunting breeds intimate relationships between farmers and their dogs. Indeed, from what I observed in the ways that they relate to each other, how these animals are seen as members of households and the kind of grief that villagers expressed when they shared their stories about losing a hunting dog, shows that this relationship entails some measure of kindred ties. For example, one morning while discussing about the ways how hunting dogs are trained, *Karim* a young adult male villager expressed to me his grief over the death of his hunting dog that was mistakenly wounded during bush clearing.

'...my dog was lying under the shrub' Karim said, '...and unknowing to the other farmer who is part of our work group, he hit him (referring to his dog) with his machete while trying to clear the shrub, I was on the other side of the forest but I immediately ran towards him when I heard his voice because I knew something was wrong ...I cried when I saw my dog. I tried to heal the wound with herbs and later with 'red and yellow' capsule (referring to Tetracycline pill, which people often apply to wounds), but it was so bad that he could not survive, ...hmmm well, I am not sure that I will have another dog like that one, because we were always together, yes, he was so attached to me...'

What *Karim* expressed to me suggests a realm of affective and relational Kinship between villagers and their hunting dogs. He displayed this kind of kindred mutuality in his use of the phrase *'I immediately ran towards him when I heard his voice because I knew something was wrong'* and in the use of the word *'cried'* among others, to describe the intimacies that they shared and the feelings he had for his dog. The event showed the depth of his relatedness to the dog (Haraway, 1997, Strathern, 1992). This kind of intimate relations that this young adult farmer expressed shows how the symbolic meaning that people attach to certain animals determines the ways that they relate and treat those animals, and the kind of social and spiritual disarray that is likely to emerge when such animals are separated from them.

Though dogs have a natural proclivity for hunting, in *Nyayetahun* 'for a dog to hunt, the farmer must first be the hunter,' Karim maintained. In a sense, this suggests that human intervention is crucial for a dog to be a successful hunter. This process often entails some special form of training regimen or socialisation and drugging in order to erode some of the canine inclinations (to bite, to be playful and be distracted) and to fully attune the dog's senses and sensibilities to its hunting capabilities. The human-dog relationship in this regard is predicated on what Haraway describes as 'positive bondage' (2003 p.5), in which dogs and their owners are mutually implicated in an ethical relationship, and the purpose of which is the fulfilment of a potential or talent (Cassidy, 2006).

The fact that dogs help people to connect to other worlds and with other non-human beings, encourages villagers to augment the senses of their dogs. To do this, farmers make their dogs ingest certain substances that increase their ability to detect prey and to effect trans-species interaction between the dog and other animals. Generally, '*Twei* or *fungui*' are names used interchangeably by villagers to describe the collection of substances that are given to their dogs to elicit these hunting capacities. Some of these substances are herbs which are applied either into the nostril (to eliminate mucus) or ingested as food mixed with the dog's meal. Other substances are derived from wild animals, insects, and reptiles. For instance, by applying some drops of a wild animal's urine into a dog's nostril, is a mode of connecting the dog to that animal species. To explain this better, villagers believe that the urine that they drop into the dog's nostril enhances the dog's capacity to trail that species in the forest through the smell of its urine. In fact, it is for this reason while butchering a deer that was caught on a trap around his farm, that *Masunday* gave the urine bladder of the deer to his mother and asked her to hang it on the ceiling and just over the fire stone to preserve it. Then turning to me, he said that the urine will be one day used when he gets another dog, as the hunting dog that he had was dead. Essentially, pouring the urine of a deer in the dog's nostril blurs ontological boundaries of species differences and promotes interspecies interaction between the dog and the deer, which further connects the human hunter to the interspecies triad.

Apart from this strategy of using urine, which farmers often do when they really want their dogs to be specialised in chasing a specific animal species – and particularly larger mammals

like deer – other common techniques that villagers use to enhance their dog’s hunting ability and promote interspecies connection between hunting dogs and prey, include rubbing a live toad on the nose of a dog. In this process, secretions from the toad’s venom gland are released into the dog’s nostril, and this is said to clear mucus from the dogs’ olfactory system and to improve a dog’s sense of smell to trail prey. A similar effect is achieved when the blood of a dog tick is rubbed on the nose of a dog.

Some of these practices however follow the logic of ‘sympathetic magic’ (Frazer, 1890), which according to James George Frazer (1890) occurs when the magical qualities or symptoms of one figure or something are manifested in another. In other words, sympathetic magic describes a magical contagion, where an impulse is being transmitted from one thing to the other by means of what may be conceived as a kind of invisible way (Varela, 2015). In this context, the magical modality involves the farmers symbolically inferring that he can produce similar reactions or effects in his dog by merely imitating something else. For instance, I observed villagers applying ‘*ɔmɔlay*’ which is a locally brewed gin that produces hallucinogenic reactions and bravery in humans into the nostril of a dog, and this produced similar kinds of reactions in the dog to confront prey. Other kinds of strong gin such as ‘*pega gin*’ also suffice for this purpose.

Another interesting demonstration of this logic of sympathetic magic is in the use of *Nɔɔmbe*, which is a crawling insect that is believed to have an extraordinary ability to locate prey. The ingestion of the ashes of *Nɔɔmbe* in a dog’s food is said to give the dog similar attributes of the *Nɔɔmbe* – to trail and locate its prey. The important point here is that, by these human interventions ontological boundaries are blurred, and trans-species connection is enhanced, and this possibility that dogs afford is essentially vital for the interactions that they and their masters have with other kinds of creatures that make the forest their home. In this sense, dogs in *Nyayetahun* have status as a linkage that help their human owners to forge relations and reach out to other beings residing within the wild. Through this process, they are made to contribute towards the food subsistence of their masters by being key participants in crop protection and in the provision of wild animal meat for household protein consumption, since domesticated livestock is rarely consumed. In addition, good hunting dogs also contribute towards the construction of the social identities of their owners by attracting admiration and

respect from other villagers towards their masters, as well as the economic rewards and human work labour that they get on their farms in exchange for the services of their dogs.

Considering these kinds of roles that dogs perform among villagers in establishing and reinforcing relations between their households and the larger village community and even beyond (stretching out to other villages and beings in the wild) suggests that their status among humans can exceed the boundaries of the *domus* or home of their domesticators, as I discuss further under the next header.

Beyond their master's household

Transcending the households of their masters, dogs support the meat subsistence of other households, enmeshing their masters in relations with other people. For instance, by aiding farmers in communal hunting activities, the relationship between hunting dogs and their owners extends to other hunting participants who are sometimes from other villages. To give a sense of this, let us look at how this hunting practice is done.

Communal net hunting is a collaborative enterprise that is usually undertaken by a group of adult farmers and hunting dogs. Boys also participate in the process, but with the primary responsibility of carrying the *mbomei* (hunting nets) and animal catch in addition to their role as *sɔleblaa* (noise-makers) – they shout and beat leaves to scare animals towards the nets. Although women and girls do as well sometimes join the *sɔleblaa*, they are however not entitled to meat share after hunting. This is because hunting is seen as a male activity. Engagement with the forest and wild mammals is associated with masculinity, while fishing is the domain for women. Therefore, if male hunters decide to give a female participant a portion of meat from hunted game considering her effort in the process, such gestures are often born out of goodwill on the part of the hunters and not as an act of obligation. Conditions like this one in its own way highlights the issues of power and gender differences with respect to roles and people's engagement with the forest. But more importantly, it draws attention to the implications of a woman's sexuality on hunting, and to issues of the profound consequences that acts of inappropriate social and sexual conduct such as infidelity, and sexual intercourse prior to hunting can have on hunting success.

As Brian Morris has pointed out following Audrey Richards (1939) in his work in Malawi, human social events and processes including those concerned with sex and procreation and those concerned with hunting mutually affect each other (Morris, 2020). Similarly, in *Nyayetahun* sexual intercourse for example makes the hunter unclean and has serious consequences on the hunting process by causing no game to be taken home. In a similar way, bad luck in hunting can be caused by improper behaviour, such as a man having quarrels with his wife, and when a woman bears a grudge against her husband. Such misfortune in hunting can only be dealt with when a man accepts his guilt and reconciles with his wife.

Likewise, a man whose wife is pregnant is also likely to experience failure in hunting. This is because from the viewpoint of villagers, a pregnant woman is '*malɔvɔngɔ*,' meaning that when a woman is pregnant, she is impure or corrupted, and therefore does not attract good fortune. Consequently, this undermines her husband's hunting success unless appropriate ritual procedures are observed. These dynamics are demonstrated in an episode when *Dayfo* was having trouble in hunting. After setting several traps without a catch, his misfortune was attributed to his wife's pregnancy. One morning, after making some metal wire snare trap loops, *Dayfo* and his eldest son *Adu* (about 15 years old) were leaving for the forest to set more traps accompanied by me, when his wife *Komeh* reminded him to perform a ritual before venturing into the forest. He immediately rushed into his house and brought out a razor blade and sitting on the long wooden bench on their veranda, *Komeh* turned the calf of her left foot on which her husband made a slight cut with the blade. With his finger, *Dayfo* rubbed the blood from the wound on the snare loops, believing that the blood of his pregnant wife will break all forces of ill luck that is caused by her pregnancy, and this will consequently attract animals towards his traps. While such ritual practices speak to the issues of fertility and power associated with the forest and the taboo on having sex there, it also shows that hunting is not just the procurement of meat, but a practice that is intrinsically connected to other aspects of people's social life and spirituality.

Despite significant variations in terms of context, these hunting related behavioural prohibitions, ritual observances and procedures observed in *Nyayetahun* are comparable with other examples in anthropological literature on hunting (e.g. Caution, 2020, Ingold, 1986). A common idea that characterises hunting rituals in these different settings is the

desire to maintain supply in game by observing these social and spiritual practices of the hunting processes. Melissa Leach (2000) has for example drawn our attention to the importance of considering the nexus between hunting ideas and practices and understanding the sociality and ecology of the rural world. In her study, 'New shapes to shift: War, parks and the hunting person in modern West Africa,' Leach focuses on the *Kamajosia* (a Mende word for a hunting brotherhood whose members use magical powers and sorcery to negotiate shape shifting between humans, animals, and spirits to overcome their animal prey), to emphasize the embeddedness of the practices that hunting constitute in linking social and ecological relations. Though her primary concern is on the role of this hunting brotherhood (the *Kamajosia*) in environmental protection following their participation in the civil war in Sierra Leone, her work however reminds us of the ritual dimension of hunting. She shows that the act of hunting can be constitutive of broader social relations with mortals, animals, spirits, and the environment (Leach, 2000). These multiple relationships in the process of hunting were evident in trapping and communal net hunting activities in *Nyayetahun*, where I observed that a successful hunting process depends on the kinds of relationalities that exist between farmers and their hunting dogs, the forest, and the spiritual world.

There is no prescribed number of participants in a communal net hunting. A group of two to as much as ten or more people can engage in a net hunting exercise. However, even though the number of humans and quantity of hunting nets available is crucial in determining the size of the forest or bush patch identified for hunting, the presence of hunting dogs cannot be underestimated, as their participation in the process is pivotal for a successful hunt. In fact, the mere absence of at least one hunting dog in a net hunting endeavour can lead to the cancellation of that exercise. This is because the job to detect and chase prey in a hunted forest or bush requires certain capabilities that somehow exceeds human ability, for which villagers largely rely on their dogs whose capabilities are seen to be more advanced to easily reveal the existence of a prey within the bush or forest, and then transmit the information to them. For example, once farmers have formed a close circle or semi-circle with their nets around a forest patch or bush in which to hunt animals (with the top of the nets hooked on vegetation and the bottom pegged on the ground with plant and tree roots or sticks, and the ends hung on tree branches or vines) the next thing they do is to release the dogs into the surrounding shrub or forest after receiving a sound signal from the *mbomabla* (hunting net

owners or those to whom the nets are assigned) indicating that the nets have been fixed. At this stage, the human hunters are dependent on the senses of their animal hunting companions who are charged with the responsibility to explore the barricaded space to search, detect, signal the existence of prey, chase and reveal hunted prey. Once the dogs start to bark, it is often an indication that a prey has been detected, thereby alerting humans to the presence of other animal species. Consequently, the *solɛblaa* standing along the areas without nets will engage in shouting and beating of plant leaves with the aim of directing the animal towards the nets. When a prey enters the net, the *mbomabla* whose responsibility is to watch over the net will rush towards the animal and grip it inside the hunting net hitting it with the fists till it can no longer move. This account clearly shows the collaborative relationship among hunting participants (farmers and their dogs) and their interactions with the natural environment. It reveals the crucial role of dogs in augmenting the senses or sensibility of humans to explore the forest, and this immensely improves the success of the hunting process, which consequently contributes towards the livelihood of different households with the provision of animal meat.

These kinds of multispecies encounters in which animals are participants in economic regimes of labour, food production systems and utility, bring to view some of the natural social relationalities in companion species worlds linking humans and animals under the context of 'lively capital' (Haraway, 2008). In a less humanist relational terms, Haraway has examined such commodity forms of human-dog entanglement to point out some of the diverse roles that dogs play in processes of investment and productive enterprise. She notes through these kinds of processes dogs attain the status of workers and commodities, and they are also made to be research models and technologies, patients and reformers, consumers of goods and breed wealth (Haraway, 2008, p.45). While Haraway's observation is largely concerned with the global North, where the commodification of companion dogs is more pronounced and with a whole industry (dog food, accessories) attached to them (Haraway, 2008), the role of dogs in *Nyayetahun* is similarly multidimensional, and the economic importance of dogs is conflated with other social functions. As I have shown in the narrative above, dogs appear as co-workers to humans and are co-producers of economic resources. They are seen here as aids that extend peoples actions into the wild, because of the ways that they expand on the

sensory capacity of villagers and connecting them with the activities of other species in the forest.

At the same time, dogs perform other socio-cultural roles that are fundamentally important to the community, such as constructing and reinforcing social relationships among people, and hence contributing towards the creation of a community by the provision of food for different households and in other services that they render especially in crop protection – as strikingly revealed in the ways how farmers without hunting dogs rely on the service of those who own dogs to deal with the problems of wildlife damage on crops. On several instances, I observed farmers going to the neighbouring villages to seek the service of other villagers who owned dogs to help them ward off animals from their farm. In an informal discussion, *James*, a young male adult farmer who together with his father was renowned for the use of dogs for hunting, informed me that sometimes he felt overwhelmed moving between villages and farm sites with his dogs to help people ward-off animals from their farm.

‘I have my own personal work to do, and besides the dogs do get tired, they also need to rest. But again, if I do not help them [referring to the people who ask for help] it will breed ill feelings and I will not be happy to hear that the animals have destroyed their crops.’ He maintained.

James and others like *Morie Amara*, another popular hunting dog owner with four dogs, felt a responsibility to divide their time between their private work and rendering services to other farmers within and outside their village, as well as sometimes undertaking hunting activities for social events for which wild animal meat is required for food preparation.

Considering these kinds of roles that dogs play in the social, economic, and ecological life of people, it is significant in adding to our knowledge about the different dimensions of human-animal relations. Their role in mediating social relationships between humans and other animals and linking their masters with the wider community of the village, shows how animals can take up the role of the human other. They are active participants in human social world, rather than latent beings living alongside humans. And as I have argued, this act of dogs mediating relations is not limited to the physical interactions with earthly beings, but linked with the spirit realm, which is equally an important dimension of human-animal co-existence.

Dogs as mediators with the spirit world

As well as aiding their human companions to traverse the forest, to track, chase and catch animals, and to profit from inter-household exchanges, dogs connect humans to the world of the spirits. Dogs are understood by villagers to be capable of discerning the presence of the dead and spirit beings, and these powers of discernment of the spiritual realm may be seen as related to their superior senses of smell and hearing. In that respect, villagers often seek to understand what goes on in the spirit realm by trying to see through the perspectives of their dogs. Dogs in *Nyayetahun* therefore straddle worlds: they are of the wild as much as they are of the village, and of the spirit world as much as of the physical world – they are thus intermediaries in relations between the domestic, the biotic and cosmological world of villagers. In this way, and not only in the ordinary perceptual way noted earlier, villagers' relations with dogs also enhance their ability to understand their world, and this way of engaging with the environment helps these people to make predictions about what goes on around them both in the physical and spiritual domain. These factors make dogs important actors in the social, economic, and spiritual lives of people, and an example of this simultaneously functional and spiritual roles of dogs is the way they serve as guards.

As guards, dogs in *Nyayetahun* perform the role of security for their masters. They offer a sense of protection by alerting their owners about approaching strangers and unusual activities around the house and the village more broadly. Howling, growling or barking especially at night keeps their owners and other villagers alert about ongoing circumstances within the village environment. The persistent howling of a dog at night is often perceived by villagers as a sign of bad omen, which can indicate the death of someone or that the dog is seeing an evil spirit or a ghost. Likewise, if a dog digs a burrow around the house, it can mean the death of a person. In this case, the attribute of the dog transcends the physical and becomes supernatural, by acknowledging and bringing into human attention activities in another area of existence separate from the physical world. In this way, dogs are seen to have double agency, one rooted in the visible community and the other an embodiment of the supernatural. Here, and like other animals that I explored such as the *Ndojin* (the sign bird that foretells death), no form of special training or human intervention is required for dogs to mediate relations. These attributes are displayed based upon their own consciousness and

perceptual experience, and not mechanically regulated compared to their work as hunting dogs that requires some form of deliberate training and enhancement. While this does not in any way try to suggest that animals have a superior perceptual ability than humans, what this analysis however demonstrates is that in some situations the perceptual prowess of animals surpasses the human person, and these abilities can be exhibited in a manner that is useful for humans.

In the 'socio-cosmic medium' that Kohn describes in Ecuadorian Amazon, he notes that humans, animals and spirits invariably transform from one form to another and communicate through what he describes as semiosis, which is the use of meaningful interpretation and response to signs and symbols to convey messages to the other (Kohn, 2007). Although I cannot account for how dogs understand the communicative modes of humans, from my understanding, villagers acquired the ability to interpret the meaning of certain behavioural traits of dogs and other animals through a process of experiential learning and knowledge gained from their ancestors.

According to villagers, their ancestors understood the languages of animals. They said that through their deep interdependence and co-existence with animals, their ancestors were able to interpret what animals communicate by associating the activities and various sounds of certain animals with specific events over time. Therefore, much of what they know about the information that certain animals convey are ideas that have been passed onto them by their ancestors. These ideas remain an important mode of understanding and relating with the physical and spiritual dimensions of their living practices, and this applies to making certain behavioural decisions including those that are related to meteorological phenomena. For instance, I was told that when a dog runs out of a house or farmhouse when it is raining and with thunder roaring, it is often an indication for the possibility of a thunder strike around that space. As such, people will also try to avoid that place by inhabiting the viewpoint of their dogs, and by this they are often able to save themselves from potential dangers communicated by dogs.

As Kohn suggests, communication to a large extent always involves some form of communion between or among parties (Kohn, 2013). In this situation, both villagers and their dogs as well

as other animals (including insects and reptiles which I will turn to next) that they also learn from, exemplify some measure of communion that is somehow responsible for making these kinds of interspecies communications possible, and this clearly demonstrates the notion of 'becoming with' others (Haraway, 2008, Kohn, 2007). The idea of 'becoming' is concerned with how humans and animals shape each other's conditions of existence, and acknowledges the process of organisms adopting the viewpoint of others, and how ontological boundaries becomes blurred through such processes (Kohn, 2007).

With the perceptual experience facilitated by living with their dogs who experience things that villagers cannot and yet share it with them – even though indirectly, helps to show how animals can enable us humans to get out of some of the limitations that we suffer as human beings. Seeing the ways that these animals connect villagers with activities and domains beyond the visible, and then to sense their social and spiritual ecology, is a good reminder that the process of our human existence and engagement with the world are intimately connected with the kinds of communion we have with our non-human animal companions. These relationships that villagers have with animals can be seen here as not always dreadful, but helpful in producing and shaping their lives and ways of living and interacting with different spaces and landscapes that they inhabit in their process of 'being in the world' (Ingold, 2000).

Other animals as mediators with the spirit realm

As Haraway (2008) puts it, becoming is always 'becoming with' and humanness is an ongoing social process involving encounters with other beings. This entails the web of relations that we have with other living and non-living organisms and how these other beings large and small, human and non-human share our social and ecological spaces and make us what we are as humans. She also argues for 'worldliness and touch across difference' (Haraway, 2008, p.14), which obviously means different species but also different experiences, and these different experiences in this context reflect in the ways how other species besides dogs connect humans with the supernatural or invisible world.

Like dogs, other non-human animals including wild animals as well as domesticated livestock play an important role in mediating relations between the physical community of villagers and the invisible or spirit world. As I have maintained in the introduction, these attributes are conceived in hierarchical terms, in that, they are seen to be exhibited by some animals more than others and are questions of situation and context. For instance, in ritual sacrifices of animals, which is one of the significant ways in which animals link the physical human community and the invisible realm, dogs are not considered important in mediating these relations. Rather, the prominent animals in this situation are chickens and sheep. Even with that, the colour and sex of the sacrificed animal is also considered with respect to the purpose of the sacrifice, and which also helps to show some of the ways in which different animal qualities participate in different aspects of human relations with spirits.

Whether in the form sacrificial killing or kept as a living offering, the ritual sacrifice of a chicken or sheep is a common practice when villagers want to communicate with the spirit realm and to make requests from gods, ancestral spirits, and deities. Some of the reasons for such ritual sacrifices often include, to attract favourable treatment like fortune and protection or for healing (as a health seeking ritual for the recovery of a sick person) or in response to a natural catastrophe and to even influence the course of events. In some cases, animal rituals are done to break demonic invocations placed on a person or household, and to inflict a curse on people. In such situations the animal can become a symbol of justice because it is the medium through which villagers negotiate as well as make their requests to spiritual entities.

In these ritual practices, both the animal sacrifice and rites involved are performed to connect or maintain a balance between the different worlds. By virtue of the ritual sacrifice, it is believed that the animal connects with the spirit world, and because the animal straddles the human and sacred realm, participants in the ritual too access the sacred realm through the aid of the animal, which centres as an intermediary between the two worlds. That notwithstanding, considering the economic importance of livestock to villagers, animal sacrifice is usually a huge undertaking particularly where the sacrifice involves ritual killing. However, even though this greatly undermines their economic security with respect to the economic importance of livestock for their survival, the need to fulfil their personal desires and ambitions, and meeting the demands of these more powerful beings often compel

villagers to make such undertakings. Unlike other animals that may be owned by a household, villagers displayed stronger emotional attachment for animals kept as living sacrifices to spirits, and this is because of their status as mediators between them and the divinities to whom they are sacrificed. This spiritual concern often triggered intimate care for the wellbeing and safety of those animals, and these relations often reflected some kind of 'kin relations.'

As I have argued, the sensibilities that animals transmit to humans is not the same across all animals, but varies according to context, hierarchy, and species type. This could be seen in the kinds of information that certain insects, reptiles and other birds could convey, and how these ideas are also internalised and processed by villagers in ways that make up the body of knowledge that connects them to the spiritual, and influence their interaction with cosmic agencies, such as rain, sun, moon, stars, and thunder, which are all considered to be in some extent related to the spiritual domain. For instance, seeing a rainbow suggests that the *Gbata Lovui* (Bullfrog) has yawned, and it is therefore not going to rain. When flying termites are seen, it often suggests that it is time for sowing or weeding. In this regard, animals play central role as mediators of the cultivation timelines of villagers, by helping them to make agricultural decisions. Unlike the *Ndojin* in the ethnographic vignette that foretells the death of a person, if a farmer is heading to his trap and hears the *Blaajin* (also a bird), it is an indication that there is a catch on his trap, which assures him of meat to take home. This example of the *Blaajin*, together with that of the flying termites, show other important ways in which the sensibilities that animals transmit to people are linked to the socio-economic systems and livelihood occupations of villagers.

It is said that the appearance and mysterious disappearance of large swarms of red ants in the bedroom or between the firestones where cooking is done also foretells death. According to villagers the ants in this sense are not just physical or biological organisms, but spiritual beings. Their appearance in the home is for the sole purpose of passing an information that could prepare the minds of people about the death of a relation, and once that information is communicated by the mere sight of the ants in the house, they get lost. Similar stories are also told about the mysterious appearance and disappearance of bedbugs in a house in relation to foretelling death. As a matter of fact, the appearance of spirit beings concealed in

animal form is a common idea among villagers, and this is one way in which the visible human domain and spiritual intersect. For instance, in a discussion at *Brahim's* farmhouse, I was informed that villagers sometimes find animals such as cats and chickens in their farmhouses, and these animals are believed to come from the spirit realm. When such animals are found, people often delight in hope of good fortune. However, the animal should be treated with care to be able to enjoy the fortune that it brings. In a sense, people must learn to live well with the animal, and such knowledge promotes some form of solidarity and mutual co-existence between humans and animals, and hence, motivate more positive attitudes and behaviours towards them.

As Brahim and his wife explained, 'a chicken that appears mysteriously in a farmhouse will disappear as time goes by, however, while living in your farmhouse, it will lay eggs, but those eggs should not be eaten unless they fail to hatch. When it is time for it to disappear, it will divide the chicks leaving some with you the host (the owner of the farm) depending on the kind of care and hospitality it enjoyed from you...' With such conception of good deeds of animals, the animal in this context somehow assumes what Fuentes (2006) describes as the humanity in animals. Even where it may be engaged in behaviour which for other animals of the same species may be seen as destructive, such as feeding from rice grains placed in the sun to dry, its actions are interpreted otherwise, and care is taken to deal with it in a humane way. In this way we see how animals produce meaning for humanness and how they construct the social worlds of people.

Like the mysterious ants that foretells death, which I have described earlier, the chicken here carries a double identity – occupying a strange place between the animal and spirit divide. In other words, though it is an animal, at the same time it is not an animal but a spirit, based upon the strange circumstance surrounding its appearance among humans. In other words, it is perceived as having a liminal status between the physical and the supernatural realm, and this distinguishes it from other animals, which thus grant it special care and respect. Such ideas, combined with the various ways I have described in which animals are connected to the spiritual domain and how they mediate relations with the invisible realm, lead us to a consideration of how animals can be spiritually constructed within human social space, and

how they contribute in constructing the evolving worlds of humans in contexts that are deeply rooted in mythological beliefs, spiritual forces and their omnipotence.

Personification of spirits and implication on human-animal relations

The social world in *Nyayetahun* that I have described is not only marked with human and animal activities, but also intertwined with the presence of spiritual agencies. The account I present in this section about the way spirits are personified helps to further show how the lives of villagers and animals intersect with those of spirit beings. The idea of personification used here, describes the attribution of human nature to non-human beings and objects. When used to describe animals or spirits, personification is shown to diminish the western cosmologies of duality between nature and culture, by socialising the personified entities and linking them more closely to humans (Kohn, 2013).

According to Ilana Gershon and Natalie Porter (2018) when humans get involved in animals' lives, it is not only humans to whom animals have to habituate, but to the environment and other beings residing in the inhabited space, and their living together requires constant negotiations and improvisation. Gershon and Porter illustrate this by drawing on Christena Nippert-Eng's account of zoo gorilla introductions, which demonstrates the accommodations that individual gorillas have to make for one another in captivity. Nippert-Eng's observed that like students allocated to share college dormitories, primate co-habitants must learn to live together, establishing social hierarchies among themselves, navigating their environment, and negotiating their relations with the human animals who determine the conditions of their residence (Gershon and Porter, 2018, p. 9). The human, duck and spirit relations that I discuss in this section might be one of such examples, though unique in its own way because, while Nippert-Eng's account is just concerned with humans and animals (primates), and how humans determine the conditions of residence, my observation in this context shows the dynamism that comes into play when spirits are involved in these relations of multispecies co-existence.

During my stay in *Nyayetahun*, I realised that duck was not among the animal species kept by villagers. This to me was something strange because duck along with fowl, goats and sheep,

are common in many other villages I have visited in Sierra Leone. One day, in a discussion with the town chief, I asked why there were no ducks in the village. Looking at me in the eyes, he shook his head and said to me in Krio '*wi nor dae mehn ducks nar ya,*' meaning that, we do not keep ducks here. Even though they had tried to keep ducks on many occasions, they did not survive. The reason for failure of ducks to survive in the village according to chief is because the '*nginei*' does not permit them to keep ducks.

'*Nginei*' in Mende is a spirit, a belief rooted in Arabian folklore of the 'Genie.' This spirit is frequently depicted as being capable of granting wishes when summoned and is often believed to present itself in the form of humans and animals. According to villagers, the '*nginei*' dwells along the stream at the edge of the village going towards the neighbouring village *MaseKa*. It is perceived as a human being with some form of deformity of the legs. It does not inflict harm on villagers and its presence around the village is considered to provide a kind of protection for villagers from other forces. Villagers sometimes physically encounter the *nginei* in the form of a bright torch light between the hours of 4 to 5 AM, believing that it is at that time that it goes for early morning prayers. But it does no harm to people who encounter him physically.

The humanness of the *nginei* portrayed by villagers recalls Viveiros de Castro's (1998) arguments about Amerindian perspectivism, where humans, animals and spirits are said to be people in their own domain. Perspectivism suggests that the world is inhabited by different sorts of subjects or persons, human and non-human, who participate and view the same world but with varied sensory apparatus, and that they describe the other from their own point of view (De Castro, 1998). While villagers might not describe the *nginei* in terms of how it sees people, they perceive it as a kind of friendly spirit being who has both spiritual and human attributes. With such considerations that villagers have about the *nginei*, we are made to recognise how people ascribe human characteristics to spirits, and how the attributes, which are supposed to set people apart from spirit beings are somehow diminished hence rendering the boundaries between the visible and invisible world fluid and permeable.

According to Chief and his younger brother who is also an adult villager, the knowledge about the *nginei* not liking ducks in the village was confirmed to them by a sorcerer who maintained

that instead of harming humans, the *nginei* prefers to take the ducks in exchange for human life. This draws attention to the centrality of sorcerers in mediating these relations, who like dogs have the capacity to cross ontological boundaries and adopt the perspective of nonhuman subjectivities to administer relations between the human and spiritual domain.

While the duck dying in place of people in this account depicts a form of sacrifice (though involuntarily) that is collected by the spirit, however, in order not to upset the '*nginei*,' nobody keeps ducks in the village. And even though its actions in some way affects their economic security by limiting them in their desire to diversify their livestock domestication, the assurance of protection provided by living alongside the *nginei* is more important to villagers. This kind of relationality is crucial in revealing to us the multispecies nature of dwelling in this rural village, and the influence of spirit beings in constructing the social world in which they co-exist with humans and animals. The way that the *nginei* transcends the nature and culture dualism to the point of imposing its agency within the community, and consequently becoming a dominant influence in human-animal sociality, with the power to decide which kinds of animals can survive in the village or should have ongoing relations with humans, shows the blurring line between the human and spirit world. Moreover, it highlights the hierarchical component that constitutes human, animal and spirit becoming, showing how essentially unequal are the parties involved – with spirits determining the conditions of co-existence and in its own way largely shaping the social space.

As Dan Rosengren (2006) points out, an understanding of the nature and articulation of trans-dimensional relations of humans and spirits is likely to produce insights not only into esoteric aspects of the human condition but also into conceptions of sociality. As I observed in *Nyayetahun*, the social behaviour of spirits with respect to their hierarchical dominance is seen to be deeply connected to people's social lives, to the extent that it profoundly impacts both their economic activities and spirituality. Villagers' ecological relations including their farming activities are predicated on negotiations with the agency of these spiritual entities which are believed to appear in different forms. Mariane C. Ferme (2001) for instance has made a similar observation about how the spirits that roam the rural Mende landscape have the ability to take different shapes and form to interact with people. In her book 'Underneath

of things: violence, history and the everyday in Sierra Leone,' Ferme's story of the *Ndɔgbɔsui* is a common narrative among villagers about one of the key transmogrifying tricksters that roams the rural Mende world. *Ndɔgbɔsui* is believed to sometimes assume the form of a hairy man often encountered by hunters, or as a man with a white skin and long white beard and sometimes as a familiar acquaintance to unsuspecting people to follow them deep into forest to entrap them. To extricate themselves from his control, his victims must answer questions about issues of daily life and the landscape. According to Ferme, peoples response to *Ndɔgbɔsui*'s questions is often done in a manner contrary to real experience, or by concealing their knowledge on the subject in order to survive its destruction (Ferme, 2001, p.31). The point here is that the knowledge of villagers about these superhuman powers shapes the way they engage with the natural world. As a matter of fact, the importance that villagers give to maintaining good relationships with spirits and proper adherence to their instructions is necessary to meet the ideals for good living. This is practically articulated at various levels of their social, economic and spiritual practices. Another important example that I will draw on to further demonstrate the practical compliance of villagers to the dictates of these spirit beings that they coexist with, is the practice of not going to the farm sites on Fridays.

Many villagers stay away from their farms on Fridays because on this day of every week, spirits are believed to visit farm sites. People who transgress this belief are often seen to be exposing themselves to possible encounters with spirits, and the repercussion is viewed as dangerous to their wellbeing. A typical case is the story of a woman in one of the neighbouring villages who is said to have met a spirit in the form of a two headed snake in her farmhouse. In her interaction with the spirit, she was told to remind other villagers to stop going to the farm on Fridays, and even though she delivered the message as instructed, this encounter had a fatal toll on her. As a result of that incident among other similar stories of people encountering beings perceived as spirits on farm sites, these spaces are often free from human activities on Fridays, and with many people spending time in the village. Such adherence of villagers to the dictates of spiritual entities reflects what Balaji Mundkur (2016) has described as 'intrinsic religiosity,' which is a state of mind incited by beliefs in forces perceived as supernatural and numinous that must be appeased. Intrinsic religiosity enacts an innate urge that is embedded in fear, and has the propensity to elicit an environmentally induced behavioural response in people (Mundkur, 2016). The influence of such beliefs on the social and economic life of

villagers shows how entities that are often relegated to the world of nature are seen to be having significant place and control in human social order.

Conclusion

The narratives I have explored in this chapter present varied and compelling ways to understand multispecies relations beyond physical interactions. The ways that humans, animals, and spirits co-exist in the village of *Nyayetahun*, shows how those beings, which are often objectified and referred to as non-humans participate in human social worlds, and profoundly shaping the social, economic, and spiritual lives of people. Such interactions observed in this village are important in anthropological thinking about the human as a being that does not live in isolation but co-exists in the company of other beings and entities as they journey through the world. Giving thought to these facts, provides a clue to note that the basic character of dwelling is living alongside or in oneness and communion with others.

As I have illustrated, the striking role of certain animals in giving humans extra social and ecological support to navigate their environment and to relate with different spaces, landscapes, beings, and entities, shows how animals live across multiple worlds and how they can mediate social relations between humans and other realms, to the point of blurring the boundaries between these different domains. Although dogs for instance are considered to largely belong to the domestic realm of the house, their activities extend human actions into other worlds of the forest and the supernatural realm. My descriptions of the collaborative interaction during hunting, and the use of dogs as guards, demonstrates the diverse array of ways in which human senses are augmented by animals, making people aware about what goes on in their social, ecological, and cosmological landscape. With their embodiment of multiple scent trails and hunting skills, dogs create social connections with the activities of other agencies beyond the domestic, and by virtue of their engagement with humans, significant aspects of their sense of the landscape are conveyed to their human companions who in turn use these experiences to understand their environment and connect with other non-human beings. The use of these sensory experiences to discern trans-species communication, and to make sense and explore the natural world, is crucial in how villagers understand and engage with nature.

Considering these kinds of support that animals afford to people in ways that vitally matter to their existence, as Kohn (2013) rightly suggests, should force us to recognise that activities like seeing, representing, and perhaps knowing as well as thinking, are not exclusively human affairs. For instance, the ways red ants provide information about death, and dogs informing people about roaming spirits, all show how the lives of people are predicated with attention to the subjectivity of animals and spirits, who like humans are active agents, and with profound influence in defining the conditions of co-existence and producing meaning to human life.

Moreover, this reflection on the double worlds of animals and the ways they connect the physical and the supernatural domains, illuminates the fluidity of the boundaries between human society and the wild or the physical and spiritual, showing how these spaces are interconnected both biophysically and socially. As I have shown, the places that villagers inhabit as living spaces are not entirely distinct worlds, but complex social spheres that are inexorably entangled with other beings and domains that lie beyond it. In other words, the material and physical spaces that they inhabit as homes, as well as other locations in the environment where they dwell are linked with the spiritual world, and animals are important actors in connecting these spaces.

On that note, it could be inferred that dwelling within this rural setting is a part and parcel of some broader social, economic, and spiritual ecology of humans, animals, and invisible beings in a constant process of interspecies encounters and negotiation of co-existence. And the degree to which animals served as objects of economic utility, at the same time functioning as allegories reflecting and directing human behaviour, perceptions, and spirituality, reveals how much we can learn about ourselves as humans by critically examining and questioning the boundaries that often separate us from non-human others.

Conclusively, human-animal relationship cannot be singularly viewed from a utilitarian context, as often practically expressed in the use of animals as a source of subsistence – as food or as in economic transactions. Rather, people's attitude to animals should be also seen as mediums of constructing and reinforcing social relations with other human beings, the environment, spaces, and landscapes that we all share. These relations can be spiritual and

mystical; mutually linked with the dwelling practices of people and cosmological forces that equally inject their agency within the social spaces that we co-habit. The insights that these interactions provoke – where biophysical beings as well as spiritual entities appear to influence life – can also have considerable implications on our understanding of human-animal health and wellbeing, and this is my subject of concern in the chapter that follows.

Chapter 7. Re-thinking human-animal relations in public health

Nyayetahun is a multispecies world, where villagers are in direct proximity and repeated interaction with the wider ecosystem – animals, plants and other non-human organisms including spiritual beings (ancestral spirits and deities). Villagers and animals come into contact with each other's bodily fluids including faeces, urine and blood countless times each day, and these multispecies encounters take place in numerous ways, since villagers and animals share important spiritual, moral, political and economic ties. The previous ethnographic chapters have demonstrated this in different ways, providing some important evidence that shows how villagers and animals co-exist, and some of the ways that their interactions are embedded in the dwelling practices of people. I have also shown this by describing how the local ecological relationships, material infrastructure, religious/spiritual practices and livelihood activities produce and sustain these multispecies assemblages.

In such contexts, the welfare and wellbeing of humans and other non-human animal species are inextricably entangled. Therefore, attempts to understand and address health problems in a community like this one requires attention to people, animals (wild and domestic), and the different ways that their lives are connected. In this regard, this chapter focuses on the public health implications of these human-animal interactions. In the post 2014-2016 Ebola outbreak context – where the relationships that humans share with other nonhuman species have taken on fresh concerns, and there is a new imperative to better understand these interactions.

In this endeavour, I start by exploring forms of multispecies encounters that are conventionally recognised as of public health concern and move on to consider the wider range of ways that animals can be sources of harm and of pleasure for people that I observed during my ethnographic fieldwork. I demonstrate how people's lived experience of animals contrasts with current public health concerns, where measures of zoonotic disease control and prevention are often narrowly focussed on a smaller number of animal species, such as rats especially *Mastomys Natalensis* (the multimammate rat that is the host of Lassa fever), stray dogs in the case of rabies, monkeys and bats for Ebola, and mosquitos for malaria. Additionally, health authorities are often critical of practices like hunting, meat handling and

food preparation. The ethnographic material I present suggests that these approaches are too narrow, because they lose sight of the broader scope of human-animal relations and the multiple dimensions of those interactions. Health is bigger than these concerns around single diseases and must include issues of economic prosperity and food security, which are all important components that contribute to produce human and animal encounters, and their health and wellbeing.

In this chapter, I situate public health concerns against a backdrop of a wider range of encounters that people have with animals by bringing into view other kinds of species and forms of human contacts with animals such as playing, touching and transporting of animals. Moreover, taking the examples of villagers' relations with bedbugs, rats, cane rats, porcupine and bushbuck, I highlight some forms of physical contacts with animals that are of concern to these rural people which are not usually considered within public health frameworks. I suggest that some of these issues might also be taken up in an expanded view of public health ideas that are concerned with the possibility of pathogenic spillover.

In this way, my thesis makes a contribution to an emerging field, which is sometimes referred to as One Health (Zinsstag et al., 2020), and which calls for a paradigm shift in developing, implementing, and sustaining health policies that engage with the different social, environmental, physical and cultural determinants of human and animal health (Zinsstag et al., 2020, Bardosh, 2016). At its core, One Health entails a shift from an individual clinical based approach to a more holistic and preventive perspective that takes into account the populations of multiple species and the context of their shared environment (Zinsstag et al., 2020, Barrett and Bouley, 2015). Though this approach is harmonious in many aspects with the 'multispecies approach' that I take, which foregrounds the diverse organisms whose vitality is linked to human social worlds (Kirksey and Helmreich, 2010), I however offer a critical One Health lens into human-animal health (Hinchliffe, 2017). In that, the kind of ethnographic approach that I present in this chapter opens up different perspectives that are important in doing One Health. I provide insights into a variety of everyday practical experiences and the roles they play in linking humans, animals and their environment, and these insights are important in broadening One Health understanding of how the connections

between humans, animals and their environment are produced, and how this entanglement shape their health.

Multispecies health in history

The conventional public health approach to zoonoses and vector-borne diseases (diseases that are spread from animals to humans, or via nonhuman vectors) has its origin in colonial medicine. At the start of the twentieth century, active colonial powers in Africa were challenged with a range of problems, one of which was the control of infectious diseases (Tilley, 2011). Vector borne diseases such as malaria and African trypanosomiasis (a parasitic disease that causes fatal illnesses of sleeping sickness in humans and nagana in cattle) and rinderpest epidemics were of concern to colonial powers (Tilley, 2011, Burnet and White, 1972). This is because they threatened both the European settlers and their economic interests, and the native population. The rinderpest epidemic for instance, caused incalculable suffering and material loss among many African communities, as the loss of ruminants from the disease severely affected the social and economic wellbeing of people whose livelihood closely depended on the ownership of animals. At that time, one of the major functions of the colonial officials was how to understand and control diseases, stem epidemics, and improve health.

To do this, four major strategies were adopted, which included the interruption of the chain of transmission through measures of separation, i.e., relocating populations from infested to non-infested areas; increasing population densities in lightly infested rural settlements; developing prophylaxis and chemotherapy treatments and inoculation; clearing bush and vegetation and culling of suspected animals. Medical services during this period were however formulated around disease specific approaches or what is otherwise referred to as 'vertical health programmes,' rather than 'horizontal frameworks' that could address the broad spectrum of health issues (Lyons, 2002). As Helen Tilley (2011) has explicitly stated, disease control was centred around 'germ theory,' in which the primary cause of infectious diseases were attributed to biological transmission of microorganisms from a host, thus losing sight of other social and ecological relationships and their importance for health (Tilley, 2011, Worboys, 1994).

Certainly, the problem of human and animal health cannot be sufficiently addressed from a narrow approach of biological determinism. Evidences of recent outbreaks of emerging and re-emerging infectious diseases such as avian flu, severe acute respiratory syndrome (SARS), the Ebola virus, and so-called 'mad cow' disease as well as the growing impact of anthropogenic landscape on disease emergence, have all revealed the intimate connection between the health of humans, animals and the environment in which we all live (Karesh and Cook, 2005, Bardosh, 2016). The bird flu (H5N1-Avian influenza) epidemic in Southeast Asia for instance, provides insight about how multispecies contact between humans, poultry and other wild birds creates the possibility of pathogenic viral infection among living beings (Porter, 2019, Lowe, 2010). Likewise, Alex Nading's study of Dengue in Nicaragua illustrates ways in which the environment can promote the assemblage of humans, mosquitoes and viruses, and show that these connective pathways linking people and other nonhuman organisms provides opportunity for human exposure and vulnerability to disease infection (Nading, 2014). All these instances show how the intricate interconnection among multiple species and the environment can lead disease causing organisms to cross species boundaries. These ideas thus demonstrate the need for an approach that integrates human, animal, and environmental health in addressing health issues for all, and this is a goal that has in recent times become a formal global health policy agenda in the form of 'One Health' (Cook et al. 2009).

One Health

In general terms, One Health is based on the premise of interdependence between humans and non-human species in complex socio-ecological systems (Zinsstag et al., 2012). One Health calls for an approach to enabling health and wellbeing in a manner that considers the embeddedness of humans and animals in the natural world (Bardosh, 2016, Barrett and Bouley, 2015, Atlas and Maloy, 2014a). It seeks to integrate wildlife, agricultural, public health, and social sciences; through a coordinated disease surveillance and response across human and animal health sectors (Cook et al. 2009).

To trace its root, the idea of One Health date back to medical writings in ancient times (Zinsstag et al., 2011). Historical accounts of medicine suggests that ancient Egyptian and

Greek scholars thought about both human and animal diseases together, by studying symptoms and treatment of human and animal illnesses in ways that acknowledge the similarities of medical problems across species boundaries. One of such historical precursors in this line of thinking is the Greek physician Hippocrates (460–370 BCE), who in his treatise ‘airs, waters and places’ argued that ill health emerges from an imbalance between man and his environment. Hippocrates emphasised what could be now referred to as ‘environmental causation,’ which has to do with the interconnection between health and social and ecological dynamics such as climate, water, soil, and a person’s mode of life and nutrition (Zinsstag et al., 2020).

Notwithstanding Hippocrates contribution, and those of other notable historical precursors like John Ford (1971) and Sir. William Osler (1849 – 1919), connections between human and animal medicine began to take shape when Calvin W. Schwabe (1927 – 2006) coined the term ‘One Medicine’ in 1984, with the aim of integrating human and animal health and research, and which later evolved to One Health (Zinsstag et al., 2011). This concept, which emerged on the outbreak of the severe acute respiratory syndrome (SARS) epidemic in 2003, was built on the idea that the health of people, animals and the environment represented a continuum, where improvements in the health of one entity can produce positive health effects in the others. Over the years, proponents of this One Health idea have attempted to foster a collaborative effort involving multiple disciplines working at the local, national and global levels to achieve optimal health for all. Today One Health is invoked in policies and activities of health institutions across the globe, including the World Health Organisation (WHO).

Though embedded in many national and global health research and policy frameworks in the field of zoonoses, One Health is fraught with contested policy narratives in the interpretation and implementation of the concept by different actors. For instance, while veterinarians tend to focus on the risk of wildlife to domesticated animals (Daszak et al., 2000), conservationists are more concerned with disease risk that humans and domesticated animals pose to wildlife and the impact that this has on humans and the environment (Hughes and Macdonald, 2013). On the other hand, those in the public health sector tend to be largely interested in the risk that animals pose on humans and not on those that humans pose on animals and the environment (Kahn et al., 2009, Alder and Easton, 2005). Moreover, even though the

intersections of human, animal, and ecosystem health lie at the heart of these public health policy concerns, yet these interactions between humans, animals and the environment are often poorly examined and understood. This is because when it comes to research and practice, the idea of One Health is often narrowly conceived and reliant on limited perspectives that are often dominated by technical veterinary and public health knowledge, which are prioritised over ecological and social sciences (Dzingirai et al., 2017, Galaz et al., 2015), like anthropology.

The consequences of this selectivity that privileges a particular understanding of human, animal, and environmental health, often have far-reaching effect on One Health implementation and practice. For instance, because of these institutional bottlenecks, response to zoonotic diseases is too often driven by top-down control and surveillance systems that are oriented on faulty assumptions. This is largely due to poorly understood ideas about the practices and conditions that promote human-animal interface and disease transmission, and generalizations that fail to fit real-world experiences (Cunningham et al., 2017). An important example of such failures in public health policy and response is reflected in the idea of separation or reduced contact between humans and animals. This approach has been problematic and often rendering health interventions almost impossible. In Sierra Leone, this was for instance seen in the 2014-2016 West Africa epidemic of Ebola virus disease, where ideas of keeping humans and animals apart, and banning bushmeat greatly undermined disease response (Brown and Nading, 2019, Bonwitt et al., 2018). This is because the approach was not grounded in local knowledge and practices, and which consequently posed economic and nutritional problems on poor people whose livelihood depend on animals (Richards, 2016, Bonwitt et al., 2018).

Certainly, in a world of social, economic, and environmental change, a One Health approach can work better if health and disease are broadly understood through a unified interdisciplinary framework that does not only consider the convergence of humans, animals, and ecological health, but takes into account local understanding and the social context in which these interactions take place (Cunningham et al., 2017, Dzingirai et al., 2017). In this respect, the multispecies perspective that I adopt here offers a framework for local

understanding of the different dimensions and processes that characterise human and animal co-existence (Kirksey and Helmreich, 2010, Haraway, 2008, Kohn, 2007).

As a project, multispecies ethnography seeks to understand the world as materially real, partially knowable, multicultural and multinatured, magical and emergent through the contingent relations of multiple beings and entities (Ogden et al., 2013). Accordingly, multispecies ethnography sees the human as not just a biocultural being but a kind of corporeality that comes into being through multiple assemblages of other organisms and things (animals, plants, bacteria, and other beings). Being a mode of enquiry based on focused participatory analysis, and a critique of anthropocentrism and nature-culture dualism, this multispecies approach is crucial in revealing the kinds of practices in which people live their lives with animals, how they relate with the environment, and the economic, political, and other social processes that produce and shape these interactions.

The ethnographic account and analysis that I present in this chapter, I believe can be helpful in overcoming some of One Health's challenges by enlarging its scope of research into the complex entanglement of humans and animals as actors in the production and shaping of knowledge. This can improve One Health's understanding of the social and ecological processes of health, and perhaps even broaden its original formulation and ultimately its importance for human-animal health and wellbeing. I begin to show this by describing the distribution of insecticide-treated nets (ITNs), which is a key public health response to the problem of malaria. By describing this public health approach, I show how local experiences and perceptions of people can contrast with public health framework, and how this can undermine health service delivery. In the following section, I go further to explain the evidence of this contrast between local concerns and public health interest, by discussing peoples' experiences with bedbugs, rats, and other crop raiding creatures. With this, I also show the interconnections between health and wellbeing, and issues of food, livelihood, and economic security. Finally, I go on to describe some other forms of contacts and ways in which people interact with animals, and which all together gives us a wider understanding of some other forms of human-animal encounters that do not often reflect in public health focus.

Public health interventions for zoonotic and vector borne diseases in *Nyayetahun*

The use of insecticide treated bed nets is the main strategy in reducing contact with mosquitoes and controlling malaria infection in malaria endemic regions like Sierra Leone, where malaria is a widespread health problem. According to a World Health Organisation report of 2022, Sierra Leone is among the countries with the highest malaria burdens in the world (WHO, 2022). Malaria is endemic and the entire population is at risk of the disease. It is the leading cause of ill health and deaths, with children under five and pregnant women the most vulnerable groups (WHO, 2022).

Malaria is mainly transmitted through the infected *Anopheles* mosquitoes that carries the *Plasmodium falciparum* that is said to be responsible for over 90% of malaria cases and all the severe types of the disease in Sierra Leone (Koroma et al., 2022). Malaria control effort in Sierra Leone is a challenge, and it is hindered by a host of factors, ranging from inadequate capacity due to the country's weak health care system and poverty-related social and environmental conditions. In remote rural areas like *Nyayetahun*, health facilities are hard to access, and infection carries high risks to health.

As a way of dealing with this health problem, mosquito treated bed net provision is a core measure in the prevention and control of malaria in Sierra Leone. This public health intervention approach is facilitated by the government and promoted by international organisations, upon the assumption that the toxic effect of insecticide treated bed nets can result in reduced contact with *Anopheles* mosquitoes (W.H.O, 2022, Lengeler, 2004), which is believed to bite mainly between 10 p.m. and 4 a.m when most people are presumed to be sleeping indoors (Tusting et al., 2016). As such, household possession of these insecticide treated bed nets and the effective use of it can regulate encounter between human hosts and mosquito bite during the night, hence serving as a barrier to prevent people from being bitten by mosquitos and tempering the threat they pose for malaria infection.

Since 2010, mass distribution of long lasting insecticide-treated nets (ITNs) is a routine activity in Sierra Leone (Leone, 2014). One of those distribution exercises which I witnessed during my fieldwork lasted from the 22nd to the 31st of May 2020, with the registration and

distribution of free treated mosquito bed nets to households in commemoration of the '*mami en pikin wɛlbɔdi wik*' – a national maternal and child health campaign week that is annually observed by the Ministry of health and sanitation (MOHS). Together with her donor partners, including the World Health Organisation (WHO), Global fund, USAid, UNICEF and the Centre for Disease Control (CDC), the government of Sierra Leone through the Ministry of Health and Sanitation distributed a total of 4.6 million insecticide treated nets in 14 out of the 16 districts, which covered a total of 149 chiefdoms in Sierra Leone. Simultaneously delivered with this ITNs mass distribution exercise, was a behavioural change campaign, where public health workers doing the distribution educated people about the need for environmental sanitation and hygiene. The campaign message emphasised that people should not just rely on the ITNs but should engage in controlling mosquito breeding sites within their environments by regularly cleaning their surroundings and to get rid of shrubs (which is consistent with the idea of separating humans from nature) and stagnant water. These public health messages which were delivered in Krio (the lingua franca), also stressed proper utilisation of the bed nets, with the slogan '*sleep inside the bed nets and not under the nets.*'

From my observation, this slogan goes contrary to some of the concerns of villagers, who complained of being uncomfortable and experience feelings of breathlessness and burning sensation each time they try to sleep inside a mosquito treated bed net. For instance, during an informal discussion, *Masunday* maintained that he feels very uneasy and finds it difficult to sleep inside a bed net, because he feels 'caged.' While the old man *Edico* complained that '*...ar nya levui malelo,*' meaning, 'it ceases my breath.' In other words, he experiences breathing difficulties whenever he tries to sleep inside an insecticide treated mosquito net. Such complaints, which from my experience are common among villagers, undermine people's usage of insecticide treated bed nets even where they have access to one. For example, in a conversation with *Angela*, a young adult female living in Bo town, she said:

'I do not sleep inside mosquito nets, if I sleep inside a bed net it makes me very uncomfortable, even if it is an old bed net which other people may have used or has been left outside for 72 hours as it is prescribed before using, it still makes me experience burning eyes. When I was a kid, I had eye problems so I do not know whether that is the cause of the problem, but I cannot sleep inside

a bed net. I even have one as I speak to you, which I collected and left outside for over a week, but I still could not use it.'

Angela told me that she prefers to use mosquito repellent aerosol spray to treat mosquitos in her room. She does this by spraying her room late in the evening and then waits outside for an hour or two before going to bed. These kinds of concerns of discomfort, breathlessness and burning sensations, together with earlier complaints I have heard of the heat associated with the use of bed nets especially during the dry season when there are high temperatures, highlights some of the ways in which public health intervention can conflict with lived experiences of people.

As a matter of fact, many people use these bed nets for other socio-economic purposes, which from my observations seems to be more important to them. For example, because of its insecticide component, villagers wrap mosquito nets around their mattresses to deal with the problems of bedbugs. It is believed that the insecticide on bed nets is sometimes potent in mitigating bedbug infestation. Apart from that, bed nets are also placed over crops as a pest control strategy, and they are utilised as a kind of cage to contain the movement of chicks and to protect them from hawks and other predators. Moreover, bed nets are popularly used by villagers to build scoop nets for fishing. All these different ways in which villagers make use of bed nets suggests that in the lives of people, there are more important issues that are of greater concern to them than malaria, and it shows that livelihood and food security are prioritised over diseases. This thus demonstrates the intricate connection between disease control and economic welfare (Tusting et al., 2016), and further remind us of the fact that processes of economic livelihood and food security are significant subjects to be considered in formulating policies for health response and intervention.

Although the strategy of using bed nets has been hailed as successful in mitigating the problem of malaria (WHO, 2022), this strategy does not fit well with people's way of life and lived experience. It does not prevent mosquitoes from entering houses, neither does it eliminate mosquitoes from the environment. As such, once people are out of the bed nets they remain exposed to mosquitos already existing in the environment, and for these villagers, separating mosquito bites that have potential for malaria infection with the

plasmodium parasite, from those bites at other times is difficult. One reason for this is because all these bites entail itchy skin reactions that are equally annoying. Villagers' exposure is further exacerbated by the long hours spent outside the house and within the village environment, where most of their dwelling activities take place (as described in chapter 4). This together with the daily routine of going to the forest, farm sites and other locations of dwelling like the *Waalihun*, and *Gadihun* early in the morning and spending long hours till late in the evening, all keeps people and mosquitoes in close contact with each other.

Considering all these diverse forms of contacts with mosquitoes, it is important to supplement this existing malaria control intervention with other approaches that can offer protection across all the different contact settings where villagers dwell, and where these multispecies assemblages take place. While such considerations as argued in some other studies, may include improving on housing infrastructure (Tusting et al., 2017, Njie et al., 2014), by having closed eaves and other openings like broken doors and windows, which allow access to mosquitoes as well as other creatures, that is still not enough. These measures must be linked with frameworks that aim at addressing problems of economic development, livelihood, and food security. The reason being that these are major factors that produce contact with animals, but more so because they are of greater concern to people – possibly more than the problem of malaria. I say so because from my ethnography, many of the issues of disease transmission that are important focus in public health reasoning about human-animal relations (as seen in the case of malaria), are not the things that bother people so much. Based on observations and interactions with villagers, there are a lot of examples of problematic experiences with animals that lie outside of conventional public health focus but that trouble people. One of such local concerns is evident in peoples experience with bedbugs and rats, and these experiences are connected to issues that go beyond the problem of disease transmission.

Problematic experiences of human-animal relations beyond mosquitoes

While on the veranda of her house, as she tries to get the room ready to lodge some guests who were coming to help her clear her oil palm plantation of unwanted plants, I saw *Yei*

Mariama (an elderly woman) splashing hot water on the uncemented mud wall of the room. In response to my enquiry as to why she was doing that, she said to me (in Mende):

'I am splashing hot water on the wall to get rid of bedbugs, it is inside these holes on the walls that they hide, I am also going to pour hot water on the bed frames and burn the palm leaflets (used a mattress) and replace them with fresh ones. ...bed bugs are plenty in this village ...even in my own room. Although I have tried different approaches including the use of petrol to kill them, they are still in there, we cannot sleep well at night, we are really looking forward to someone that will help us to deal with this problem.'

This exchange helps to draw attention to some of the encounters with animals that are of larger concern to people, and these concerns are expressed in ways that often do not cohere with problems and risks viewed in public health lens. While public health authorities are for instance interested in the risk that animals pose for disease spread, villagers are more concerned about the psychological and emotional distress, and the damage that animals cause leading to food loss.

As with *Yei Mariama*, '*Kpengbeyawuii ke Nyinei*,' is the response of villagers each time I ask them about household pests that are of greatest concern to them. '*Kpengbeyawuii*' in Mende means bedbugs, while rat is referred to as '*Nyinei*'. I will start by looking at the problematic encounters of people with bedbugs and then discuss their interactions with rats.

Problematic experiences of people with bedbugs

The problem that villagers have with bedbugs is that they cause significant physical pain and discomfort. Their habit of feeding on human blood when people are sleeping at night (Lowe and Romney, 2011, Goddard and deshazo, 2009) limits farmers from having sound sleep after a laborious and intensive day's work. Rashes from bedbug bites characterises the skin conditions of villagers. Children as well as adults often scratch their skin because of the itchy dermatological reactions of bedbug bites, which sometimes cause abrasions to their skin. They often showed me their skin so that I could see the rashes, confirming the level of infestation and discomfort they face. These issues from my observations are not just in

Nyayetahun, as similar rashes were visible on the necks, arms, and other exposed body parts of many other people I interacted with from the neighbouring villages, who expressed similar concerns about the discomfort caused by these creatures.

Sadly, these frustrations over bedbug infestation do not tend to be reflected in the dominant public health purview. Unlike mosquitoes for malaria and rats for Lassa fever for example, which have attracted so much public health attention, it might be appropriate to think of bedbugs as a 'neglected public health problem', as an echo of the way that under-researched and understudied diseases fall under the medical framework of 'Neglected Tropical Diseases'. Despite its capability to host about 27 and more pathogens, and that it is suspected of transmitting infectious agents (Adelman et al., 2013, Delaunay et al., 2011), there is rarely any commitment in terms of policy and intervention in managing and controlling bedbugs in Sierra Leone. While this may be in some way attributed to the lack of conclusive evidence to demonstrate that bedbugs are infectious disease vectors, it also somehow reflects the disease specific and outbreak focus of public health, which is one major hinderance in addressing global health.

Considering the socio-economic deprivation in this rural community, where people have limited access to antiseptics, medicines and proper health care, the already existing preconditions for bed bugs to host pathogens is a cause for concern as a potential intermediate host between humans and other animals. Besides, some studies have shown that allergy to bed bugs can stimulate asthmatic related reactions, and that high infestation and persistent feeding on humans can be a cause for blood loss, which can lead to anaemia especially among children (Ling et al., 2020, Doggett et al., 2012). This – in addition to the nuisance that they cause leading to psychological distress, anxiety and sleeplessness – can affect people's mental health, and can subsequently undermine productivity. Moreover, the frustration caused by these pests can lead people to employ desperate and dangerous measures such as the use of hot water and petrol (as shown the ethnographic vignette). Splashing of hot water on mud walls can cause structural damage to houses, while the use of petrol to treat bedbugs in the home has significant risk for fire because of its flammable nature. All of these can have devastating consequence on individuals and the community,

such as loss of property and homelessness, which can worsen the poverty of already poor households.

Ironically, even the health centre where people go to seek health care is infested with bed bugs, and this is a prevailing condition that can facilitate and exacerbate other health problems for patients who visit this health facility. In a discussion with the community health officer (CHO) in *Damballa*, she maintained that:

...(smiling) even when they (referring to villagers) visit the health centre they come along with them. (Pointing to one of the long wooden benches) even these benches, when they visit the centre, they leave bedbugs on them.

'...if you do thorough cleaning in your house, you will hardly experience those things, but for them (referring to the villagers) as soon as it is morning, they will just leave their houses for the farm and come back late in the evening. It is filth that brings those things into the homes, after eating in a plate and dish you must wash them, but if you leave them like that you will be encouraging rats and cockroach'.

From the point of view of the CHO, poor hygiene practice by villagers is a major factor that promotes and sustains the breeding of these pests in the homes. In some way, her perceptions about these issues reflect ideas of 'victim blaming' – a notion that describes the easy conviction of victims of crimes, physical and psychological abuses, and infectious diseases, as being responsible for bringing their conditions upon themselves. The idea of victim blaming is a mindset that seems to have also undermined health delivery and escalated the prevalence of diseases. This is reflected in the public health response to HIV/AIDS in Africa in the 1980s, where despite the political will and commitment by many African governments, donor agencies, NGOs and global financial responders, response to the disease remained a challenge for many years, due to lack of thoughtful analysis of the local realities (Dionne, 2017). Earlier public health campaigns about the HIV/AIDS disease were linked to individual responsibility, risky behaviour and practices rather than on thoughtful analysis of the local realities of the socio-economic conditions that made people vulnerable to the disease (Dionne, 2017, Prince and Marsland, 2013).

Though, unarguably the idea of poor sanitary condition as mentioned by the CHO, has long been central in discourses of animal pest and disease control, the case of bedbugs somehow tells a different story, because there are other human activities that exacerbate this problem. The movement of people between villages and houses for instance, as well as communal utilisation of household furniture are integral in facilitating the spread of these creatures among villagers, which hence makes efforts to extirpate them difficult. As Nading (2014) has shown us with mosquitoes in Nicaragua, bedbug is a typical example of social insects. Its proliferation among people is embedded in human social activities and interactions. Therefore, as we have also learnt from Ebola (Richards, 2016), control of bedbugs requires both technical and social approaches that are rooted in community involvement and local knowledge of how these multispecies interactions takes place and how they are perceived by people. As we have seen in the case of mosquito treated bed nets and bedbugs, the conventional public health focus in dealing with these animal related issues does not often fit with the concerns of local people and how they understand these problems.

Problematic experiences of people with rats

Rats figure in public health messaging in Sierra Leone on account of their role in the transmission of Lassa fever. Lassa fever is a rodent-borne illness that is transmitted to humans primarily through direct or indirect contact with multimammate rat (*Mastomys natalensis*) and its excreta. It is an infectious and often deadly viral haemorrhagic disease that is recognised by the global community, and it is a major public health threat in Sierra Leone. Although cases of Lassa has been identified in other parts of Sierra Leone, infection is largely prevalent in the Kenema district that is located in Eastern region of Sierra Leone (Shaffer et al., 2019). There are no vaccines for Lassa fever, and control measure has been mainly about managing and eradicating the host.

In Sierra Leone, the focus on Lassa fever has been on telling people not to eat rodents and to keep their houses clean, in reality, the prevailing environmental conditions and livelihoods makes efforts to keep rodents out of human domains difficult. These challenges usually become more complex during the post-harvest period when the harvest is in the house, which attracts rodents in the home. This is because, in addition to other kinds of human activities

such as improper disposal of waste, these rodents also depend on this stored food to feed, while villagers on the other hand often rely on these animals as meat. Hence, this mutuality of co-existence makes mitigation efforts to keep them away complex, difficult, and even impossible.

Indeed, food is a major link connecting humans and nonhuman animals. Crop raiding by animals and related resource exploitation patterns by humans, are the traditional reference points for human–animal interactions. And from the perspective of villagers, the main problem they have with animals is that they eat their food and destroy property. There are many animal threats to food security. Cane rats, porcupine and other crop raiding animals such as bushbuck can cause damage on farm crops especially at their growth stage. The presence of rodents in the living spaces of villagers threatens the nutritional status of these subsistence farmers, as this is where they store food. The risks that rats cause to post-harvest stored grains, fruits and vegetables raises significant implications for food security, but these are concerns that public health does not say much about, even though it is a major issue of health and wellbeing – undermining people’s subsistence and dietary intake, which can cause hunger and malnutrition, and exacerbates existing health conditions in people and make them more vulnerable to disease.

Though there are several rat species that raid these human spaces for survival, the most common in *Nyayetahun* is the Black rat (*rattus rattus*) or ‘*Tɔndwei*’ as it is called in Mende. *Tɔndwei* is a long tailed rodent rat with great climbing ability that originally lives in trees particularly palms. It also inhabits houses and stores (Kingdon, 2020). Unlike other rat species which people told me they usually come in contact within the forest or in the farm sites and swamps, ‘*Tɔndwei*’ is often in the roofs of thatch houses and farm huts, where they create their nests. The palm thatch on the roof of houses gives black rats a conducive environment to survive within human domain.

‘As soon as you roof a house with thatch, within the next few days, the roof of that thatch house or farm hut becomes a lodge for Tɔndwei.’ Masunday explained.

Because of their climbing ability, the rough surfaces of mud walls and trees around houses make it easier for '*Tɔndwei*' to climb through the walls and trees into the roof of houses, from where they descend into the homes at night or during the day when the houses are quiet. Moreover, openings on doorways and windows provide easy access to these nonhuman guests. This suggests the effect of housing characteristics and domestic organization in promoting human-animal co-habitation, which are concerns that other studies in this region (Bonwitt et al., 2017a) and elsewhere (Nading, 2014) have identified as profoundly important factors that promote and sustain human-animal commensality.

Adult rats are said to have a routine of going into the forest during the day and return to the houses in the evening. In a sense, their behavioural pattern mirrors that of their human neighbours with whom they co-exist. Villagers go to the forest or farms in the morning, where they spend much of their day and return to the village in the evening. This host seeking behaviour of rats is seen to be shaped by the diversity of dwelling among villagers, and this in some way exemplifies the mutuality of human-animal co-existence. It also shows that in the process of living together and in their quest to benefit from human activities, animals are not passive creatures in human made landscape but are constantly learning how to live together with humans, just as humans learn to live with them. Agustin Fuentes and Kimberley J. Hockings (2010) have shown us something similar in relation to primates, noting that human ecologies and societies can influence the ecology and behaviour of other animals, just as nonhuman kinds can influence the ecology and behaviour of humans.

Despite the destruction and discomfort that they cause, which make them pests that people try to keep at arm's-length, paradoxically, household rodents are also an important source of available protein for villagers, and it is these kinds of paradox that also make keeping them away a complicated process. Though some people maintain that they prefer to eat rats that are caught in the forest, others, particularly children, consider household rats as edible meat, on the grounds that they equally come from the forest to live within human spaces and are therefore worthy to be eaten. Women on the other hand use dead rats as bait for fishing, as rats are said to attract fish and lobsters into fish traps especially when they are exposed to fire (the smell of a toasted rat is seen as an attractant for fish and lobsters into fish traps). Without much consideration to the possible risky implications that may be associated with a

dead rat (in terms of food poisoning, and especially when killed with pesticides) a rat that is at one instance considered as pest and therefore eliminated because of its threat within houses, is in another situation a meal, and in yet another situation useful tool in the harvest of other animal organisms (fish and lobsters) for household consumption.

What goes for *Tɔndwei* does not necessarily apply to other species of rats, however. The Shrew rat or *Tulii* is despised by children and adults alike because of its pungent odour, and more importantly because it is (incorrectly) associated with Lassa fever based on what they have learned from erroneous public health messages about Lassa from community outreach health officials and via radio discussions, which are often done in Krio and Mende. Yet the types of interactions that villagers have with rats in terms of food, shows the dynamic nature of people's relationship with animals in these communities. These dynamics in the different status of rats from being pests to a source of food, illuminates the various forms that animals take in their interaction with humans. It reminds us of the kinds of deep multispecies interdependence that exists between villagers and animals, and how this relationship with rats is connected to issues of livelihood and food subsistence. Moreover, the ways they immediately try to get rid of *Tulii* within their social spaces when noticed, compared to other rat species like the *Tɔndwei* that they eat, highlights how people's perception about different animal species can influence their ways of interacting with those species.

Generally, from this discussion, it could be seen that not only are conventional public health messages on zoonosis out of sync with what people think about the connection between animals and health and wellbeing, they also miss all these wider textures of life that is important to understanding how these contacts with animals are really playing out in real life context. Public health responses to zoonoses must take into account people's modes of making a living. This is particularly important because, the interactions that people have with animals are much more connected to different aspects of their lives and existence, than what is viewed from the surface. Villagers interact with animals in different ways and the status of animals can take different forms depending on the situation. This, therefore, suggests that approaching these contacts from just one narrative is not sufficient. To broaden our ideas of the dynamics that characterises these relationships, in the next section, I describe some other

interactions that people have with animals, which also seem to be outside of public health attention.

Spillover? Rethinking forms of human-animal contact

On our way to the farm of his friend *Amerikin*, who also doubles as his in-law (the husband of his younger sister who lives in the neighbouring village *Damballa*), *Masunday* made a sudden stop and started looking closely at the crown of an oil palm tree that was tapped for palm wine. Moments later, he asked me to wait while he climbed the palm tree using the scaffold (made with tree branches and attached to the palm tree with plant fibres used as ropes). I assumed he wanted to check on the container attached to the crown of the palm tree to see whether some palm wine juice had dripped in. On the contrary, I saw him struggling to catch a '*fofoi*' – red palm weevil (*Rhynchophorus ferrugineus*), that he had spotted on the crown of a palm tree. He caught one and then another, both of which he kept between the palm of his left hand while trying to catch another. Unfortunately, he could not as his effort to prevent the two *fofois* that he already had from slipping off his hand could not permit him to catch the third one, which swiftly crawled into the base of a palm leaf.

Upon coming down the palm tree, he showed me the *fofois* saying in krio, '*nar dem tin ya so ar see, ar dae send am for me pikin Senya, e lek for play with am.*' Meaning, "These are the things that I saw, I am sending them for my child *Senya* (his daughter of about three years old) she likes to play with them." He slipped the two insects (*the fofoi*) in the pocket of his trouser. On our return to the village, he placed one of the *fofois* on a broom straw and gave it to her daughter *Senya* to play with, at which she was excited. On another occasion, I remember seeing *Dayfo* giving a *fofoi* held on a broom straw to his daughter *Sattu* (fig. 22), however moments later the *fofoi* was roasted and eaten by the child. Animals used in this way appear both as pets and food, another example of complex connectivity involving humans and animals.

To the parents, *fofois* are seen as good pets that the young children find pleasurable to play with. From my observation, the children found pleasure in the humming sound of a *fofoi* when it beats its wings in trying to fly off a straw or rope on which they are often held. Also, the

breeze that meets their skin when a *fofoi* is brought closer to their face for instance, forms part of the things that they find enjoyable. How might we square these kinds of multispecies interaction that involves playing with an insect as a pet with public health literature on human-animal encounters?



Figure. 22. A *fofoi* (red weevil) attached to a palm leaf straw

Generally, having animals for recreation or fun in the form of pet is not peculiar to villagers, it is a common practice in many human societies (Cormier, 2002, Serpell, 1999). Haraway in her exploration of the rich ecological diversity and connections that we humans have with other beings, has described these kinds of human-animal relations as companion species (Haraway, 2003). As described in the ethnographic vignette, it is normal for children to receive live baby animals including rodents, birds, and insects from their parents to play with. On their own, children themselves catch live animals, which they keep as pets. Having a bird held on a string, or a rodent or an insect in their pockets or back packs when coming from the farm is not an uncommon practice among children in *Nyayetahun*, who often engage in some form of experimentation with these animals by trying to discover certain things about them, such as opening and inspecting their mouths and stroking their fur and inspecting to see their genitals or stretching out their wings – in the case of birds and other flying creatures including the *fofoi*. In some way, these practices gives children the opportunity to learn about animals,

as playing with pet animals have featured prominently in the socialisation of children and in helping children understand and develop a sense of solidarity or psychological attachment and closeness towards other nonhuman kinds as well as with the natural environment generally (Serpell and Paul, 2002, Amiot and Bastian, 2017). Loretta A. Cormier's (2002) study of the Guaja' Indians for instance, offers a good example of an anthropological account that illustrates the ways how pet animals can contribute to the socialisation of children. Cormier's study narrates that infant monkeys are important in helping Guaja' young girls to learn childcare, while the boys developed their hunting skills by interacting with infant monkeys. She observed that young girls typically experience taking care of several infant monkeys before they bear their first child. An infant monkey clinging to a girl, she explains, stimulates the sense of responsibility they show in caring for their infant child as adults. For the young boys, the keeping of monkeys as pets in the households familiarises them with the call of monkeys and aids them in recognising and discriminating these sounds in the forest (Cormier, 2002).

Although such human-animal interactions are an important opportunity for children in *Nyayetahun* to learn about animals, nonetheless, in the process of these interactions these pet animals often end up as food – largely roasted and eaten. A case in point is *Daddy* and his *Peikwi* (baby mongoose). *Daddy* (*Zaco's* son of about eight years old) had a *Peikwi* which he often carried around the village clinging to his shoulder. He was so attached to the animal that he did not allow other children to come too close to it, let alone play with it, for fear of the animal being harmed by other children. At night, the *peikwi* was placed in a small coop built by his father and kept inside the house. One day, upon my return to the village after spending the weekend in Bo, the *peikwi* was neither in the coop nor on *Daddy's* arms or shoulder on which it was usually carried, it had been eaten. While such emotional attachment that *Daddy* demonstrated towards his animal highlights how pets can contribute to the attitude of children towards animals (Serpell and Paul, 2002, Serpell, 1999), on the other hand, just like in the case of the rat, which I have discussed in the preceding section, the transition in the mode of interaction between him and his *peikwi* and that of *Sattu* and her *fofoi* also reminds us of how animals can become different things at different levels of their interaction with humans. At one stage, animals can take the form of pets, which people find

pleasure to play with; at another point they can become food, wealth and economic capital, or symbols of ritual sacrifice to deities.

In essence, animals are objects of fun, pleasure, economics, and spiritual elements. These including their annoyances and threat forms the multiple identities of nonhuman animals at different times. And just as the animals take different forms at different stages, so also does touching them take distinct forms at those various levels, based upon the kind of relationship they have with humans at each point of the interaction. For instance, people are fond of stroking and caressing pet animals and animals kept as symbols of ritual sacrifices to ancestral spirits and deities. Conversely, those animals are again pushed, smacked and even culled when their activities are seen to pose risk or seen to contravene the social expectations of their coexistence with humans (Philo and Wilbert, 2000).

As I have earlier highlighted in the ethnographic vignette in the introduction of the thesis, within the village, the habit of scaring and chasing animals is often an exciting moment for children, especially when asked by their parents or an adult to chase, catch or kill an animal. For them, it is a form of recreation and often a moment to practice their hunting skills. Male children for example use that as an opportunity to practice the craft of net hunting particularly on pigs. They do this by barricading an area with a hunting net and then chase the pigs while directing them towards the net (just as it is done in the forest when hunting). Once an animal enters the net, they will grip and smack it several times on the back or thigh with their bare hands before releasing it. In fact, in some cases, the animals are left in the net to struggle for some time before taking them out, followed with some smacking. I remember the old man *Edico* being furious at some of the children for leaving two pigs in a net struggling to free themselves, while they (the children) and some adult female villagers were busy laughing. At the time I wondered if this was out of consideration for the pain that the animals suffered, or the possible harm that the animals might inflict on the children in retaliation. As it happened, *Edico* was not angry because of the pain inflicted on the pigs, or for the possible risk of animal bite that the children were exposed to, but for the hunting nets, considering the destruction that the pigs might cause to the nets and the economic implication of such destruction on their livelihood. As for the women, they complimented the children's actions,

on the grounds that the animals were very stubborn and destructive and should be disciplined.

Although these kinds of interactions that children have with pigs demonstrate some of the risky encounters with animals that are often outside public health thinking, it is equally some of these experiences of recreation and socialisation that contribute to make the idea of keeping animals separate from humans impossible. In fact, the practice of playing with animals is not just common among children, it is distributed across gender and age, as adults also find pleasure in playing with animals (live and dead, domesticated as well as wild animals). For instance, on my way to *Dambala* one day, I observed some young adult male and female villagers throwing a dead snake at each other. After which, one of them (a young man) held the snake with his bare hands trying to discover its genitals (*fig. 23*).

In few of the instances where I witnessed direct contact with animals were there considerations for sanitary care such as hand washing. Even in situations where injuries like wounds and scratches are sustained during these interactions, they were left untreated. This is particularly evident during communal net hunting, where in the event of gripping and bludgeoning animals to death with their fist (to avoid damaging expensive hunting nets with tools like machetes), villagers often sustained wounds from animals' teeth and claws. These injuries were left to heal on their own without any form of post exposure treatment. In one of those instances, I observed a male youth stepping on a grass cutter that was trapped in the net, after which I realised that he had bruises as well as droplets of animal blood on his foot (*fig. 24*), which he wiped using the palm of his hands and with no antiseptic or other form of treatment applied to disinfect the bruises. Such practices from a public health point of view have important implications, as animal related injury is a critical public health problem in its own right (Nadal, 2020, Abrahamian and Goldstein, 2011). These concerns tend however to be largely focussed on animal bites, especially in relation to disease transmission, and particularly with respect to rabies – a zoonotic disease that accounts for large number of human morbidities and mortalities, and this is said to be predominantly in rural and economically disadvantaged and marginalised communities (Nadal, 2020, Gholami and Alamdary, 2020, WHO, 2018). Certainly, focusing on bites alone is not enough, as scratches

and bruises from animal claws and teeth can also involve laceration of skin and tearing of flesh. This can equally cause physical pain and psychological stress and are possible portals of entry for disease agents and infection, especially where they are left untreated.



Figure. 23. An adult male villager holding a snake with his bare hand, trying to discover its genitals.



Figure 24. Bruises sustained by a farmer hunter while trying to kill a grass cutter caught in the net with his foot.

Conclusion: From multispecies ethnography to critical public health?

One of the major challenges in public health response to zoonosis is narrow understanding of the depths, intensities, and affective complexities of social relations between humans and animals (Brown and Nading, 2019). Public health policies and interventions aimed at controlling diseases are often framed from an outsider's point of view and informed by vertical health models that lack knowledge of local realities. A multispecies ethnography, much like One Health governance, is an interdisciplinary venture that acknowledges the entangled nature of humans and non-humans—among them animals, plants, and microbes. However, multispecies approach looks at health and wellbeing from a more-than-human perspective, by turning ethnographic attention to how multiple species interact with each other as subjects, and how in their process of interaction, constitute and construct health and wellbeing for each other and for their shared environment. In this way, multispecies ethnography provides a critical One Health view into human-animal relations, and thus helps to deal with some of the public health drawbacks, by providing a broader understanding of human-animal interactions, and the multiple dimensions of these encounters based on real world context.

In the ethnographic examples presented in this chapter, I have revealed some of the disconnections between public health narratives and the local realities, describing some forms of human encounter with animals that do not feature in the public health purview. In doing so, I have pointed at ways in which these interactions play out in real life situation, and how peoples experiences with animals contrast with conventional public health interest. My focus on the distribution of insecticide treated bed nets for example, which is a major public health response in controlling mosquitoes, demonstrates ways in which public health frameworks can go contrary to the perceptions and experiences of people at the local level. Though a popular strategy in mitigating human exposure to mosquitoes, and with significant strides achieved in successfully reducing the number of malaria cases through its utilisation, this approach is however marked with problems when used by certain people. The concerns of villagers about feelings of being caged, breathing difficulties, and burning sensation when sleeping in an insecticide treated bed net, points at some of the side effects of this strategy at the community level, and which undermines its effective usage. Similarly, taking into

account the modes of people's dwelling – which is a practice that takes place in both the village environment and forest where they spend long hours from morning till late in the evening, consequently entangled with these other creatures – opens up new vistas for thinking about disease risk. This draws attention to the relevance of incorporating local experiences and perceptions in zoonotic policy design and response, and it reinforces the significance of diverse environmental pathways, including housing conditions but also the modes of dwelling that promotes and sustain these contacts.

These ways that people interact with animals exceeds the existing public health focus on few animal species and contacts, and this diversity cannot be explained or understood by relying on one narrative. While the problem of disease transmission from animals to humans remains a key public health concern – which obviously is a notable factor responsible for the emergence and re-emergence of many illnesses – from the local point of view, people are more concerned about the discomfort and emotional distress caused by repeated bites and the impact that animals pose to their food security. The loss of crops, stored grains, fruits and vegetables to rodents and other wild creatures significantly undermines the nutritional intake of villagers. These issues of livelihood, economic or nutritional matters are equally worthy of public health attention as they can cause hunger and malnutrition, and this can consequently undermine resistance to diseases and make people more vulnerable illnesses.

Certainly, food as I have demonstrated is a crucial component that brings people and animals into intimate proximity. It is a key link that promotes and reinforces human-animal assemblage. Competition over food is often characterised with direct and indirect contact with animals, and this multispecies convergence of humans and these food searching species expose people to animal faeces and urine. These issues become more complicated by the economic and nutritional constraints of villagers, which often leads to the consumption of food including fruits and vegetables that are partly eaten and discarded by animals. All these different forms of human-animal contacts are critical risk factors to our health and wellbeing with regards to infectious diseases.

Additionally, for farmers who rely on their livestock and crops as sources of economic security, crop loss to animals can also lead to further financial difficulties, and this can hinder

their financial ability to access social services including health care in time of illness. Vulnerability to illness as a result of poverty has been a subject of concern in critical medical anthropology (Farmer, 2015, 2004) and bio-cultural anthropology (Goodman and Leatherman, 2010), where attention has been drawn to how people's socio-economic status can affect their health outcome. Paul Farmer for instance has stressed the need to address these existing problems of economic inequities in dealing with global health challenges. Farmer informs us that problems of 'structural violence' – that is, violence of injustice and inequity, social and political marginalisation and other forms of structured disparities that are embedded in a society's social structure – are key factors that promote illnesses and make the poor more vulnerable to curable diseases, or 'avoidable deaths' as he puts it (Farmer, 2004). On that note, considering the kind of prevailing economic and ecological conditions in which people and animals are entangled, any effort to address the issue of human-animal health requires a broader approach that is informed by richer understanding of the multiple ways in which people and animals interact and the social and environmental relations they share.

As Porter (2019) suggests, such an approach certainly requires putting ourselves – as researchers and public health officials/responders – closer to both humans and animals as actors that are mutually becoming, and to pay closer attention to the exchanges between them. This framing accommodates the diversity of contexts in which people encounter animals. The kind of strategy I suggest should be however done without leaving behind problems of poor housing infrastructure, economic, and food security, which are all underlying factors that have often derailed public health campaigns addressing human-animal health problems. I strongly believe that an expanded approach of One Health understanding of health and diseases in this kind of way – that thinks about these prevailing issues of food, economic, and infrastructural conditions that provide opportunities for human and animal entanglement – can better help in addressing the problem of zoonosis. In fact, such an approach is more likely to be accepted by people, because these are some of the issues that are consistent with their everyday dwelling needs and concerns.

Chapter 8. General Conclusion

The goal of this thesis was not to compare ontological differences between humans and animals, neither to question the status of humans with other nonhuman beings, nor to argue the distinctions of how villagers and animals should live in the right or wrong way with the other. Rather, this study was aimed at opening-up possible ways to understand a world that extends beyond the human.

This thesis presented various ways of understanding human and animal relationships in a rural village in Southern Sierra Leone, in the post 2014-2016 Ebola context. In doing so, it has revealed that by attending to the lives of beings beyond the human, and paying attention to things that may otherwise seem as insignificant details about how humans and animals engage with each other (e.g. how they learn from and rely on one another), we can understand that our wellbeing as humans – and even the social, moral and political worlds that we create for ourselves – are constituted by relations with the nonhuman world. This forces us to rethink the ideas we carry about the place of animals in our lives, and the kinds of approaches that we can use to enable us to better understand these relations.

As opposed to the classical or conventional perspective that views human-animal interactions typically in terms of predator-prey, hunter-hunted, parasite-host, or property-ownership relations, this thesis has shown the intimate ties that people have with animals, on account of which separating humans from animals is often difficult or impossible. I have argued that the relationships that human beings and animals share is one of co-existence between multiple parties – humans, animals, spirits, as well as other organisms such as plants, who all form part of the multispecies web of becoming together. This is a complex and multifaceted relationship that is constitutive of social, economic, moral, political, and spiritual interactions, and all these forms of relationship are directly ecological and connected to people's modes of existence and livelihood activities.

The multispecies assemblage that I have described in this study is created through the engagement of many species, and I considered the various ways that these different species participate in the (re)production of life. My account of villagers' relationships with animals

challenges the dominance and integrity of the human subject – both as a bounded corporeal whole, and as the sole architect of society. These ethnographic narratives highlights a world that extends beyond human exceptionalism, where people understand life from the perspective of mutual co-existence with both companion species (Haraway, 2013) and unloved others (Van Dooren and Rose, 2011), all of whom contribute in their diverse ways in constructing and shaping their mutually inhabited world. I have shown how villagers and nonhuman beings forge ways to co-exist and cooperate, to inhabit, secure food and thrive in the same spaces; and in doing so, I have suggested that they interact as subjects who learn about themselves and each other.

One key message of this thesis is that humans and other nonhuman beings are always in a state of dwelling, and the process of dwelling itself is typically a multispecies becoming. It is an ongoing social and ecological practice that involves encounters with other beings, and this multispecies dwelling is articulated in a logic of the everyday social, livelihood, spiritual, moral, political, and economic activities of people. In this process, humans and animals do not just encounter each other, rather they incorporate, alter, and sometimes resist one another's actions in order to thrive. This logic I suggest is pivotal in rethinking human-animal relations. It offers a fresh analytical tool that can provide an integrative approach for reflecting and writing alongside humans and animals.

Towards an anthropology of multispecies dwelling

At the outset of this thesis, I asked several questions. Among them, I asked what does the frustration of villagers over crop damage by animals, and the pleasure that children get in chasing animals around the village tell us about the place of animals in their everyday lives? I also asked that what do the kinds of effort that villagers make to rebuild their animal pens suggest about human co-existence with other nonhuman agents and about the status of animals in the local governance and political system of villagers? And how do these forms of interactions with animals reflect on public health ideas and initiatives concerning human-animal health and wellbeing? In responding to those questions, I have argued that the interactions between villagers and animals are produced and shaped by the ways that people live and experience their world, and this is constitutive of their economic and other livelihood

activities. The intimate proximities of villagers and certain animals which forms the bases of domestication and consequently other forms of relatedness such as interspecies kinship, are facilitated by their mutuality of being, which allows animals and humans to co-exist and participate in each other's existence.

Although the status of villagers and animals, and their processes of interaction within the community are in some way unequal, they however share multispecies landscapes (Fuentes, 2010) where villagers and animals participate in co-producing, sharing and shaping mutual dwelling spaces. While these interactions are often marked with pragmatic feelings of attachment – with a sense of closeness, and with care and solidarity, they are sometimes antagonistic, aggressive, and repulsive – causing physical and psychological pain to either one or both parties. Certainly, this ambivalence in the interactions between villagers and animals is often amplified by the need to survive, as they all thrive to co-exist in their shared world of existence.

What my analysis has shown is that, while much of contemporary global health and public health often orients itself to the biomedical relations between human and animal bodies in seeking ways to deal with the problems of zoonoses, in the politics of zoonotic diseases and health, it is as much about having an in-depth understanding of the social and ecological entanglement of humans and animals, as it is about focusing on their biomedical relatedness. This is because the social and environmental connections between humans and animals can contribute significantly to informing knowledge production about possible pathways for pathogenic spill over, and I have demonstrated this, by exploring some hidden aspects of ways that people interact with animals, and how these encounters are embedded in the dwelling activities of people.

One implication of this is to question some of the fundamental frameworks in public health intervention, emphasising with other scholars the importance of drawing on local knowledge, perceptions, behaviours and experiences (Richards, 2016, Galaz et al., 2015). I have made a case for a more radical incorporation of people's own perspectives, practices and conceptual frameworks in understanding human-animal interactions, and diseases emerging from those interactions. I have argued that a better understanding of these relations can save health

practitioners and development experts from the misinterpretations and conflicting narratives that often inform public health policy and response frameworks.

In this thesis, I deliberately focused on the dwelling perspective because of the possibilities that it offers in understanding this issue of human-animal relations, and the different kinds of relationships it can produce. The challenge that I have taken up is to deny limiting myself to practices of dwelling that are confined to just one domain such as the built environment or built infrastructure of the home or house. Although the house is itself a zone of human-animal entanglement, however, focusing on only one domain can undermine or limit efforts in providing a broader account of the ways people and animals are connected. In this regard, I have adopted dwelling as a concept that encompasses human (and animal) ways of living and engaging with their surroundings. It is a process that is multidimensional, since it constitutes several social practices that people undertake in their process of being in the world. It is within these practices of dwelling that the processes of human-animal interactions can be better understood. Dwelling is not fixed; it is a process that cannot be confined to a particular practice or to one sphere, just as our encounters with animals are not limited to a specific activity or domain. The practices of dwelling, I have argued, constitute an ongoing endeavour that can take place in multiple spaces, places, and landscapes. Moreover, practices of dwelling do not only transcend the domestic spaces of the home, but also go beyond the immediate boundaries of the built environment.

Although dwelling often involves establishing boundaries around inhabited spaces – as I have shown for instance in the construction of houses, farmhouses, and fences around domestic spaces, and separating its occupants from the outside world – dwelling however transcends these physical/material boundaries as well as the mundane world. I have shown that dwelling practices extends into the wild or forest and the spirit world. As such, this thesis contributes to the ‘society and nature’ debates by suggesting that ideas of nature and culture do not always reflect local representation of these spaces. The ways in which villagers in *Nyayetahun* experience and perceive these spaces is different from dominant ecological explanations. Even though these two realms are perceptually distinct, there is no definitive discrete distinction separating them. Rather, they have fluid boundaries, and they are mutually interactive and often acting on each other. Therefore, since the process of dwelling cuts

across these boundaries of society and nature, it thus provides theoretical opportunities for examining or rather re-examining this issue of nature and culture duality, and for which it is of broader use in the study of human and animal relations. In essence, using dwelling as a multispecies approach can offer a more effective methodological tool for investigating spaces where multiple species become entangled. I argue that by ethnographic engagement in everyday practices and spaces where dwelling take place, we as anthropologists can engender varying social and ecological dimensions of what Haraway (2008) describes as “be-coming with others”.

In the ethnographic narratives that form the core of this thesis, dwelling emerges as a mode for multispecies enquiry, to describe how people dwell across different domains, and the ways in which these practices of dwelling provide opportunities for their entanglement with other nonhuman beings. Such practices include food production processes such as farming, gathering of wild plants, hunting, fishing, and animal domestication, as well as religious practices, which all support the survival needs of people. As Donna Haraway has observed, human-animal interconnections are bidirectional, i.e., it is free from centripetal force of anthropocentrism, and it is this that allows both parties to co-habit an active story (2003, p. 20). In line with such thinking, this study has suggested that treating the subject of human-animal interactions by focusing on one species alone or on a single dimension of this relations can hide certain aspects of these encounters, and as a matter of fact, this approach cannot be sufficient in telling the full story of the local representation of the different ways that people interact with animals.

I have shown that *Nyayetahun* is a community of multispecies dwelling. The community is in a constant state of dwelling with multitude of other beings. As villagers go about their everyday lives, they deliberately and unconsciously navigate and negotiate their interactions with a wide range of nonhuman animal beings including birds, snakes, rats, mice, and several species of insects. These encounters take place not only in the homes, but also in the open layout of village environment, and in other spaces such as community health centres where people go to seek healing, in their farm sites, gardens and other locations that they inhabited within the forest. It is a dynamic and immensely complex process, with animals actively participating in different dimensions of the lives and existence of people. The relationships

between villagers and animals (particularly domesticated animals and certain wild animals) are those between subjects with agency, rather than one in which animals are thought of as mere objects living with people.

I have shown that domestication brings people and animals into intimate relations. This interaction with animals alters the material infrastructure of the environment and shapes inter-human relations, and enacts policies that manage their co-existence, and consequently draws people and animals into moral and political relationships. All these ideas open a way of understanding the kinds of social and environmental shifts and moral and political considerations that can emerge when humans and animals dwell within the same spaces.

Going beyond the subject of food and economics, as well as the moral and political relations that I have established, I have also added another layer to these relationships. By showing that animals can mediate and strengthen social bonds among people, and they can also mediate relationships between the mundane and profane world – bridging connections between these two domains. While this further establishes the issue of more-than-human subjectivity which remains prominent in post-humanist thinking of multispecies anthropology (Kirksey and Helmreich, 2010), I want to however reiterate here that the subjective experience of human-animal relations varies across species. Moreover, it is a matter of social context and hierarchy. In a sense, these attributes are exhibited differently by species, and they are displayed by some animals more than others, which suggests an unequal distribution of agency among species.

In sum, this thesis takes forward dwelling as a concept that cuts across different ways of thinking about multispecies interactions, and thus offers a useful means for thinking about human-animal health. Health is the product of a network of material, social, symbolic, and ecological relations between and among human and nonhuman actors (Nading, 2014). The account in this thesis therefore asks us to look at dwelling as a shared practice that connects human, and nonhuman bodies with material objects and the environment, as it is these practices that links their health into entangled relationships. As such, I suggest that public health practitioners should think about dwelling as a pattern that connects human life to other nonhuman life forms, and hence an activity that provides a meaningful site for

knowledge production in understanding and addressing issues of human-animal health and wellbeing. I think that the adoption of dwelling as a useful public health concept could be helpful in informing new public health and even global health policy frameworks and interventions.

Appendices

Appendix 1: Research authorization from Njala University Institutional Review Board



Bibliography

- ABRAHAMIAN, F. M. & GOLDSTEIN, E. J. 2011. Microbiology of animal bite wound infections. *Clinical microbiology reviews*, 24, 231-246.
- ACEMOGLU, D., REED, T. & ROBINSON, J. A. 2014. Chiefs: Economic development and elite control of civil society in Sierra Leone. *Journal of Political Economy*, 122, 319-368.
- ADELMAN, Z. N., MILLER, D. M. & MYLES, K. M. 2013. Bed bugs and infectious disease: a case for the arboviruses. *PLoS pathogens*, 9, e1003462.
- AGAMBEN, G. 1998. *Homo sacer: Sovereign power and bare life*, stanford university Press.
- AHUJA, N. 2011. Abu Zubaydah and the caterpillar. *Social Text*, 29, 127-149.
- ALBRECHT, P. 2015. The chiefs of community policing in rural Sierra Leone. *The Journal of Modern African Studies*, 611-635.
- ALDER, M. & EASTON, G. 2005. Human and veterinary medicine. British Medical Journal Publishing Group.
- ALIE, J. A. D. 1990. *A New History of Sierra Leone*, Macmillan.
- ALTIERI, M. A. & KOOHAFKAN, P. 2008. *Enduring farms: climate change, smallholders and traditional farming communities*, Third World Network (TWN) Penang.
- AMIOT, C. E. & BASTIAN, B. 2017. Solidarity with animals: Assessing a relevant dimension of social identification with animals. *PLoS one*, 12, e0168184.
- ANDERSON, K. 1997. A walk on the wild side: a critical geography of domestication. *Progress in human geography*, 21, 463-485.
- ASDAL, K., DRUGLITRO, T. & HINCHLIFFE, S. 2016. *Humans, animals and biopolitics: The more-than-human condition*, Routledge.
- ATLAS, R. M. & MALOY, S. One health : people, animals, and the environment. 2014a.
- ATLAS, R. M. & MALOY, S. 2014b. *One Health: people, animals, and the environment*, ASM Press.
- AWETO, A. O. 2012. *Shifting cultivation and secondary succession in the tropics*, Cabi.
- BARDOSH, K. 2016. One health. *Science, Politics and Zoonotic Disease in Africa*, Abingdon: Routledge.
- BARRETT, M. A. & BOULEY, T. A. 2015. Need for enhanced environmental representation in the implementation of One Health. *Ecohealth*, 12, 212-219.
- BARRETT, R., KUZAWA, C. W., MCDADE, T. & ARMELAGOS, G. J. 1998. Emerging and re-emerging infectious diseases: the third epidemiologic transition. *Annual review of anthropology*, 27, 247-271.
- BJØRKDAHL, K. & DRUGLITRØ, T. 2016. *Animal housing and human-animal relations: Politics, practices and infrastructures*, Routledge.
- BOKONYI, S. 1974. History of domestic mammals in Central and Eastern Europe.
- BONNER, P. C., SCHMIDT, W.-P., BELMAIN, S. R., OSHIN, B., BAGLOLE, D. & BORCHERT, M. 2007. Poor housing quality increases risk of rodent infestation and Lassa fever in refugee camps of Sierra Leone. *The American journal of tropical medicine and hygiene*, 77, 169-175.
- BONWITT, J., DAWSON, M., KANDEH, M., ANSUMANA, R., SAHR, F., BROWN, H. & KELLY, A. H. 2018. Unintended consequences of the 'bushmeat ban' in West Africa during the 2013–2016 Ebola virus disease epidemic. *Social Science & Medicine*, 200, 166-173.
- BONWITT, J., SÁEZ, A. M., LAMIN, J., ANSUMANA, R., DAWSON, M., BUANIE, J., LAMIN, J., SONDUFU, D., BORCHERT, M. & SAHR, F. 2017a. At home with *Mastomys* and *Rattus*: human-rodent interactions and potential for primary transmission of Lassa virus in domestic spaces. *The American journal of tropical medicine and hygiene*, 96, 935-943.
- BONWITT, J., SÁEZ, A. M., LAMIN, J., ANSUMANA, R., DAWSON, M., BUANIE, J., LAMIN, J., SONDUFU, D., BORCHERT, M. & SAHR, F. 2017b. At home with *Mastomys* and *Rattus*: human-rodent interactions and potential for primary transmission of Lassa virus in domestic spaces. *The American journal of tropical medicine and hygiene*, 96, 935.
- BROOKS, G. E. 2019. *Landlords and strangers: ecology, society, and trade in Western Africa, 1000-1630*, Routledge.

- BROWN, H. & KELLY, A. H. 2014. Material proximities and hotspots: toward an anthropology of viral hemorrhagic fevers. *Medical Anthropology Quarterly*, 28, 280-303.
- BROWN, H., KELLY, A. H., MARÍ SÁEZ, A., FICHET-CALVET, E., ANSUMANA, R., BONWITT, J., MAGASSOUBA, N. F., SAHR, F. & BORCHERT, M. 2015. Extending the “social”: Anthropological contributions to the study of viral haemorrhagic fevers. *PLoS neglected tropical diseases*, 9, e0003651.
- BROWN, H. & MARÍ SÁEZ, A. 2021. Ebola separations: trust, crisis, and ‘social distancing’ in West Africa. *Journal of the Royal Anthropological Institute*, 27, 9-29.
- BROWN, H. & NADING, A. M. 2019. Introduction: human animal health in medical anthropology. *Medical anthropology quarterly*, 33, 5-23.
- BUDIANSKY, S. 1992. *The covenant of the wild: why animals chose domestication: with a new preface*, Yale University Press.
- BURNET, F. M. S. & WHITE, D. O. 1972. *Natural history of infectious disease*, CUP Archive.
- CARSTEN, J. 2013. What kinship does—and how. *HAU: Journal of Ethnographic Theory*, 3, 245-251.
- CASSIDY, R. 2006. I Want to Know about the Dogs. *The Companion Species Manifesto: Dogs, People, and Significant Otherness* by Donna Haraway. *Theory, Culture & Society*, 23, 7-8.
- CASSIDY, R. & MULLIN, M. 2020. *Where the wild things are now: domestication reconsidered*, Routledge.
- CAUTEREN, E. V. 2020. Hunting ideology and ritual treatment of animal remains in hunter-gatherer societies: an enactive anthropological approach. *Journal of Anthropological Research*, 76, 296-325.
- CLARK, N. 2020. Animal interface: the generosity of domestication. *Where the wild things are now*. Routledge.
- CLOKE, P. & JONES, O. 2001. Dwelling, place, and landscape: an orchard in Somerset. *Environment and planning A*, 33, 649-666.
- CLUTTON-BROCK, J. 1999. *A natural history of domesticated mammals*, Cambridge University Press.
- CLUTTON-BROCK, J. 2014. *The walking larder: patterns of domestication, pastoralism, and predation*, Routledge.
- CONTEH, M. 2013. The Institution of Paramount Chieftaincy in Sierra Leone. *An introduction to its history and electoral process*. URL: <https://nec.gov.sl>.
- CORMIER, L. A. 2002. Monkey as food, monkey as child: Guajá symbolic cannibalism. *Cambridge Studies In Biological And Evolutionary Anthropology*, 63-84.
- CROSBY, A. W. 2004. *Ecological imperialism: the biological expansion of Europe, 900-1900*, Cambridge University Press.
- CUNNINGHAM, A. A., SCOONES, I. & WOOD, J. L. 2017. One Health for a changing world: new perspectives from Africa. The Royal Society.
- DASZAK, P., CUNNINGHAM, A. A. & HYATT, A. D. 2000. Emerging infectious diseases of wildlife-- threats to biodiversity and human health. *science*, 287, 443-449.
- DAVEY, V. J. 2007. Questions and Answers on Pandemic Influenza. *AJN The American Journal of Nursing*, 107, 50-56.
- DE CASTRO, E. V. 1998. Cosmological deixis and Amerindian perspectivism. *Journal of the Royal anthropological Institute*, 469-488.
- DELAUNAY, P., BLANC, V., DEL GIUDICE, P., LEVY-BENCHETON, A., CHOSIDOW, O., MARTY, P. & BROUQUI, P. 2011. Bedbugs and infectious diseases. *Clinical Infectious Diseases*, 52, 200-210.
- DEMELLO, M. 2012. *Animals and society: An introduction to human-animal studies*, Columbia University Press.
- DESCOLA, P. 2013. *Beyond nature and culture*, University of Chicago Press.
- DESCOLA, P. & PÁLSSON, G. 1996. *Nature and society: anthropological perspectives*, Taylor & Francis.
- DIONNE, K. Y. 2017. *Doomed interventions: The failure of global responses to AIDS in Africa*, Cambridge University Press.

- DOGGETT, S. L., DWYER, D. E., PEÑAS, P. F. & RUSSELL, R. C. 2012. Bed bugs: clinical relevance and control options. *Clinical Microbiology Reviews*, 25, 164-192.
- DUCOS, P. 1978. "Domestication" Defined and Methodological Approaches to Its Recognition in Faunal Assemblages, Peabody Museum of archaeology and ethnology.
- DZINGIRAI, V., BETT, B., BUKACHI, S., LAWSON, E., MANGWANYA, L., SCOONES, I., WALDMAN, L., WILKINSON, A., LEACH, M. & WINNEBAH, T. 2017. Zoonotic diseases: who gets sick, and why? Explorations from Africa. *Critical Public Health*, 27, 97-110.
- ENGELS, F. 1972. The origin of the family, private property and the state (1884). New York: International.
- FAIRHEAD, J. & LEACH, M. 1996. *Misreading the African landscape: society and ecology in a forest-savanna mosaic*, Cambridge University Press.
- FARMER, P. 2001. *Infections and inequalities*, University of California Press.
- FARMER, P. 2004. *Pathologies of power*, University of California Press.
- FARMER, P. 2015. Who lives and who dies. *London Review of Books*, 37, 17-20.
- FERME, M. C. 2001. *The Underneath of Things: violence, history, and the everyday in Sierra Leone*, Univ of California Press.
- FRAZER, J. G. 1890. *The golden bough: A study in comparative religion, Volume 2*, Macmillan.
- FUENTES, A. 2006. The humanity of animals and the animality of humans: A view from biological anthropology inspired by JM Coetzee's Elizabeth Costello. *American anthropologist*, 108, 124-132.
- FUENTES, A. 2009. Re-situating anthropological approaches to the evolution of human behavior. *Anthropology Today*, 25, 12-17.
- FUENTES, A. 2010. Naturalcultural encounters in Bali: Monkeys, temples, tourists, and ethnoprimateology. *Cultural anthropology*, 25, 600-624.
- FUENTES, A. 2016. The extended evolutionary synthesis, ethnography, and the human niche: Toward an integrated anthropology. *Current Anthropology*, 57, S13-S26.
- FUENTES, A. & GAMERL, S. 2005. Disproportionate participation by age/sex classes in aggressive interactions between long-tailed macaques (*Macaca fascicularis*) and human tourists at Padangtegal monkey forest, Bali, Indonesia. *American Journal of Primatology: Official Journal of the American Society of Primatologists*, 66, 197-204.
- FUENTES, A. & HOCKINGS, K. J. 2010. The ethnoprimateological approach in primatology. Wiley Online Library.
- FYLE, M. C. 2006. *Historical Dictionary of Sierra Leone*, Scarecrow Press.
- GALAZ, V., LEACH, M., SCOONES, I. & STEIN, C. 2015. The political economy of One Health research and policy.
- GERSHON, I. & PORTER, N. 2018. Living with Animals: Bonds across Species.
- GHOLAMI, A. & ALAMDARY, A. 2020. The World Rabies Day 2020: Collaborate and Vaccinate. *Iranian Biomedical Journal*, 24, 264.
- GODDARD, J. & DESHAZO, R. 2009. Bed bugs (*Cimex lectularius*) and clinical consequences of their bites. *Jama*, 301, 1358-1366.
- GOODMAN, A. H. & LEATHERMAN, T. L. 2010. *Building a new biocultural synthesis: political-economic perspectives on human biology*, University of Michigan Press.
- GREEN, E. C. 1999. *Indigenous theories of contagious disease*, Rowman Altamira.
- GRIFFITHS, D. & PROZESKY, M. L. 2010. The politics of dwelling: Being white/being South African. *Africa Today*, 56, 22-41.
- HARAWAY, D. J. 1997. Feminism and technoscience. *New York: Routledge*, 39, 3.
- HARAWAY, D. J. 2003. *The companion species manifesto: Dogs, people, and significant otherness*, Prickly Paradigm Press Chicago.
- HARAWAY, D. J. 2008. *When species meet*, U of Minnesota Press.
- HARAWAY, D. J. 2013. *When species meet*, U of Minnesota Press.
- HEIDEGGER, M. 1971. Building dwelling thinking. *Poetry, language, thought*, 154.

- HEIDEGGER, M. 2006. Building dwelling thinking. *Spaces of visual culture*. London, Routledge, 66-76.
- HEWLETT, B. S. & AMOLA, R. P. 2003. Cultural contexts of Ebola in northern Uganda. *Emerging infectious diseases*, 9, 1242.
- HINCHLIFFE, S. 2017. More than one world, more than one health: Re-configuring inter-species health. *Global health and geographical imaginaries*. Routledge.
- HUGHES, J. & MACDONALD, D. W. 2013. A review of the interactions between free-roaming domestic dogs and wildlife. *Biological Conservation*, 157, 341-351.
- HURN, S. 2012. Humans and other animals: cross-cultural perspectives on human-animal interactions. (*No Title*).
- INGOLD, T. 1986. Hunting, sacrifice and the domestication of animals. *The appropriation of nature: essays on human ecology and social relations*, 243-77.
- INGOLD, T. 1993. The temporality of the landscape. *World archaeology*, 25, 152-174.
- INGOLD, T. 2000. *The perception of the environment: essays on livelihood, dwelling and skill*, Psychology Press.
- INGOLD, T. 2005. Epilogue: Towards a politics of dwelling. *Conservation and Society*, 501-508.
- INGOLD, T. 2011. Being Alive: Essays on movement, knowledge and description. *London and New York: Routledge*.
- INGOLD, T. 2013. Anthropology Beyond Humanity. *Suomen Antropologi: Journal of the Finnish Anthropological Society*, 38.
- INGOLD, T. & PALSSON, G. 2013. *Biosocial becomings: integrating social and biological anthropology*, Cambridge University Press.
- JACKSON, P. 2007. Reshuffling an old deck of cards? The politics of local government reform in Sierra Leone. *African Affairs*, 106, 95-111.
- JENSEN, P. 2002. Behaviour of pigs. *The Ethology of Domestic Animals*. CABI Publishing, Wallingford, UK, 159-172.
- KAHN, R., CLOUSER, D. & RICHT, J. 2009. Emerging infections: a tribute to the one medicine, one health concept. *Zoonoses and Public Health*, 56, 407-428.
- KARESH, W. B. & COOK, R. A. 2005. The human-animal link. *Foreign Aff.*, 84, 38.
- KEEN, D. 2005. *Conflict and collusion in Sierra Leone*, James Currey (imprint of Boydell & Brewer Ltd.).
- KELLY, A. H. 2012. The experimental hut: hosting vectors. *Journal of the Royal Anthropological Institute*, 18, S145-S160.
- KINGDON, J. 2020. *The Kingdon pocket guide to African mammals*, Bloomsbury Publishing.
- KIOKO, J., KIRINGE, J. & OMONDI, P. 2006. Human-elephant conflict outlook in the Tsavo-Amboseli ecosystem, Kenya. *Pachyderm*, 41, 53-61.
- KIRKSEY, S. E. & HELMREICH, S. 2010. The emergence of multispecies ethnography. *Cultural anthropology*, 25, 545-576.
- KOHN, E. 2007. How dogs dream: Amazonian natures and the politics of transspecies engagement. *American ethnologist*, 34, 3-24.
- KOHN, E. 2013. *How Forests Think: Toward an Anthropology Beyond the Human* Berkeley, University of California Press.
- KOROMA, J. M., WANG, Y., GUO, X., ZHANG, X., NGOBEH, J. J. K., GABIR, A. M. E. A., LI, Z., LI, L., WU, R. & ZHOU, X. 2022. A cross-sectional survey on the malaria control and prevention knowledge, attitudes, and practices of caregivers of children under-5 in the western area of Sierra Leone. *Tropical Medicine and Infectious Disease*, 7, 120.
- KRELL, A. 2006. Barbed Wire: An Ecology of Modernity. *Great Plains Quarterly*, 26, 210.
- LADAN, S. I. Examining human wild life conflict in Africa. International conference on biological, civil and environmental engineering, 2014. 102-5.
- LATOURETTE, B. 2005. *Reassembling the social: An introduction to actor-network-theory*, Oxford university press.

- LAW, J. 2006. Disaster in agriculture: or foot and mouth mobilities. *Environment and planning A*, 38, 227-239.
- LEACH, E. 1964. Anthropological Aspects of Language, Animal Categories and Verbal Abuse'in New Directions in the Study of Language (ed.) EH Lenneberg. MIT Press.
- LEACH, M. 1992. Women's crops in women's spaces. *Bush base: Forest farm, culture, environment and development*, 76-95.
- LEACH, M. 1994. Rainforest relations. *Rainforest Relations*. Edinburgh University Press.
- LEACH, M. 2000. New shapes to shift: War, parks and the hunting person in modern West Africa. *Journal of the Royal Anthropological Institute*, 6, 577-595.
- LENGELER, C. 2004. Insecticide-treated bed nets and curtains for preventing malaria. *Cochrane database of systematic reviews*.
- LEONE, S. S. 2014. Malaria Indicator Survey 2013 Final Report. *Freetown: SSL and ICF International*.
- LEONE, S. S. 2015. Population and Housing Census Summary of Final Results Planning A Better Future. *Statistics*.
- LING, J., PERSSON VINNERSTEN, T., HESSON, J. C., BOHLIN, J., ROLIGHETEN, E., HOLMES, E. C. & PETERSSON, J. H. 2020. Identification of hepatitis C virus in the common bed bug - a potential, but uncommon route for HCV infection? *Emerg Microbes Infect*, 9, 1429-1431.
- LITTLE, K. 2013. *Mende Of Sierra Leone IIs 65*, Routledge.
- LOWE, C. 2010. Viral clouds: becoming H5N1 in Indonesia. *Cultural Anthropology*, 25, 625-649.
- LOWE, C. F. & ROMNEY, M. G. 2011. Bedbugs as vectors for drug-resistant bacteria. *Emerging infectious diseases*, 17, 1132.
- LYONS, M. 2002. *The colonial disease: a social history of sleeping sickness in northern Zaire, 1900-1940*, Cambridge University Press.
- MACKENZIE, J. S., JEGGO, M., DASZAK, P. & RICHT, J. A. 2013. *One Health: the human-animal-environment interfaces in emerging infectious diseases*, Springer.
- MACNAGHTEN, P. & URRY, J. 1998. *Contested natures* Sage. London.
- MAGOURAS, I., BROOKES, V. J., JORI, F., MARTIN, A., PFEIFFER, D. U. & DÜRR, S. 2020. Emerging zoonotic diseases: Should we rethink the animal-human interface? *Frontiers in veterinary science*, 7, 582743.
- MARÍ SAÉZ, A., WEISS, S., NOWAK, K., LAPEYRE, V., ZIMMERMANN, F., DÜX, A., KÜHL, H. S., KABA, M., REGNAUT, S. & MERKEL, K. 2015. Investigating the zoonotic origin of the West African Ebola epidemic. *EMBO molecular medicine*, 7, 17-23.
- MARTIN, B. & MOHANTY, C. T. 1986. Feminist politics: What's home got to do with it? *Feminist studies/critical studies*, 191-212.
- MCNEILL, J. R. 2001. *Something new under the sun: An environmental history of the twentieth-century world (the global century series)*, WW Norton & Company.
- MEIJBOOM, F. L. & STASSEN, E. N. 2016. *The end of animal life: a start for ethical debate: Ethical and societal considerations on killing animals*, Wageningen Academic Publishers.
- MOREY, D. F. 1994. The early evolution of the domestic dog. *American Scientist*, 82, 336-347.
- MORGAN, L. H. 1877. *Ancient Society, or. Researches in the lines of Human Progress*.
- MORRIS, B. 2000. *Animals and ancestors: an ethnography*, Routledge.
- MORRIS, B. 2020. *The power of animals: an ethnography*, Routledge.
- MULUNGU, L. S. 2017. *Control of rodent pests in maize cultivation: the case of Africa*. Burleigh Dodds Science Publishing Limited.
- MULUNGU, L. S., MAKUNDI, R. H., LEIRS, H., MASSAWE, A. W., VIBE-PETERSEN, S. & STENSETH, N. C. 2003. The rodent density-damage function in maize fields at an early growth stage. *ACIAR Monograph Series*, 96, 301-303.
- MUNDKUR, B. 2016. 11 Human animality, the mental imagery of fear, and religiosity. *What is an Animal?*, 141.
- NADAL, D. 2020. *Rabies in the Streets: Interspecies Camaraderie in Urban India*, Penn State Press.

- NADING, A. M. 2013. Humans, animals, and health: from ecology to entanglement. *Environment and Society*, 4, 60-78.
- NADING, A. M. 2014. *Mosquito trails: Ecology, health, and the politics of entanglement*, Univ of California Press.
- NETZ, R. 2004. *Barbed wire: An ecology of modernity*, Wesleyan University Press.
- NJIE, M., DILGER, E., LINDSAY, S. W. & KIRBY, M. J. 2014. Importance of eaves to house entry by anopheline, but not culicine, mosquitoes. *Journal of medical entomology*, 46, 505-510.
- O'CONNOR, T. P. 1997. Working at relationships: another look at animal domestication. *Antiquity*, 71, 149.
- ODLING-SMEE, F. J., LALAND, K. N. & FELDMAN, M. W. 2013. *Niche construction: the neglected process in evolution (MPB-37)*, Princeton university press.
- OGDEN, L. A., HALL, B. & TANITA, K. 2013. Animals, plants, people, and things: A review of multispecies ethnography. *Environment and society*, 4, 5-24.
- PANDIAN, A. 2008. Pastoral power in the postcolony: On the biopolitics of the criminal animal in South India. *Cultural Anthropology*, 23, 85-117.
- PARATHIAN, H. E., MCLENNAN, M. R., HILL, C. M., FRAZÃO-MOREIRA, A. & HOCKINGS, K. J. 2018. Breaking through disciplinary barriers: human-wildlife interactions and multispecies ethnography. *International Journal of Primatology*, 39, 749-775.
- PARKER, M., HANSON, T. M., VANDI, A., BABAWO, L. S. & ALLEN, T. 2019. Ebola and public authority: saving loved ones in Sierra Leone. *Medical anthropology*, 38, 440-454.
- PAXSON, H. 2008. Post-pasteurian cultures: The microbiopolitics of raw-milk cheese in the United States. *Cultural anthropology*, 23, 15-47.
- PEDERSEN, M. A. 2014. The fetish of connectivity. *Objects and Materials*. Routledge.
- PHILO, C. & WILBERT, C. 2000. *Animal spaces, beastly places: New geographies of human-animal relations*, Psychology Press.
- PORTER, N. 2013. Bird flu biopower: strategies for multispecies coexistence in Việt Nam. *American Ethnologist*, 40, 132-148.
- PORTER, N. 2019. *Viral economies: bird flu experiments in Vietnam*, University of Chicago Press.
- PRINCE, R. J. & MARSLAND, R. 2013. *Making and Unmaking Public Health in Africa: ethnographic and historical perspectives*, Ohio University Press.
- RICHARDS, A. I. 1939. *Land, labour and diet: an economic study of the Bemba tribe*. London: Oxford University Press.
- RICHARDS, P. 1985. *Indigenous agricultural revolution: ecology and food production in West Africa*.
- RICHARDS, P. 2016. *Ebola: how a people's science helped end an epidemic*, Bloomsbury Publishing.
- RICHARDS, P., ABC-CLIO, L., HEINEMANN, EDUCATION, P., VARIOUS & INSTITUTE, I. A. 1996. *Fighting for the Rain Forest: War, Youth & Resources in Sierra Leone*, International African Institute.
- ROBBEN, A. C. & SLUKA, J. A. 2012. *Ethnographic fieldwork: An anthropological reader*, John Wiley & Sons.
- ROSE, M. 2012. Dwelling as marking and claiming. *Environment and Planning D: Society and Space*, 30, 757-771.
- ROSENGREN, D. 2006. Transdimensional relations: on human-spirit interaction in the Amazon. *Journal of the Royal Anthropological Institute*, 12, 803-816.
- RUSSELL, N. 2007. The domestication of anthropology. *R. Cassidy and M. Mullin (eds.)*, 27-48.
- RUSSELL, N. 2020. *The domestication of anthropology. Where the wild things are now*. Routledge.
- SAÉZ, A. M., WEISS, S., NOWAK, K., LAPEYRE, V., ZIMMERMANN, F., DÜX, A., KÜHL, H. S., KABA, M., REGNAUT, S. & MERKEL, K. 2015. Investigating the zoonotic origin of the West African Ebola epidemic. *EMBO molecular medicine*, 7, 17-23.
- SAHLINS, M. 2013. *What kinship is-and is not*, University of Chicago Press.
- SCOTT-PHILLIPS, T. C., LALAND, K. N., SHUKER, D. M., DICKINS, T. E. & WEST, S. A. 2014. The niche construction perspective: a critical appraisal. *Evolution*, 68, 1231-1243.

- SEAMON, D. & MUGERAUER, R. 1985. Dwelling, place and environment: An introduction. *Dwelling, Place and Environment*. Springer.
- SEAMON, D. & MUGERAUER, R. 2012. *Dwelling, place and environment: Towards a phenomenology of person and world*, Springer Science & Business Media.
- SERPELL, J. 1999. Guest editor's introduction: Animals in children's lives. *Society & Animals*, 7, 87-94.
- SERPELL, J. & PAUL, E. 2002. Pets and the development of positive attitudes to animals. *Animals and human society*. Routledge.
- SEYTRE, B. 2016. The wanderings of the communication on the Ebola virus disease. *Bulletin de la Societe de Pathologie Exotique (1990)*, 109, 314-323.
- SHAFFER, J. G., SCHIEFFELIN, J. S., GBAKIE, M., ALHASAN, F., ROBERTS, N. B., GOBA, A., RANDAZZO, J., MOMOH, M., MOON, T. D. & KANNEH, L. 2019. A medical records and data capture and management system for Lassa fever in Sierra Leone: Approach, implementation, and challenges. *PLoS one*, 14, e0214284.
- SHERIFF, A. I. & MASSAQUOI, B. A. 2012. The Food Security Situation in Sierra Leone: Policies, Strategies, Achievements and Challenges. *Economic Challenges and Policy Issues in Early Twenty-first-century Sierra Leone*.
- SPONSEL, L. E., RUTTANADAKUL, N. & NATADECHA-SPONSEL, P. 2002. Monkey business? The conservation implications of macaque ethnoprimateology in southern Thailand. *Cambridge Studies in Biological and Evolutionary Anthropology*, 288-309.
- SPRADLEY, J. P. 2016. *Participant observation*, Waveland Press.
- STENSETH, N. C., LEIRS, H., SKONHOFT, A., DAVIS, S. A., PECH, R. P., ANDREASSEN, H. P., SINGLETON, G. R., LIMA, M., MACHANG'U, R. S. & MAKUNDI, R. H. 2003. Mice, rats, and people: the bio-economics of agricultural rodent pests. *Frontiers in Ecology and the Environment*, 1, 367-375.
- STRATHERN, M. 1992. *Reproducing the future: essays on anthropology, kinship and the new reproductive technologies*, Manchester University Press.
- SUBRAMANIAN, M. 2012. Zoonotic disease risk and the bushmeat trade: assessing awareness among hunters and traders in Sierra Leone. *EcoHealth*, 9, 471-482.
- SWANEPOEL, L. H., SWANEPOEL, C. M., BROWN, P. R., EISEB, S. J., GOODMAN, S. M., KEITH, M., KIRSTEN, F., LEIRS, H., THEMBA'ALILAHWA, A. & MAKUNDI, R. H. 2017. A systematic review of rodent pest research in Afro-Malagasy small-holder farming systems: Are we asking the right questions? *PLoS One*, 12, e0174554.
- TAYLOR, B. K. 2014. *Sierra Leone: The land, its people and history*, New Africa Pres.
- THOMAS, L. F., DE GLANVILLE, W. A., COOK, E. A. & FÈVRE, E. M. 2013. The spatial ecology of free-ranging domestic pigs (*Sus scrofa*) in western Kenya. *BMC veterinary research*, 9, 1-12.
- TILLEY, H. 2011. *Africa as a living laboratory*, University of Chicago Press.
- TSING, A. 2013. More-than-human sociality: a call for critical description. *Anthropology and nature*. Routledge.
- TUSTING, L. S., BOTTOMLEY, C., GIBSON, H., KLEINSCHMIDT, I., TATEM, A. J., LINDSAY, S. W. & GETHING, P. W. 2017. Housing improvements and malaria risk in sub-Saharan Africa: a multi-country analysis of survey data. *PLoS medicine*, 14, e1002234.
- TUSTING, L. S., WILLEY, B. & LINES, J. 2016. Building malaria out: improving health in the home. *Malaria journal*, 15, 1-3.
- VAN DOOREN, T. & ROSE, D. 2011. Introduction. Unloved Others: Death of the Disregarded in the Time of Extinctions Special Issue. *Australian Humanities Review*, 50, 1-4.
- VARELA, S. H. 2015. Origins of Misfortune: Sympathetic Magic and the Transference of Animality in Thüring von Ringoltingen's Melusine (1456). *Neophilologus*, 99, 271-285.
- VON SEIDLEIN, L., WOOD, H., BRITAIN, O. S., TUSTING, L., BEDNARZ, A., MSHAMU, S., KAHABUKA, C., DEEN, J., BELL, D. & LINDSAY, S. W. 2019. Knowledge gaps in the construction of rural healthy homes: A research agenda for improved low-cost housing in hot-humid Africa. *PLoS medicine*, 16, e1002909.

- W.H.O 2022. *World malaria report 2022*, World Health Organization.
- WAHA, K., MÜLLER, C., BONDEAU, A., DIETRICH, J. P., KURUKULASURIYA, P., HEINKE, J. & LOTZE-CAMPEN, H. 2013. Adaptation to climate change through the choice of cropping system and sowing date in sub-Saharan Africa. *Global Environmental Change*, 23, 130-143.
- WANG, L. & CRAMERI, G. 2014. Emerging zoonotic viral diseases. *Rev Sci Tech*, 33, 569-81.
- WHEATLEY, B. P. 1999. The sacred monkeys of Bali. (*No Title*).
- WHO 2018. *WHO expert consultation on rabies: third report*, World Health Organization.
- WHO 2022. *World malaria report 2022*, World Health Organization.
- WILKINSON, A. & LEACH, M. 2014. Briefing: Ebola—myths, realities, and structural violence. *African Affairs*, 114, 136-148.
- WILLERSLEV, R. 2007. *Soul hunters*, University of California Press.
- WILSON, P. J. 1991. *The domestication of the human species*, Yale University Press.
- WOLFE, N. D., DASZAK, P., KILPATRICK, A. M. & BURKE, D. S. 2005. Bushmeat hunting, deforestation, and prediction of zoonotic disease. *Emerging infectious diseases*, 11, 1822.
- WORBOYS, M. 1994. The comparative history of sleeping sickness in east and central Africa, 1900–1914. *History of Science*, 32, 89-102.
- YOUNG, J. 2002. *Heidegger's later philosophy*, Cambridge University Press.
- ZEUNER, F. E. 1963. A history of domesticated animals. *A history of domesticated animals*.
- ZINSSTAG, J., SCHELLING, E., CRUMP, L., WHITTAKER, M., TANNER, M. & STEPHEN, C. 2020. *One Health: the theory and practice of integrated health approaches*, CABI.
- ZINSSTAG, J., SCHELLING, E., WALTNER-TOEWS, D. & TANNER, M. 2011. From “one medicine” to “one health” and systemic approaches to health and well-being. *Preventive veterinary medicine*, 101, 148-156.