Governance, Use, and Interdependencies of Pastoral Resources in Tajikistan's Rasht Valley

By

Kramer Y. Gillin

A dissertation submitted in partial fulfillment of

the requirements for the degree of

Doctor of Philosophy

(Geography)

at the

UNIVERSITY OF WISCONSIN-MADISON

2024

Date of final oral examination: 5/31/2024

The dissertation is approved by the following members of the Final Oral Committee:

Matthew D. Turner, Professor, Geography (Committee Chair)
Ian Baird, Professor, Geography
Morgan Robertson, Professor, Geography
Sarah Robinson, Research Associate, Department of Agricultural Policy and Market Research, University of Giessen

Table of Contents

Acknowledgements

A long chain of events and many people helped me to pursue, carry out, and finish the research, fieldwork, and writing of this dissertation.

Thank you to my undergraduate professors, especially: Bill Moseley for providing me with a strong passion and foundation for people-environment geography. William C. Rowe for introducing me to Tajikistan and creating enough interest in Central Asia for me to move there.

Thank you to my friends, colleagues, and *ghayri-khuni* family with me from the beginning in Tajikistan, especially: Tahmina, Olim, Dilnoza, Parvina, and Zamira in Dushanbe for providing the closest thing to a home-away-from-home. To Zarrina, Saltanat, and Faridun for bestowing the Tajik language. To Ibrohim for his agricultural knowledge and generous assistance. And to all of you for your friendship.

Thank you to my graduate-school-era professors/mentors, especially: Ian Baird and Morgan Robertson for serving on my M.S. and PhD committees and setting me up with strong intellectual foundations well-crafted qualifying exam reading lists and questions. To Heinz Klug for individualized instruction on property theory, contributing significantly to the thinking that underpins Chapter 4. To Kris Olds, Lisa Naughton, and Keith Woodward for mentorship and friendship. Huge thank you to Sarah Robinson, for your patience and being my only guide for specifically understanding Central Asian pastoralism.

Thank you to all my graduate school peers and department-mates, especially: Erin Kitchell, Rachel Boothby-Hentschel, Garrett Nelson, Leif Brottem, Will Shattuck, and Michael Eggen, for commiseration and, I assume, lifelong friendship.

Thank you to my fieldwork friends in Tajikistan, especially: Corrie Hannah, Aeron O'Connor, Sohrob Aslamy, Katie MacDonald, and Patryk Reid. Enormous thank you to Jace Livingston for so many things, including a reliable room and camaraderie in Dushanbe.

Thank you to those who directly helped with my fieldwork: Amrullo, Handullo, Ne'mat, Subhon, Gulsara, and Asliddin. Special thank you to Firuz Jalolov, a dear friend, expert research-mate, and keen thought-partner to help make sense of all that we learned. Thank you to Marat and Zamira for a home in Gharm (my second-home, of three, in Tajikistan).

Thank you, of course, to my family. To my parents and Calder for unflinching moral support, no matter the stage of my dissertation. To Dean for being refreshingly unaware that any of this was happening and providing seemingly limitless non-negotiable diversion. Most of all to Becca, for all manner of support—moral and practical—without which this wouldn't have happened (and also thanks for being okay with my leaving for Tajikistan for 16 months).

My advisor, Matt Turner, was officially recognized by the AAG as an "extraordinarily generous mentor to students," and that doesn't even approach doing him justice. He has supported me in uncountable ways with humility, respect, generosity, and compassion. This is in addition to his immeasurable impact on me as a scholar and, more generally, thinker and professional, through

his knowledge, thoughtfulness, analytical approach, demeanor, and integrity. I do not know how I will ever thank him enough.

Research and writing were supported by the: Fulbright US Student Research Grant (US Department of State), Title VII Advanced Research Fellowship (US Department of State), Whitbeck Dissertation Writing Fellowship (UW-Madison Geography Department), Mellon-Wisconsin Fellowship (UW-Madison Graduate School), and COVID-19 Dissertation Completion Funding (UW-Madison Graduate School).

A version of the second chapter was previously published as:
Gillin, K. 2021. Variability is not uncertainty; mobility is not flexibility: Clarifying concepts in pastoralism studies with evidence from Tajikistan. *Pastoralism, 11*(13).

Chapter 1
Introduction: Structure, Study Area, Methods, and Challenges

1. Introduction

In June 2016, I was in the Rasht Valley of Central Tajikistan, beginning to interview herders who had just arrived at their summer pastures. I visited a professional herder, who had recently acquired about 500 hectares of grazing land up in the mountains, in a summer pasture known locally as Safedkhok, a name that doesn't appear on any maps. As we walked through his camp, I asked him if anyone from the government routinely made the trip up to help monitor or enforce the boundaries between different pastures. He started laughing and asked rhetorically, "The government? Where is it? They don't do *anything*. Okay, there are security forces watching us and tax collectors taxing us. Aside from that, where *is* the state? What state?" In fact, he had obtained this land through working with the State Land Committee, and his legal documents were crucial in communicating the legitimacy of his claims to that land, especially to the non-local herders who spend the summer on the land that abuts his, grazing the livestock of a giant agricultural enterprise owned by one of the country's most powerful men.

But the role of the state in pastoral land governance is indeed murky and has changed dramatically over the more than 30 years since Tajikistan has gained independence with the fall of the Soviet Union. Communities have gone from being part of one of the world's two superpowers to citizens of one of the poorest countries in the world.[1] With its post-socialist transition, Tajikistan has adopted new legal and economic frameworks, including massive

[1] Based on GNI per capita using the Atlas method, Tajikistan is the 28th poorest country in the world and the 4th poorest non-African country (World Bank, 2022).

decollectivization and a reorganization of how livestock, labor, and land are owned, managed, and governed. Reforms have been passed alongside unimaginable cuts of government support and capacity, resulting in uneven or absent implementation of laws. The post-independence transition was complicated by a civil war that began soon after independence, with opposing sides largely defined by regional identities roughly corresponding to mountain regions in central and eastern Tajikistan versus the lowlands of southwestern Tajikistan. The war is generally understood as lasting from 1992-1997, but political violence along the same socio-political fault lines erupts to this day. Due to a combination of i) the opportunity to bring Western influence to a post-Soviet state, ii) the clear needs of an impoverished nation, iii) the humanitarian crisis created by Tajikistan's civil war, and iv) an exaggerated post-9/11 fear that Tajikistan (which has a long southern border with Afghanistan) was at risk of becoming a hotbed for global terrorism, foreign aid and international development organizations flocked to Tajikistan with their own agendas and global 'best practices' for economic and agricultural development, often filling a vacuum left by the government.

FIGURE 1.1: Summer camp for non-local herders. (Author)

This dissertation examines the governance of pastoral resources in the context of these changes, focusing on land resources (for grazing and collecting cut fodder[2]) but also considering the relationship of this governance with the management of livestock and labor. It seeks to address three main gaps in the literature. First, this fills a gap in the research on the effects of post-Soviet land reform in Tajikistan, which has tended to focus on lowland cultivated agriculture, especially on cotton-growing land and water resources. There has been very little research on the effects of land reform on pastoralism, and researchers focusing on land tenure and cultivated agriculture in Tajikistan have recognized the need for scholarly research on the governance of pastures, which compose 80% of the country's agricultural land (Hofman and Visser, 2021).

Second, my research on central Tajikistan fills a geographical gap in research on pastoralism—or agrarian life in general—in the country. Research on post-Soviet pastoralism in Tajikistan has focused almost exclusively on the Gorno-Badakhshon province (e.g. Kreutzmann, 2009 and 2011; Robinson and Whitton, 2010; Vanselow, 2011; Kraudzun, 2012; Vanselow et al., 2012; Watanabe and Shirasaka, 2018), with the notable exceptions of Robinson and Guenther (2007) and Robinson, et al. (2008), which examined the present study area—the Rasht Valley—alongside other regions. Research on Gorno-Badakhshon cannot be easily extrapolated to the rest of the country because of the sparsely populated province's exclusion from interregional transhumance systems, its high desert climate, and its culturally distinct Pamiri and Kyrgyz populations. A 2011 review of research on pastoralism and farming in the mountains of Central Asia noted, in bolded text, the dearth of research in this part of Tajikistan, specifically directing

[2] In this dissertation, I use "fodder" solely to refer to plants cut by people and fed to animals in contrast to "forage," which animals independently eat directly from the ground. This is a common distinction, but it is not universal.

future researchers to study the Surkhob River[3] valley (Kerven *et al*., 2011: 40); following this call, I conducted research in this valley. Aside from the two Robinson articles mentioned above, the only other academic research in the last twenty years on this part of Tajikistan has focused on political violence, Islamism, or public health.

Third, this dissertation fills gaps in pastoralism studies by putting mountain pastoralism in direct conversation with global discourses and paradigms that were developed in dryland contexts but have been increasingly expanded into global narratives about pastoralism. The rigor of pastoralism research has suffered from research on mountain pastoralism being conducted in parallel to these more dominant streams of pastoralism scholarship, rather than trying to contribute to and advance it. The general structure of the pastoral system described in this dissertation is not exceptional, but rather a common type within the realm of global pastoralism, and the insights gleaned from analyzing it alongside mainstream pastoralism literature should influence the latter.

2. Structure of dissertation

This dissertation addresses these gaps in three substantive chapters. CHAPTER 2 focuses on patterns of livestock mobility and the governance of pastures for grazing, considering both local herders and non-local herders who travel to the region for summer grazing. This empirical material from the Rasht Valley is presented alongside a critical review of key concepts used in scholarly and practitioner-oriented discourse on pastoralism. Much of that discourse is rooted in

[3] The general region where the study area is located is known as the Rasht Valley. I use this term because it is the most common, though it does not correspond to a specific river: there is no "Rasht River". There are many different rivers in the "Rasht Valley", the largest being the Surkhob River. The study area is part of this specific valley.

the “new rangeland paradigm,” which took shape in the 1990s and has often considered climatic variability in pastoral ecosystems to be “uncertainty” and argued that the essential mobility of pastoral systems is possible only with flexible land access rights. These context-specific principles have increasingly been globalized in analyses of diverse pastoral systems. While new understandings of the role of uncertainty and flexibility in pastoral systems have been unquestionably beneficial for some contexts, uncertainty has been problematically embraced as intrinsically central to all pastoral systems.

The dynamics of the pastoral system in the Rasht Valley are used to critique these characterizations and clearly illustrate the differences between variability and uncertainty, on the one hand, and mobility and flexibility, on the other. This allows us to see that livestock mobility is a strategy to cope with environmental variability in all pastoral contexts. Flexibility, however, is a strategy to cope with environmental uncertainty that is only present in a subset of pastoral contexts. Importantly, flexibility is not a required precondition for mobility. These realizations carry important implications for governance in pastoral settings. Due to the many challenges of building flexibility into property systems, pastoral land governance should be developed by looking for predictability, and efforts to maintain flexibility should be judicious and empirically well-justified.

CHAPTER 3 focuses on cut fodder and the governance of the land that it grows on and begins by explaining how cut fodder has often been mischaracterized and insufficiently examined in pastoralism literature. Using a mix of historical documents and novel data, the chapter explains the history of the role of fodder from the Soviet era to the present and shows how access to fodder land is highly determinant of household livestock holdings. The chapter then turns to determinants of fodder land access by explaining post-independence land reforms,

how they have unfolded in practice in the study area, and what extra-legal dynamics—many specific to fodder land in contrast to both pasture and cultivated land—augment and mediate the governmental reforms. Thus, de jure and de facto dimensions of the fodder land tenure regime generate livestock ownership patterns, which, in turn, have implications for how livestock mobility is managed.

Building on the earlier discussions of use and governance of both pasture and fodder resources, CHAPTER 4 explores the relationship between them by focusing on two intersections. First, patterns of fodder land access (CHAPTER 3) have resulted in many households with small numbers of livestock, which has led households to share herding labor by combining their individually owned animals into collective herds, a practice that leads to common access to village pastures. Second, most fodder harvested from areas that also serve as pastures for part of the spring and summer, so the distinction between "fodder land" and "pasture"—though it has significant governance implications—is often temporal rather than spatial. This second interdependency is used to illustrate how these lands could be understood either as a single resource that oscillates over time between two purpose-dependent governance regimes or as oscillating between two different resources that are each governed with stable rules. These two potential framings are explored by bringing two distinct but complementary literatures—legal theory on property and critical resource studies—in conversation, with the conclusion that both framings are applicable and accurate to capture the divergent views of the state and the communities of resource users.

3. Site selection and study area

This dissertation focuses on Rasht district in central Tajikistan, the most populous of the five districts that make up the Rasht Valley. This study area was selected primarily because of its

position in the country's pastoral sector. As rugged and high-altitude mountain region, the Rasht Valley is especially dependent on livestock. The Gorno-Badakhshan province (GBAO[4]) in the far east of Tajikistan is also extremely mountainous and livestock-dependent, but because of its remoteness from the western lowlands, it is not part of Tajikistan's interregional transhumance system. In contrast, the Rasht Valley receives hundreds of large sheep and goat herds every summer that spend the rest of the year in low-altitude areas in the country's southwestern Khatlon province (see FIGURE 1.2). The dynamics of pastoral land access and use in Rasht Valley involve coordination between local and non-local herds as well as national-scale governance that facilitates long-distance livestock migrations, allowing for examination of cross-regional and multi-scalar property relations that are less salient in GBAO. Moreover, as mentioned above, the current academic research on livestock mobility and pasture management in Tajikistan has focused disproportionately on GBAO. Since part of the value of this dissertation is its geographic focus on an under-researched part of the country—prominent in the country's pastoral system but distinct from some other areas that have received more scholarly attention—readers should not try to extrapolate the dynamics described in this research to the rest of Tajikistan.

A secondary consideration in choosing the study area was the position of the Rasht Valley—and especially Rasht District—"at the periphery of Tajik politics" since Tajikistan first came into existence as a coherent political entity in the 1920s, initially as a Soviet Socialist Republic within the USSR (Lemon, 2014: 252). The political disenfranchisement has been companied by characterizations of the Rasht Valley as "embod[ying] danger, backwardness, and extremism" (Roche, 2019: 205). The region served as home base for the opposition during both the

[4] Commonly known as GBAO for Gorno-Badakhshon Autonomous *Oblast* [province]

1920s and the Tajik Civil War (1992-1997) and to this day maintains a distinct identity as especially religious and more likely to oppose the current leadership. Fatal political violence between the government and opposition groups from the region continues to flare up periodically. For these reasons, I believed this region would hold more diverse systems of rules and norms and be more fruitful for an examination of the interplay of state and non-state institutions.

This mountainous district is bisected by the Surkhob River. Fieldwork was conducted primarily in Askalon and Hijborak sub-districts (*jamoat*), bounded in the north by the Surkhob River and in the south by the ridges of the Peter the First (*Pyotri Yak)* mountain range to cover a total of around 340 square km (FIGURE 1.3). Among the twelve sub-districts of Rasht district, these two were selected for reasons that relate to their topography. The slopes on the southern side of the Surkhob River are less steep, resulting in larger expanses before the land becomes rocky and sparsely vegetated. Since the slopes in these sub-districts are north-facing, they have shorter growing seasons than the rest of the district, and more of the vegetated land is covered in naturally occurring plants rather than being cultivated. Consequently, even within this largely livestock-dependent district these sub-districts stand out for having larger pastures and fodder-growing areas.[5] This also means that they have large areas that are used as summer pastures by non-local herders coming from Khatlon province in the southwest of the country, while many other sub-districts host no such herders. Though the sub-districts are not far from Gharm, the administrative center of Rasht district, they are effectively quite remote, as the main road is on the north side of the river, there are no paved roads on the south side, and there are only two bridges that cross the river. For example, though Zuhibed village is only 7.5 km from Gharm as

[5] For others interested in researching similar topics in Rasht District, Rahimzoda, Qal'ai Surkh, Yasman, and Hoit may also be promising sub-districts to consider.

the crow flies, it takes an hour of tedious driving on rough, serpentine tracks to get there, usually after several hours of waiting in Gharm to find a car headed in that direction.

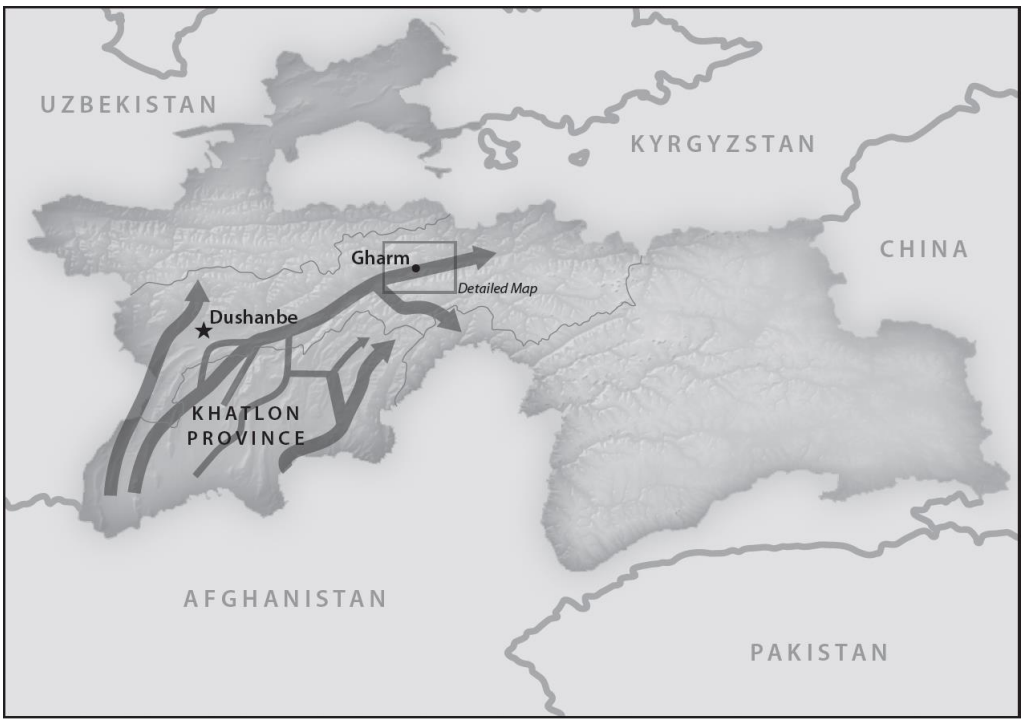

FIGURE 1.2: Map of Tajikistan with migration routes of non-local herders. Extent of FIGURE 1.3 shown in rectangle. (UW-Madison Cartography Lab)

The sub-districts' elevation ranges from 1340 meters above sea level (masl) on the banks of the river up to 3900 masl at the highest peaks that define its southern border. Climate data is only available for the lower elevations in this area, where temperatures average -3.5°C in January, the coldest month, and 24°C in July and August, the warmest months (all climate values calculated by author from monthly data in Williams and Konovalov, 2008). An average of 743mm of precipitation falls a year, with a coefficient of interannual variation of 0.23. Half of the year's rain falls from March through May, and the seasonality index for precipitation (after Walsh and Lawler, 1981) is 0.55.[6]

[6] The Seasonality Index describes how precipitation is distributed across the year. The lower the index, the more evenly spread the precipitation, with indices above 1.2 showing the most extreme seasonality. An index of 0.55, according to Walsh and Lawler (1981) means the precipitation regime is "rather seasonal with a short drier season."

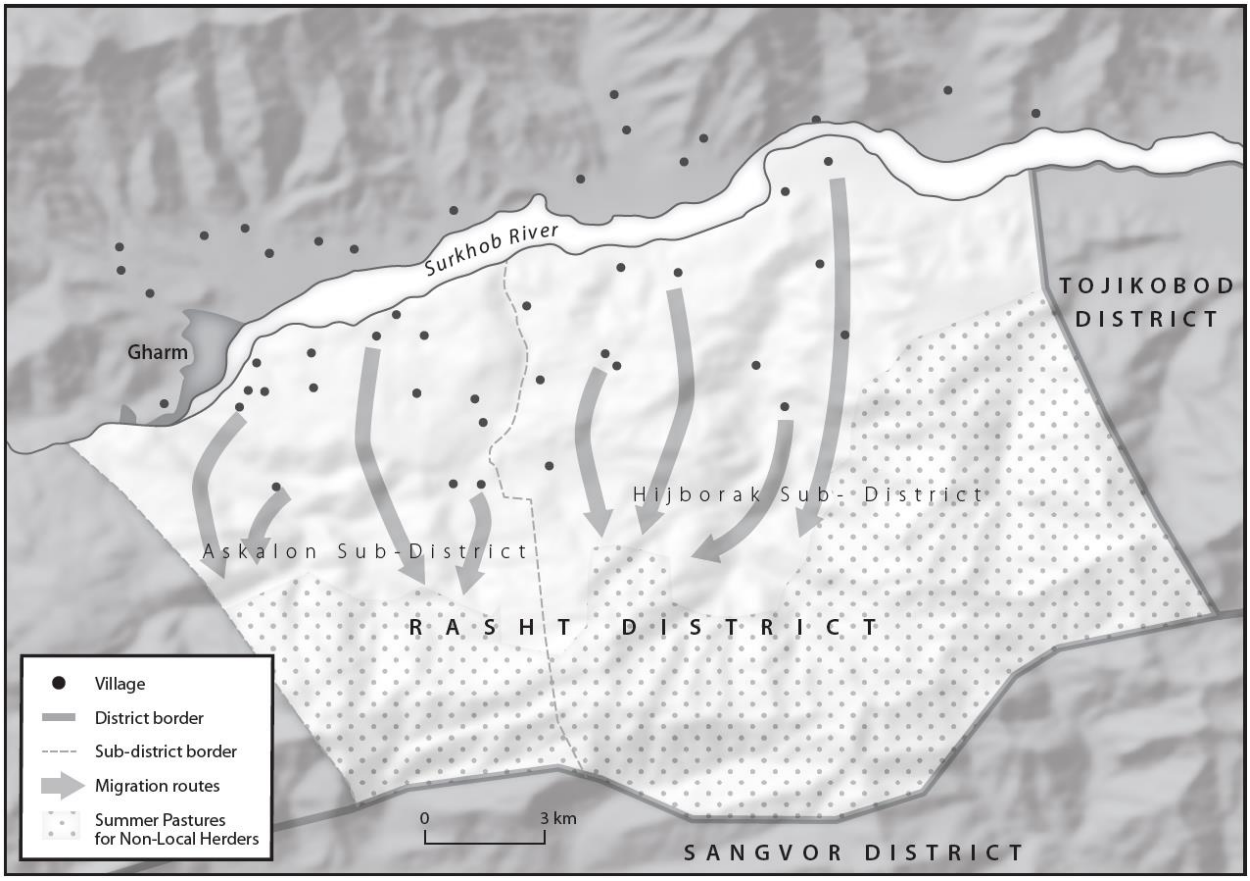

FIGURE 1.3: Askalon and Hijborak Sub-Districts and Local Herder Migration Routes (UW-Madison Cartography Lab)

Askalon and Hijborak are home to 9,800 residents spread across 23 villages, the highest of which is 2200 masl. Around a fifth of households have a family member with salaried employment, mostly governmental positions in schools, medical clinics, or local government, with a handful of people owning small shops. However, livelihoods here are mostly based on a *combination* of agriculture, livestock keeping, and remittances from family members working in Russia; while the relative importance of these three varies between families, households are not differentiated as livestock-keeping versus farming households. Tajikistan is the most remittance-dependent country in the world, with remittances making up 48% of the country's GDP (World Bank, 2023). While around three-quarters of households in the study area received remittances at

some point between 2010 and 2016, this was only a primary source of income for 10-20% of families, with agriculture and livestock generally being more central to the local economy.

Most households, around 80%, grow crops to support their family, and this is the most important livelihood activity for about a third of the households in the area, though even these families are likely to also raise livestock. While most families grow a variety of vegetables, pulses for household consumption, the short growing season means that many of the most common staples found in markets are imported from other parts of the country. Grains, tree fruit, and root vegetables are grown for sale, with potatoes being the most important market crop by far. This is partially because of sub-district quotas for potato production determined at the national level. Local government employees are accountable to higher-level officials for meeting these quotas and exert informal pressure on farmers to prioritize potato production, even when it is not in the best interest of households or the local economy.

Roughly 80% of the households here raise livestock, and raising livestock is the primary source of income for about one-quarter of the households in the sub-districts. Households here keep a mixture of sheep, goats, and cattle. While all three species are useful for household meat consumption or live sales for cash, only cattle are milked, and households here do not use or sell their animals' skin or wool. Though there are several households with large herds of over 100 small-stock, the average household owns 2-4 head of cattle and 8-10 head of small-stock. These families' animals are stall-fed indoors for the coldest months of the year, then graze in collective herds in spring-fall pastures near the village and summer pastures at higher altitudes.

In the summer, the livestock population in this area balloons, as around 20,000 head of sheep and goats arrive as part of a long-distance seasonal migration from the hotter and drier lowlands in Khatlon province of southwestern Tajikistan. Each of these herds has roughly 2,000

head of sheep and goats and is managed by teams of three to five professional herders. While the locals who live full-time in Askalon and Hijborak are all ethnic Tajiks, these non-local herders are either Qallugh or Loqay, two Turkic ethnic groups most prevalent in southwestern Tajikistan. Non-local herds mostly belong to a giant private agricultural enterprise that sends dozens of herds to different parts of the country, and are carefully managed, with their own winter grazing areas, fodder supplies, large shelters, and dedicated veterinarians and breeding specialists at their home bases in Khatlon province.

Additional research was conducted in Dushanbe, Tajikistan's capital and primate city, where I interviewed national government officials, professionals in the development sector, and academics. This is also where I was able to do library research and attend several conferences and workshops about the livestock sector and pasture management.

4. Research methods

This dissertation is based on 14 months of field research conducted in Tajikistan in 2016 and 2017. Original data was collected through semi-structured interviews, focus groups, informal conversations and participant-observation in rural areas and at livestock and pasture-related conferences, a household survey, and several participatory mapping exercises. Information from those sources was complemented by articles from Soviet-era newspapers and agricultural journals, internal and external project documents provided by NGO and IGO staff, and documents and data created by the Government of Tajikistan.

This section provides information beyond what is necessary to grasp the research methods, with the hope that the extra details will help future researchers in Tajikistan.

4.1. Household surveys

In November and December of 2016, a household survey was administered by four local enumerators using tablets and the open-source survey software CSPro, developed by the US Census Bureau. The target population was all *households* in Askalon sub-district in Rasht district. The sample of 108 households comprised a *minimum* of 19.3%[7] of the target based on the maximum possible number of households in the sub-district. However, since the correct number of households at the time was not certain, the sampling ratio may very well be larger than 20%.

Household lists for each of the 14 villages in Askalon sub-district comprised the sampling frame. They were provided by the secretary (*qotib*) of the sub-district. These official government statistics defined distinct households based on whether they were associated with their own plot of residential land. In reality, a portion of the entries in the household list were actually not living on their own; they owned their own plot of land legally designated as "household land" (*zamini nazdihavligi*), but they had not built a home on it and still lived as members of a larger household. Household lists also sometimes had not been purged of households that no longer existed because of relocation, death, and consolidation of family members. I was able to correct most of the household lists by conferring with village heads while running surveys in each village, but this was after my samples were generated. Government-provided household lists had on average 10% more entries than the number of actually discrete households. In one village, government data listed 50% more households than there really were.

The sample of households in Askalon sub-district was first stratified by village with a goal of surveying 20% of the households in each village (see TABLE 1.1). Within each village, a

[7] The 108 households surveyed contained a total of 907 people. This is 21.9% of the total population of the sub-district, based on governmental population data.

secondary stratification by a combination of wealth and livestock ownership was applied. During interviews with sub-district officials, every household was assigned a wealth category (poor, medium, wealthy) and livestock holding category (none, low, high). It is not clear exactly what criteria officials used to group the households into these categories, but they had refused to provide any raw data that would allow me to do my own grouping. I then created single-village sampling frames based on the combination of these two categories (e.g. 10 households with medium wealth and high livestock ownership, 7 households with low wealth and low livestock ownership).

TABLE 1.1: Survey sample by village

Village	Total HH in village	Surveyed HH	% of Sub-District HH in Village[8]	% of Sample
Kul	95	19	17%	18%
Askalon	86	17	15%	16%
Sharkho	62	11	11%	10%
Gulkhani	60	12	11%	11%
Runob	49	8	9%	7%
Sari Shukhon	45	9	8%	8%
Chakiho	43	9	8%	8%
Zuhibed	38	8	7%	7%
Safedtundak	33	8	6%	7%
Tughak	17	3	3%	3%
Dodbakht	15	3	3%	3%
Dukonisang	10	0	2%	0%
Kamoliyon	9	1	2%	1%
TOTAL	562	108	100%	100%

Unfortunately, the ratings of wealth level and livestock holdings provided by government officials appear to have been totally inaccurate. Several questions in the survey were used to corroborate the wealth level and livestock holdings assessments that were used for stratification, and the survey responses for questions about livelihood status and animal ownership showed no

[8] Total number of households in village divided by total households in Askalon sub-district (562). In a perfectly stratified sample, the last two columns would match.

correlation to the pre-assigned categories. In some cases, individuals who I knew to be especially wealthy and major livestock owners were listed as poor and with few livestock in the government-provided data. However, given the high sampling rate and robust stratification based on village of residence, the poor stratification by wealth and livestock holdings likely did not impact the quality of the survey data significantly.

After the quotas were determined based on the criteria described above, specific households were randomly chosen. Other households with the same attributes were listed as alternates if the household initially selected was unavailable. Because there were cases when we ended up conducting the survey with these alternates out of convenience, the sample cannot strictly be considered a stratified random sample.

FIGURE 1.4: Slow traveling between villages with enumerators while running surveys in the winter of 2016. (Author)

The surveys were administered by four enumerators who were all residents of Rasht district, but none of whom lived in Askalon sub-district, and two of them had never traveled there before. All surveys with female respondents were conducted by a female enumerator.

The surveys were wide-ranging and, in some cases, would take up to an hour to complete. They included sections on income sources and labor migration; land acquisition, ownership, and access, with special attention to pasture; livestock ownership, sales, and consumption; grazing locations, timing, and fees; and fodder cultivation, sales, and consumption.

4.2. Interviews

Over the course of 2016 and 2017, I conducted 97 interviews with key informants in Dushanbe, the Rasht Valley, and, in the case of some foreign professionals, remotely. TABLE 1.2 gives a general breakdown of the *primary* roles of the key informants, though some informants had experiences that would put them in multiple categories (for example, local government official and major landowner) and were interviewed in both capacities.

TABLE 1.2: List of interviews

Type of Informant	# of Interviews	Location
Current Professional Herder	18	Rasht Valley
Soviet-Era Herder or Sector Specialist	8	Rasht Valley
Major Landowner	8	Rasht Valley
Local Government Official	26	Rasht Valley
National Government Official	6	Dushanbe
Development Professional (National)	17	Rasht; Dushanbe
Development Professional (Foreigner)	11	Dushanbe; Remote
Scholar	3	Dushanbe
TOTAL	97	

In contrast to Hofman (2019), I found that after I had explained the context of the research and the precautions I was taking to protect their anonymity, my Tajik informants were generally willing to be recorded. I conducted many of these interviews in the presence of local research

assistants, who were invaluable for helping to explain the goals of my research and vouching for my trustworthiness.

I spent my entire fieldwork period living with three different families and working closely with three local research assistants. Countless conversations with them over those 14 months added extensive context and texture to the information gleaned from the informants, documents, and focus groups (see below).

FIGURE 1.5: Breakfast during one of three weeks of interviews with non-local herders in their high-altitude summer camps. (Author)

4.3. Focus groups

Eighteen focus group discussions (FGDs) were conducted with a total of 56 different respondents in Askalon and Hijborak sub-districts. Six villages were chosen to include two lower-elevation villages, two middle-elevation villages, and two higher-elevation villages. All villages in Askalon and Hijborak sub-districts are relatively high mountain villages, but these three designations are useful for distinguishing between 1) different microclimates (livestock in

the higher villages have to winter longer in barns than livestock in the lower villages) and 2) connectivity to larger towns, roads, and markets (the lowest villages are a 15- or 20-minute drive from the administrative center, while it takes an hour to get to the highest villages by car).

TABLE 1.3: List of focus group discussions

Altitude Grouping	Elevation (masl)	Village	# Focus Groups	Total Village HH	HH in FGDs	% HH Represented
High	2230	Hazorchashma	2 livestock 2 fodder	68	13	19%
	2180	Zuhibed	1 livestock 1 fodder	38	6	16%
Medium	1980	Kul	2 livestock 2 fodder	95	12	13%
	1950	Sharkho	1 livestock 1 fodder	56	7	13%
Low	1650	Chakiho	1 livestock 1 fodder	43	6	14%
	1550	Askalon	2 livestock 2 fodder	86	12	14%

Half of the FGDs focused on issues of livestock management, grazing, and pasture access. The other half focused on winter fodder, the fodder market, and access and management of fodder-growing land. Each focus group had three to four participants who were selected with the help of village-specific fixers as representing average citizens who were neither elite nor especially impoverished. These FGDs were semi-structured conversations based on the same interview guides across all villages. Conversations lasted 40-90 minutes.

4.4. Participatory mapping and walking tours

I conducted four participatory mapping exercises to ascertain the locations and distribution of different types of pastures and agricultural land, the boundaries between different users' and user groups' land, and the history of land use and land-cover conversion. I first attempted to do this by asking questions of middle-aged village residents, especially those with substantial herding

experience, while looking over and drawing on laminated posters of satellite imagery. Roughly half of the participants were able to interpret the satellite photos well enough to use them to describe the landscape; these tended to be people who had had occasion to use maps in previous employment, often in the military. When it became clear that some individuals were incorrectly identifying locations on the satellite images, I asked them to take me on walking tours of their villages, and I would use the satellite images to take notes on what they were telling me about past and present land uses.

4.5. Documentary sources and project data

I conducted a total two weeks of archival research of Soviet-era newspapers, agricultural journals, academic papers, and maps at the Republic of Tajikistan Academy of Sciences, the National Library of Tajikistan, and the State Institute for Livestock Keeping.

Current and former staff for governmental and non-governmental projects and legislative working group participants provided me with copies of internal and external project reports, meeting agendas, PowerPoint presentation files, and unreleased working drafts of legislation. While many governmental legal documents are easily available online, some legal documents—such as presidential decrees—are not always posted online, and these were provided by various contacts working in government and the development sector.

One critical source of information—especially for CHAPTER 3—was the "Land Balance" (Taj. *balansi zamini*) for Rasht District, a giant set of tables sorted by sub-district that list the names of private agricultural land holdings,[9] their total area, and area per land-cover type. It does

[9] Each single holding of agricultural land is given a legal name by its owner. This is usually not the name of the owner, but another name that has some significance to them.

not indicate whether these holdings are individual or collective, who their owners are, what year they were organized as private land, or where exactly they are located. I requested the "Land Balance" from a dozen individuals at many levels of government, and while such data was freely shared with many researchers in the 2000s, all my requests were denied. One day, however, I surprisingly received an Excel file of the data from an unfamiliar email address with no accompanying message. I did not want to complicate things by looking into who sent this; to this day I don't know who shared the data with me.

Employees in rural sub-district (*jamoat*) offices were very forthcoming with statistical data on human and livestock populations. This data was often partial and, in some cases, misleading, but any shortcomings appeared to be totally unintentional.

5. Challenges of conducting research in Tajikistan

The individuals I met during fieldwork constantly humbled me with their generosity, varied experiences, illuminating perspectives, senses of humor, curiosity, and often surprising open-mindedness. Traveling around the country, especially the rural highlands, afforded me views of sublime mountainscapes, gorgeous rivers and streams, and rolling expanses of grassland. Tajikistan has much to offer any visitor, including researchers. I thoroughly enjoyed all the time I spent there during fieldwork, and it would be inaccurate and unfair to identify the *challenges* of doing research in Tajikistan as the country's primary features. However, I will outline here some of the unique research challenges created by its current political and security climate to help prepare others who wish to conduct fieldwork there. That said, the research conditions in Tajikistan are extremely dynamic. Those who have conducted fieldwork there over the last decade have seen the government making things harder and harder for foreign researchers.

Thibault, who conducted her fieldwork in 2010-2011, noted that "political space is closing in Tajikistan and future fieldwork might be arduous, if not even perilous for scholars" (2018: 5). I witnessed this trend even just over the course of my own single research project.

Tajikistan is generally considered an authoritarian country. The Economist Intelligence Unit ranked it 8th to last among all countries in its 2018 Democracy Index, with a score of 1.93 out of 10 (EIU, 2019). In 2019, Freedom House gave it a score of 9 out of 100, placing it 10th to last among all countries in its freedom index based on political rights and civil liberties (Freedom House, 2019). The country's only viable opposition political party has been labeled a terrorist organization and outlawed by the current government. The sitting president has been in power since 1992, and after a state law bestowed upon him the official title of "Founder of National Peace and Unity" in 2015, he now has a number of lifelong executive privileges and immunity from prosecution. The government's hold on power is facilitated in part by its pervasive national security and intelligence agency—the post-independence incarnation of the Soviet-era KGB—and tight leash on government officials.

This political climate limits researchers' access to official information, contact with government officials, and sometimes the candor of conversations with ordinary citizens. In order to access even the most mundane official information or gain honest answers from regular people, researchers must slowly gain trust and familiarity, and even that frequently does not work. Scholars conducting research on topics deemed especially sensitive have been barred from reentry to Tajikistan, and one graduate student was even arrested on serious charges and imprisoned for over a month before being able to leave the country.

Hofman (2019) notes that as Tajikistan's agricultural sector is "highly politicized," even seemingly innocuous questions about agricultural practices can raise red flags for respondents.

Though I avoided asking any questions that I believed would be especially sensitive and made sure to frame my research as focused on agriculture, I came to realize that I was being constantly surveilled by the security apparatus, though they never interfered with my research or caused me any problems. The primary effects of this climate on the project were inefficiency in research activities due to waits for research permissions, a lack of access to government publications and officials, reluctance of many potential informants to participate in the research, and my reluctance as a researcher to ask certain types of questions.

5.1. Research permissions

I arrived in Tajikistan in 2016 with an educational visa sponsored by the US Embassy as part of a Fulbright research scholarship. Official diplomatic notes between the Embassy and the Government of Tajikistan outlined that I was in the country to conduct research on pasture management and local livestock economies. Briefings from several Embassy employees implied that I was cleared to begin my research, and no further protocols for gaining research permission were mentioned. After a couple of months of preliminary work in the capital, including interviews with some national government officials, I left for Rasht district to begin my fieldwork.

At my first meeting to interview a sub-district official, he asked if I had obtained explicit permission from the head of Rasht district to conduct my research. Because I had not, I did not start the interview, and went to the district government office to try to schedule a meeting to explain and show the permissions I had received from the central government. Eventually, I was able to meet with the deputy head of the district, who denied me permission to do any research at all in the district until I had gotten the Ministry of Foreign Affairs to send a letter directly to the

head of the district that gave me clear permission to continue my research. Any documents that I personally showed the district officials, I was told, were considered untrustworthy and potentially falsified.

With invaluable assistance from the US Embassy and many frustrating meetings, I was eventually able to resolve the issue after three months. I was not allowed to "do any research" during this time, which I interpreted as conducting interviews or visiting places other than friends' houses, restaurants, and stores. As one of only two foreigners in the district at the time, I was easy to monitor, and I was careful to not violate any of the instructions I was given to make sure I did not jeopardize the overall project. This delay affected my research in three main ways. First, I decided to confine my rural fieldwork to Rasht district rather than go through a similar process for other adjacent districts. Second, I used my waiting time to develop a household survey so that I could obtain data from many households in a short period of time. And third, I decided then to return for a previously unplanned three-month research stint in the summer of 2017 to try to make up for the time lost.

5.2. Access to government officials and data

Over the course of my field research, it became increasingly difficult to meet with government officials at any level. In the first few months of 2016, I was generally able to meet with employees in the national-level government offices that I contacted, though sometimes only more junior staff. Those who I did meet with were invariably kind but would not directly answer questions. After gaining clear permission from the Rasht district government, the district-level officials and village heads were similarly open to talking, even if they refused to share certain information. However, this changed mid-way through 2016. Because of the timing, I believe this

was due to a change in government policy. According to two informants and a fellow researcher, a legal order issued on May 20th, 2016—potentially a restatement of a 2013 order—declared that all communications between international entities and the government had to go through Tajikistan's Ministry of Foreign Affairs.

I have never been able to find any documentation of this order, but to comply with it, I submitted dozens of official letters over two years to the Ministry of Foreign Affairs asking for meetings with different government officials. The Ministry never responded to any of my requests. However, one personal contact within the Ministry told me that my requests were not considered because I was affiliated with the University of Wisconsin, and the University does not have an official relationship with the Government of Tajikistan.

Perhaps even more frustrating was the inaccessibility of seemingly innocuous official data. Often, officials openly discussed with me what types of data they had, sometimes even showing me their own copies of it perhaps to prove that they were telling the truth, but they then refused to share it with me. This occurred at all levels of government. Geospatial data of any form was the most guarded, including hard copy maps. A surprising array of maps—for example, geobotanical maps showing dominant grass species and outdated maps of pasture carrying capacity—have been designated and stamped as "military maps" that cannot be shared with foreigners. My interest in seeing these maps appeared to confirm for the staff of the State Land Committee's Geobotanical Department that the data were precious and sensitive.

5.3. Participant reluctance

Aside from government officials, people were generally very willing to talk with me. Understandably, informants wanted clear explanations about what exactly I was doing, but to my

surprise they were less worried about my status as a foreigner and more worried that I was an agent for the Tajikistani government. Specifically, they wanted reassurances that I was neither working for Tajikistan's security service nor there to assess or collect taxes on them. The keys to assuaging these fears were 1) having great local research assistants with wide-reaching social networks in the area and who would vouch for me, and 2) my long stays in rural areas that had rarely, if ever, received long-term visitors. Even so, a number of respondents I had good rapport with still underreported their livestock holdings.

5.4. Researcher reluctance

Researchers in "closed contexts" must craft their research approaches with state security services in mind (Gentile, 2013). When one NGO conducted fieldwork in Rasht district several years before my research period, security services followed behind and called in informants to divulge what was asked of them and how they answered. Though to my knowledge this did not happen with any of my informants, I kept this in mind when conducting interviews and crafting my household survey. I avoided a number of topics that could have illuminated key themes of this dissertation: people's feelings about the district and national government, the mechanics of bribery and extra-legal dealings with the government, participation in opposition groups, and feelings of regional identity and interregional animosity following the country's civil war. To be sure, some informants addressed these topics without prompting, but I did not encourage further discussion of them in order to protect informants, my research assistants, and myself.

When conducting his dissertation research in Tajikistan, Foster waited until the end of his research period to conduct his most sensitive interviews, in the event that they might lead to an involuntary end to his fieldwork (2015). I did the same, unfortunately putting off many key

government interviews until after the passage of the legal order that led government officials to reject all my interview requests.

6. Conclusions

Despite all the difficulties, it was certainly possible to conduct a rigorous research project in the country. Prospective researchers should not be dissuaded from carrying out a project in this woefully understudied context but should adjust their expectations in accordance with the political environment and not compare the volume and specificity of their data to those of peers working in other, less closed contexts. However, researchers should bear in mind that the topic of their research will have a significant effect on how the Government of Tajikistan treats them. None of these difficulties posed any risk to my safety. Government officials generally seemed interested in helping me but regretfully worried about the professional risks of cooperation. My ability to complete my research project appears to be the result of choosing a topic with potential benefits to some aims of the current government and, perhaps most importantly, my full acceptance of and patient compliance with all of the often-frustrating road blocks that my interactions with the government produced.

Chapter 2
Variability is Not Uncertainty; Mobility is Not Flexibility: Clarifying Concepts in Pastoralism Studies with Evidence from Tajikistan

[NOTE: A version of this chapter appeared as an article of the same name in the journal *Pastoralism: Research Policy and Practice* (Volume 11, Article number 13, 2021).]

1. Introduction

Scholarly understandings of pastoral systems have been underpinned by the concepts of variability, uncertainty, mobility, and flexibility. Despite the centrality of these terms to the pastoralism literature, they have been used inconsistently, imprecisely, and sometimes superfluously. Two separate but related analytical fallacies have emerged as a result. The first is conflating these four distinct terms into two pairs, failing to differentiate between the distinct environmental characteristics of variability and uncertainty (or unpredictability) on the one hand, and also failing to differentiate the two pastoralist responses of mobility and flexibility. The second fallacy, which is inevitable if the first fallacy is committed, is the characterization of *all* pastoral environments as intrinsically unpredictable, and pastoralists' movements and governance systems as intrinsically flexible.

After disentangling these four concepts, we can see that mobility is a response to environmental variability, whereas flexibility is a response to environmental uncertainty. Though some degree of uncertainty is present in every context and livelihood activity, uncertainty as it has been understood and deployed *within the pastoralism literature* is, in fact, not the most mobility-influencing type of variability in all pastoral settings. Therefore, while mobility is

intrinsic to pastoralism, the need for flexibility is context-specific and not intrinsic to pastoralism.

In the 1990s, a critical mass of scholars of pastoralism argued that spatiotemporal environmental variability in rangelands necessitated the very flexibility and mobility that was traditionally found in pastoral systems but endangered by pastoral settlement programs, initiatives of land privatization, or various restrictions on pastoral movements (Niamir-Fuller, 1999). While there had been prior scholarship on the importance of pastoral mobility for adapting to unpredictable environments, in this period we saw a "convergence of concepts, interpretations, and analyses between the natural and social sciences" (Scoones, 1994: 3), which replaced the existing dominant narratives with a new model to understand pastoralism, variously known as "new directions in pastoral development" (Scoones, 1994), the "mobility paradigm" (Niamir-Fuller and Turner, 1999), the "new rangeland paradigm" (Hiernaux, 2000), or the "new pastoral development paradigm" (Turner, 2011).

Despite sweeping implications of these labels, the Africa-focused scholars initially developing and employing these new paradigms advanced their ideas in very empirical and site-specific studies, likely not attempting or intending to describe mobility, rangelands, and pastoral development in *every* context. Research on mountain pastoralism—which flourished especially in the 1970s-1980s—did not help shape the development of the new pastoral paradigm, a product of the larger problem that "pastoral studies are still regionally compartmentalized" (Behnke, 2000: 142). Equating variability with uncertainty and mobility with flexibility has been one lasting result of this compartmentalization. The distinctions between these concepts are crucial to recognize in *every* pastoral setting, but in some areas—especially the non-montane environments where these words have become terms of art—the differences can be subtle and difficult to parse.

However, in many non-arid mountain pastoral systems like the one presented in this dissertation, the important distinctions between variability and uncertainty and mobility and flexibility come into focus.

The new pastoral paradigm is not universally applicable. Nevertheless, it has been extremely influential to many scholars of pastoralism and has been erroneously globalized, especially by development practitioners. The FAO's 2016 Governance of Tenure Technical Guide 6, for example, which focuses on pastoral lands the world over, characterizes rangelands in general as uncertain and unpredictable, often using the terms uncertainty, variability, and heterogeneity interchangeably (Davies et al., 2016). The apparent overdiagnosis of environmental uncertainty and overprescription of flexibility in institutions and grazing itineraries, then, has been a result of both a lack consistency and precision in how these terms have been used as well as the dominance of a regionally-specific conceptual model—focused on Sub-Saharan Africa and East Africa in particular—in global conversations about pastoralism.

In this chapter, I critically review the ways that concepts of variability, uncertainty, mobility, and flexibility have been employed in literature on pastoralism. Building upon common threads found in the literature and using fieldwork from two pastoral groups in mountainous central Tajikistan, I will clarify the significant differences between these concepts and delineate more precise relationships between them. The definitions and explanations of the relationships that I advance in this chapter are not novel, but they have not been clearly delineated at length in the context of the extant literature, as evidenced by the inconsistency and imprecision with which they are often invoked. Ensuring that the shared lexicon of pastoralism scholars in fact has shared meanings will improve our scholarship, especially when making cross-regional comparisons. In that spirit, one goal of this chapter is to suggest a more precise vocabulary that

can describe diverse pastoral contexts in comparable ways. In the process, I refer to inconsistencies and imprecisions in language in works that are, nevertheless, excellent and useful pieces of scholarship; my critiques are directed at how certain concepts are *discussed* rather than the central arguments of these works.

Most importantly, however, conflating these concepts or overextending the pastoral paradigm has significant practical implications for governance and pastoral development. It is challenging to develop institutions and access rules around uncertainty. Rather, institutions should be designed around the predictable patterns in resource availability and mobility needs that exist in a given context, leaving only enough institutional flexibility to address uncertainty that has been assessed empirically. An a priori embrace of unpredictability and flexibility can lead to advocacy for tenure arrangements that are inappropriate for their given context and unnecessarily hobbled by overly porous boundaries and unreliable land access.

As Jane Addison carefully acknowledged, "Institutional generation is not purely a product of biophysical conditions…nevertheless, ceteris paribus, biophysical characteristics do act as broad pressures or drivers that make some institutional arrangements more beneficial than others" (2016: 138). Certainly, socio-cultural and political factors may be primary determinants of land governance in many pastoral settings. This chapter focuses on the relationship between environmental conditions and the demands of livestock mobility, however, as this dynamic is central to the way pastoral governance has been studied and explained by scholars and practitioners.

2. Analytical fallacies and key concepts in pastoralism studies

2.1. The first fallacy: Conflating terms

2.1.1. Variability and unpredictability/uncertainty

All pastoralists must respond to environmental variability—differences over time and space in, for example, temperature, precipitation, or green forage abundance—and this variability can range from very predictable to very unpredictable. That is, environmental unpredictability or 'uncertainty' is one sub-class of environmental variability; they are not interchangeable terms[10]. It is strikingly common, however, for the terms to be used in ways that either muddle their differences or even directly conflate their definitions.

Like everyone, pastoralists are faced with myriad uncertainties in their lives. Most literature on pastoralism, however, explains that there are specific types of uncertainty that are unique to this livelihood. Scholars and development practitioners routinely argue that pastoralists require special forms of resource governance because of the unique manifestations of variability and unpredictability found in pastoral contexts. The significant governance implications of these claims make it crucial to isolate the pastoralism-specific dimensions of variability and unpredictability to justify distinct property governance regimes.

While all sorts of people—pastoralists included—are subject to unpredictable variabilities in employment, markets, climate, politics, social life, crime, disease, and more (see Mehta et al., 2000; Meinzen-Dick and Pradhan, 2002; edited volume by Scoones and Stirling, 2020), the unique variability and uncertainty assigned to pastoralists concerns primarily the

[10] "Variability refers to variation in environmental quantities…uncertainty refers to the degree of precision with which these quantities are estimated" (Van Belle, 2008: 99).

spatiotemporal distribution of forage resources[11]. This is the subset of unpredictability that I focus on in this chapter. Though in some temperate and Arctic rangeland systems temperature and snow cover can be additional factors constraining forage availability (Casimir and Rao, 1992; Behnke, 2000), precipitation almost always is used as a proxy for forage availability; in the vast majority of literature on pastoralism, environmental variability and unpredictability are about rain.

Environmental variability in pastoral systems is routinely referred to as "spatiotemporal variability," which conveys the importance of the *interplay* of spatial and temporal dimensions of variability for influencing pastoralists' strategies; after all, if variability were either purely spatial or purely temporal, there is no way that pastoral mobility would increase access to forage. Temporal variability alone is a central environmental dynamic for most settled agriculturalists—consider a crop calendar with cycles of planting and harvesting—but the spatial dimension is unique to pastoralists. Because resource abundance can fluctuate at a wide range of both spatial scales and temporal scales, the term 'spatiotemporal variability' encompasses multiple disparate patterns.

Spatial environmental variation in pastoral systems includes, for example, differences between wet and dry regions at farthest reaches of a given pastoral group's range—perhaps several hundreds kilometers away from each other—but also microclimates in mountain areas that might be within a single kilometer. The chosen spatial scales—including both extent and resolution—of observation and analysis will sway any assessment of not only spatial variability and but also temporal variability (Augustine, 2010; Brottem et al., 2014).

[11] Some authors also discuss manifestations of variability and uncertainty in water sources (e.g. Peters, 1987; McCarthy & Di Gregorio, 2007; Bassett, 2009). Water availability generally has less variation and far less spatial uncertainty than does forage availability, which is likely why it is not a primary focus of the literature.

Environmental variability has been recognized at multiple time scales in pastoral contexts: interannual, seasonal, and intra-seasonal (this final scale is by far the least common, but see discussion of phenology in Hobbs et al., 2008). Some scholars specifically articulate these different types of variability (e.g. Davies et al., 2016; Hobbs et al., 2008) or at least define a single type of variability they are interested in (e.g. McCarthy and di Gregorio, 2007), but more often variability is invoked vaguely and readers must infer which time-scale is described. Invocations of "unpredictability" or uncertainty (e.g. Ensminger and Rutten, 1991; Niamir-Fuller and Turner, 1999; Adriansen, 2005) are often a sign that a scholar is referring to interannual variation. Significantly, the new pastoral paradigm was developed around high *interannual* variation in precipitation, and this particular type of temporal variation—as well as the conspicuously non-spatial calculation of the coefficient of interannual variation in precipitation at a single location—became the dominant measure of variability. The focus on interannual variability put "uncertainty" at the forefront of understandings of pastoral systems, especially with the publication of the edited volume *Living with Uncertainty* (ed. Scoones, 1994), which focused on African pastoral systems. As a stark visual representation of this, Davis's "Drylands Variability Map" shows only isopleths demarcating coefficients of interannual variation in precipitation greater than 33% (2016: 17).

Though some contexts may be shaped predominantly by such unpredictable factors, many dimensions of environmental variability in pastoral systems can be predictable (Brottem et al., 2014): for example, temporal variability such as seasonal weather patterns, planting and harvest schedules, and some phenological cycles; or spatial variability such as differences between wetter regions and drier regions, floodplains, altitudinal zonation, or latitudinal differences, among others. In most pastoral systems, there will be a mix of some parameters of

variability that are more predictable and others that are more unpredictable; the existence of some unpredictability does not preclude some predictability, and vice versa. Despite this, it is common for pastoralism literature, especially when concerning the arid tropics, to use the terms "unpredictability" and "variability" interchangeably, *implicitly* defining the latter as the former. This phenomenon is widespread: in influential and important articles both in the early years of the pastoral paradigm (e.g. Casimir and Rao, 1992; Scoones, 1992; Scoones, 1994) and more recently (Davis, 2016; Moritz et al., 2019); in surveys of the academic literature (Niamir-Fuller and Turner, 1999; Vetter, 2005) and in publications geared towards practitioners (Davies et al., 2016; IFAD, 2020). In some cases, variability in pastoral contexts is *explicitly* defined as unpredictability. An IFAD guide for practitioners (Rota et al., 2018: 43) defines variability by explaining unpredictable and ephemeral rainfall, and an editorial introduction to a recent special issue of *Nomadic Peoples* defines variability as "unpredictable variations of vegetation structure, ground cover and precipitation" (Pappagallo and Semplici, 2020: 181).

Many studies of pastoralism in mountains or temperate areas, in contrast, highlight the more predictable variability of seasons and altitude-determined spatial heterogeneity (e.g. Arbos, 1923; Rhoades and Thompson, 1975; Netting, 1976; Balikchi, 1990; Ehlers and Kreutzmann, 2000; Fernández-Giménez, 2002; Pérez León et al., 2020). Non-arid montane pastoral systems—including the one featured in this dissertation—very clearly illustrate that not all variability is unpredictable, but the mountain pastoralism literature has not directly engaged with the new rangeland paradigm thus far. Krätli and Schareika (2010) is one of the rare articles that explicitly identifies "unpredictable variability" as a distinct environmental phenomenon present in only a subset of the world's pastoral contexts, which altogether comprise "a large spectrum of realities" that they are not claiming to describe (606). While the distinction between more unpredictable

and more predictable types of variability is often less obvious in arid and non-montane pastoral systems, it is nonetheless an important consideration in all pastoral contexts because of the implications for the strategies herders use to respond to variability, chiefly mobility and flexibility.

2.1.2. Mobility and flexibility

Livestock mobility is the defining characteristic of pastoralism. It allows herders to cope with and even exploit environmental variability. However, mobility is only worthwhile as a response to certain types of variability. *Absolute* changes in, for example, precipitation or forage availability in a single area—purely temporal variability—reveal nothing about mobility patterns. They can tell us whether the conditions are more or less suitable for livestock, but not how that might result in a livestock movement. This is because movements are in fact driven by the preference of one grazing area over another due to *relative* characteristics. Additionally, if one area is *always* preferred over others—if variability is purely spatial—then there would be no justification for mobility; the herd should just stay in that one preferred location. In short, mobility is a response to the variability over time between the relative suitability of multiple grazing areas. When this type of variability is regular and predictable, mobility patterns can be regular and predictable. However, when variability is more unpredictable, mobility must be flexible. Just as uncertainty is a sub-class of variability, flexible mobility is a sub-class of mobility.

Though flexibility and mobility should be understood as distinct concepts, the distinction between them is often unclear: “mobility and flexibility” frequently appears as a single phrase in the literature, and “mobility” is often used alone in order to signify flexible mobility (e.g. Ingold,

1980; Galaty and Johnson, 1990; Casimir and Rao, 1992; Bassett, 2009; Davies et al., 2016). Indeed, these two concepts are often difficult to separate in the subset of instances where livestock mobility is, in fact, flexible.

While the most general definition of livestock mobility is self-evident, there are no clear definitions that allow for ordering of pastoral groups as more or less mobile than one another (Turner, 2011; Turner and Schlecht, 2019). The two primary dimensions of mobility are frequency of movement and distance traveled (Galaty and Johnson, 1990; Turner et al., 2016), but even these components don't lend themselves well to single metrics could be assessed by looking at all daily herd movements or simply the movements between different sites of encampment (Butt, 2016).

Mobility is not an end in and of itself (Turner, 2011; Herrera et al., 2014; Davies et al., 2016), but a functional livelihood strategy. Moving around can play a role in helping herders avoid social and political unrest (Elam, 1979; Fernández-Giménez, 2002; Fernández-Giménez and Le Febre, 2006) and access markets (Agrawal, 1999; Starrs, 2018), but of course, sedentary agriculturalists would also want to avoid unrest and seek access to markets. Mobility is *uniquely* important to pastoralists as a strategy to respond to the spatiotemporal heterogeneity—changes over time in the spatial distribution—of forage resources (Scoones, 1994; Niamir-Fuller and Turner, 1999; Fernández-Giménez, 2002; McCarthy and di Gregorio, 2007). In other words, pastoralists move with their herds to allow a herd to access the right 'bundle' of land resources to sustain itself (Galaty and Johnson, 1990).

Looking across pastoral systems at what exactly constitutes an adequate 'bundle,' we can broadly characterize three potential objectives of mobility, which I term 1) 'completing the set,' 2) 'hedging bets,' and 3) 'diffusing pressure.' The first two objectives are most important to

differentiate. ‘Completing the set’ is the use of mobility to assemble a set of grazing areas in *different ecological zones* that are biophysically distinct in reliable and predictable ways—for example, wetter areas and drier areas, colder and warmer areas, or multiple locations along an altitudinal gradient—and grazed according to a repeating temporal pattern (e.g. as described by Ingold, 1980; Fernández-Giménez and Le Febre, 2006). The crucial need in agropastoral systems to keep animals away from cultivated crops or uncultivated fodder-growing areas during the growing season (e.g. Guillet, 1983; Intigrinova, 2010) can be considered a type of the ‘completing the set’ objective, where mobility patterns based on predictable seasonal land cover cycles, though in this case the cycles are punctuated by the human activities of sowing and harvest.

When mobility is a strategy for hedging bets, the necessary bundle of land resources comprises a wide array of *patches within a single ecological zone* that may experience different forage abundances due to unpredictable climatic conditions (Galaty and Johnson, 1990; Swallow and McCarthy, 2000). These two objectives are not mutually exclusive; while in some pastoral contexts only one of these objectives might be present, they might both play important roles. For example, in the Malian “transhumance sheds” described by Brottem et al. (2014), herd movements between wetter regions and drier regions follow a regular seasonal pattern, while movements within the drier “northern dispersion zone” are less predictable and more driven by the unique conditions of that specific year. The third objective, diffusing pressure, is when livestock move in order increase the total area grazed, thereby reducing the consumption of forage per areal unit, resting pastures so that they can recover, or both. As with the other objectives, diffusing grazing pressure can exist as a singularly prominent objective for livestock mobility or operate in concert with others.

These three objectives of mobility are ideal types. Actual livestock movements are conditioned not only by the objectives of mobility, but also from diverse constraints on land access and travel. This typology is not intended to be used as a system for cleanly categorizing all pastoral groups, but as a tool to help discuss mobility needs and their implications for governance of pastoral land. Completing the set, hedging bets, and diffusing grazing pressure are all justifications for mobility, but they require and accommodate different types of property arrangements. To effectively hedge bets, herds must opportunistically respond to unpredictable environmental conditions through flexible mobility, but the two other objectives of mobility are based on predictable types of variability. In pastoral systems where hedging bets is not an important objective of pastoral mobility, flexible mobility is not needed.

The term "flexibility" is employed in diverse ways by scholars of pastoralism. Fernández-Giménez and Le Febre (2006) apply the term to strategies of livelihood diversification and destocking through sale or slaughter, and Swallow and McCarthy (2000), among many others, see adjustment in species composition of livestock holdings as an expression of pastoral flexibility. Nozières et al. enumerate 32 very specific types of pastoral flexibility, focusing especially on aspects of animal husbandry (2011).

While income diversification and inventory adjustments are strategies found in many non-pastoral contexts, in the pastoralism literature 'flexibility' most often refers to aspects of land use and access that are unique to this livelihood strategy. It is these types of flexibility that I focus on in this chapter. First, flexibility can refer to the *changeability of grazing itineraries* themselves: the location of grazing areas (Neudert, 2015; Moritz, 2016) or the precise routes taken and timing of movements between predictable final destinations (Barth, 1961; Brottem et al., 2014; Turner et al., 2016). Second, especially in recent literature on pastoralism, flexibility

refers not to the mobility patterns themselves but to institutional structures and access rules that configure the array of options for livestock itineraries: the ability for *spatial* boundaries of territory and *social* boundaries of group membership (edited volume by Scoones, 1994; Niamir-Fuller and Turner, 1999; Marin, 2006 in the Arctic; and many others) to be easily and repeatedly modified. Though flexible *institutions and access rights* may be present in a number of contexts, they are only essential for pastoral livelihoods when they are needed to facilitate flexibility *in mobility*. However, flexible mobility does not always require flexible institutions and access rights; if social and spatial boundaries are inclusive and large enough, then they can facilitate flexibility in mobility even when they are non-porous and stable.

Flexibility in land use and access has been described as integral to pastoralists' ability to cope with emergencies or extreme events (e.g. Fernández-Giménez, 2002; Moritz, et al. 2013) or more persistently erratic or unpredictable climates (e.g. Galaty and Johnson, 1990; Casimir and Rao, 1992; Scoones, 1994). The relationship between size of resource management unit and unpredictable climates has also been noted (e.g. Tapper, 1979; Swift, 1994; McAllister et al., 2006; Davies et al., 2016).

2.2. The second fallacy: Globalizing unpredictability and flexibility

While mobility and variability are intrinsic to all the world's pastoral systems, we have seen above that not all pastoral contexts are characterized by high levels environmental uncertainty and do not, therefore, necessitate flexible livestock mobility patterns. When these pairs of concepts—variability and unpredictability, on the one hand, and mobility and flexibility, on the other—are erroneously conflated, however, it is impossible to invoke them selectively and deliberately. The result is the second analytical fallacy that pervades much of the literature on

pastoralism: the overdiagnosis of uncertainty as intrinsic to pastoral systems and overprescription of flexible mobility as a requisite response to this uncertainty. This fallacy manifests itself as 1) overly specific global-scale characterizations of pastoralism as a livelihood strategy and 2) local-scale mischaracterizations of specific pastoral contexts as unpredictable.

Given the diversity of pastoral systems across the globe, it is extremely difficult to accurately say much that all these systems have in common. Nevertheless, non-academic praxis-oriented organizations have released publications that do just that, with the noble goal of elevating the needs and priorities of pastoralists world-wide. These publications almost certainly produce far more good than harm, but in their endeavor to create a cohesive 'bloc' of pastoral peoples, they often define pastoral systems too narrowly by claiming that environmental unpredictability and flexible mobility are intrinsic aspects of pastoralism as a livelihood (see TABLE 2.1). A recent online discussion about the definition of pastoralist similarly led to statements about "the inner [*sic*] uncertainty of rangelands" and how "pastoralism is about creating livelihoods in highly variable environments," presumably referencing unpredictability given the extreme seasonal variability in many agricultural areas (Pastoralist Knowledge Hub, 2020). Though less common, there are also examples of overextension in academic literature of conditions of uncertainty (Nori 2019) and necessity of flexibility (Fernández-Giménez, 2002; Butt, 2016) to all pastoral contexts.

TABLE 2.1: Illustrative excerpts from practitioner publications regarding uncertainty and flexibility

Publication [Organization]	Comments on Uncertainty	Comments on Flexibility
Herrera et al., 2014. *Governance of Rangelands* [N/A]	"Unpredictable and comparatively unproductive lands…rangelands are so vast and unpredictable that communal management has been the key to survival" (xviii).	"The success of pastoralism relies on flexibility" (25)
Davies et al., 2016. *Improving the Governance of Pastoral Lands* [FAO]	"Pastoralism is, to a large extent, an adaptation to ecological and climate variability [and] other sources of unpredictability" (11). "[Pastoral lands] are challenging and unpredictable environments" (12). One of the "defining characteristics of pastoral management and governance" is "Variable and unpredictable climate" (24).	"Pastoralist land tenure systems need…flexibility in their [natural and artificial infrastructure] use" (16). "…the flexibility and adaptability inherent to pastoral systems" (21). "Secure and flexible access to land and resources is crucial for the economic, social, and environmental benefits from rangelands managed by pastoralists" (26). "…the necessary flexibility and fuzziness of pastoralist governance" (33).
Gomarasca, M., C. Heine, and A. Jenet, 2016. "Securing pastoralists' land tenure rights" [VSF International]	----	"Pastoralism enables communities to manage their resources in a sustainable, independent and flexible way" (30).
Davies, et al., 2018. *Crossing Boundaries: Legal and Policy Arrangements for Cross-Border Pastoralism* [FAO/IUCN]	"Mobility…is essential for…managing the unpredictable climate" (1).	"…inherent flexibility of arrangements for natural resource management [in pastoral contexts]" (xiv).
Rota, et al., 2018. *How to Do Note: Engaging with Pastoralists—A Holistic Development Approach* [IFAD]	When defining pastoralism: "Pastoralism…takes advantage of the characteristic instability of rangeland environments, where key resources…become available in short-lived and largely unpredictable concentrations" (42).	"Crucial aspects of pastoralist specialization are…the development of flexible resource management systems" (42).

When pastoralism in general is defined with concepts that fit only a subset of examples, these concepts condition observers' assumptions. Moritz et al. (2013: 363-364) argue that scholars' fervent and necessary rebuttals of the tragedy of the commons have led to "such a commitment to the pastoral commons that we see it even pastoralists tell us it" isn't there. Similarly, the vital interventions that explained and defended the importance of flexible mobility in certain especially unpredictable pastoral contexts has led people to see uncertainty and the need for flexibility when they are not there, including in cases like the one described in this chapter. There are academic examples of this in studies of Russia (Intigrinova, 2010), and Central Asia (Steimann, 2012[12]). In a 2011 conference presentation about pasture tenure policy in Tajikistan, an international expert's recommendations stressed the need to facilitate flexibility in grazing patterns. And in a 2018 online discussion where I pointed out that uncertainty was not a *uniformly* dominant aspect of all pastoral systems, a prominent voice in pastoralism advocacy challenged my point, arguing that because of "unpredictable climatic events every so often such as bad winter snows…flexibility would be required" even in the temperate Central Asian climates I was writing about.

3. Results

Pastures in Askalon and Hijborak sub-districts are grazed by herds of locally owned livestock that spend their entire years in the area as well as non-local herds that travel for 15-30 days from Khatlon province with professional herders to graze mountain pastures in the summer. Within each of these groups there are different management choices available; the presence of any choice, by definition, means that there is some element of flexibility in how livestock are

[12] Steimann does, however, offer a very nuanced and well-considered view of uncertainty.

managed. Both groups' experiences illustrate the necessity of livestock mobility; however, none of the herders in the study area appeared to use *flexible mobility* to opportunistically track spatiotemporally unpredictable forage resources. While grazing areas and movements are extremely predictable, pastoral flexibility manifests in two ways 1) flexible timing for livestock movements between pre-determined grazing areas that are consistent from year to year, and 2) decisions made each year by livestock owners about where to send their animals in the summer based predominantly on household wealth, labor availability, and which professional herder would be caring for their animals in a given area. Pastoral land governance in the area is structured by these highly predictable dynamics yet can accommodate these minor manifestations of flexible management.

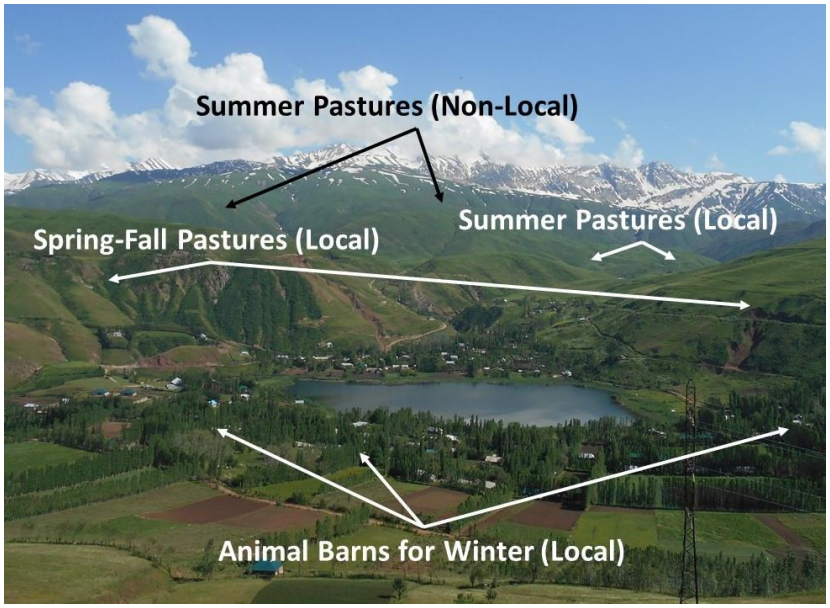

FIGURE 2.1: Spatial organization of livestock areas in typical village of study area. (Author.)

3.1. Mobility and flexibility for local livestock

The general seasonal pattern for livestock based in Askalon and Hijborak sub-districts is static. Livestock overwinter in their owners' private animal barns, where they are stall-fed for roughly

six months. In the spring, each village or neighborhood's animals are aggregated every morning into collective herds—one for cattle and one for sheep and goats—returning back to their owners' homes in the evening after grazing on pasture or land that will be protected in the summer as fodder-growing land. Herding responsibility during this time rotates through the livestock-owning households. After several weeks of spring grazing, these village herds then fracture, as the families in Askalon can choose to pay to send their animals off with one of several teams of professional herders or keep their animals at home and grazing with the village herd all summer. Summer pastures (*ayloqs*) are generally more remote and higher-altitude. In the fall, all livestock return to the village to graze on both the spring pastures and post-harvest crop residues until they go back into their barns when the snow falls.

Herd mobility is an essential part of this system, driven by both 'completing the set' and 'diffusing pressure' motivations. At the seasonal timescale, livestock move consecutively between biophysically distinct zones across an altitudinal gradient to access pastures that are snow-free and dense with forage. At daily and weekly timescales, livestock mobility reduces grazing pressure on any one given area. Perhaps just as important as its role in providing access to forage resources as they become available, livestock mobility also is vital for ensuring that certain fodder-growing areas around the village remain ungrazed long enough in the summer to provide sufficient fodder harvests to sustain animals indoors when they are stall-fed during the winter.

This mobility is extremely predictable, insofar as it is responding to the certain changes of the seasons and taking advantage of fixed altitudinal gradients (See FIGURE 2.1). Each village has well-defined spring and fall grazing areas, and these are small enough that the entire available area is grazed every year. The areas grazed in the summer are also identical every year,

regardless of environmental conditions. The territories of all these areas are delineated by formal legal boundaries. These boundaries are widely recognized and respected, so monitoring and enforcement of boundaries seldom involves the government but can if disputes escalate.

While grazing locations for each season are fixed, the timing of seasonal transitions is flexible. Sheep and goats generally leave the animal barns to begin spring grazing as soon as the snow melts, when they begin feeding on grass from the previous year that had been under the snow. Cattle begin grazing around a week later, mostly feeding off early growth of new grass. From year to year, the start date for spring grazing can reportedly vary by as much as a month, usually starting around mid to late April. By mid to late-May, grazing is prohibited on areas that will grow winter fodder, but timing of arrival at summer pastures is also flexible, determined by when the higher altitude summer pastures are snow-free. Snowfall also dictates when herds return to the lower-elevation fall pastures, and ultimately when they move from fall pastures back into the animal barns for stall-feeding. Because herds begin stall-feeding as soon as pastures are covered with snow, extreme snowfall events occur after animals have already stopped leaving their barns for fall pastures[13]. This contrasts with contexts elsewhere in Central and Inner Asia where extreme cold weather events—sometimes known as *dzuds* or *dzhuts*—can be significant unpredictable drivers of herd movements (Robinson and Milner-Gulland, 2003; Kerven, 2004; Fernández-Giménez et al., 2015).

Though a household's livestock will almost certainly spend every summer in an area within 10km of its home village, they may graze in a different area each summer. For example, 24% of survey respondents who had livestock in the summers of 2015 and 2016 (n=75) sent

[13] Presumably, it would be possible for an extreme snow event to also be the first snow of the year, marking the end of grazing of fall pastures.

them to different locations each of those two years. Every year, the same grazing territories—ranging in size from 50 to 250 hectares—will be grazed by local herds managed by local professional herders. These territories are individually owned[14] by relatively wealthy locals, most of whom also work as the lead professional herders for these summer pastures. In some cases, however, the landowner does not work as a herder but rather receives payment from a professional herder for exclusive grazing rights for that summer. In the latter case, the pasture will be reliably grazed by a professional herder every summer, but it will not necessarily always be the same herder in charge. The livestock owners always coordinate with and pay the professional herder directly, regardless of whether he owns the land he is grazing, and do not have to coordinate with or pay the landowner themselves. Livestock owners can choose which of several nearby summer pastures to send their animals to. While this decision can be considered an example of flexible livestock management, it is *not* an example of flexibility in response to unpredictable environmental conditions. In fact, forage quality is just one of many factors that are weighed when making this decision, and not necessarily an important one.

The first choice a livestock owner makes is whether to keep their animals[15] in the village-managed herd that grazes in the areas adjacent to their village. Because livestock-owning families take turns grazing these herds rather than paying professional herders, this option places additional demands on household labor, but it is cheaper than paying to send their animals to a more distant pasture under the care of a professional herder.[16] Families that keep their livestock

[14] These areas are individual *dehqon* farms. See CHAPTER 3, SECTION 4.1 for a description of formal land ownership categories.

[15] This is not a decision that has to be made for milking cattle; because there is no milking at remote summer pastures, every household will keep these animals at home over the summer.

[16] When livestock owners give their animals to a professional herder for the summer, they pay a single fee to the herder. In 2016, this was around 10 TJS (US$1.10) per sheep-goat per month and 50 TJS (US$5.50) per head cattle per month. This fee covers both land access and herding labor.

around the village are usually poorer *and* have sufficient herding labor to contribute. Some heads of household have elected to keep their animals at home because of negative experiences with their animals getting lost, injured, killed, or stolen when out of their care for several months. The cost savings, however, is the primary reason to keep livestock in the village herd.

In general, livestock owners with the means to do so will prefer to send their animals away from the village to more remote summer pasture areas because there is more forage, and their livestock will gain more weight. In some cases, this is a livestock owner's only option either because they are not able to provide the household labor to take their turn grazing the village herd or because they live in a village where there is not adequate pasture to support an aggregated village herd over the summer.

TABLE 2.2: Summer grazing options for local herders in Rasht Valley

Summer Grazing Options	Advantages
OPTION 1: Keep in village pasture Part of an aggregated village herd and herded by family members of livestock owners on a rotating basis	• Cheaper (no need to pay for herding labor) • Able to obtain milk (cattle only) • Reduced risk of livestock theft, loss, or injury
OPTION 2: Send to remote pasture Herded by professional herders as part of a larger herd	• Livestock gain more weight (higher-quality, more abundant forage) • No need to allocate household labor to herding

Livestock owners who have decided to send their livestock with a professional herder must next choose *which* herder to send them with. Professional herders will graze livestock on land that they either own themselves or have secured access to with contracts with the land's owner; long before summer it is clear which area each professional herder will take his herd to. For livestock owners, then, the decision of who to send their animals with and *where* to send their animals are one and the same. When making this decision, livestock owners report that they consider both the quality of the pasture and the quality of the herder. The characteristics of a

good pasture, as described by livestock owners who do not necessarily visit these pastures themselves, are general and obvious: a large land area (100 hectares or more), ample water, and lots of good quality grass. A good herder is described as one who has a lot of experience, a track record of not losing animals, changes camps frequently, gives salt and waters animals at the right time, and has a lot of livestock owners wanting to send their animals to him. Oftentimes, however, the decision of who to send your animals to comes down to logistics. Some livestock owners prefer to send their animals with a herder who goes up to the summer pastures earlier in order to alleviate winter fodder shortages. Some herders accept in-kind payments of, for example, one out of every 10 or 15 sheep or goats that they herd for a summer, which appeals to cash-poor livestock owners. Lastly, though most interviewees claimed it did not influence their decision-making, many livestock owners sent their animals with summer herders with whom they had some sort of familial or neighborhood connection.

The Soviet past has influenced aspects of this system, but the ways that land is used by livestock owners is based on the needs of the animals and diverges from the situation in the Soviet era and even the land policies advanced by the current government. During the Soviet era, household livestock holdings were limited to one head of cattle and five head of sheep or goats. Household and state-owned herds had spatially distinct grazing areas. These state-owned herds are no longer present, and private livestock ownership has increased rapidly. During the Soviet era, the long-distance migrations between Khatlon province and Rasht were bi-directional, with many Rasht-based herds migrating to Khatlon during the winter. The system of privately owned summer pastures where herds are watched by professional herders for a fee is an innovation. But the story is not simply one of increased private land management. In the post-independence period, waves of land reforms led to the privatization and individualization of pastures, often

against the will of those who received fragments of pasture. In many villages, the “village pasture” comprises many dozens of separate pasture plots that are individually owned, but the borders between these are ignored in practice and the agglomeration of pastureland is grazed in common as a single land unit.

3.2 Mobility and flexibility for non-local livestock

The importance of livestock mobility is even more pronounced for those sheep and goat herds traveling up to 400 km to the Rasht Valley’s mountain pastures from their winter pastures in the lowlands of Khatlon province in southwestern Tajikistan. These long migrations enable herds to ‘complete the set’ of predictably distinct ecological zones necessary to support animals year-round. The lush mountain pastures dependably provide abundant forage and water during the summer, when the herds’ winter areas in the lowlands are invariably drier and more barren, unable to fatten the sheep and goats nearly as well as the mountain pastures. By returning to the lowlands for the rest of the year, however, the herds avoid the harsh mountain winters that require livestock to spend all winter indoors and supplied with large fodder stores. Seasonal livestock migrations between Khatlon and Rasht have occurred for decades, if not centuries, ceasing with the onset of Tajikistan’s civil war in 1992 and resuming gradually in the mid- to late-2000s. According to both the non-local shepherds—many of whom come from families that have been leading these seasonal livestock drives generations—and locals who live in villages adjacent to the summer pastures, the very same areas have been grazed for decades.

Before starting their multi-week trek to the summer mountain pastures of Rasht district, herders coming from Khatlon district already know which areas have been assigned to them for summer grazing, usually around 300-400 hectares. These herders are employees of agricultural

firms with managers who oversee the legal aspects of securing use rights for summer grazing areas and also assign teams of herders to herds of sheep and goats and to specific locations. Selecting the summer grazing area, then, is the responsibility of the herders' bosses rather than the herders themselves. At the scale of the agricultural firm, summer grazing areas are quite static. With some minor variation, a given firm will send their herds to the same set of summer grazing areas each year. Herders report that managers like to send the same herds to the same places year after year because the livestock become accustomed to particular areas. While a given *herd* of livestock returns to the same set of pastures year after year, *herding teams*—the humans—may be assigned to different herds different years.

Non-local livestock graze on summer pasture that lies within State Reserve Land[17] (Taj. *Zamini Zakhirai Davlati*). Use rights for this class of federal land are obtained through short-term contracts—usually one-year contracts in Rasht district—from the district offices of the State Land Committee. All contracts are issued *before* the spring migration to the summer pastures begins and pasture conditions can be observed. A herding team and its animals will stay within their allotted area no matter what conditions they face upon arrival. The predictable spatiotemporal environmental variability across seasons and altitudes has enabled these secure and dependable institutional arrangements to form.

For herds moving from Khatlon to Rasht, the seasonal migration occurs along official livestock transit routes (Taj. *rohhoi chorvoguzar*) that are state-sanctioned and under the purview of Ministry of Agriculture's Pasture Trust (Taj. *Tresti Charogoh*). These routes are mostly unchanged since the Soviet era, but some herders report taking minor detours to avoid stretches recently constricted by encroaching cultivation. These detours are exceptions, though, and the

[17]In the study area, only State Reserve Land was used by herds from Khatlon. However, in some nearby areas these types of herds would also use State Forest Land.

well-established network of transit routes means that flexibility during the seasonal migrations is only manifest in the timing of movements. The lead herder (referred to as *starchiy*) for each herd makes his own personal decision about when to begin spring and fall migrations. Those who leave early in the spring face harsher weather along the way and may find that much of their summer pasture is still snowbound. Those who leave later in the spring have a harder time filling their animals up during their month of travel, as the slivers of pasture on the margins of the transit routes have already been grazed by many other herds. Those who leave at peak time must contend with high traffic from other herds following the same routes. The same trade-offs must be considered for the return trip, but herders must additionally make sure that they time their return around the mating period, which can happen in mountain pastures before the fall migration, but most often occurs after herds return to the lowlands around the end of September.

Within their summer pastures in Rasht district, non-local herds use mobility both to 'complete the set' at a smaller scale and also to diffuse grazing pressure. Each mountain pasture territory delineated for a single herd is oriented to contain its own altitudinal gradient. In this study area, a single non-local herd's summer grazing territory would vary 500-700 meters in elevation, with the highest altitude territory stretching from 2700 to 3300 masl. Over the course of the May-September grazing period, non-local herders take advantage of this small-scale altitudinal gradient, first setting up camps in lower altitude areas—used as hubs for daily grazing orbits—moving to the higher reaches as weather warms, and moving back down to the lower areas within their grazing territory for the month before they begin their fall migration. Each herd rotates between four to seven different camps (*q'tan*[18]) over the course of their time in Rasht,

[18] *Q'tan* (қътан) comes from Uzbek *qo'ton* (қўтон) and specifically refers to an overnight resting point for sheep and goat herds rather than a camp for humans, though the herders will also camp in the same location (Mahmudov et al., 2012).

using some camps multiple times. Herders expect to rotate roughly every 15 days, but their precise timing of migration depends on a visual appraisal of the condition of the land around them. Each movement from one camp to another is not necessarily an explicit move from one altitude to another. For example, one lead herder considered their team to have three low altitude camping locations and three high altitude camping locations but didn't think of them as on a gradient beyond those two categories.

Here again, we see that even within just the summer grazing period, livestock mobility is an integral part of herd management. Because summer grazing territories are circumscribed, pre-determined, and grazed in their entirety, there is no manifestation of flexibility in the location or spatial extent of grazing. This maintenance of distinct grazing territories is particularly notable because almost all the non-local herds in the study area belong to the same company, so use rights for all these pastures are held by a single entity. The boundaries of grazing areas for these herds are an internal organizational strategy rather than a practice of exclusion by powerful actors, so the adherence to these boundaries can be seen as evidence that they were not discernably at odds with the needs of the livestock. There is some flexibility in the exact timing of grazing movements, but the sequencing of movements is based on predictable seasonal temperature patterns and stable altitudinal differences.

TABLE 2.3: Livestock mobility patterns in study area (April through November)

Group	Environmental context		Mobility Response			Institutional Arrangements
	Type of Variability	Predictability	Season	Description	Justification Type	
Local Herds	Seasonal and altitudinal variation in temperature (including snowfall and snow melt)	Predictable; some temporal fluctuations ±2 weeks	Spring**	Begin grazing of spring-fall pastures	Completing the set	Clearly defined territorial boundaries and user group. Grazing allowed until village leaders reserve land for fodder growth.
			Summer**	Move up to summer pastures Rotating Camps within summer pastures	Completing the set Completing the set & Diffusing pressure	Clearly defined territorial boundaries and user group. Access through deed or temporary contract with deed-holder.
			Fall**	Return down to village to graze on spring-fall pastures	Completing the set	Clearly defined territorial boundaries and user group. Grazing allowed after fodder harvest.
Non-Local Herds	Seasonal and altitudinal variation in temperature (including snowfall and snow melt)	Predictable; some temporal fluctuations ±3 weeks	Mid-Spring	Migrate from lowlands to summer mountain pastures	Completing the set	Clearly defined state-owned livestock migration routes open to all herds.
	Intra-seasonal and altitudinal variation in temperature; grazing-induced variability in forage density		Summer**	Rotating camps within summer pastures	Completing the set & Diffusing pressure	Clearly defined territorial boundary and user group. Access through single-year contracts with State Land Committee.
	Seasonal and altitudinal variation in temperature (including snowfall and snow melt)		Early Fall	Return from summer mountain pastures to lowlands	Completing the set	Clearly defined state-owned livestock migration routes open to all herds. Lowland pastures have clearly defined territorial boundaries and user groups. Access through deed.

These mobility patterns are combined with **daily grazing orbits. Daily grazing is a "**diffusing pressure**" response to **grazing-induced variability in forage density** which is **predictable** because it is caused by the herds themselves.

4. Discussion

The dynamics of this case study illustrate the differences between variability, uncertainty, mobility, and flexibility more clearly than do many other pastoral contexts. While central Tajikistan is not representative of all pastoral contexts, these *distinctions* are relevant in every

system. The distinctions do concern definitions of terms, but these definitions are crucial to understanding mobility and also have very real practical implications. Advocates and scholars of pastoralism consistently invoke these terms when justifying land tenure and resource governance imperatives, so the way we use these terms will almost always have consequences for livelihoods, economies, politics, and conflict. Several guiding principles emerge from this refinement of definitions.

4.1. Principles for understanding pastoral systems

4.1.1. All pastoral contexts require mobility.

Mobility is not simply a strategy to cope with uncertainty, but a strategy to accommodate and take advantage of *all* types of spatiotemporal variability in forage availability. Even where environmental patterns are more predictable—as in the central Tajikistan case described here—it is still imperative that pastoralists can maintain livestock mobility to respond to predictable variability. Those working in these types of pastoral settings must still be vigilant about the dangers posed to mobility, including pasture fragmentation and dissolution or constriction of livestock transit corridors.

4.1.2. Some, but not all pastoral contexts are characterized by unpredictability.

It is admittedly difficult to categorize a pastoral system as ‘predictable’ or ‘unpredictable.’ Certainly, there is no single measure for unpredictability for pastoralists, and even if there were one, we would then have to determine a threshold for this hypothetical measure. A system may display more predictability at larger scales and less at smaller scales (Illius and O’Connor, 1999;

Sullivan and Rohde, 2002; Brottem et al., 2014), so scale of analysis would affect any assessment even with an established measure and threshold.

Despite the absence of a precise assessment tool, we can realize that in many pastoral contexts livestock mobility is more conditioned by cyclical environmental patterns than by dynamics of uncertainty, while in others the reverse may be true. Pastoral systems cannot be assumed to be unpredictable, and the presence of *some* unpredictability at certain scales or according to certain metrics does not denote the absence of regular patterns. In the Tajikistan case, there is some temporal unpredictability, but this does not change the fact that the system is mostly characterized by clear patterns. When seeking to understand or advocate for the need for livestock mobility, it is not always accurate to invoke 'uncertainty,' and doing so superfluously or exaggeratedly may in fact work against the end goals of such advocacy work by erroneously making pastoralists' land management priorities seem erratic and unamenable to legal protections. Diagnoses of uncertainty should always be empiric and never dogmatic.

4.2. Principles for pastoral land governance

4.2.1. Flexibility in access rules is not a required precondition for mobility

As described earlier, the term 'flexibility' has been invoked to describe both mobility patterns as well as institutional structures and social and spatial boundaries. Here we are focused on flexibility in this latter sense of access rules. Flexible or 'fuzzy' access rules have been identified as important for facilitating livestock mobility better than clear rules or fixed boundaries (e.g. Lane and Moorehead, 1994; Fernández-Giménez, 2002[19]; Bassett, 2009; Mwangi & Ostrom,

[19] Though focusing most on flexibility, Fernández-Giménez (2002) also frames secure use rights as threatening to mobility and reciprocity.

2009; Butt, 2016; Davies et al., 2016). However, there are two ways that stable access rules can maintain mobility. Firstly, it is possible that spatial or social boundaries are so large or inclusive that they can remain firm without ever being "crossed," even when livestock are highly mobile. Secondly, and more important to the current point, when territorial boundaries do need to be crossed, it is the *substance* of the access rules rather than their stability that determines whether or not they facilitate mobility. Indeed, dependable boundaries and access rules can facilitate mobility.

For over a century, legal scholars have understood property as a "bundle" of many different rights, which can be combined in diverse ways. This metaphor reflects how "ownership interests can be divided over time[…]and among different people, as in the case of concurrent interests[…]and common interest communities" (Baron, 2013: 58). With respect to property rights over natural resources, these rights can include many incarnations of rights of access, withdrawal, management, exclusion, or alienation (Schlager and Ostrom, 1992). Rights can only exist when they are protected by corresponding duties (Schlager and Ostrom, 1992), and the 'bundle' metaphor is also variously rendered as a bundle 'rights and duties' or 'rights and obligations.' This fuller view of property relations—rather than a caricatured view of all property rights solely as fee simple absolute ownership—makes clear that clearly defined rights are not antithetical to mobility.

Non-possessory property rights for access (rights to enter an area) and withdrawal (rights to take something from an area) can be given to individuals or groups with specifications for which manners and timing of use are permissible. More comprehensive possessory property interests—more akin to what may be commonly thought of as "ownership," often including rights of exclusion or alienation in addition to management—can be bound with certain duties,

such as an obligation to maintain a certain land use or allow other parties periodic access. A property arrangement, in sum, can be stable and secure without being absolute ownership.

Both governmental and non-governmental systems of rules and norms can produce and maintain secure and predictable property relations. The relative suitability, relevance, and authority of one system over another is context-specific (F. von Benda-Beckmann, 1997), but governmental law is often qualitatively different due to its symbolic stature and coercive power (Merry 1988). Examples of secure non-governmental property relations that facilitate livestock mobility include persistent agreements between farmers and herders that allow for post-harvest grazing on crop residues or even, as Moritz (2016) argues, reliable open access to certain common-pool resources as facilitated by duties of reciprocity. In formal codified law, there are examples such as government-owned livestock migration routes and accompanying livestock resting points, as are found in Tajikistan, or public lands whose grazing rights can be leased.

Servitudes are another important instrument of formal codified law that can facilitate mobility with clear, dependable rules. Fragmentation of rangelands into privatized parcels belonging to a patchwork of owners has rightly been identified as a threat to livestock mobility (see Galvin et al., 2008 and Galvin, 2009 for many examples), but privatization, individualization, and disaggregation of pasture areas are not insurmountable obstacles to livestock mobility. Servitudes—a long-standing class of agreement that includes easements, covenants, and *profits à prendre*—can grant certain land rights to parties other than the possessor and also restrict or direct the possessor's management of the land and do so in a way that endures even as properties change hands, "[giving] stability to property arrangements over both time and space" (Rose, 2011: 297). Servitudes can prevent fragmentation of *use rights* and grazable *land*

cover—types of fragmentation that can threaten livestock mobility—even in the face of fragmentation of ownership.

In Rasht district, there customary arrangements have arisen that function like servitudes. Every village's spring and fall pastures are actually aggregations of individual households' private fodder-growing plots. While these are treated as individualized plots for the summer months of fodder growing and harvest, in the spring and fall the owners open these areas up for grazing the animals that belong to any other resident of their village.

Secure dependable property relations can include a wide array of potential conditions, restrictions, and extents of rights to cater to a given context. For example, a group could have a clear, inalienable, and heritable right to graze up to 1000 head of small-stock in a certain area for up to 90 days a year between June 1st and October 1st as long as it does not cut any trees down or prevent transit of other herds. The person who possesses title to that land might not be allowed to develop or cultivate the areas used for grazing.

Property rights can be partial and circumscribed without being flexible, and it is the distribution of specific use and access rights that can facilitate livestock mobility and grazing in multiple non-contiguous areas. In contexts where the spatiotemporal patterns of relative forage abundance are highly unpredictable, then mobility patterns themselves must be flexible. In this case, such fixed access rules may not work, and emphasis should be put on fixed processes for negotiating access or resolving disputes (Niamir-Fuller and Turner, 1999), but as this chapter has shown, this is not the norm and it must be understood that institutional flexibility is not a precondition for mobility.

4.2.2. Pastoral land governance should be developed by looking for predictability, and efforts to maintain flexibility in access rules should be judicious and well-justified.

Flexibility in pastoral land use and governance can have costs. It is difficult to implement (Niamir-Fuller and Turner, 1999), can make land tenure insecure and resource access less reliable (Fernández-Giménez, 2002), and it is difficult to design governance systems for (Brottem et al., 2014). It may at times help pastoralists cope with environmental uncertainty, but it also introduces "knowledge uncertainty" which can confound management efforts by making the actions of others difficult to predict (Meinzen-Dick and Pradhan, 2002: 14; Ostrom, 1990). Maintaining regular spatial patterns of livestock movement can lead to longer and perhaps more cooperative relationships with other land users (McAllister et al., 2006).

Because of these costs, flexibility should only be advocated to the extent that it is necessary from a livelihood standpoint and not embraced as an immutable and inherent quality of all pastoral settings. Neither mobility nor flexibility are ends unto themselves. In this chapter, I have explained that mobility is a response to variability over time in the spatial distribution of pastoral resources, while flexibility is a response to especially unpredictable variability. As clarified in SECTION *4.2.1* above, mobility alone is not a sufficient justification for flexible access rules and boundaries. Even where unpredictable environmental variability necessitates flexible mobility and access rules, pastoralists can be understood as "primarily reliability seeking" (Roe et al., 1998: 387). So that those of us advocating for pastoralists are not unwittingly introducing needless obstacles to pasture access and governance, the presence and importance of unpredictable variability should be empirically assessed rather than assumed.

In short, pastoral land governance should be developed by looking for predictability. The patterns uncovered can then form the basis for creating secure tenure arrangements. To be clear,

I am not advocating for a *presumption* of stability or predictability but rather arguing against a presumption of unpredictability. In practice, there will inevitably be certain parameters that are more predictable and other parameters that are less predictable; in the process of identifying patterns in some parameters that influence livestock mobility, you will also end up recognizing those areas of persistent uncertainty that need to be accommodated. The approaches to find these patterns will be context-specific, and a set methodology for doing so is outside of the scope of this dissertation. In almost every context, the pastoralists themselves will likely be the single most important source for identifying patterns.

Because the scale of observation will affect assessments of predictability (Brottem et al., 2014), it should be assessed at multiple scales that are meaningful for the dynamics of the given system, including the scale of the entire area or region that a pastoral group uses over the course of several years. Assessments of important parameters at multiple scales may also uncover the scales at which certain parameters display sufficient regularity to suggest a particular land governance arrangement. That is, in looking for predictability, we may find the right blend of spatial scales and types of rules to best serve pastoralists.

5. Conclusion

This chapter clarified two pairs of bedrock concepts that we use to talk about pastoral systems: variability and unpredictability; mobility and flexibility. Variability and mobility are inherent to all pastoral systems, but it is just a subset of these where dynamics of unpredictability and flexibility are significant. In many contexts, the distinctions between these terms are subtle and difficult to parse. In the mountain pastoralism system of Tajikistan presented here, however, the differences are stark. Here, livestock mobility is an essential response to the highly

pronounced spatiotemporal variability of forage availability. The spatiotemporal variability in this system is conditioned by distinct seasons and altitudinal zonation—temporal and spatial patterns that are regular across years. As a result, the mobility patterns themselves do not require much flexibility beyond minor adjustments in timing of movements to respond to slight variations in the onset of assured seasonal changes.

By clarifying the differences between these terms, we can then tie mobility to variability and flexibility to unpredictability. This allows us, as scholars and advocates for pastoralists, to characterize individual contexts more accurately and assess governance requirements without erroneously over-diagnosing unpredictability and overprescribing flexibility. Without question, some pastoral systems are uniquely characterized by unpredictable environmental conditions that require flexibility in both livestock mobility patterns and the land governance institutions that condition mobility patterns. However, this chapter has shown that discussions of pastoralism—especially outside of academia—have exaggerated how often these characteristics are predominant. This chapter also introduced three types of justifications for livestock mobility—completing the set, hedging bets, and diffusing pressure—to help describe the mobility needs in a given pastoral system. To avoid deleterious mischaracterizations of pastoral systems and to make management of pastoral resources more tractable, I proposed first looking for predictability and building from the reliable elements of the system rather than starting with an embrace of unpredictability and flexibility.

Putting this into practice is not a simple or obvious task, and the conceptual clarifications and calls for predictability-first analysis are meant to provide a basis for further refinements. Future work is needed to articulate coherent methods for assessing unpredictability, including further investigation into the scale-dependence of notions of uncertainty (building from Brottem

et al., 2014) and perhaps development of a method to assess how the *relative* desirability among multiple distinct grazing areas changes over time, as this the precise type of variability that actually influences mobility. While this chapter mentions several options for codified, non-possessory land rights that appear theoretically compatible with the requirements of pastoral mobility, these are admittedly unproven and untested but deserve more scrutiny.

Regardless of whether these research directions are pursued further, this chapter should at a minimum serve as a modest call for future scholarship on pastoralism: distinguish between unpredictable versus predictable variability and flexible versus predictable mobility patterns.

Chapter 3
Beyond the Pasture: The Central Role of Fodder in the Dynamics of Land Governance and Livestock Ownership in the Rasht Valley

1. Introduction

The 2016-2017 winter was especially long in the Rasht Valley, and this was bad news for the valley's livestock owners. With the region's pastures locked up with snow for longer than usual, households' winter fodder[20] reserves were getting stretched, and by the early spring many households had lost a portion of their animals to starvation or illnesses exacerbated by malnutrition. One wealthy livestock owner lost 170 head of his 400 sheep and goats, and he became a common subject of conversation and critique in the area: "That idiot. If he had any sense, he would have sold or slaughtered animals so that they wouldn't die [naturally]![21] Just reduce your numbers."

From large herd owners down to the average household, everyone keeping livestock in this area requires both access to pastures to graze in the warmer months of the year as well as access to cut fodder to feed to their animals indoors during the colder part of the year, when pastures are snow-covered and ungrazable. This is a major change from the Soviet era, when most of the Rasht Valley's livestock population would migrate for weeks to spend the winters in the lowlands of southwestern Tajikistan. Livestock-based livelihoods today are strongly influenced by the governance of both grazing land *and* land for harvesting fodder to save for the winter.

---

[20] In this dissertation, I use "fodder" solely to refer to plants cut by people and fed to animals in contrast to "forage," which animals independently eat directly from the ground. This is a common distinction, but it is not universal.

[21] If an animal dies of starvation or illness, it is not *halal* and cannot be consumed. If he had slaughtered them, they would still have value as consumable meat.

This chapter focuses on the role of fodder and the land it grows on in Askalon and Hijborak sub-districts of Rasht district. Fodder resources—though often generalized in the pastoralism literature as a forage replacement that disrupts the sustainability of traditional pastoral systems–are a keystone of many mountain pastoral systems, including this one; fodder resources deserve dedicated attention not simply because of their importance for livestock owners but also because the way their distribution and governance impact the dynamics of complementary resources in a pastoral system, including labor, livestock, and pasture.

After positioning this case within the extant literature on fodder in pastoralism literature (SECTION 2), this chapter explains the role of fodder in the study area from the Soviet era to the present, using novel data to show the tight connection between fodder-land access and livestock ownership (SECTION 3). I then explain the post-independence agricultural land reforms and extra-legal dynamics that have combined to create the current landscape of fodder-land governance, which shapes patterns of livestock ownership (SECTIONS 4 & 5). The chapter concludes with a discussion of the implications of these livestock ownership patterns.

2. Fodder in pastoralism research

Cut fodder has not received much attention in pastoralism studies.[22] It is frequently framed as a substitute for grazing—moving food to the animals rather than moving the animals to the food—and frequently characterized as the categorically less efficient of the two, with respect to labor and financial costs (Niamir-Fuller and Turner, 1999; Herrera et al., 2014). This is especially true in research based in the arid and semi-arid tropics, which dominates pastoralism

[22] This section is specifically characterizing how fodder has been discussed in academic pastoralism studies. Cut fodder is certainly discussed by livestock development practitioners and studies of livestock nutrition and feeding.

studies. When scholars conclude that the feeding animals is replacing grazing, cut fodder is often implicated as a driver of sedentarization or reduced mobility (Singh et al., 2013). Hobbs et al. generalize fodder as a supplement rather than a replacement for forage; erroneously assuming fodder to always be an "external input" that is imported, they argue that fodder provision "decoupl[es] the plant-animal system," rupturing an erstwhile balance between animals and pasture vegetation by circumventing endogenous limiting factors on livestock populations (2008: 779). Presumably, the resulting larger livestock populations may then become vulnerable to downturns in forage supply during the seasons when forage availability is typically high, and the increased grazing pressure may also damage pasture resources. Other scholars have found that stall-feeding livestock with cut fodder can be a beneficial addition to a livestock system, yet still a discretionary practice that herders would have to decide whether to adopt (Addison and Brown, 2014; Mohamed Sala et al., 2020).

However, in many temperate contexts with severe winters, like the one described in this chapter, livestock owners have no choice but to stall-feed their animals for a portion of the year because winter snow cover renders grazing impossible within a realistic range of livestock mobility. That is, a migration to winter pastures that are not covered in snow is unfeasible either because of travel distance or, in this case, a lack of access rights in the distant location. While summer pastures are in areas that might be inhospitable for much of the year, pastures that are uniquely suitable for winter grazing tend to be in areas that are closer to settlements, where access rights for outsiders are less likely. In these situations, the provision of cut fodder is part of the seasonal cycle of livestock-keeping. Mobility is not purely decreased by the provision of fodder—which, in contrast to the above assertion by Hobbs et al. (2008), is often sourced locally and not imported—rather, fodder harvest is one major reason why mobility is imperative, as livestock must

be kept away from fodder-growing areas for certain stretches of the year (Guillet, 1983; Intigrinova, 2010). In other words, fodder is a complement rather than a substitute for pasture.

The critical importance of cut fodder has been recognized in studies of pastoralism in High Asia and temperate mountains more globally. In the Swiss Alps, scholars identified a mountain-specific agro-pastoral strategy where communities pool their livestock into collective herds, take them to higher-altitude summer pastures which are usually common property, and stall-feed their livestock indoors in the winter using fodder cut from individually owned plots. Referred to as *alpwirtschaft* or translated into English variously as "mixed mountain agriculture" or "combined mountain agriculture," this strategy has been recognized across the temperate mountains of Asia as well (e.g., Nepal in Rhoades and Thompson, 1975; Pakistan in Kreutzmann, 2004; the Caucasus in Schmidt, 2017). Though an overgeneralization, Fazlur-Rahman's assertion that "winter stall-feeding is the most important and determinant factor for herd size and composition…throughout the whole Himalayan, Hindu Kush, and Karakorum regions of High Asia" emphasizes the attention that cut fodder deserves in these pastoral systems (2009: 381). Many studies of pastoral systems where animals are fed indoors during the winter have indeed identified fodder access as the limiting factor for livestock production (e.g. Netting, 1975; Robinson et al., 2008; Robinson et al., 2012; Blatter, 2009; Intigrinova, 2010; Mandler, 2012; Azarov et al., 2020).

Fodder and the land from which it is collected are most often possessed and managed individually by households, though there are some exceptional contexts where cut fodder is managed as a common resource (Fazlur-Rahman, 2009). In contrast, pastures—or at least *some* of the pastures used by a community—are often managed as commons. In these situations, a household oscillates over the course of a year between depending on its *own* resources and being supported by *communal* resources to sustain its livestock; this is one of the defining features of

mixed mountain agriculture.

Pasture and fodder resources have the potential to interact in two main ways. Firstly, there is a positive correlation between the demand for pasture and fodder: an increase in fodder availability, for example, can allow for larger livestock holdings and, therefore, more demand for pastures when weather allows for outdoor grazing. Secondly, there can be a negative relationship between the land allocated for grazing and the land allocated for fodder production. Grazing is typically prohibited from fodder-growing areas for long enough to allow for a sufficient stand of vegetation to grow. Swathes of land—sometimes referred to as 'meadows' versus 'pastures'—can be dedicated to fodder production alone (Netting, 1975), but in some contexts the prohibition of grazing is not purely spatial but temporal, with fodder being collected from areas that are grazed outside of established periods of herd exclusion (Smith, 2000; Kissling-Näf, Volken, and Bisang, 2002). Whether or not fodder-growing affects grazing resources depends on the type of fodder grown, as sown and irrigated fodders such as alfalfa and sainfoin will tend to just displace other crops (Sedik, 2012)—though they may be part of a crop rotation scheme—while natural hay will usually compete with grazing land.

3. The role of fodder

3.1. History of livestock, fodder, and pastures in the study area

These days, the residents of Askalon and Hijborak sub-districts own the livestock that they care for and the use rights for the pastures and fodder-growing land that they manage. For the decades when Tajikistan was part of the Soviet Union, however, most of the land and livestock belonged

to state farms.[23] Households did privately own livestock but were limited to ten head of small-stock (sheep and/or goats) and three head of cattle. Livestock holdings were inspected, and households that exceeded these numbers had to turn over excess animals to the state. Private and state animals were grazed in separate herds on separate pastures. State animals tended to graze on better pastures farther from the village. In the fall, the majority of the state livestock would leave the region and travel for roughly 10 days to lowland winter pastures 150 km away in Danghara district of Khatlon province. Privately owned animals were not allowed to use these distant winter pastures and remained in their home regions, where snow cover required livestock owners to stall-feed animals indoors with harvested fodder. Access to winter pastures greatly reduced but did not eliminate the fodder needs of state livestock, which were given supplementary fodder, especially when pregnant, nursing, or when forage in winter pastures was insufficient.

Just as state-owned livestock and privately held livestock were grazed on different pastures, areas that grew fodder for the state-owned animals were distinct from the areas where people collected fodder for their own household's animals. State-farm fodder areas tended to be in more open and flat areas, where fodder could be harvested with agricultural machinery or at least with large scythes (Kislyakova and Pisarchik, 1966). Many of these areas were also irrigated, which allowed for the cultivation of leguminous fodder crops, especially alfalfa and sainfoin. These were often ensiled and turned into haylage (Taj. *tarbeda,* Rus. *senazh*), which retains some moisture and partially ferments, providing more nutritional value than fully dried fodder. In contrast, private fodder was natural hay grown in tight, sloped areas; harvested with hand sickles; and dried.

[23] I use this broad term to refer not only to sovkhozes ("state farms") but also the earlier kolkhozes (literally "collective farms"), as the specific differences between these two structures in this part of Tajikistan are not relevant to the current chapter, even though in some contexts the distinction may be important.

As with other agricultural products, there were official quotas set for the amount of fodder that state farms were supposed to produce, with specific sub-quotas for the amount of haylage, which averaged around 40% (by weight) of total fodder in this region of the country (*Qarotegini Soveti*, 1976). In an article on the eve of independence titled, "Private livestock are not outsiders," one journalist complained that while state farms in mountainous regions were producing 140-180% of their fodder quotas for the government, the workers were not able to provide sufficient fodder for their own household's animals, partially because they were not able to get enough time off work to harvest private fodder at the required time (Afzalov, 1990).

In 1991, Tajikistan gained independence as the Soviet Union dissolved, and from 1992 to 1997, the country was gripped by a civil war, with considerable fighting in the Rasht Valley, which includes what are now the Hijborak and Askalon sub-districts. The onset of civil war ruptured long-distance livestock migrations from the mountains to the lowland winter pastures. By 1997, herds had completely stopped making this migration. Livestock owners from the mountain communities in Rasht say migration of their animals to the lowlands ended because their animals were now privately owned, and only state-owned animals had permission to use the winter pastures previously grazed by Rasht-based livestock. Limits on private livestock ownership were lifted. As government fodder quotas disappeared, the irrigated flatlands of Hijborak and Askalon that had been used for alfalfa and sainfoin production were converted to crops for human consumption, especially potatoes. Silage operations ceased.

3.2. Fodder today

While overall fodder production in the region has decreased since the Soviet era, *household* demands for fodder have increased because of the larger private livestock holdings and the cessation of migration to winter pastures in Khatlon province. Households in the study area stall-

feed their animals with harvested fodder for 4.5 to 7 months of the year. Though not the sole variable, the length of time that animals spend in animal barns (sing. Taj. o*ghil* or *oghilkhona*) is largely dependent on the elevation of the village, with each 100 m of elevation gain leading to an average of six more days inside (see FIGURE 3.1). In some villages, animals spend more time eating harvested fodder than they do grazing.

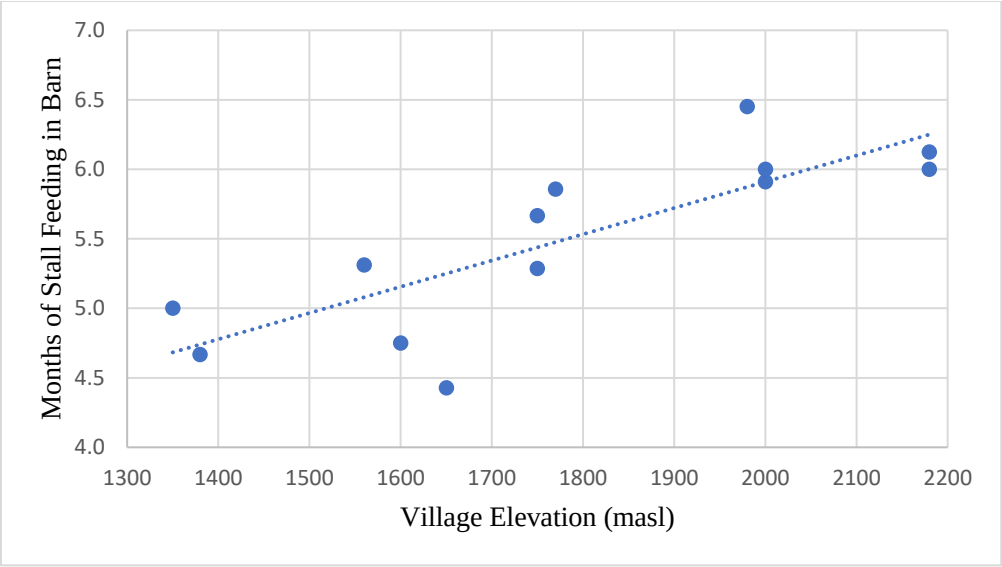

FIGURE 3.1: Mean number of months kept in animal barn (based on this study's household surveys) and village elevation in Askalon sub-district. (Author)

The amount of time that animals are kept in barns varies slightly year-to-year based on the weather. In the fall, animals start being stall fed once the communal near-village pastures are locked up with snow, which tends to happen within the same four-week window each year. In the spring, sheep and goats will leave to graze as soon as the snow melts, first eating any vegetation that was present underneath the snow. Cattle generally stay in the barns until the new grass starts to grow and begin their grazing about a week after the sheep and goats. As in the fall, the spring start dates for grazing—in the same near-village pastures grazed in the fall—can vary by up to a month from year to year. Individual households that are especially low on fodder may send their animals out earlier than the rest of the village, but most families within a village send

their animals out to graze at the same time, as the village's livestock graze together in aggregated herds. Since duration of feeding in barns depends on duration of snow cover, livestock owners do not know in advance how long they must provide fodder for their animals in a given year.

Almost all the fodder people harvest in the study area is natural hay [Taj. *kahi tabii*], meaning that it is vegetation that grows on its own without cultivation. Natural hay comprises whatever plants grow in households' fodder plots. People recognize that some plants are more useful than others—for example, the perennial legume *Vicia tenuifolia* [Taj. m*unj* or *munch*] is recognized as especially nutritious—but because people reap their entire plots, livestock owners in the region pay little attention to the particular species present in their natural hay.[24] An exception to this is *yughan* (*Prangos pabularia*), which predominates in some households' fodder plots, and must be differentiated because its oils can blister bare skin and, though often fed to sheep and goats, is not fed to cattle and reportedly will blind any horses who ingest it. In the highest elevation village, hogweed (*Heracleum spp.,* Taj. *kurush*) has significantly encroached on fodder plots and has become a major impediment to natural hay production.

Some households also cultivate fodder crops—sainfoin, alfalfa, or both—in addition to harvesting natural hay, but this is not a significant portion of the area's fodder production, unlike during the Soviet era. Only 10-20% of the households in the study area cultivate any fodder crops at all, and those who do estimate that only around 20-25% of their fodder is cultivated. Household fodder cultivation is limited by the cost and availability of fodder seed and access to enough suitable land. People grow these fodder crops on land that is relatively flat and has good soil. Many will only grow these crops on irrigated land. Alfalfa must be irrigated and sainfoin

[24] This is not to say that there is no *knowledge* of the different species, especially among those with considerable herding experience. Some people may harvest particular plants for their medicinal properties, paying close attention to species, but this would be an inconsequential portion of someone's fodder plot.

can only be harvested once a year in this area on rainfed land but twice when it is irrigated. Only a small percentage of most households' land is irrigated, however (See TABLE 3.1[25]), so this land is usually reserved for higher-value crops, with fodder crops rotated in. Alfalfa is often rotated with potatoes, and sainfoin can be rotated with potatoes or wheat. Even among those who cultivate fodder crops in some years, the yield varies significantly from year to year depending on where they are in a multi-year crop rotation schedule oscillating between fodder and other crops.

TABLE 3.1: Percent of land that is irrigated. Figures calculated by author from official State Land Committee statistics from 2016

Sub-District	Percent of Land that is Irrigated		
	Total in District	Mean for Titled Lands[26]	Median for Titled Lands
Askalon	0.6%	9.5%	4.0%
Hijborak	0.3%	7.7%	0.9%

The vast majority of the fodder is grown on sloped, rainfed (Taj. *lalmi*) land that is usually located farther from people's homes than the croplands, but this depends on the topography of the immediate area. In the rainfed fodder-growing areas with relatively good soil and shallower slopes, some families will occasionally rotate in lentils, chickpea, flax or, as explained above, sainfoin crops, but this is not the norm (See FIGURE 3.2). Though fodder crops are sometimes planted as part of a crop rotation scheme areas mostly dedicated to food crops, I am only referring to the sloped rainfed areas that are *primarily* used for fodder when I refer to "fodder land."

[25] See SECTION 4.1 for implications of the higher percentage of titled land that is irrigated.

[26] "Titled lands" are individual dehqon farms, and those figures are the mean and median percentages among those lands, not a percentage of the aggregate land within individual dehqon farms.

FIGURE 3.2: Fodder land with small field of flax (in center with yellow flowers). (Author.)

In this region, there is a single harvest for natural fodder. It begins in July and can continue into September. Haymaking is a famously rain-dependent task, and households are careful to avoid cutting the grass if they are aware of any upcoming rain. Almost all fodder is cut by hand using either hand sickles or, more rarely, long scythes. A handful of families have sufficiently flat and accessible fodder plots and enough cash on hand to hire a tractor to mow their plot, but this is very rare in the area. Fodder is cut and bunched into small piles (Taj. *tupcha*) to dry in the field (see FIGURE 3.3). After the grass is dried, it is tied into bundles (Taj. *darza*) and stored under cover, usually in the animal barn (see FIGURE 3.4). 'Bundles' are the primary unit of measurement people use when quantifying fodder amounts, which can be confusing since bundles are not uniform in size. Excess fodder can be stored outside in a giant haystack (Taj. *khav*) (see FIGURE 3.5).

FIGURE 3.3: Freshly cut fodder piled and drying in the sun. (Author.)

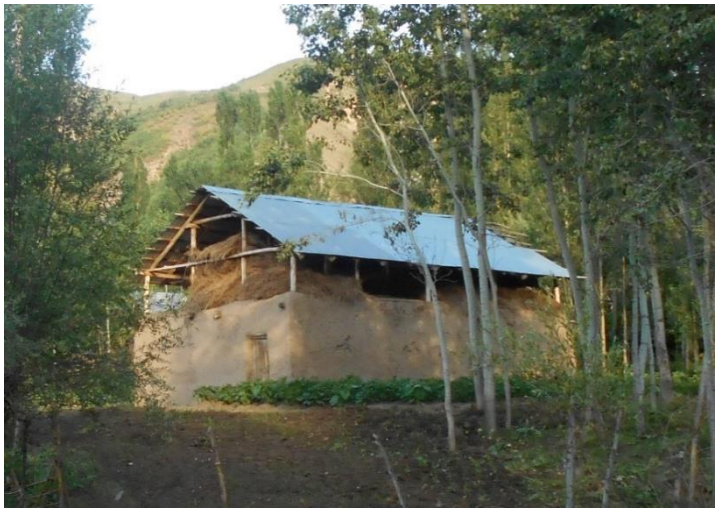

FIGURE 3.4: Animal barn with full hayloft. (Author.)

FIGURE 3.5: Haystack belonging to one village's wealthiest household. (Author.)

Unlike cultivated crops, natural hay is not tended, so no labor is required except for harvesting and bunching into piles. If rained on while still drying in piles, the fodder will rot and become unusable, so it is important to cut, pile, dry, and transport the fodder in as short a period as possible. More than other harvests, then, the fodder harvest requires a substantial short-term increase in household labor. Urban residents will often travel to lend their labor to their rural relatives at this time, and village neighborhoods are often especially quiet, with a huge portion of the residents toiling all day up in the fodder-growing hills. Wealthier households will sometimes pay teams of laborers to help them harvest their fodder.

Heated debates and expressions of disapproval during focus group discussions revealed strong differences of opinion in how to manage feeding rates over the winter. The more common school of thought holds that you must always feed your animals as much as they wish to eat, filling them up with every feeding. A sizable minority, however, advise that you need to first take stock of how much fodder you have, and then feed your animals at a rate that you have enough fodder reserves to maintain until one month beyond the average date when stall feeding ends in the spring. The dominant method—basing the feeding rate on animal health or demand rather than fodder stores—especially makes sense for families who have the means to purchase fodder from those with excess reserves or for families who can rely on receiving emergency fodder from relatives or neighbors or who can even give their livestock to another household to house and feed for a portion of the winter, a practice that has existed for generations (Kislyakova and Pisarchik, 1966).

Of course, a household would ideally have sufficient fodder reserves that they would never have to decide between the two feeding strategies listed above, and many households try to maintain fodder reserves that carry over from year to year. However, the significant livestock

losses endured by many people in the study area during the long 2016-2017 winter show the difficulty many people have with fodder supplies. Household surveys help us understand the prevalence of these difficulties. Of the livestock-owning households surveyed (n=92), 55.4% said that access to winter fodder was a problem they faced, and 33.7% of the sample said this without being prompted to comment on fodder specifically. When asked to identify the most significant livestock-related problem they faced, 27.2% said supplying winter fodder, second only to livestock disease (39%). In contrast, no respondent said that accessing summer pastures was the most significant difficulty.

In sum, as in many other temperate mountain settings, winter fodder is the primary limiting factor on livestock holdings in the Rasht Valley. Livestock fatten up when they are grazing on pastures and begin losing weight to varying amounts—sometimes starving to death—during the winter. In the words of one livestock owner, “The households who raise livestock calculate how many head of livestock they are able to save fodder for. Here, they just need to think about the winter. Every fall and winter I sell my excess [animals]. I calculate it all.” Another interviewee explained, “If you have a lot of livestock, if you try to increase your livestock holdings, you won’t find [enough] fodder for them.” Here, fodder is not an external “decoupling” influence on the local socio-ecological system, but an integral piece of it, with fodder supplies tied to the individual fodder plots owned by livestock owners.

3.3. Livestock and fodder land: A tight connection

A household’s fodder supply is limited by the amount of fodder-growing land they have. Aside from harvesting fodder from one’s own land, the only other way to obtain fodder is by purchasing it. According to household surveys, only 24.7% of livestock-owning households purchase any amount of fodder. Even among those who *do* purchase some fodder, the average

household still gets the majority of its fodder (56.2%) from their own land. This is likely because the profit margins for sale of live animals—the method by which people in the study area make money from their livestock— are too small with purchased fodder to encourage people to get many more animals than their land can support.

Interviewees said that sheep and goats require an average of 110 bundles of fodder per head per winter, and cattle require an average of 500 bundles of fodder per head per winter. Though fodder prices fluctuate over the course of the year, peaking in late winter, someone planning ahead could purchase fodder in the fall for 5 TJS per bundle. The cost of feeding livestock solely on purchased fodder for an entire winter would then be 550 TJS for a sheep or goat and 2500 TJS per head of cattle. In 2016, the average sheep/goat price was 365 TJS and the average cattle price was 3300 TJS. Thus, the cost of feeding a sheep or goat solely on purchased fodder for one winter exceeds the amount that could be recouped by selling the animals, while a modest profit could be made off of cattle if kept for only one winter. The margins appear even worse when considering that animals are often kept for several winters before sale. For comparison, landowners only pay 8 TJS[27] of annual property taxes for a hectare of non-irrigated natural hay land, which can supply a household with around 500-1000 bundles of fodder in a year (mean of 786 bundles per hectare, according to household surveys).[28] To be clear, feeding an animal some purchased fodder to keep it healthy and alive during the latter part of an unexpectedly difficult winter can still be worth it, but acquiring new animals with the plan of purchasing 100% of their winter fodder is not profitable.

[27] Tax rate in 2016.

[28] Data on fodder yields was collected by both household surveys and focus groups. Fodder yield data from surveys was calculated by dividing reported yields by reported fodder land holdings, while in focus groups participants were simply asked how much fodder one could harvest from a single hectare of fodder land. The range of calculated responses using the survey data was extremely wide, 90-3500 bundles per hectare. The mean of 786 bundles per hectare was calculated with the outliers removed from the set. This seems to comport well with the focus group responses, which ranged from 400-1000 bundles per hectare.

Because the size of fodder land holdings is the main determinant of fodder supply and fodder supply is a limiting factor for livestock holdings, there are very significant correlations between a household's fodder land and number of livestock owned. The Pearson coefficient for the correlation between reported area of fodder-growing land and reported livestock holdings (in sheep units)[29] is 0.335, with a p-value <0.01. Slightly stronger ($r=0.454$, $p<0.01$) is the correlation between the number of bundles of fodder reportedly harvested from one's own land each year and reported livestock holdings. It makes sense that this would be slightly stronger, as fodder yields per hectare vary. Though statistically very significant, these correlations are only moderate because not everyone chooses to raise the maximum number of livestock every year that their fodder production capacity can support.

A household's fodder-growing land holdings, then, are significant in establishing the upper limit of how many livestock it can own. "We raise livestock in accordance with the land and grass that we have," summarized one informant. Understanding patterns of livestock ownership requires an examination of patterns of *fodder land possession*.

4. Land reform & the acquisition of land use rights

On the eve of independence, land beyond a family's home and yard belonged to the state. The effectively private yards—also written about in English as "household plots" or "kitchen gardens" and known in Tajik as *havli*s or officially *zamini nazdihavligi*—were used for both household and market-oriented fruit and vegetable production (Rowe, 2009) but have never been

[29] Using interview and focus group data about feeding rates, cattle and horses were counted as five sheep units per head. Sheep and goats were one sheep unit per head. This is in line with livestock unit coefficients suggested by the FAO for Sub-Saharan Africa and the Near East, but differs slightly from their suggested conversion of six sheep to one cattle for "Transition Markets," which could include Tajikistan (FAO, 2011: 37).

important for fodder production or grazing. Like most of Tajikistan's agricultural land, fodder land and many pastures were on the territories of collective and state farms and were thus officially governmental resources, even if individual households were allowed to use some land to graze and cut fodder for their limited number of private household animals. This began to change as soon as Tajikistan gained independence, with the introduction of the first land reform laws in 1991. Since 1992, over 30 laws and decrees related to land and farm reorganization have been issued. Because of the tumult of the 1992-1997 civil war, however, these legal developments had little to no effect on the ground until around 1998 (Hofman and Visser, 2014).

4.1. Background: Understanding privatization, individualization, and dehqon farms

The most consequential laws of Tajikistan's post-independence agrarian reform—and most relevant to fodder access—are those that have determined the fate of the lands that made up Soviet-era state-run farms, sovkhozes and kolkhozes, which ceased to exist on paper shortly after independence. By 1992, the legal instruments were in place for these farms to not only become *privatized*—turning the state-controlled collective farm into a *non-state* collective farm—but also *individualized*—broken up into many independent farms belonging to a single household or extended family. The private farms that emerged out of the Soviet state-run farms became known as "dehqon[30] farms"(DFs), a term that has always referred to both large collective farms and individualized farms. Notably, relevant laws did not distinguish between pasture and cultivated land, lumping these together into a single "agricultural land" category (Hayward, Hofman, and Gillin, 2022). More specific sub-categories of "agricultural land" are delineated, however, in the

[30] In English language texts, this word, meaning "villager" or "peasant," is transliterated myriad ways (e.g. dekhan, dehkhan, dekkhan) either in error or due to Tajik-to-Russian-to-English translation. Here I transliterate directly from the Tajik spelling. It is pronounced, more or less, day-CONE.

legal documents conferring use rights to specific pieces of property. On these documents, fodder growing land is listed as "pasture" (Taj. c*harogoh*) despite the existence of a rarely used "meadow" (Taj. *alafzor*) category, but the same legal framework applies regardless of the recorded land cover category.

Privatization was a prerequisite for individualization but did not entail it. With privatization, the Soviet-era state-run farms became *collective DFs* (i.e. 'private' in the sense of not state-run, but *not* belonging to an individual person or household). Early on, this transformation was often semantic, and little changed in the farms' operation and leadership (Rowe, 2010). According to the "Law on Dehqon Farms",[31] each former permanent worker of the erstwhile sovkhozes and kolkhozes should receive an equal share (Taj. s*ahm*) of the newly formed collective DF (Robinson et al., 2008). Some households did not include former permanent state farm workers, while others included multiple ones, so the distribution was not designed to necessarily be equal for every household. Collective DFs have a farm head (Taj. *rais*) who is supposed to be elected by the members. In the study area, there is generally one collective DF per village. The same law gives shareholders or "members" of collective DFs the legal right to withdraw their share from the collective DF to form an individual DF; this is 'individualization'. Individualization is a piecemeal process that is driven by farm members' gradual removal of their shares from the collective farm; it is not a top-down, simultaneous splintering instigated by farm leadership.

Land use rights for former Soviet state and collective agricultural land can be held either in the form of a *share of a collective dehqon farm* or as an *individual dehqon farm*. It is important to understand these as context-specific legal terms; they are *not* markers of collective versus individual

[31] The first Law on Dehqon farms was ratified in 1992, but has been revised several times, most recently in 2016.

use and management. Each of these two forms has its own type of documentation. Shareholders have a document that indicates the amount of land in their share, broken down by land type in proportion to the makeup of the entire collective dehqon farm—for example, 0.2 ha irrigated cropland, 0.7 ha rainfed cropland, 0.1 ha orchard, and 1.5 ha pasture—but this document does not specify where within the collective DF any of this land is located. In contrast, when a person withdraws their share to form an individual DF, the district office of the State Land Committee will determine specific boundaries of a parcel that conforms to the types and quantities of land in their share, and the new owner of the individual DF will have a land *certificate* that maps out the precise boundaries of their land. To match the variety of land types in their share, a single DF can often comprise several non-contiguous plots of land (See FIGURE 3.6).

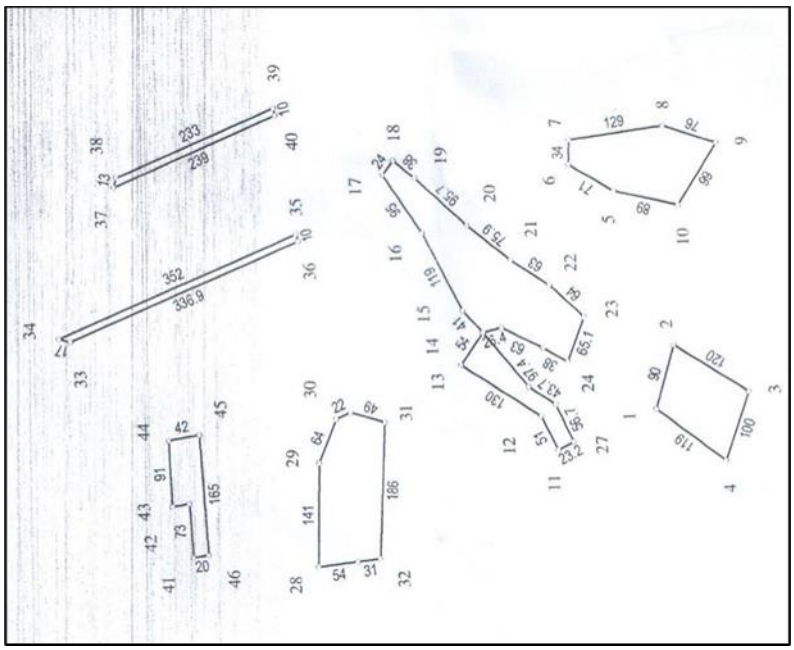

FIGURE 3.6: Boundary map for individual dehqon farm extracted from actual cadastral document. Source: State Land Committee, Rasht District, Tajikistan. Extracted by author.

Despite the seemingly major legal and semantic distinctions, the differences *in practice* between being a shareholder in a collective dehqon farm and having a certificate for an individual dehqon farm are not consistent or obvious (Hayward, Hofman, and Gillin, 2022).

Even though a shareholder's document does not indicate a particular area that belongs to them, a shareholding household almost always has exclusive and widely respected de facto individual use rights for a clearly bounded, spatially fixed plot of land, including fodder land. That is, *households manage their cropland and fodder land individually, even if the land they work is legally a portion of a collective DF*. Conversely, those who hold certificates for their own individual DFs do not always *use* the precise land that the certificate indicates, and owners of an individual dehqon farm in one region may have less de facto autonomy in how they use their land—for instance, control over what they plant—than a shareholder in another region (USAID, 2017). Crucially, the law prohibits the sale of either collective DF shares or individually owned DFs; they are either inherited or divided among relatives.

4.2. Post-independence acquisition of agricultural land use rights in the study area

Privatization of state land is almost complete in the study area, but individualization is partial and ongoing. District land records show that, in 2016, 90% of the agricultural (both crops and pasture) land in Askalon and Hijborak was legally classified as dehqon farmland, and therefore private, which is much higher than the national figure of just 65% of arable land alone for the same year (TajStat, 2017). From 2005 to 2015, the total number of *individual* DFs in these two sub-districts quadrupled from 57 to 244.

Those who have obtained certificates for individual DFs seem to mostly have been pursuing[32] arable land rather than land officially classified as "pasture" or "shrubland," which is used to harvest natural fodder. Official statistics in the study area show that individual DFs have

[32] Individual DFs are often created by an individual withdrawing their share of a collective DF, but there are many cases—especially in the earliest years of land reform when savvy, well-connected people were using the immature and poorly understood system to amass land—where getting a certificate has meant acquisition of different, larger areas of land; this process is opaque, seldom discussed openly, and has perhaps often been illegal. It in these cases that one would be "pursuing" a specific type of land.

a higher proportion of arable land[33] than collective DFs do (see TABLE 3.2) as well as a higher proportion of irrigated land (see TABLE 3.1), which is generally not used for fodder production. This suggests that fodder production is not a primary driver for land individualization, and that most fodder production is happening within collective DF land.

TABLE 3.2: Discrepancies in % arable land between collective and individual DFs. Calculated by author. Source: Land balance from State Land Committee of Tajikistan.[34]

Location	Individual DF - % Arable	Collective DF - % Arable
Hijborak (sub-district)	12%	3%
Askalon (sub-district)	16%	8%
Kul (village)	42%	6%
Sharkho (village)	39%	3%

These discrepancies also indicate that land distribution inequitably flouted agrarian reform policies. As described in SECTION 4.2, the law dictates that every share of a particular collective DF—the unit of agricultural land that can be converted to an individual DF—should have roughly equal proportions of each officially distinguished land type. If this policy were followed, the proportion of land types in a collective DF and the individual DFs that split off from it should be equal, no matter how many collective DF shares are converted to individual DFs. There is no data available on the relative distribution of land types and quantities for households who solely own shares in collective DFs.

Inequality and illegality of land acquisition has been documented throughout the country during the initial post-independence disorder and instability as well as in the calmer years after the end of the civil war in 1997 (Gomart, 2002; Robinson et al., 2008; Halimova, 2012; Mandler,

[33] Note that all figures are based on official classifications of "arable land" rather than data that shows this land is actively cultivated and used as cropland. In general, there is government surveillance and pressure to ensure arable land is being used productively, so it is unlikely that there is a major discrepancy between the percentage of land classified as arable and the percentage used as cropland.

[34] Kul and Sharkho villages selected for table based on data availability.

2012; Robinson et al., 2012; Klumper et al., 2018; Hofman and Visser, 2021). Interview and focus group responses in the present study corroborated other authors' conclusions that patterns of land access were influenced by asymmetries in 1) knowledge about property law and legal processes, 2) personal connections with government employees who can assist in the process, and 3) financial means to pay the necessary bribes on top of standard fees.

Despite irregularities in land acquisition that benefited elites and well-connected households, the distribution of land was far from an opportunistic free-for-all. State legal provisions for equitable distribution of land based on the number of former sovkhoz workers in each household—though not fully or uniformly applied—*did* have strong influence on land distribution, and extra-legal social norms of respect for prior use also affected distribution.

In contrast to the legal provisions, which only concerned the amount of land, norms regarding prior use also helped shape *which* land households would have access to. Legal provisions and social norms of prior use *could* be complementary, with the latter determining the location of a households' land and the former defining the quantity. Or the two could be in conflict, with a household using either more or less—either officially or solely informally in the eyes of the community—than the amount of land they would seem to have legal claim for.

In focus groups and interviews, people repeatedly discussed the continuity in land use in the face of political, economic, and legal upheavals. One person expressed longing for the Soviet era, because he had the exact same fodder-growing land back then, but now he must pay taxes on it. Others in the same village claimed that they were cutting fodder from the same land that their family had used since the 1940s, except for portions of their land that they had voluntarily given to new families moving to their village. Many reported that a family's history of land use "was taken into consideration" [*ba nazar girifta*] when the government legally granted land rights for

areas (e.g. in the individualization process) that were previously part of the sovkhoz. “If I was using the land in the previous era,” explained one interviewee, “They would give that land to me, make a document and give it to me.” In a neighboring district, Mandler found that “plausible requests for land are often developed by those who were able to underline habitual use,” and that in general there was “broad acceptance” of claims to ancestral property[35] (2012: 21).

Informants in many villages explained that with fodder-growing land there was more continuity in land use rights—less reorganization and reallocation—than with either cropland or pastureland. Fodder for household consumption was collected from steep slopes [Taj. *jariho*] because the sovkhoz “only used the flat areas [Taj. *dasht*] where tractors could operate.” Fodder for state-owned animals was harvested from these flat areas. While the former state-owned fodder land was converted after independence to individual food crop plots, hillside fodder has been harvested by individual families in both Soviet and post-Soviet periods.

The above-mentioned forces shaping current distributions of land—1) the official legal frameworks, 2) opportunistic acquisition by wealthier, better connected, and better-informed households, and 3) histories of prior use—were not three mutually exclusive pathways to acquiring land but interacting influences that rarely worked individually. As time goes on, the subdivision and conveyance of property to children starting their own households has become an additional—indeed, perhaps the most currently salient—factor shaping land holdings. As shown above, households displayed a clear prioritization for arable land rights, and the relevance and weight of those three forces is different with fodder land, where official legal frameworks and

[35] In Kuhistoni Mastchoh district, Mandler (2012) found this local institution referred to as “*bobogi*.” I am intentionally not using that term here, though I am describing a similar if not identical practice. Though people in Rasht recognize, of course, the standard Tajik word “*boboi*” as meaning “pertaining to or belonging to one’s grandfather,” they did not use or recognize either “*boboi*” or “*bobogi*” as the name of any sort of land-related institution in the way that Mandler uses it.

elite capture appear less influential. In the next section, we turn to the current state of fodder land access and governance in the study area.

5. Present-day possession of fodder land

5.1. (Non-)alienability of fodder land

Fodder plots are managed individually by a single household. The borders between them are clear to residents, universally agreed upon, and stable (See FIGURE 3.7). By all accounts, all fodder-growing land has been attached in some way or another to a household, so there is no unclaimed fodder land to acquire, nor has there been any reshuffling of fodder-land possession in the study area in the last decade. There also appears to be very little *potential* for future reshuffling, given the current legal prohibitions on sales of dehqon farmland. This is reflected in household surveys, where—of the 50% of respondents who said they wished they had more land—the majority (52%) said that they were not able to get more land because either there is no land available or the land that they would want is not available. In contrast to the reported dynamics of land acquisition right after independence, very few respondents cited a lack of information about the legal process (4%) or a lack of connections in government (7%) as obstacles to acquiring more land.

FIGURE 3.7: Fodder growing area, with boundaries between plots discernible by minor undulations and changes in vegetation. (Author.)

However, a lack of money was commonly identified (39%) as a key obstacle to obtaining more land. Sufficient money, importantly, has the power to circumvent other obstacles. In interviews and focus groups, the same individuals who exasperatedly replied "There's no land left to get!" when I asked why they didn't try to increase their holdings would also sometimes explain to me that "Anything is possible with enough money." In other words, the legal obstacles to land transfers could be overcome with sufficiently large illegal payments. When asked, hypothetically, whose land they would try to acquire if they had enough money, several people mentioned only State Reserve Land that is leased to non-locals for summer grazing. Interestingly, three major landowners who have each recently acquired over 100 hectares have all received previous State Reserve land that had been used by non-locals rather than obtaining land that had belonged to other members of their community.

Fodder plots only change hands when children in a household come of age, get married, and move away from their parents' home to form their own new household. In this case, the head

of household will actually transfer a portion of land to his child—I am only aware of this happening with sons—rather than simply sharing the harvested fodder among the households. The parents, of course, want to make sure that their children's families are well provided for, but they are not thrilled about their diminishing landholdings. *Without exception*, respondents in every focus group would animatedly bemoan how much the area of fodder-growing land in their village had decreased over the last ten years. Asked to elaborate, it was clear that they were not referring to an absolute decrease in the total area of fodder-growing land but a decrease in the area per household as the natural fragmentation of households leads to ever-increasing fragmentation of plots of land.

> *KG:* So when you said that the fodder-cutting land was getting smaller, that's all your relatives' fault!
> *FGD Participant:* Not our relatives' fault but our *children's* fault! [All participants laugh]. The population is getting bigger, and you have to give [fodder-cutting land to them].

Despite ubiquitous concern about the decreasing amount of fodder land *per household*, nobody spoke about the amount of fodder land *per head of livestock*. The latter ratio is more relevant, since it is the number of livestock that is more directly related to fodder demand than the number of households, and the livestock population in the sub-districts is steadily increasing as households invest more in their livestock holdings.

5.2. Rules and norms underpinning claims to fodder land

Households' fodder-growing plots vary in size, vegetation, remoteness, and slope, but the use rights tied to them are identical for all households across the study area: rights are permanent, heritable, and also transferable (i.e., before death) to one's children; boundaries are clear, heeded, and uncontested. But these uniform land rights are the de facto rights. Interestingly, there

is much *more* variety in the informal and formal underpinnings of the rights that are exercised, and it is unclear to what extent the type of justification for a household's rights even matters.

5.2.1. Governmental laws

In general, the knowledge of governmental property law is uneven in the area. Many residents are unfamiliar with the distinctions between individual and collective dehqon farms or their accompanying documents. Many interviewees and FGD participants used these distinct legal terms interchangeably and would also refer to categories of land, such as "community land," that do not correspond to official legal definitions. Even the official land administrators at the sub-district level did not necessarily know the laws well and said they never received any training or communications about land reforms; one said he would learn about new laws by reading about them in the local newspaper. These confusions rendered unusable some household survey data collected by enumerators about forms of fodder land possession, but during interviews and focus groups that I conducted myself, I was able to clarify ambiguities with follow-up questions to better understand the diversity of access arrangements.

Fodder-land holdings are justified by a mix of governmental and customary rules and norms. Even on a case-by-case basis, these are not mutually exclusive, with a single household's claims to their fodder land undergirded by a blend of justifications. There are four different legal instruments that were found to be relevant. The overwhelming majority of fodder land was in dehqon farmland, and most households' plots were part of a collective DF rather than part of an individual DF. A few households interviewed collected their fodder from so called "Presidential land" (Taj. *zamini presidenti* or *zamini yorirasoni* [lit. "assistance land"]), which is land granted by presidential decree to land-poor households; however, most Presidential land is sown with crops. Finally, residents of one village made one-year contracts with an agricultural enterprise

located 190km away in Khuroson district for use rights to State Reserve Land adjacent to their village but under the control of that distant company because of a national cross-district land allocation policy that gives lowland districts access to high-elevation land in mountainous districts in order to facilitate long-distance transhumance.

5.2.2. Extra-legal aspects

None of the legal instruments above functions independent of customary arrangements, which can either complement or contradict the provisions of the formal legal instruments by determining the de facto *location* and *size* of a household's fodder plot. As explained in SECTION 4.1, shareholders in a collective DF have a legally registered amount of land, but the location is always determined outside of the confines of the law. In the case of fodder, it seems that this is usually based on prior use, and certainly in recent decades a given shareholding household's fodder lands have not been changing within the boundaries of the collective DF.

In contrast, a certificate for an individual DF indicates the precise boundaries of the holding, listing the spatial coordinates for every vertex of the boundary. While these official borders accurately reflect the de facto use of the *cropland* farmed by owners of individual DFs, this is not true when it comes to their fodder land. All land that is predominantly natural grass is officially classified as "pasture," including on certificates. When someone creates an individual DF, they are given a mix of land classes, which should be in proportions that match the proportions of land classes in their original share of the collective farm rather than reflecting the mix of land types they desire. This means that those seeking a certificate to secure cropland are most often also given a much greater amount of pasture as part of the holding, but the pasture on people's certificates often does not correspond to the land from which they are actually harvesting fodder.

Nineteen of the surveyed households clearly held "pasture" as part of an individual DF. Of these, 15 (79%) said that they did not want to have the "pasture" on their certificate, and 8 (42%) said that they did not even know where this land was located.[36] Those eight households were harvesting fodder from the same land they used before obtaining their individual DFs, and it is unclear whether they currently have formal rights to it (as individual or collective DF land) or not. This data is well corroborated by the many conversations with holders of individual DF certificates that led to the inclusion of those survey questions; however, in those conversations a far greater proportion of certificate holders did not know where their legally registered pasture areas were located. The lack of knowledge of the location and the desire to get the natural grassland tracts removed from the certificates are evidence that these officially demarcated areas are, for many, not the places from which they harvest the fodder that their livestock need to survive the winter. For these households, inclusion of the tracts of natural grassland on the certificate has no benefit and only saddles them with tax burdens, a situation that has been described elsewhere in Central Asia (Robinson & Milner-Gulland, 2003; Hofman, 2019). One especially well-informed and well-resourced interviewee said he made regular visits to the State Land Committee district office over the course of two years to finally get the pasture removed from his certificate. He harvests his fodder from land that he says has been in his family since before the Soviet era.

Another subset of individual DF owners reported that they *do*, in fact, harvest fodder from the "pasture"-designated areas demarcated on their certificates. This is a small percentage of the households in the study area, and I only developed close enough relationships with two

[36] There is no map on the certificate that shows the land's location in context. The location is indicated by 8-digit UTM coordinates of each vertex of the plot. One certificate I saw listed 27 vertices for a 2.5 ha plot. This would be indecipherable to almost all certificate holders.

such households to allow me to both view their certificates and do field walks with them. Using the certificates, I was able to identify the plots of land on cadastral maps created by the State Land Committee. In both cases, their actual fodder plots did not even overlap with the boundaries listed on the certificate, nor were their actual plots as large as the parcels that were legally allotted to them. When I shared this with one owner, the official record did not seem authoritative to him. “I don’t know about maps and all that, but this [area we actually harvest from] is where our dehqon farm is.” At least to me, he did not express concern with the fact that the fodder land he was using was smaller than the tract on his certificate.

5.3. Parity in fodder land holdings

There is relative parity in fodder land holdings within the study area. This is surprising given the general context in Tajikistan of an authoritarian state, rent-seeking elites dominating the agricultural sector, unequal access to land acquisition processes, the ubiquity of bribery, corruption, and widespread poverty.

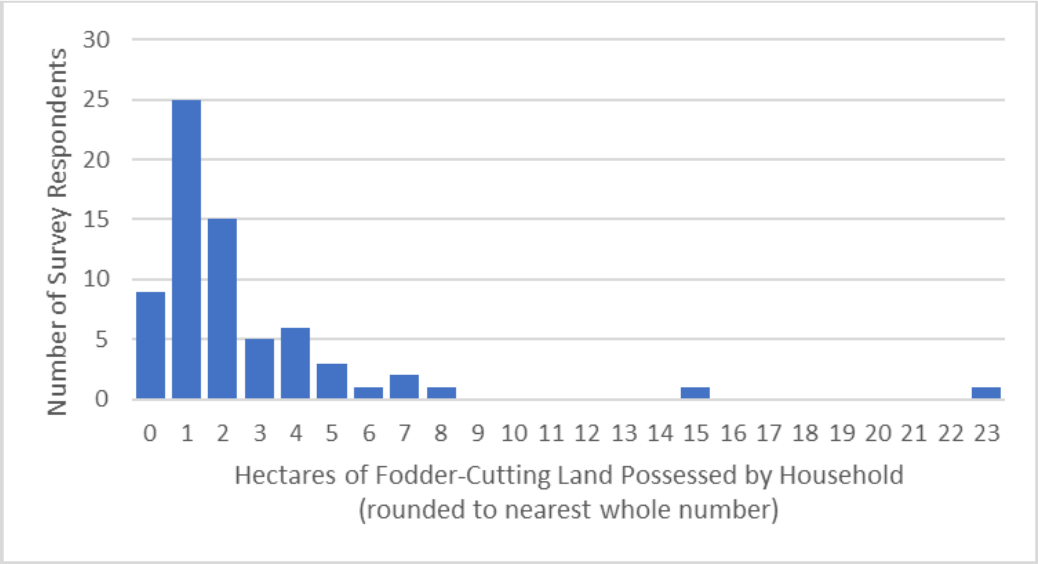

FIGURE 3.8: Histogram of fodder land holdings among surveyed households (n=69).

Data from household surveys illustrates the overall pattern in the study area: a majority of households holding small areas of fodder land with a few notable outliers of individuals with large fodder land holdings (see FIGURE 3.8). Among the surveyed households that have fodder land, 78% have three hectares or less; and 93% of households have within one standard deviation (0-6 ha) of the mean area (2.2 ha) of household fodder land. Based on qualitative descriptions of the distribution of fodder land from focus groups and interviews, this sample appears very representative of the total picture in the study area. In interviews, village heads and collective DF heads (those who hold the certificates for collective DFs and are often also current or former village heads) explain this as a feature of the post-independence egalitarian land reforms. While that certainly contributes to the relative parity, the deviation of *de facto* fodder land possession from *de jure* land ownership means that there are other significant drivers of this parity. Fieldwork did not clarify these, but they are likely tied to respect for pre-independence histories of land use.

The outliers are not insignificant; if the land were hypothetically distributed equally among these households—note that this would never actually be possible, as the post-independence apportioning and allocation of Soviet-era state-farm land was calculated at the village level, not attempting to be equal *across* all villages—then over 75% of households would see some increase in their holdings. But the present parity has implications for the functioning of the entire pastoral system because, as explained in SECTION 3.3, the amount of fodder land a household can use significantly influences their livestock holdings and imposes a maximum limit on the number of livestock they can support.

Using survey-derived median values for yields per hectare and fodder needed per sheep unit per winter, a *hypothetical* household with the median 1.5 ha of fodder land should be able to

support 26 sheep units[37], and this calculation is notably close to the *observed* median sheep units per household (27 SU). We would expect half of the population to have fewer livestock. In TABLE 3.3, maximum herd sizes are estimated for hypothetical households with larger fodder land holdings above the median. This table includes estimates based on yield per hectare data both from the survey as well as the higher estimated fodder yield per hectare from the focus groups (1000 bundles/ha) (far right column of TABLE 3.3).

TABLE 3.3: Estimated maximum livestock holdings based on fodder land area owned

Fodder Land (ha)	Percentile of Households	Max Total Sheep Units (rounded)	
		Using yield data from survey	Using yield data from FGD
1.5	50th	26	36
3	78th	51	71
6	91st	103	143

When we plot households' actual fodder land and livestock holdings along with a line indicating the estimated limits of livestock holdings imposed by fodder land possession[38], we see that one-third of the respondents—households above the reference line—own more livestock than a simple linear equation predicts that they would be able to support (See FIGURE 3.9). Most of these households, however, purchase supplementary fodder (red markers in chart); 69% of the fodder-purchasing households have more livestock than their fodder-land holdings suggest they could support compared to just 20% of the households that do not purchase additional fodder.

[37] 26 sheep units would equal 26 head of sheep/goats or 5 head of cattle (1 head of cattle = 5 SU). The average household's total sheep units were 60% cattle; with this same proportion, 26 sheep units would translate to three head of cattle and 11 head of sheep and goats.

[38] This line was calculated using the median estimate of fodder required annually per sheep unit (42 bundles per sheep unit) and the higher focus group fodder yield estimate (1000 bundles per hectare per year).

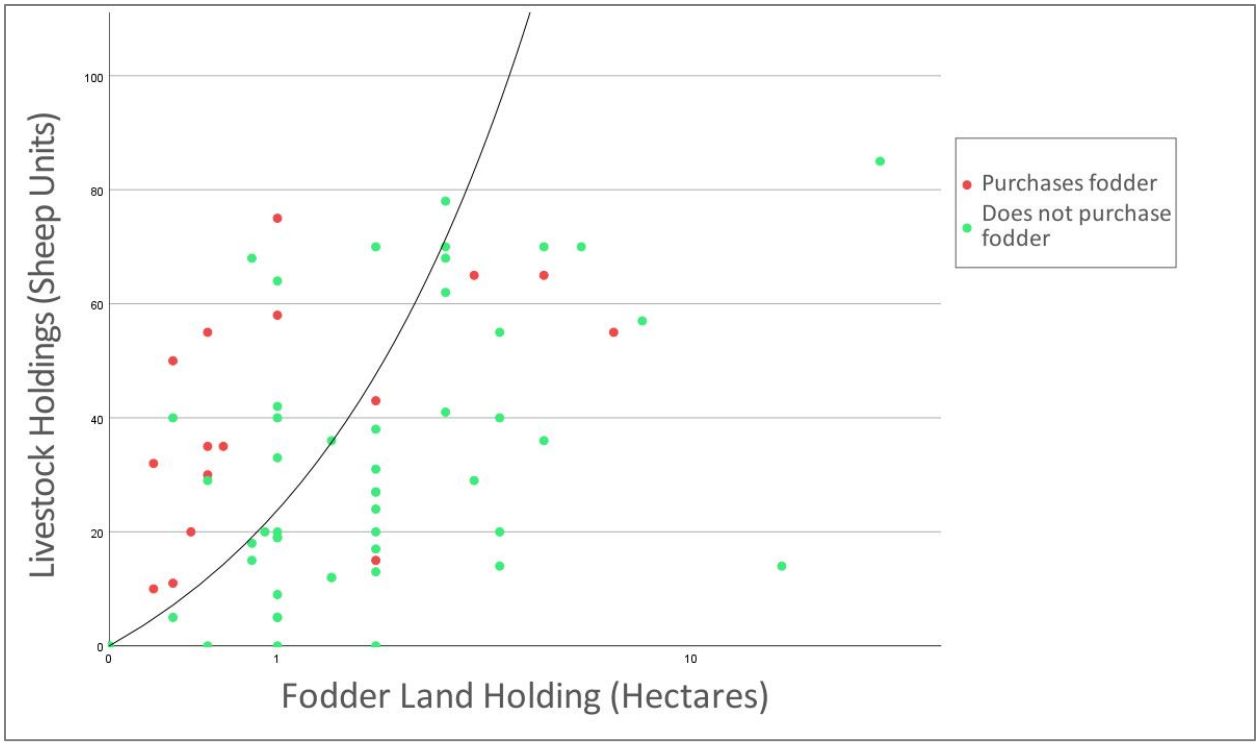

FIGURE 3.9: Scatter plot of actual fodder land and livestock holdings.
X-axis scale is logarithmic. Line shows estimated limit of livestock ownership based on FGD estimates of fodder yield per hectare and survey-derived fodder requirements per sheep unit ($y = 23.81x$). Red points indicate households that purchase additional fodder. Source: Data from Author.

The significant number of households above the reference line is not surprising; it is impossible to define a single equation that captures the limits that a household fodder land possession imposes on livestock ownership. Firstly, not all fodder land provides the same nutritional value per areal unit because of differences in vegetation species composition, density, above ground biomass, and length of growing season. The mean survey-estimated fodder yield from one hectare of land was 720 bundles, while some focus groups came to a consensus of 1000 bundles, but even the nutritional value of a single "bundle" would vary considerably based on the height and species of the cut fodder. Secondly, as explained in SECTION 3.2, the duration of indoor stall-feeding varies across villages depending on elevation and microclimate, and feeding regimes vary between households. Using responses from multiple survey questions, I calculated

a median of 42 bundles of fodder fed to each sheep unit per year. However, several focus groups came to a convincingly reasoned consensus that 100-110 bundles were needed per sheep unit each year. In addition to the actual variation in fodder land productivity and feeding practices, these estimates were likely difficult for respondents to accurately make on the spot. No direct observations or measurements of fodder productivity and feeding practices were made as part of this study.

Despite the variable parameters of fodder land possession's limits on livestock holdings, the fact of its limiting influence is clear from the qualitative and quantitative data presented in this chapter. Because of the distribution of fodder land, the great majority of the population will own *at most* a dozen cattle and a few dozen sheep and goats, with most owning far less. Among the surveyed households, the largest livestock holding at any time over the last ten years was 150[39] sheep units, and only five households have ever owned more than 100 sheep units. The survey sample did not include the several largest livestock owners of the study area, but information about them was obtained from interviews. The two households with the most livestock each have herds of around 700 sheep and goats. One of these herds migrates 400km to winter pastures in the lowlands of Khatlon province in southwestern Tajikistan, obviating the need for fodder land in Rasht beyond what is needed to support the 10-15 animals that are too sick to make the migration. The other household has the greatest fodder land holdings in the area, though I was unable to determine the land area. One of his neighbors told me, "If you see his haystacks in the fall, you would think they are from a [Soviet-era] state farm."

[39] Sixteen head of cattle, 20 goats, and 50 sheep.

6. Conclusion

This chapter responds to the paucity of literature on the role of fodder in pastoral systems. When fodder does appear in literature on pastoralism, it is often cast as a forage substitute that disrupts pastoral systems rather than a forage complement that is integral to the functioning of a system, as is the case in many mountain pastoral contexts, including the one described here. A chapter dedicated specifically to fodder is warranted because its patterns of governance are distinct from both the governance of cultivated land and of pastures, as it is managed individually but often not in accordance with *de jure* property rules. One contribution of this chapter is to highlight the need to take fodder production seriously on its own terms when understanding a pastoral system.

As a key pastoral resource (Brottem et al., 2014), fodder land's access and use rights influence the functioning of the entire pastoral system and interact with its other components. This chapter showed that fodder availability is a major limiting factor for livestock ownership, and that fodder *land* possession is a major limiting factor on fodder availability. Access to fodder land, therefore, is a key limiting factor on livestock holdings. This has two major practical implications.

First, while livestock have been identified as "of critical importance in the coping strategy of poor rural households" in Tajikistan (IFAD, 2020: 27), the fodder-land requirements for livestock ownership make it difficult for land-poor families to shift to more livestock-based livelihoods. Livestock would otherwise be an attractive source of wealth and income, as owners do not need to individually own land for grazing and small holdings can quickly grow, especially if new livestock owners first purchase goats, which have relatively high twinning rates. However, household differentiation in livestock wealth is not independent from differentiation in

land, even though it may be independent from differentiation in arable land. Though not evident in the quantitative data, some interviewees reported that Tajik labor migrants returning after years in Russia will focus more on livestock than cultivated agriculture because of these perceived lower barriers to entry, which are particularly salient for those returnees who have less access to land than those who have always remained in their home villages. However, the fodder-land requirements suggest that this will not be a viable long-term solution for them.

Second, the combination of land-related limitations on livestock holdings, non-alienability of fodder land, and current patterns of fodder land distribution leads most households to have relatively small numbers of livestock. Independent of the absolute numbers of livestock in the area, the fact that most livestock are distributed across households into small holdings influences the management of grazing—and grazing land—during the warmer half of the year when livestock are not eating cut fodder. These dynamics are explored at length in the next chapter.

Unless the relative prices of fodder and livestock change to make supporting livestock on purchased fodder more profitable, these two implications will endure, and livestock holdings *per household* will decrease even further as households proliferate and fodder plots are divided among them. If the prices do change to make it worthwhile to winter animals fully on purchased fodder, then the sale and purchase of fodder will become far more important to the region, justifying additional attention and updated investigation on the role of fodder in the local economy and livestock production.

Chapter 4
Contingent Resources, Interdependent Governance: Near-Village Group Herding and the Intersections of Fodder-Land and Pasture Management

1. Introduction

The previous chapter introduced fodder as a key pastoral resource in the mountains of central Tajikistan that affects other components of the pastoral system and showed how the distribution of fodder land has led to the area's livestock population to be distributed into small livestock holdings in many households. Continuing the examination of how the governance of fodder affects other components of the pastoral system, this chapter considers the relationship between the governance of fodder land and pasture, focusing on two interactions between these resources. First, the distribution of individual fodder land across households encourages common access and management of near-village pastures through collective herding. Second, fodder land governance and near-village spring-and-fall pasture governance are closely intertwined because these two resources are, in fact, the same land, distinguished by the way that the grass that grows upon them is detached and handled prior to being consumed by livestock.

SECTION 2 provides the empirical basis for this chapter, describing group herding in the study area and the divergence between de jure and de facto rules regarding pastoral land. Group herding—the combining of individually owned livestock into a communal herd—leads to the effective fusion of many different livestock owners into a single land user, resulting in near-village pastures being used as a common resource without the need for internal governance rules, despite the de jure fragmentation of use rights. SECTIONS 3 and 4 are a theoretical discussion of the how to understand resource governance in the context of interdependent resources, drawing upon literatures from i) legal studies scholarship on mixed property regimes and property as "the

law of things" (Smith, 2012) and ii) critical resource studies from geography and anthropology. Most importantly, these sections provide novel insights from the combination of the two literatures in the context of the present case.

Two different types of interdependencies with accompanying lessons are described in SECTION 3. First, through the present study of how pasture governance is shaped by fodder land governance and livestock ownership, I argue that to understand the implications of property rules that govern a resource—for instance, the relevance of *de jure* rules on actual resource use—analysis must incorporate the property regimes of highly intertwined resources. Second, by understanding a 'resource' as an object that is defined both by its material properties and social significance, we can see that the same areas can be thought of as multiple resources—in this case, land, fodder land, or pasture—each with its own governance rules that interact with one another. When fodder-land/pasture governance is understood as 'land' governance, the system can be understood as a semicommons, oscillating between common and individual use. If we thinking of fodder land and pasture as distinct resources, it is not a semicommons. Though all resources are created by social processes that have material and discursive dimensions, the present example of fodder land and pasture illustrates this especially well because—in contrast to cases where livestock may graze on residues of human-consumed crops after harvest—in this case both resources are not only co-spatial but involve the very same vegetation being used for the same purpose.

How different groups and entities create a resource as a governable 'thing' determines *what* is governed and, thus, influences *how* it is governed, and SECTION 4 focuses on the governance implications of invoking a singular ('land') or dual ('fodder land' and 'pasture') resource to understand the present system. To do this, I merge insights from legal scholars and

critical resource scholars, arguing that their approaches are complementary, though distinct. Property relations between the state and communities are best understood from the perspective of land governance, while intracommunal governance is best understood as two different (but related) governance regimes for fodder land and pasture, even though the resources are materially the same.

FIGURE 4.10: Freshly stacked piles of fodder drying in the sun. This area is also used for grazing village herds in the spring and fall. (Author.)

2. Near-village group herding

The previous chapter explained how the distribution of fodder land limits the livestock holdings of most households. This has implications on the management of grazing—and grazing *land*—

during the warmer half of the year when livestock are not eating cut fodder, as the only viable way for a household to graze its livestock is through group herding with other households in their village in order to pool the labor needed to move livestock to grazable areas.

2.1. Group herding

Households in the study area seasonally combine their livestock with those of their neighbors to form collective herds.[40] In most villages, there is one collective cattle herd and one collective sheep and goat herd, but in the few villages that are large enough to be divided into two or three *mahallas* (lit. 'neighborhood'), there is a cattle herd and a sheep and goat herd for each mahalla. The livestock-owning households take turns assuming daily responsibility of the herd, paying a fee to others if they do not have available herding labor within their own household. In most villages, all participating households herd with equal frequency, while in others, a household's herding responsibilities are proportional to the number of livestock they have in the herd. This system only functions when these herds are grazing close enough to the village that they leave early each morning and return in the evening, allowing the day's herders to sleep at home and the next set of herders to set off with the animals again the following day.

Variously referred to as group herding, common herding, collective herding, or cooperative herding in the literature, it is prevalent in post-Soviet Central Asia and the Caucasus (e.g., Schumacher & Chorshanbiev, 2010; Steimann, B., 2010; Robinson et al., 2012; Neudert, Allahverdiyeva, & Beckmann, 2019; Robinson et al., 2021) and can be found in other world regions (e.g. Turner & Hiernaux, 2008; Yu & Farrell, 2013; Dessalegn, 2016). It is a labor-

[40] Many families will send most of their animals with the common herd but leave a milch cow to graze around their own property or common property in the village on the margins of roads, paths, and non-residential buildings.

saving strategy employed when individual households' livestock holdings are not large enough to warrant the considerable effort of daily herding, allowing households to spend just a few days a month herding animals rather than every day. Robinson and Milner-Gulland (2003) found that in Kazakhstan families with fewer than 150 animals would aggregate livestock into a common herd; this seems roughly the case in the Rasht Valley, but there are too few families herding independently or with such high livestock numbers to posit any specific threshold. The few households with the most livestock—over 500 head—do not participate in this system and graze their animals on their own extensive lands. Among the 20% of households in Askalon sub-district captured by the survey sample, the family with the most sheep and goats (60 head) and the two families with the most cattle (12 head) both send their animals with collective herds.

There were a handful of outlier survey respondents who reported not participating in group herding (See TABLE 4.1). These few families did not have large herds (4 to 20 small-stock; 1 to 5 cattle); they were not given follow-up interviews to clarify their decision-making or the accuracy of their answer, and it is possible that these cases were mis-recorded on the survey.[41] The most common reported instance of independent herding is for cattle during the summer, likely indicating households that keep one or two milch cows at home for continued access to dairy products.

[41] Some potential inconsistencies: 1) the sole household that reported herding their small-stock independently was categorized as "low wealth" by the village head, owned a total of 0.4 hectares of land, and had only recently obtained his animals. 2) There were four enumerators conducting surveys, each one surveying 27 households. While two of the enumerators didn't encounter any families who herded independently, the others encountered three and six households, respectively, who herded independently. The fact that an enumerator reported that over 25% of the livestock-owning households he surveyed herded independently in a context where such cases were not found among small-scale livestock owners by any other research method is particularly suspicious.

TABLE 4.1: Number of surveyed households who do not participate in collective herding, by species and season.

Season	Households Herding Individually on Their Own Land	
	Sheep-Goats (n=74)	Cattle (n=88)
Spring	2 (2.7%)	1 (1.1%)
Summer	1 (1.4%)	5 (5.7%)
Fall	1 (1.4%)	0 (0%)

Despite these possible few exceptions, the clear pattern is one of households pooling their animals into group herds because of their small numbers of livestock. The distribution of fodder land across the population encourages this group herding by limiting the livestock holdings of individual households, as explained in the previous chapter. The practice of group herding, in turn, affects how near-village grazing land is governed. Fodder-land governance, then, shapes pasture governance in the study area.

2.2. Governance of near-village pastures

Livestock in the study area graze in pastures for 5-7.5 months a year, as described in the previous chapter. While this is not a full three seasons, different grazing areas are considered either spring-fall pastures or summer pastures. All villages have their own spring-fall pastures within the range of a daily grazing orbit—what I am calling "near-village"—and invariably this is the same land where households' fodder plots are located; the distinction between spring-fall pastures and fodder land is a matter of timing and use, not location. Spring grazing lasts 4-8 weeks, starting when snow melts away from the pastures and ends around mid- to late-May when livestock are sent to summer pastures (see next paragraph) and grazing is prohibited on the areas that then transition to fodder-growing. Depending on where a household chooses to send their animals in the summer—usually a choice between various professional herders using different high-altitude pastures—different animals will leave the spring pastures at different times. Livestock owners explained that the move to higher-elevation summer pastures, however, is

determined by the weather rather than closure to protect fodder plots. Until all the animals who *will* leave the village have done so, all the spring pasture is open to the village herd, even those areas owned by households whose animals may have left earlier. Once the herd gets as small as it will be for the summer—often only milch cattle remain—grazing will be prohibited. One informant said that towards the end of spring grazing, "All of us in the village come together and say that we're keeping the milk cows out of the grass-cutting areas," but it was unclear if he was speaking literally about a meeting, and no one else described such a collective decision-making process. The general timing—within a week or two—is obvious, but the specific date of prohibition is usually declared by a village head. Grazing resumes in these areas in the fall when snow comes to the higher-altitude summer pastures after the fodder harvest has ended.

FIGURE 4.2: Looking south to Hijborak sub-district from the north side of the Surkhob River. Summer pastures covered in snow while spring pastures are grazable. (Author)

Most villages in the study area do not have summer pastures within their territory, and residents in these areas send their animals with professional herders away from the village to

individually owned[42] summer pastures at higher elevations, paying grazing fees to the hired shepherds for several months. In the few villages that have their own nearby summer pastures, no fodder ever is collected from these areas, and those households who use these closer-in summer pastures continue to take turns managing an aggregated common herd. Even in villages that have their own communal summer pastures, a large portion of families prefer to pay to send their animals to the higher-altitude pastures, where they will gain more weight; the families that choose to keep their animals on nearby village pastures in the summer do so either to save money or, less often, to decrease the possibility of livestock injury or theft.

Near-village pastures are *grazed* as common land even though they may be de facto individualized as (often undocumented) household fodder plots during the summer or de jure individualized on individual DF certificates. All land falling within spring-fall pastures is individualized in some way or another. The (less-common) near-village *summer* pastures are not used in an individual manner, but some fragments of the pasture have been legally assigned to people who have created individual DFs. This reality contrasts with assertions that allocation of grassland to individual households in Tajikistan necessarily "diminishes the area available to common grazing" (Halimova, 2012: 306). The fragmentation of *ownership* for these pastures has not led to the fragmentation of *use rights*. In the words of one interviewee, "Nobody pays any mind to anyone else. This guy here grazes his animals on my pasture. I have a dehqon farm and it includes two or three hectares of pasture. I don't use that land myself; *everyone* uses it. But *I* pay the taxes for it. I don't ask them to pay taxes."

[42]The hired shepherds are responsible for securing access to these individually owned summer pastures. In some cases, the lead shepherd leases the pastures from the certificate holder for the land, though in most cases in the study area the shepherd himself is the owner of the land.

2.3 Why pastures are used in common despite fragmentation of ownership

While each individual *animal* may be privately owned by a household, the aggregation of these animals into village or mahalla (neighborhood) herds means that they are managed as a single unit when grazing. The herd moves together, regardless of whose animal is whose. It is possible that some livestock owners take extra care to keep their own animals safe and accounted for on the days when it is their turn to take the collective herd to the pastures, but such special treatment was not evident when I accompanied the herds and is perhaps averted by the knowledge they would have to compensate any households whose animals were lost or came to preventable harm under their watch. The pasture available to each herd is clearly defined—this is true in the case of either all-village herds or neighborhood-specific herds—and that single herd comprises all the animals that are allowed to graze on that land; there is no competition for this land and therefore no need for negotiation. In this sense, there is only one land user for each of these pastures: a customary corporate entity formed by all the livestock owners of the village or neighborhood.

In some commons systems—for example, a fishery where many separate parties are active on their own boats—people act individually to appropriate the common resource, so internal rules are necessary to manage resource use among the community of appropriators in addition to the externally facing exclusion rules for those outside of the community (Ostrom 1990; Schlager and Ostrom 1992). Group herding, in contrast, combines the appropriation *on behalf of* the many livestock owners into a single stream of resource use, which is facilitated by the exclusion of outsiders but eliminates the potential for any 'internal' rules aimed at individual households pertaining to the timing and location of resource use during the period when these lands are used for grazing. In a group-herding case in the Swiss alps described by Netting (1976) and used by Ostrom (1990) to illustrate successful and enduring self-governance of common-

pool resources, the only internally facing rules concerned rates of resource withdrawal—or "the quantity of resource units they harvest" (Ostrom, 1990: 92)—and stipulated that community members can only send as many livestock to the communal pasture as they can support with the winter fodder harvested from their own individual lands. However, no such rule exists in Askalon and Hijborak sub-districts, where, as explained in the previous chapter, the present costs of raising livestock on purchased, imported fodder make fodder-land holdings a natural control on livestock ownership even in the absence of such a rule.

The aggregation of animals into a single stream of use means that the access and exploitation of the pasture is necessarily collective, so one individual household's ability to access and withdraw forage from near-village pastures is inextricable from those same rights for all the households in their village. The question of why near-village pastures are used in common, then, is actually a question of why households with individual use rights for fragments of the pasture do not exclude the village herd from the land. Do the benefits—material or social—of allowing the village herd to access this land outweigh the costs?

This calculus varies by season. Those who hold individual legal rights to the less common near-village *summer* pastures would see no benefit to excluding the village herd from this land, as these areas are not used for any purpose besides grazing, and these fragments of land are in fact often unwanted and cannot even be located by their legal owners (see SECTION 5.2.2 of the previous chapter). In contrast, springtime exclusion of the village herd from *spring-fall* near-village pastures may materially benefit a family by allowing for more vegetation growth in the spring, improving summer fodder harvests, though no data is available to confirm this. It is not clear what the effects, if any, of post-harvest exclusion would be when this land would

otherwise be used as common fall pasture.[43] Materially, the benefits to a hypothetical single household that excludes in the spring could possibly[44] outweigh the costs for that one household of a small shrinkage of the communal pasture, which would be borne across all the households with livestock in the village herd. If one household with average land holdings decided to exclude the village herds from their fodder-growing land in the spring, this would not likely have noticeable consequences for the common herding system. If, however, additional families followed suit, there would not be enough pastureland to support near-village grazing.

This apparent collective action problem is, in fact, averted by a strong social norm that makes the exclusion of the village herd from one's own land unthinkable. There are no negotiations with individual land holders to gain access to this land. Nobody is doing any sort of cost-benefit analysis about whether to grant the village herds access to their land, except perhaps taking into consideration the social costs of bucking these norms. In focus groups, I asked participants what would happen if someone wanted to put a fence up around their fodder plot in order to exclude grazing of the village herd. The question was not taken seriously, as nobody has ever attempted to do this, and it was met with laughter and jokes about how whoever did this would get beaten up. A local land administrator confirmed that even holders of individual dehqon farm certificates never prevented grazing on their land, despite legally having the right to do so.

---

[43] A meta-study of crop residue grazing found the effects between grazing on post-harvest residues and productivity—involving soil compaction, moisture retention, erosion, nutrient cycling, waterlogging, and more— to be variable and extremely complex, with grazing generally having more positive than negative impacts (Rakkar and Blanco-Canqui, 2018).

[44] No data was collected to assess how much of a benefit, if any, there would be. Given the slow rates of vegetation growth early in the year, it is clear that there would still only be one fodder harvest each summer. It is possible that if grazing were excluded that single harvest would yield more fodder, but that is not necessarily true.

The expectation that individual landholdings should be treated as common property when used as near-village pastures appears to apply to anyone who does not manage their animals separately in an individual herd on their own land. No interviewees or focus group participants stated this rule, as such, but the common herds do not graze on the land owned by the few households with large herds that are managed individually on their own property. In the study area, these lands were not contiguous with the communal near-village pastures, so it is hard to definitively discern this relationship with such a small sample of exceptional households and without anyone reporting this connection. There were no reported cases of households without livestock excluding common herds from their individual grassland.

Admittedly, the relationship between group herding and land tenure is debated. While this case and others (Zhaoli et al., 2005; Robinson et al., 2008) have shown that group herding prevents fragmentation of pasture *ownership* from leading to fragmentation of *use*, others contend that individualizing pasture rights dissolves herding groups (Netting, 1976; Neudert, 2015), seeing the pooling of herding labor as dependent on particular forms of land tenure rather than a driver of forms of land use that may override de jure fragmentation. In this case, it is hard to imagine how households would manage without aggregating their animals into common herds without drastic changes in the distribution of the livestock population toward ownership in the hands of a few households.

The strength of the social norm against excluding common herds from individual land does not imply that the norm is permanent. The legal and economic changes to the country are still relatively new but might eventually change land-related norms. The fact that many people have access to pasture even if they don’t have land certificates with pasture led many informants to say that there was no point to organizing such farms, and this perspective is especially obvious

among those who are trying to get rid of the pasture portion of their DFs. However, one informant predicted that people's thinking will gradually change. He intentionally acquired pasture on his DF certificate because he is "thinking about the future," and perhaps one day he will require people to pay him in order to access his land. "In 10 years, it will become necessary [to close off these lands]. That's how it is—the passing of time."

3. Mixed property regimes

Low stock ownership has previously been observed to lead to group herding and, thus, to a disregard for de jure pasture fragmentation in Tajikistan (Robinson et al., 2008). In this study, we also see that *non-governmental* property divisions—those that sometimes delineate fodder plots—dissolve when animals are grazed. In sum, fodder land governance and pasture governance are intertwined in two ways: 1) fodder land access *creates livestock ownership patterns* that favor group herding and therefore communal use of near-village pastures, and 2) the fodder plots and spring-fall pastures are not only *co-spatial* but also produce the *exact same material*—vegetation for livestock consumption—that makes them of value.[45] These relationships, when considered through the lens of mixed property regimes, confer two useful lessons for the analysis of land and resource governance.

[45] This is distinct from contexts where there is one governance framework for land and another for vegetation that grows upon it, such as separate land tenure and tree tenure systems (e.g. Fortmann, 1985; Takahashi et *al.*, 2024).

3.1. Land, livestock, and mixed property regimes

Lesson #1: When multiple resources interact in significant ways, the implications of the property rules that govern them can only be understood by analyzing the resources and their property regimes together.

Mixed property is a lens for examining the interaction of individual and common elements in a system of property. Such interactions are ubiquitous, given the vast array of elements—from one's own body to the air we breathe—that interact, even if these elements are not always thought of as 'property' (Fennell, 2009). Analysis of the property relations for every object in a context is obviously unfeasible and would likely add little value. However, the lens is especially useful for elucidating the interactions between more salient resources that are particularly complementary—where the having of both resources increases the value of each (Fennell, 2021)—such as livestock and land.

Presenting his mythical "tragedy of the commons," Hardin warned of the dangers of open access resource regimes, presenting a single-resource argument about land management (1968). This characterization has been widely and validly critiqued as divorced from reality (notably Ostrom, 1990, along with thousands of others). A mixed-property perspective provides another important critique—remaining in Hardin's own abstract space of 'positive and negative utility'—noting that the proposed tragedy "is just as much a result of the rancher's ability to fully internalize the grazing benefits associated with adding an animal" as a result of the private ownership of livestock (Fennell, 2009: 5). That is, what Hardin presented was not simply a tragedy of common land ownership, but of a mix of common land ownership and private livestock ownership (see FIGURE 4.3). When different objects or resources interact, such as livestock and land, the way that one of the resources is used will be influenced by the property regimes not only of that resource but also of the interacting resource.

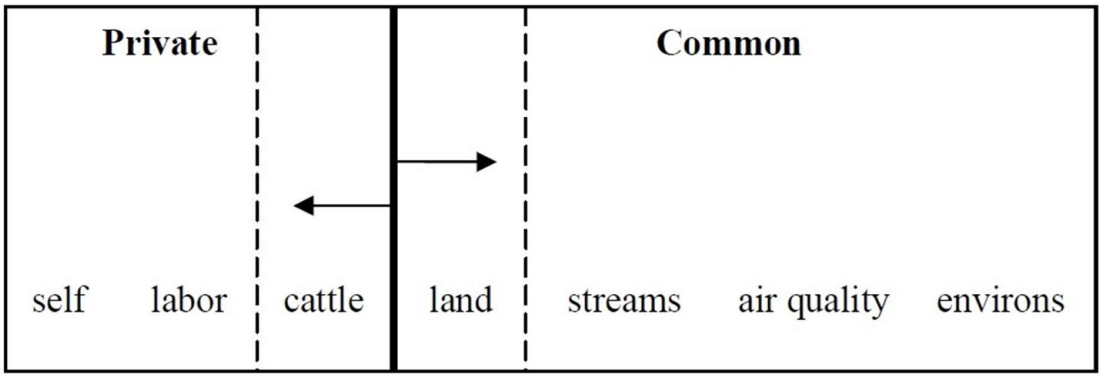

FIGURE 4.3: Conceptual diagram of mixed ownership. (Reproduced from Fennell, 2009: 7)

Though Hardin and Fennell both illustrated their arguments with hypothetical pastoralist contexts, the case presented in this chapter concerns a completely different type of resource-user decision. The relevant resource user's choice here is *not* whether to add an animal onto a common pasture but whether to grant a common herd access to one's individual land. The figure above—with a set menu of resources ordered so that if one resource is private, so too are the resources to its left, and without distinctions between de facto and de jure property regimes—also does not adequately capture what is happening in Askalon and Hijborak sub-districts.

Here, we need to differentiate between each head of livestock, which is privately owned, and the village herd (the relevant unit of management when it comes to access and exclusion), which is effectively common property because it comprises livestock from all of the village's livestock-owning households. Because livestock owners take turns herding, herding labor is also effectively a common resource. While the labor and herd are common, the near-village pasture land is at least partially, if not fully in some villages, owned by individuals with de jure rights to exclude. These rights are not exercised by individual owners of fodder land / near-village pasture (see SECTION 2.3). Individually excluding all grazing from one's parcel of near-village pasture would increase the amount of fodder a household could collect. Allowing grazing, then, means

incurring an individualized harm.

Despite this harm, the only households who do exclude grazing from their land are the very few with large numbers of livestock and sufficient land to support them. They have enough livestock to warrant expending the labor necessary to manage their herd independently and eschew the collective village systems of livestock and pasture management. Everyone else—those with relatively small livestock holdings—relies on the common herd and, therefore, on *de facto* treating all of this land as common pasture during the grazing times regardless of their individual *de jure* rights to the *land* or *de facto* rights to it specifically as *fodder land* during the summer. This system is maintained by a strong, if tacit, social norm that sending one's animals with the collective herd obligates a livestock owner to also pool his land with that of the rest of the group herding families to create a large, communal, near-village pasture. For these small-holders of livestock, the substantial benefits of participating in group herding outweigh the individualized harm of having one's own land grazed. The governance of grazing land is conditioned by the effectively common ownership of the relevant management unit, the village herd.

3.2. Fodder land and pasture as distinct resources

Lesson #2: It is not only the governance of a particular resource that is socially produced, but also the ontology of the resource itself. How different groups and entities understand a resource as a governable 'thing' will affect what *is governed and* how.

Two different narratives can accurately describe the governance of fodder land and spring-fall pastures in the study area. The narrative presented so far in the chapter is one of *dynamic land governance*, where the land is treated as individual property during the summer months when fodder is left to grow and is then harvested but treated as a commons during the

spring and fall. An alternative narrative is one of static resource governance, where fodder land is always individual property and near-village pasture is always the common property of the village. In this second framing, it is the *resource category* that is dynamic, oscillating between fodder land and pasture.

TABLE 4.2: Two characterizations of fodder land and spring-fall pasture governance

Characterization	Resource Definition	Governance
Semi-commons	**Stable** "Land"	**Dynamic** Oscillating between individual and common
Two resources	**Dynamic** Oscillating between "fodder land" and "pasture"	**Stable** (for each resource type) Individual for fodder land Common for pasture

In the former characterization, a single resource—the land—is governed as what Henry Smith has termed a semicommons, where "a resource is owned and used in common for one major purpose, but, with respect to some other major purpose, individual economic units—individuals, families, or firms—have property rights to separate pieces of the commons" (2000: 131). Interestingly, Smith first illustrated the semicommons idea with the example of the governance of overlapping common pastures and individual croplands and hayfields in medieval England. Smith argues that this system emerges for the sake of labor efficiency, just as we see in Askalon and Hijborak.

Such dichotomous governance, for Smith, is the result of the dual *purposes* (grazing versus growing crops) of a single *resource* (land). This is an especially reasonable framing for distinguishing grazing and fodder collection in the study area, as the vast majority of the fodder collected from these areas is natural hay. That is, it is not only the same land but actually the same *vegetation* being used for both "purposes". In fact, in contrast to situations where livestock graze in common on the residues of harvested crops, even the ultimate purpose—feeding

livestock—is the same for both land uses. The primary differences are the amount of human labor necessary to exploit the resource (cutting, drying, transporting fodder) and the increased duration of possible use because of the ability to store fodder.

In the second characterization, however, fodder land and spring-fall pastures are two distinct resources. The usefulness of framing is supported by a subset of work on property theory from legal scholars as well as critical resource studies by geographers and anthropologists. These two areas of scholarship have not been put in conversation with each other[46] despite striking overlap in their areas of inquiry and their common understanding that the agglomerations of matter that we understand as resources or property are socially constructed objects. The next section explores these two literatures and how, when used together, they allow for 1) fodder land and spring-fall pastures to be considered distinct resources even when materially identical and 2) understanding how this bifurcation can make resource governance simpler and, therefore, better functioning.

4. Governance and the making of resources: Merging insights from legal studies and critical resource studies

Recent legal scholarship on the nature of property—especially work by the same Smith and Fennell as above—emphasizes that property relations are based upon the "legal things" or "modules" that they govern (Smith, 2012). In other words, when somebody has a property right

[46] The only example I have found of geographers citing the relevant work by legal scholars is Blomley (2016) engaging with Smith, which makes a few interesting contributions, noted below, but is unfortunately a major misreading of Smith. Blomley implies that Smith does not understand that property is complex, which any reading of Smith will immediately prove false. Blomley misunderstands Smith as talking about the "thingness" of boundaries, when Smith is discussing how "legal things" are bounded by non-material boundaries. Blomley's article is mostly a disciplinarily chauvinist critique of legal scholars for not using the methods of geography, missing the opportunity to exploit the clear value of combining diverse approaches to addressing similar questions.

to something, we must accurately understand and define that 'something' that the right applies to; "a fundamental question is how to classify 'things'" (Smith, 2012: 1703). But the answer to this question is not simple, as "thinghood is contingent" (Fennell, 2020: 155), and the delineation of a module of property or (or a resource) will be context-specific. To them, the relevant contextual factors concern the "problem one is solving" (Smith, 2015: 72) or the function of the resource (Smith, 2012). Delineation as just as much a *grouping together* of things as a division of things, bounding together "useful attributes[47] that tend to be strong complements" which benefit society more together than separately (Smith, 2012: 1693; Fennell, 2020). Fennell has proposed the possibility of understanding complementarity through the lens of activities or events, the "sets of actions and effects involving resources" that generate interactions between different 'attributes' and illuminate what delineations of matter into governable 'things' align best with the ways they are used (Fennell, 2020: 166).

Just as the legal theorists consider delineation and classification of 'things' to be fundamental areas of inquiry, a foundational question of critical resource geography is "How do resources become meaningfully present in the world?" (Valdivia et al., 2021: 3).[48] Bridge defines a resource as "those components of the non-human world that are considered to be useful or valuable in some way" (2009: 1219), which maps onto Smith's above explanations of a legal 'thing' being defined by its function or in reference to addressing a problem. But in contrast to the legal theorists, the critical resource scholars focus less on what set of matter is bounded together into a legal 'thing' than how *meaning* is attached to matter to transform it from a mere

[47] "Attribute" is used very particularly here by Smith to be understood as infinitesimally granular, e.g. the different parts of a single plant or individual particles of soil.

[48] As early as 1933, economist-geographer Erich Zimmerman explained, "Resources are not: they become" (15).

physical substance into something considered a “resource.” Such assemblages of matter and meaning are actively created with the help of “inscription devices” that include the tools, technologies, techniques, and tales used to exploit and explain the resource (Li, 2014: 589).

4.1. Conflicting or complementary perspectives?

These two closely related approaches to analyzing property and resources as contingent ‘things’ each address the other’s blind spots. While critical resource scholars are ostensibly interested in the material aspects of resource assemblages, in practice they take the material delineation for granted and instead focus on the way that meaning is incorporated into the assemblage. That is, while legal scholars have rigorously investigated how infinitely divisible matter is grouped and delineated into discrete ‘things,’ the critical resource scholars take the physical aspects of the ontology of resources and property for granted, focusing solely on how they are mobilized as objects of social meaning.

In contrast, the legal scholars have narrowly focused on the role of humans in bounding matter, rather than fully understanding a governable ‘thing’ as not only *delineated* because of its meaning and value, but in fact *constituted*, in part, by the meaning it has to people. We see obvious and easy to understand examples of the contingency of ‘thinghood’ play out in contexts where an entity’s rights to an area of land may not extend to the minerals below it, the air above it, the flora and fauna upon it, or the water coursing through it. But the critical resource scholars, by stressing the non-material aspects of a “resource assemblage,” show us how a single grouping of matter—in the present case, the land and vegetation—can be construed as two resources because a resource is a contingent “cultural category” that is defined both physically and socially based on how the matter is used and what about it confers value (Bridge, 2009: 1219). Physical

properties are vital to the categorization of a discrete resource, but the same physical entity can exist as two (or more) resources if different meanings and social relations are attached to it.

Using this framework, we can understand spring-fall pasture and fodder land as distinct resources defined by different 'inscription devices' and activities in order to solve different problems. In addition to the clearly divergent governance regimes for each, people use different terms for each, referring to "fodder-cutting land" (Taj. *zamini kahdarav[i]*) and spring, fall, or 'seasonal' (i.e., spring-fall) pasture (Taj. c*harogohi bahori, charogohi tiramohi, charogohi mavsimi*) rather than simply discussing the different uses occurring on the same resource.

The legal scholars who have written about these topics work within the sub-field known as 'law and economics,' and their analysis of how social forces shape understandings of property is limited by their "presumption that property"—and, by extension, how 'legal things' are bounded—"is centered on the coordination of economic transactions, with efficiency understood as the driver of property rules" (Blomley, 2016: 247). Geographers and anthropologists do not think that assemblages are the product of a natural inclination towards efficiency, and they critically examine "whose interests are served by these practices of resource-making," an important intervention that recognizes that resource creation is not neutral and will often produce inequitable outcomes (Valdivia et al., 2021: 5). Perhaps because of this focus, critical resource scholars have been overwhelmingly interested in resources of considerable global importance rather than those resources relevant to small-holders. Legal scholars have put more time into understanding the governance implications of how resources are bounded, and their more theoretical and context-neutral analysis allows for better application to small-holder contexts.

In sum, the two approaches are especially complementary for the analysis of the present case. Critical resource scholars provide an understanding of a "resource" that allows for fodder

land and spring-fall pastures to be understood as two distinct resources despite being materially the same. Legal scholars provide a framework for understanding the governance implications of resource definition, described in the next section.

4.2. One resource or two? Why might it matter?

Bounding a resource defines the object or category of objects which is to subject to a set of resource access and management rules. When the 'thing' is more specific or homogenous—or in Fennell's terminology, when it comprises more tightly related complements—then this is a simpler task, requiring fewer exceptions, negotiations, and contingencies with fewer opportunities for misunderstanding and conflict. Smith's "architectural view" of property emphasizes that the delineation of a resource is important for facilitating the coarse instruments that he calls "basic features" of property: exclusion rights and residual claims[49] (Smith, 2012: 1710). If more specific rules are needed, then people employ what Smith distinguishes as "governance" strategies, a term he uses very specifically (and confusingly) to mean narrower rules about specific types of uses, rather than the blunt tools of boundary-setting and exclusion. These "governance" rules have the advantage of being more tailored to a situation, but are more difficult to understand, monitor, and enforce than simple delineation and exclusion (Smith, 2012).

"Land" is an extremely broad category that encompasses almost limitless uses and interests; different parties will view it as a very different type of resource, and even a single party will not consider all land in the same way (Li, 2014). When "land" is conceived as a type of

[49] Residual claims are the "unspecified uses that the proxy [i.e., the delineated resource] sweeps up" (Smith, 2012: 1710). That is, when someone has exclusion rights to property, this also confers to them many different use rights that don't need to be individually delineated. For example, if you are a fee-simple owner of your home, you don't need separate rights to sleep in it, read in it, cook in it, etc.

governable resource, there is always a need for complex and bespoke governance rules, which are often difficult to navigate without special expertise. The benefit of understanding fodder land and spring-fall pastures as distinct resources is that the *rules* surrounding them are simpler. The benefit of understanding land as a single resource is that the *delineation of the resource* is simpler and less context-specific, so it will be more intelligible to those who are not embedded within the community.

TABLE 4.3: Implications of different ways of defining the resource(s)

Characterization	Resource Definition	Governance
Semi-commons	Easy to understand, even for outsiders	More complicated governance rules needed. More difficult to understand, monitor, enforce.
Two resources	Difficult for outsiders to understand	Less complicated governance. Fewer exceptions and less need for negotiation.

In this case, it appears that the community members treat fodder land and spring-fall pastures as two separate resources when dealing with each other. This explains not only the absence of denials of grazing access on fodder plots but also the absence of mere negotiations or discussion about allowing grazing access. The temporal dimension of the delineation between the resources is obvious to those for whom it is relevant, even though it may appear nuanced and non-intuitive to outsiders.[50] In contrast, these 'modules' are lumped into the single category of 'land' in the *de jure* property relations between community members and the state where land carries importance as both an object of taxation and a performative metric of individualization reforms (Robinson et al., 2008; Hofman and Visser, 2021). Divergence in the social categorization of resources corresponds to the legal pluralism described in SECTION 5 of the

[50] In reference to a different postsocialist context, Verdery has written that "complex property rights [are] at their fuzziest" when they lie "at the interface of collective and individual, with minimal state mediation" (1999: 56).

previous chapter and SECTION 2 of this chapter: the ways that fodder land and near-village pastures—unlike cultivated land—are not accessed in accordance with the property demarcations understood by the state.

Community rejection of state-supported "formal" resource governance systems in favor of alternative systems has been tied to the mismatch between the formal system and the nature of the resource (Addison, 2016), but it can also be the result of a fundamental difference in what resource is actually being governed. This case shows that the bounding of a resource does not simply "vary over time and space" (Bridge, 2009: 1220), but between different groups of people and even among a single party depending on what groupings of parties and entities are implicated in a property relation. In other words, multiple ways of defining a resource may coexist, each with its own utility and implications for resource use and access.

5. Conclusion

As a key pastoral resource (Brottem et al., 2014), fodder land's access and use rights influence the functioning of the entire pastoral system and interact with its other components. Access to fodder land is a key limiting factor on livestock holdings, leading most households to have relatively small numbers of livestock (CHAPTER 3). Because most households own few livestock, they pool their animals into communal herds and pool their labor for the sake of efficiency, resulting in communal "village herds" that comprise individually owned single animals. This group herding, in turn, facilitates the maintenance of "community pastures" that nullify the potential damage to grazing access of *de jure* and *de facto* fragmentation that is only relevant when this same land is being used for fodder production or as an object of taxation by the state.

The ripple effects of fodder governance on other pastoral resources, including pasture,

labor, and the livestock themselves, are further evidence for the need to consider fodder when understanding or seeking to alter governance regimes for pastoral system. Because of these ripple effects, fodder governance is also a potential entry point for policy interventions that ultimately seek to effect change in other types of pastoral resources; goals related to pasture governance could be reached in part by policies directed at fodder access.

But this chapter also illustrates that even outside of pastoral contexts the implications of a resource governance regime can only be understood by taking into account the governance of complementary or closely related resources. Identifying which resources are relevant requires an analysis that does not take the bounding of a resource for granted. What might appear to an observer to be a single resource governed with a difficult to parse "bundle" of rights and duties may in fact be considered by the resource users to comprise multiple distinct resources, each with their own simpler governance rules. Rather than trying to empirically research a resource governance system with *a priori* categories of which resources are at play, learning how resources are delineated by different actors should be the first step in trying to understand a governance system.

As explained in SECTION 4.1, combining complementary approaches from law-and-economics scholars and critical resource studies provides useful tools to understand the making of resources and property. The legal scholars, though not using the terminology of "making," offer more robust analysis of the material aspects of resource definition and bounding, while critical resource scholars have developed frameworks and language for understanding the importance of socio-cultural meaning in resource assemblages. Property theorists in legal studies offer more insights into the implications of resource delineation for the operation and effectiveness of resource governance. 'Effectiveness,' however, will be different for various

actors with divergent priorities—consider small-holders versus the state in the present example—and critical resource scholars emphasize the need to understand that the social construction of resources will produce winners and losers.

Attention to the bounding and definition of resources has practical relevance for policy creation or development interventions related to resource governance, particularly in contexts where there are disputes related to resource access and use. In cases where the relevant parties in a resource governance regime can come to shared definitions of resources, then this approach may allow for more stable and predictable access rules, which makes governance easier and less prone to conflict and minimizes the uncertainty that can negatively affect livelihoods.

Of course, this approach is no panacea. For example, in areas where land-related conflicts arise between agriculturalists and pastoralists, you can expect fundamental differences in resource definition: the agriculturalists may never see cultivable land as the 'wet-season pastures' that pastoralists do. In cases where relevant parties have divergent or disputed definitions of a resource, then a more sophisticated understanding of the contingency of resource delineation will not likely lead to simpler and more stable land access rules. However, it may provide openings for negotiation and understanding, elucidating a set underlying differences that contribute to resource-related disputes. If, in a given context, these definitional disagreements have not yet been explored, they may prove more approachable and less sensitive than previous types of disputes, facilitating renewed discussion and arbitration in the face of a persistent impasse.

Chapter 5
Conclusions: Key Findings and Policy Implications

1. Introduction

This dissertation analyzed the governance of pastoral resources in Tajikistan, focusing on the land-based resources of pasture and fodder but also considering labor and livestock. Pastoralism scholarship has transformed over the last 35 years through rigorous research informed by the particulars of the socio-environmental contexts in which it was conducted, centering the experiences of pastoralists, even when it meant contradicting dominant exogenous global narratives. My research is a distinct product of this intellectual history. The questions I pursued, the frameworks and concepts I used to answer them, and my attention to diverse governance mechanisms—formal and informal—will be instantly familiar to any scholar of pastoralism. Additionally, my critiques of "the new rangeland paradigm" and my insistence that, in some contexts, fodder must be understood as an intrinsic component of a functioning pastoral system are my extension of the subarea's dedication to understanding these systems from the point of view of the pastoralists, rather than erroneously imposing mismatched outside understandings (even if, in this case, these mismatched understandings come from some pastoralism scholars).

In this chapter, I briefly review the key findings that emerged in the three substantive chapters (SECTION 2). Each of those chapters concludes with implications of its findings, but in this chapter, I will discuss the implications of the chapters together for pastoral legislation in Tajikistan (SECTION 3).

2. Summary of key findings

In the late 1980s, crucial scholarship on African drylands developed new paradigms for understanding these ecosystems and how they are used by pastoralists. There was a consensus—among a set of pastoralism scholars, if not policy makers and development practitioners—that spatiotemporal variability in forage availability and interannually erratic rainfall requires livestock mobility patterns that can shift to accommodate this uncertain environmental variability. Such flexible mobility patterns, in turn, require flexible use rights facilitated by norms and institutions that allow for property boundaries and definitions of user groups to be porous or 'fuzzy'. Though at first radical among scholars and development practitioners, these ideas gained ground and eventually became dominant among those who focus on pastoralism around the world.

CHAPTER 2 of this dissertation looked critically at how key concepts within this dominant paradigm—variability, uncertainty, mobility, and flexibility—are deployed globally in analyses of pastoralism. Combining an analysis of academic and development-sector literature on pastoralism with field work in the Rasht Valley, I showed how these concepts are 1) confused and used imprecisely, and 2) are not appropriate to invoke similarly in all pastoral contexts. Specifically, I argued that livestock mobility was necessary in all pastoral contexts to accommodate spatiotemporal variability in forage availability. However, flexible mobility is only necessary in the subset of contexts where this variability is highly unpredictable, and this is not the case in all (perhaps not even most) pastoral systems. While mobility must be facilitated by 'partial' (non-possessory) property rights, it is not necessary for these to be *flexible* unless, perhaps, the mobility patterns themselves are flexible. Due to the inherent difficulties of unstable property rights regimes, I argued against a priori assumptions and an embrace of uncertainty and

unempirical calls for flexibility, advocating instead for "looking for predictability" upon which to build resource governance systems that are as stable as possible without undermining the need for mobility.

This dissertation also diverges from most pastoralism research in its thorough consideration of cut fodder as 1) an important resource *in its own right* and 2) a resource that must be considered when trying to understand *pasture governance*. Every chapter discussed both fodder and pasture and their relationship. CHAPTER 3 argued that fodder can be an integral and intrinsic part of a pastoral system, contributing to rather than rupturing the 'coupling' of a pastoral system with its environmental context. The relationship between fodder land governance and pasture land governance was discussed in two ways in CHAPTER 4. First, the overall parity in the distribution of fodder land among households has led to a general pattern—with some exceptions—of many households with small livestock holdings, leading to the combining of individually owned livestock into common herds in order to maximize labor efficiency. This 'group herding' leads to pastures being used in common, despite the fact that de jure use rights for these lands have been individualized. Second, the distinction between fodder land and near-village pastures (mostly spring-fall pastures, but some summer pastures) is often temporal: the two resources are identical in terms of material composition but differ in when and how they are exploited and how they are governed. The land is managed individually when it is considered fodder-growing land and in common when it is considered pasture.

A more common theme in pastoralism research which is covered in depth here is the relationship between de jure and de facto resource governance regimes. Importantly, both de jure and de facto rules are relevant. Exclusive grazing areas for wealthy individuals with large herds—either belonging to locals with hundreds of animals and or belonging to a non-local

agricultural enterprise with tens of thousands of animals and owned by one of the most powerful men in all of Tajikistan—are delineated by governmental property rules. The local elites acquire their areas by obtaining certificates for individual dehqon farms (DFs) from the State Land Committee, and their claim to this land is respected by local and non-local herds because of these documents. Non-local rights to high-altitude summer pastures are conveyed by annual leases granted by the State Land Committee and State Forest Agency. These leases are made in accordance with 10-year presidential decrees[51] that allocate use rights for specific amounts of pasture between districts to facilitate long-distance livestock migrations (see FIGURE 5.1). Governmental laws supporting equitable distribution of former state-farm lands—though certainly not applied universally—have created a general pattern of parity in household fodder-land holdings. People consider their rights to fodder land to be tied to their legal documents in some way, whether these are shareholder documents for collective DFs or certificates for individual DFs. The land areas listed on these documents determine the taxes assessed for people's fodder growing land.

10	Шахритус	Вахдат	ЗФДЧ	11065	586
			ЗЗД	15080	6836
		Кубодиён	ЗФДЧ	3139	1281
			ЗЗД	2320	1412
		Варзоб	ЗЗД	881	85
			ЗФДЧ	1450	232
11	Хуросон	Рашт	ЗЗД	14873	8373
12	Чиликул	Тавилдара	ЗФДЧ	1856	977
			ЗЗД	1435	749

FIGURE 5.1: Extract from Presidential Decree 696 "About the use of seasonal pastures" showing cross-district allocation of high-altitude pasture use rights (in hectares). Highlighted row shows number of hectares in Rasht district allocated to herds from Khuroson district.

[51] Most recently, Presidential Decree 696 "About the use of seasonal pastures" [Tajik: "*Дар бораи истифодаи чарогоҳҳои мавсимӣ*"], issued on October 31st, 2014.

Despite the clear relevance of state law, this research also focused on the centrality of non-state rules and norms for pastoral land governance. These extra-legal dimensions of property relations sometimes work in concert with state law; for example, the location of the DF land that people harvest fodder from is largely based on a history of prior use. Other times, de facto use ignores or contradicts state law. Despite the overall parity in the distribution of fodder lands across households, there are clear exceptions where some especially savvy or relatively elite individuals were able to acquire large amounts of land, especially in the early days of land reform immediately after independence. Though people view their use rights to fodder land as being tied to their legal documents, the land that they use sometimes differs from what is on their certificates (both in size and location). In fact, many people who have legal use rights to "pasture" on their individual DF certificates do not actually know where this land is located even though they pay taxes on it every year. Lastly, the fragmentation of grassland use *rights* into individual parcels does not actually result in a fragmentation of pasture *use* among small-holders who send their livestock to graze with the collective village herds, as these individuals do not exclude others' animals from their own land.

When de facto aspects of pastoral resource governance and use diverge from governmental laws, most people demonstrate little or no effort to invoke the latter. Official documents and rules hold power and relevance when they are wielded, but it is generally the most well-resourced—through wealth, position, or social stature—who are able to acquire documents and successfully navigate the often-corrupt machinery of the state to take advantage governmental rules. In sum, formal state law is not consistently implemented, but it is consequential. The next section uses lesson learned from this dissertation to assess the implications of several key aspects of recent pasture legislation in Tajikistan.

3. Implications for pasture legislation in Tajikistan

There have always been laws in Tajikistan that pertain to pastures and fodder land. These include sets of laws related permanent heritable use rights in the form of dehqon farms and laws and decrees related to the temporary leasing of State Reserve Land and State Forest Land. In 2010, shortly after Kyrgyzstan passed its "Law on Pastures," several international organizations started uncoordinated efforts to develop pasture-specific legislation for Tajikistan, culminating in the passage of Tajikistan's own "Law on Pastures" in 2013 (Robinson, Jamsranjav, and Gillin, 2017). The legislation was subsequently revised in 2019 to clarify administrative roles of different entities and reduce the stated responsibilities for government bodies, which still do not have the capacity to fulfill their duties as written (Hayward, Hofman, and Gillin, 2022). The legislation was "a response to international donor concerns about land degradation, the possibility of transboundary pasture conflicts, and the increasing fragmentation of [pasture use rights]" as shareholders of collective DFs withdrew their shares to create individual DFs (Hayward, Hofman, and Gillin, 2022).

The law has yet to significantly affect the governance of pastoral resources. Unlike Kyrgyzstan's Law on Pastures, Tajikistan's legislation does not prohibit individual ownership of pastures or include provisions to undo elites' exclusive accumulation of pastures (Robinson, Jamsranjav, and Gillin, 2017). One piece that has been implemented is a provision for households to incorporate as a "pasture users' union" (PUU) [Taj. *jam'iyati istifodabarandagoni charogoh*], a collective legal entity that can acquire its own land certificate, essentially resulting in a recollectivization of pastures that were individualized when households withdrew their shares of collective DF land. However, PUUs have only formed through international development projects, and their distribution is based on the vagaries of international donor

project site selection; there are no PUUs anywhere in Rasht District and only a handful in the five neighboring districts. The majority of the perhaps 200-300 current PUUs are in Khatlon Province in the southwest of the country.[52] While essentially unimplemented, the Law on Pastures does have the potential to eventually affect pasture governance in Rasht. In this section I discuss the implications of several aspects of the law, including both the provision for PUUs and its lack of considerations of fodder or mechanisms to revive long-distance transhumance for livestock owners based in Rasht.

3.1. Facilitating long-distance transhumance: Winter pastures for mountain-based livestock

The long-distance transhumance described in this dissertation involves 'non-local' herds based in the southwestern lowlands of Khatlon province traveling to Rasht's high-mountain summer pastures. With the exception of one livestock owner with a large herd and special connections in Khatlon[53], all of the local herders keep their animals in Rasht in the winter, stall-feeding them cut fodder for roughly half the year. This was not the case in the Soviet era, when Rasht-based livestock would overwinter in lowland pastures in Danghara district in Khatlon province, sustained by a mix of winter-pasture grazing and supplemental feed. Those winter pastures were allocated specifically to herds from Rasht; their neighbors in those winter pastures were herds from neighboring districts such as Sangvor (previously Tavildara) and Tojikobod.

[52] Current figures are unavailable. In 2015, there were 177 PUUs, with all but 13 located in Khatlon (GIZ, 2015). More have been created since then, including some in the Gorno-Badakhshon Autonomous province, but there are still none in the study area.

[53] This arrangement, facilitated by political connections, is explained vaguely to preserve anonymity.

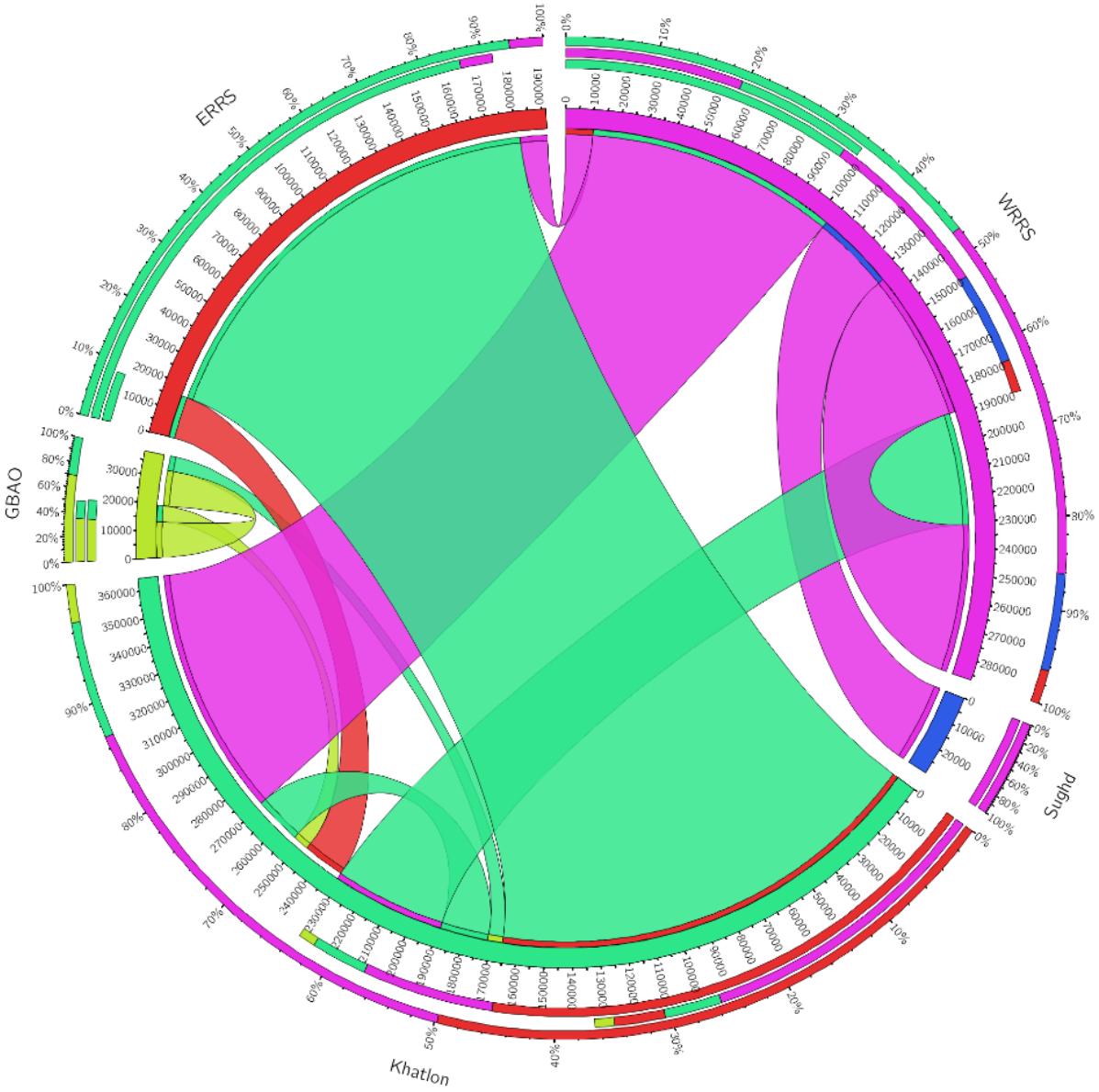

FIGURE 5.2: Chord diagram of cross district pasture allocations by area based on Presidential Decree 696 "About the use of seasonal pastures". (Author.)

Since independence, however, mountain-based herders, including those in Rasht, have lost access to lowland winter pastures. These herders report that they lost access because of the disintegration of their state farms, and that only state-owned animals have rights to pastures outside of their home districts. This belief is false. As described above, governmental decrees continue to allocate pasture-use rights between districts, and these allocations facilitate the

granting of one-year leases to private herds. All the non-local Khatlon-based herds that get such contracts in the study area are private herds. However, the official governmental allocations are now regionally inequitable, almost exclusively facilitating access to summer mountain pastures for lowland-based herds. The chord diagram above (FIGURE 5.2) shows cross-district allocations of pasture between regions; the larger the band, the greater the area allocated.[54] The cyan bands show the allocation of use rights for mountain pastures to Khatlon herds. The small red band shows pastures allocated to herds in districts within the region where the Rasht Valley is located.

As described in CHAPTER 3, herd size in Rasht is limited by households' ability to sustain their animals through the winter on locally sourced cut fodder. Reviving long-distance transhumance for local herds would provide substantial benefit to herders in the region, increasing the number of animals that they could own, reducing losses during especially harsh winters, and improving animal condition. The substantial benefits would outweigh the likely challenges for herders. Restarting transhumance would require more sophisticated cooperation among smallholder households, and while there is currently plenty of pasture available within Rasht for the current livestock population, a substantial increase in the livestock population due to less restrictive winter conditions could demand more careful management of local pastures, especially in the less expansive spring-fall pastures closer to villages. First of all, however, Rasht herders would have to regain access to lowland pastures through legal mechanisms. This would require changes to the national cross-district pasture allocation scheme as well as transfer of control of Khatlon pastures that have, in many cases, been privatized by locals. There is no

[54] Some cross-district allocations are made because villages' nearest pastures happen to fall in another district. To capture only those allocations made to facilitate transhumance, allocations between neighboring districts have been excluded. Districts were grouped by province, but the Regions of Republican Subordination (RRS), which do not have an associated provincial government, have been divided into Western RRS and Eastern RRS to reflect the large area they cover. In general, the WRRS are more lowland and the ERRS, where Rasht is located, is mountainous.

provision in the new legislation for either of these, effectively guaranteeing a continued prominent role for fodder provision in the pastoral system of the Rasht Valley. Unfortunately, the new legislation has almost nothing to say about fodder.

3.2. The absence of fodder in the Law on Pastures

In the 32 articles of the law spanning about 15 pages, fodder is mentioned once: alongside medicinal plant collection, hunting, beekeeping, tourism, and leisure activities in a list of "other uses of pastures" that are permissible as long as they don't limit grazing. That is, according to this legislation, "pastures" are lands for grazing livestock. This is a departure from how the term "pasture" operates in certificates (deeds) for dehqon farms: as a land *cover* designation that does not prescribe how this land ought to be *used*. Though it may initially seem reasonable for legislation named "Law on Pastures" to not consider fodder land, this dissertation shows that considering the two land uses in isolation is untenable. From a technical legal perspective, it is unclear how the current law—if implemented as written—could accommodate household needs for fodder provision. Most families in the mountainous parts of the country, who are especially dependent on livestock, grow no fodder on their household plots or on cultivable land, and those that do only get a small percentage of their fodder from such land. The vast majority of fodder comes from land that is classified in legal documents as "pasture" and that is used for grazing at certain times of the year. Growing and harvesting fodder in these areas *does* limit where and when grazing is possible, directly conflicting with how the current law allows fodder collection on pastures. Any nationally applicable laws regarding pasture must allow for periodic prohibition of grazing on these lands and acknowledge their crucial use as fodder-growing areas as well as grazed pastures.

As described in CHAPTER 4, state pasture legislation will almost certainly be understood to apply year-round to areas of land that are considered ‘pasture’ rather than applying on a temporary basis to land only while it is used for grazing (versus fodder growing). Therefore, the current model of having one set of legislation that applies solely to pastures for grazing while continuing to use other laws geared towards cropland to govern fodder land will likely result in either fodder shortages—were fodder production to cease on lands that are sometimes grazed—or, much more likely, the Law on Pastures being unimplementable. A more reasonable approach would be to have two separate pasture laws—or at least separate frameworks within a single law—one for lands that are used exclusively for grazing, such as many higher-altitude summer pastures, and another for lands that must oscillate between fodder production and being grazed. For the latter, there should be a clearer description of legal tools that could facilitate both of these land uses, such as types of servitudes (mentioned in CHAPTER 2) that could codify and protect the customary arrangements that currently are enabled through social norms, which are subject to change. There is very brief mention of servitudes in Article 10 of the Law on Pastures, but only for the purposes of water access and allowing passage of livestock to other areas. To mimic current de facto property regimes, servitudes should promise time-bound access for common herds on individually owned plots (rather than the more complex alternative of a patchwork of individual servitudes allowing fodder collection on common land).

3.3. The promise of pasture users’ unions

The Law on Pastures includes provisions for the formation of “pasture users’ unions” (PUUs), corporate bodies comprising individual members, usually within a single village. Once formed and incorporated as a legal entity, a PUU can obtain a DF in its name for its members to use in

common. While the post-independence trend of land tenure in Tajikistan has been a gradual fragmentation and individualization of agricultural land, this novel provision allows for re-collectivization of pastoral land. In contrast to a collective DF with individual shareholders who may have different shares of the land, this is an individual DF owned by a single corporate entity, with no differentiation between members of the PUU. Based on a review of organizing documents for existing PUUs outside of the study area, areas of land are assigned to herds—some PUUs are large enough to comprise multiple herds, just as some villages in Rasht are large enough that they have multiple neighborhood-specific herds—but land is not allocated to individual people or households.

Pasture users' unions hold promise for smallholders in Rasht. This arrangement could help align de jure pasture-use arrangements with ways village herds are currently using pasture, ignoring the boundaries of legally individualized pastures to create de facto common pastures. Forming a PUU and transferring individual pasture plots to it would not require changes in mindsets or practices regarding pasture governance. Since people do not exclude grazing on their land and many are interested in removing some of the pasture areas from their land certificates, it is unlikely that there would be much resistance to PUU-owned pastures *with respect to grazing*. However, such an arrangement would be untenable without a provision for people to continue to grow and harvest fodder on these lands for part of the year. This is the key obstacle that must be overcome. PUUs are supposed to develop pasture-use plans, and the ones that I have been able to review—all from southwest Tajikistan, outside the study area—have not included any provision for fodder. For PUUs to be useful in Rasht, pasture-use plans must be more nuanced and include non-possessory individual use rights for fodder collection. Though fodder growing that constrains grazing is not listed as an acceptable 'alternative' pasture use in the legislation, it

would seem that since a PUU would be the sole private owner of any pastures they obtained, they would have the right to devise the plans as they wish, but this should be clarified by Tajikistani jurists.

Despite the difficulties of accommodating individual use rights to collect fodder on PUU land, the potential benefits of legally owning land in common make PUU formation and ownership of pastures worth considering. Firstly, despite no current examples of households with individual de jure use rights for pasture preventing village herds from using their land, some people I interviewed wondered if legal reforms would eventually affect the social norms of collective pasture use. Though this is unlikely to happen on a large scale due to the small livestock holdings of most households (see CHAPTER 4), even just a handful of households excluding village herds would sow discord and add new challenges to grazing. Enshrining common access in legal documents could avert this. Secondly, once legally aggregated into larger pieces of land tied to whole village populations, pastures used by Rasht-based herders would be less likely to be obtained by non-locals. Up to now, the only pastures in the study area (Hijborak and Askalon sub-districts) that have been used by non-locals are remote summer pastures in State Reserve Land, but on the other side of the Surkhob River in northern Rasht District (e.g. Navdi and Hoit sub-districts) there are cases of non-local herders legally obtaining near-village pastures and excluding locals, suggesting this is a legitimate risk.

Thirdly, and perhaps most promisingly, forming a new PUU may provide local herders in Rasht with an improved pathway to accessing *summer* pastures. As described in CHAPTER 2, livestock owners either keep their animals on poor quality near-village summer pastures (though in most villages, there are no summer pastures) or, more commonly, pay per head for their animals to go to a remote summer pasture. Remote summer pastures for local livestock are all

currently owned by relatively wealthy locals who levy fees for the use of their pastures. In several cases, these pastures were previously State Reserve Land that had been annually leased by non-local herders; when they obtained certificates for this land, the owners effectively increased the total area of land available to local livestock. These wealthy locals have the discretion to set the price for others' animals to graze on their land and could theoretically stop accepting others' animals on their land in the future, though currently, accepting others' animals is an important—sometimes primary—income stream for them, and the landowners have strong social ties with the owners of the livestock they accept. This situation offers little assurance of ongoing affordable access for the several hundreds of households—the majority of the households in the study area—that rely on them, but access would be reliable if those households were able to co-own summer pastures as PUU members. Additionally, summer pastures are typically used exclusively for grazing, and a PUU would not have to create special arrangements to facilitate fodder production in those areas.

There would be two pathways for PUUs to obtain their own summer pastures. First, they could obtain the summer pastures that are currently held by wealthy locals as individual DFs. The close social and familial relations between current owners and the rest of the community may make this possible. One of the wealthy individual summer pasture owners strongly emphasized—whether or not it was genuine—that he obtained this pasture just to improve the livelihoods of his community, charging access fees as low as possible while still recouping the amount he pays in property taxes. If we take him at his word, he would be happy to transfer ownership of that land to a PUU. The other option would be for a PUU to obtain land that is currently State Reserve Land that non-local herders are able to access via annual contracts. Since this land is currently used by animals owned by some of the most powerful people in Tajikistan,

this would at first seem like an impossibility. However, the fact that two locals have been able to do this suggests that this may be a realistic aspiration.

4. Conclusion

Though the Law on Pastures remains mostly unimplemented, with PUUs only forming as a result of internationally funded development projects in select districts, this dissertation has shown that government laws do significantly, though not exclusively, influence the governance of pastoral resources. In the early days of post-independence land reform in the 1990s and early 2000s, savvy individuals were able to use new laws to their advantage while many were caught flat-footed, creating new patterns of land distribution and dispossession that have proven lasting and apparently irreversible. Communities in Rasht and those governmental bodies and development organizations interested in their welfare should engage with the new legislation now, even if it has thus far proven inconsequential.

There are three priority areas for engagement. First, there must be assurance that fodder production will not be disrupted in areas considered "pasture." This could happen through clarification in how the existing law will be interpreted and implemented or through advocacy for revision of the law. Second, households in Rasht should form PUUs with an aim of obtaining summer pastures. For reasons described in SECTION 3.3, forming a PUU for spring-fall pastures that are also used for fodder production is complicated, so that should be deprioritized to allow a focus on summer pastures. Forming a PUU as a legal entity does not require immediate acquisition of land and does not automatically trigger recollectivization of near-village pastures, so organizing a PUU does not mean running the risk of disrupting fodder production.

Because summer pastures in Rasht are used by households from multiple villages, however, PUUs in Rasht cannot follow the existing model of each PUU corresponding to a single village. Any development organization wishing to form PUUs in the area must consult extensively with communities to determine the correct model of membership for PUUs. Lastly, development organizations should work with legal experts and State Land Committee staff to explore the possibility of securing individual access to fodder-growing land within pasture areas owned as an individual DF by a PUU. If this is possible, it opens the door for Rasht communities to organize single-village PUUs for near-village pastures, following the model of existing PUUs elsewhere in the country. Though the potential benefits of resuming mountain-to-lowland transhumance were discussed in this chapter, the current political atmosphere in Tajikistan makes it extremely unlikely that any communities from Rasht would secure access to land in Khatlon, and therefore this should not be a priority for further work.

This dissertation has shown the importance of a more complete and nuanced understanding of pastoral requirements and resource rights regimes. The current Law on Pastures does not accommodate these nuances, and therefore has the potential, if implemented, to impose harm on the pastoral sector. A lack of nuance has also impaired global discourse among pastoralism scholars and advocates, whose collective efforts to amplify the knowledge and practices of pastoralists have unwittingly created a movement with its own locus of power and internal logic, compromising its effectiveness to represent the lived experiences of specific pastoralist groups. However, simply acknowledging nuance is insufficient, and can lead to false assumptions that pastoral practices are based on inscrutable local knowledge that defies articulation and, therefore, reliable governance regimes or ‘certainties’. Rather, the empirical understanding of what exactly the nuances are—in resource requirements, use, and even resource

definition—is crucial to allow for similarly refined and precise governance arrangements (e.g. non-possessory and time-bound access rules). Nuance allows pastoral resource governance to be both stable and appropriate.

Works Cited

Addison, J. 2016. The predictive value of resource defence theory in understanding resource user responses to climatic variability: Implications for the viability of institutions in a resource dependent context. *Human Ecology, 44*: 137-152.

Addison, J. and C. Brown. 2014. A multi-scaled analysis of the effect of climate, commodity prices and risk on the livelihoods of Mongolian pastoralists. *Journal of Arid Environments, 109*: 54-64.

Adriansen, H.K. 2005. Pastoral mobility: A review. *Nomadic Peoples, 9*(1&2): 207-215.

Afzalov, S. 1990. Chorvoi shakhsi begona nest. ["Private livestock are not outsiders."] *Tojikistoni Soveti*. September 13

Agrawal, A. 2009. *Greener Pastures: Politics, Markets, and Community among a Migrant Pastoral People*. Durham, NC: Duke University Press.

Augustine, D.J. 2010. Spatial versus temporal variation in precipitation in a semiarid ecosystem. *Landscape Ecology 25*: 913-925.

Arbos, P. 1923. The geography of pastoral life illustrated with European examples. *Geographical Review, 13*(4): 559-574.

Barth, F. 1961. *Nomads of South Persia: The Basseri Tribe of the Khamseh Confederacy*. Boston, MA: Little, Brown and Company.

Balikchi, A. 1990. Tenure and transhumance: stratification and pastoralism among the Lakenkhel. In *The World of Pastoralism: Herding Systems in Comparative Perspective*, eds. J. Galaty and D. Johnson. New York: Guilford Press.

Baron, J. 2013. Rescuing the bundle-of-rights metaphor in property law. *University of Cincinnati Law Review, 82*(1): 57-102.

Bassett, T.J. 2009. Mobile pastoralism on the brink of land privatization in northern Côte d'Ivoire. *Geoforum, 40*: 756-766.

Behnke, R. 2000. Equilibrium and non-equilibrium models of livestock population dynamics in pastoral Africa: Their relevance to Arctic grazing systems. *Rangifer, 20*(2-3): 141-152.

Blatter, M. 2009. The transformation of the alpine economy in the fourteenth to eighteenth centuries: Harvesting 'wild hay' in the high mountains. *Nomadic Peoples 13*(2): 146-159.

Blomley, N. 2016. The boundaries of property: Complexity, relationality, and spatiality. *Law and Society Review, 50*(1): 224-255.

Bridge, G. 2009. Material worlds: Natural resources, resource geography and the material economy. *Geography Compass, 3*(3): 1217-1244.

Brottem, L, M.D. Turner, and A. Singh. 2014. Biophysical variability and pastoral rights to resources: West African transhumance revisited. *Human Ecology, 42*(3): 351-365.

Butt, B. 2016. Ecology, mobility and labour: dynamic pastoral herd management in an uncertain world. *Scientific and Technical Review of the Office International des Epizooties, 35*(2): 461-472.

Casimir, M. and A. Rao. 1992. *Mobility and Territoriality: Social and Spatial Boundaries Among Foragers, Fishers, Pastoralists and Peripatetics*. Oxford: Berg.

Davies, J., et al. 2016. *Governance of Tenure Technical Guide 6: Improving Governance of Pastoral Lands*. Rome, Italy: FAO.

Davis, D. 2016. *The Arid Lands: History, Power, and Knowledge*. Cambridge, MA: MIT Press.

Dessalegn, M. 2016. Threatened common property resource system and factors for resilience: Lessons drawn from serege-commons in Muhur, Ethiopia. *Ecology and Society, 21*(4).

Economist Intelligence Unit. 2019. *Democracy Index 2018: Me too? Political participation, protest and democracy.* London: The Economist Intelligence Unit Ltd.

Ehlers, E. and H. Kreutzmann. 2000. High mountain ecology and economy: Potential and constraints. In *High Mountain Pastoralism in Northern Pakistan,* eds. E. Ehlers and H. Kreutzmann. Stuttgart, Germany: Franz Steiner Verlag.

Elam, Y. 1979. Nomadism in Ankole as a substitute for rebellion. *Africa, 49*: 147-158.

Ensminger, J. and A. Rutten. 1991. The political economy of changing property rights: dismantling a pastoral commons. *American Ethnologist, 18*:683-99.

FAO. 2011. *Guidelines for the Preparation of Livestock Sector Reviews*. Animal Production and Health Guidelines, No. 5. Rome: FAO.

Fazlur-Rahman. 2009. Population growth and sustainability of common property resource management systems in the Eastern Hindu Kush: the use of communal fodder resources in Mehlp Valley, North Pakistan. *Journal of Mountain Science 6*: 380-393.

Fennell, L.A. 2009. Commons, Anticommons, Semicommons. John M. Nolin Program in Law and Economics Working Paper, No. 457. University of Chicago Law School.

——. 2020. Property as the law of complements. In *Research Handbook on Private Law Theory*, ed. by Dagan, H. and B.C. Zipursky. Pp. 155-173. Northampton, MA: Edward Elgar Publishing.

——. 2021. Remixing Resources. *Yale Journal of Regulation, 38*: 589-611.

Fernández-Giménez, M. 2002. Spatial and social boundaries and the paradox of pastoral land tenure: A case study from postsocialist Mongolia. *Human Ecology*, *30*(1): 49-78.

Fernández-Giménez, M. and B. Allen-Diaz. 1999. Testing a non-equilibrium model of rangeland vegetation dynamics in Mongolia. *Journal of Applied Ecology, 36*: 871–885

Fernández-Giménez, M. and S. Le Febre. 2006. Mobility in pastoral systems: Dynamic flux or downward trend? *International Journal of Sustainable Development and World Ecology, 13*: 341-362.

Fernández-Giménez, M., B. Batkhishig, B. Batbuyan, and T. Ulambayar. 2015. Lessons from the Dzud: Community-Based Rangeland Management Increases the Adaptive Capacity of Mongolian Herders to Winter Disasters. *World Development, 68*: 48-65.

Fortmann, L. 1985. The tree tenure factor in agroforestry with particular reference to Africa. *Agroforestry Systems, 2:* 229-251.

Foster, D. 2015. *Militarism in Tajikistan: Realities of Post-Soviet Nation Building*. Doctoral dissertation. Department of Geography, University of Oregon.

Freedom House. 2019. "Freedom in the World 2019." freedomhouse.org/report/countries-world-freedom-2019. Accessed 6 Jan 2020.

Galaty, J. and D. Johnson. 1990. *The World of Pastoralism: Herding Systems in Comparative Perspective.* New York: Guilford Press.

Galvin, K.A. 2009. Transitions: pastoralists living with change. *Annual Review of Anthropology 38*: 185-198.

Galvin, K., R. Reid, R. Behnke, and N. T. Hobbs (eds.). 2008. *Fragmentation in Semi-Arid and Arid Landscapes: Consequences for Human and Natural Systems.* Dordrecht: Springer.

Gentile, M. 2013. Meeting the 'organs': the tacit dilemma of field research in authoritarian states. *Area* 45(4): 426-432.

GIZ. 2015. Policy note. [Unpublished PDF dated February 6th, 2015. Shared with author.]

Gomart, E. 2002. Between civil war and land reform: Among the poorest of the poor in Tajikistan. In *When Things Fall Apart: Qualitative Studies of Poverty in the Former Soviet Union*, ed. N. Dudwick, E. Gomart, and A. Marc. Washington, DC: The World Bank.

Guillet, D.W. 1983. Toward a cultural ecology of mountains: the central Andes and Himalaya compared. *Current Anthropology 24*(5): 561-574.

Halimova, N. 2012. Land tenure reform in Tajikistan: Implications for land stewardship and social sustainability: A case study. In *Rangeland Stewardship in Central Asia: Balancing Improved Livelihoods, Biodiversity Conservation and Land Protection*, ed. V. Squires. Dordrecht, The Netherlands: Springer.

Hardin, G. 1968. The tragedy of the commons. *Science 162*(3859): 1243-1248.

Hayward, D, I. Hofman, and K. Gillin. 2022. Tajikistan - Context and land governance. In *Land Portal. Http://landportal.org/book/narratives/2022/tajikistan*. Accessed 25 May, 2022.

Herrera, P., J. Davies, and P. Manzano Baena. 2014. Principles of pastoralist governance and land management. In *The Governance of Rangelands: Collective Action for Sustainable Pastoralism,* eds. P. Herrera., J. Davies, and P. Baena. New York: Routledge.

Hobbs, N. T., K. A. Galvin, C. J. Stokes, J. M. Lackett, A. J. Ash, R. B. Boone, R. S. Reid, and P. K. Thornton. 2008. Fragmentation of rangelands: Implications for humans, animals, and landscapes. *Global Environmental Change* 18, 776–785.

Hofman, I. 2019. *Cotton, Control, and Continuity in Disguise: The Political Economy of Agrarian Transition in Lowland Tajikistan*. Doctoral Dissertation. Leiden, the Netherlands: University of Leiden.

Hofman, I. and O. Visser. 2014. Geographies of transition: The political and geographical factors of agrarian change in Tajikistan Leibniz Institute of Agricultural Development in Transition Economies, No. 151. Halle, Germany.

———. 2021. Towards a geography of window dressing and benign neglect: The state, donors, and elites in Tajikistan's trajectories of post-Soviet agrarian change. *Land Use Policy 111(*105461).

IFAD. 2020. *How to Prevent Land Use Conflicts in Pastoral Areas*. Rome: IFAD.

———. 2020. *Republic of Tajikistan, Country Strategic Opportunities Programme, 2019-2024* [EB 2020/130/R.19]. Rome: International Fund for Agricultural Development.

Illius, A. and T. O'Connor. 1999. On the relevance of nonequilibrium concepts to arid and semiarid grazing systems. *Ecological Applications, 9*(3): 798-813.

Ingold, T. 1980. *Hunters, Pastoralists, and Ranchers: Reindeer Economies and Their Transformations.* Cambridge: Cambridge University Press.

Intigrinova, T. 2010. Social inequality and risk mitigation in the era of private land: Siberian pastoralists and land use change. *Pastoralism, 1*(2): 178-197.

Kerven, C. 2004. The influence of cold temperatures and snowstorms on rangelands and livestock in northern Asia. In *Rangelands at Equilibrium and Non-Equilibrium: Recent Developments in the Debate Around Rangeland Ecology and Management,* ed. Susanne Vetter. Cape Town: Programme for Land and Agrarian Studies.

Kerven, C., B. Steimann, L. Ashley, C. Dear, and I. ur Rahim. 2011. "Pastoralism and Farming in Central Asia's Mountains: A Research Review." Mountain Societies Research Centre Background Paper No. 1. University of Central Asia: Bishkek.

Kislyakova, N.A. and A.K. Pisarchik. 1966. *Tadzhiki Karategina i Darvaza* [Tajiks of Qarotegin and Darvoz]. Dushanbe: Donish.

Kissling-Näf, I., T. Volken, and K. Bisang. 2002. Common property and natural resources in the Alps: the decay of management structures? *Forest Policy and Economics 4*: 135-147.

Klümper, F, I. Theesfeld, and T. Herzfeld. 2018. Discrepancies between paper and practice in policy implementation: Tajikistan's property rights and customary claims to land and water. *Land Use Policy 75*: 327-339.

Koch, N. 2013. Introduction – Field methods in 'closed contexts': undertaking research in authoritarian states and places. *Area* 45(4): 390-395. DOI: 10.1111/area.12044

Krätli, S. and N. Schareika. 2010. Living *off* uncertainty: the intelligent animal production of dryland pastoralists. *European Journal of Development Research 22*: 605-622.

Kraudzun, T. 2012. Livelihoods of the 'new livestock breeders' in the Eastern Pamirs of Tajikistan. In Kreutzmann, H. (ed.) *Pastoral Practices in High Asia* (pp. 89-107). Dordrecht: Springer.

Kreutzmann, H. 2004. Pastoral Practices and their Transformation in the North-Western Karakoram. *Nomadic Peoples 8*(2): 54-88.

———. 2009. Transformations of High Mountain pastoral strategies in the Pamirian Knot. *Nomadic Peoples 13* (2), 102-123.

———. 2011. Pastoralism in the Pamirs. Regional contexts, political boundaries and market integration in central Asia. In *Economic Spaces of Pastoral Production and Commodity Systems: Markets and Livelihoods*, eds. J. Gertel and R. Le Heron. Ashgate, Aldershot.

Lane, C. and R. Moorehead. 1994. New directions in rangeland resource tenure and policy. In *Living With Uncertainty: New Directions in Pastoral Development in Africa*, ed. Ian Scoones. London: Intermediate Technology Publications Ltd.

Lemon, E. 2014. Mediating the conflict in the Rasht Valley, Tajikistan: The hegemonic narrative and anti-hegemonic challenges. *Central Asian Affairs 1*(2): 247-262.

Lerman, Z. and D. Sedik. 2008. *The Economic Effects of Land Reform in Tajikistan.* Budapest: FAO Regional Office for Europe and Central Asia.

Li, T. 2014. What is land? Assembling a resource for global investment. *Transactions of the Institute of British Geographers, 39*(4): 589-602.

Mahmudov, M., G. Jüraev, and B. Berdiev. 2012. *Farhangi Güishhoi Janubii Zaboni Tojiki*. Dushanbe: Pazhühishgohi Farhangi Forsi-Tojikii Saforati Jumhurii Islomi Eron dar Tojikiston.

Mandler, A. 2012. Knowledge and governance arrangements in agricultural production: Negotiating access to arable land in Zarafshan Valley, Tajikistan. ZEF Working Paper Series, 106. Bonn: ZEF.

Marin, A. 2006. Confined and Sustainable? A Critique of Recent Pastoral Policy for Reindeer Herding in Finnmark, Northern Norway. *Nomadic Peoples, 10*(2): 209-232.

McAllister, R., I. Gordon, M. Janssen, and N. Abel. 2006. Pastoralist's responses to variation of rangeland resources in time and space. *Ecological Applications, 16*, 572-583.

McCarthy, N. and M. Di Gregorio. 2007. Climate variability and flexibility in resource access: the case of pastoral mobility in Northern Kenya. *Environment and Development Economics, 12*:403-21.

Meinzen-Dick, R. and R. Pradhan. 2002. *Legal pluralism and dynamic property rights* (CAPRi Working Paper No. 22). Washington, DC: International Food Policy Research Institute.

Merry, S.E. 1988. Legal pluralism. *Law & Society Review*, *22*(5): 869-896.

Mohamed Sala, S., Otieno, D.J., Nzuma, J. et al. 2020. Determinants of pastoralists' participation in commercial fodder markets for livelihood resilience in drylands of northern Kenya: Case of Isiolo. *Pastoralism: Research, Policy, and Practice 10*(18).

Moritz, M. 2016. Open Property Regimes. *International Journal of the Commons, 10*(2): 688-708.

Moritz, M., P. Scholte, I. Hamilton, and S. Kari. 2013. Open access, open systems: Pastoral management of common-pool resources in the Chad Basin. *Human Ecology, 41*: 351-365.

Moritz, M., E. Gardiner, M. Hubbe, and A. Johnson. 2019. Comparative study of pastoral property regimes in Africa offers no support tor economic defensibility model. *Current Anthropology 60*(5): 609-636.

Moritz, M., I. Hamilton, Y. Chen, and P. Scholte. 2014. Mobile pastoralists in the Logone floodplain distribute themselves in an ideal free distribution. *Current Anthropology, 55*: 115-122.

Mwangi, E. and E. Ostrom. 2009. Top-down solutions: Looking up from East Africa's rangelands. *Environment, 51*(1).

Netting, R. 1976. What Alpine Peasants Have in Common: Observations on Communal Tenure in a Swiss Village. *Human Ecology, 4*(2): 135-146.

Neudert, R. 2015. Is Individualized Rangeland Lease Institutionally Incompatible with Mobile Pastoralism? A Case Study from Post-Socialist Azerbaijan. *Human Ecology, 43*: 785-798.

Neudert, R., Allahverdiyeva, N., & Beckmann, V. 2019. Common herding in the South Caucasus - What motivates smallholders and how do they sustain cooperation? Conference paper. *Small Farms in Transition: How to Stimulate Inclusive Growth?* June 26-28, Halle, Germany.

Niamir-Fuller, M. and M. Turner. 1999. A review of recent literature on pastoralism and transhumance in Africa. In *Managing Mobility in African Rangelands: The Legitimization of Transhumance*, ed. Maryam Niamir-Fuller. London: Intermediate Technology Publications.

[no author]. 1976. Ma'lumot dar borai rafti jam'ovarii khoshok dar sovkhozhoi rayon to 28 iyuni soli 1976. ["Information about the progress of fodder harvesting in the district's state farms as of June 28th, 1976."] *Qarotegini Soveti.* June 30.

Nori, M. 2019. *Herding Through Uncertainties – Regional Perspectives: Exploring the interface of pastoralists and uncertainty. Results from a literature review.* EUI Working Paper #68. Florence: EUI.

Nozières, M., C. Moulin, and B. Dedieu. 2011. The herd, a source of flexibility for livestock farming systems faced with uncertainties? *Animal 5*(9): 1442-1457.

Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: Cambridge University Press.

Pappagallo, L. and G. Semplici. 2020. Methodological mess: Doing research in contexts of high variability. *Nomadic Peoples*, 24(2): 179-194.

Pastoralist Knowledge Hub. 2020. Defining pastoralism and nomadic pastoralism. *Forum of the Pastoralist Knowledge Hub*. [https://dgroups.org/fao/pastoralist-hub/discussions/v2nw5899]. Accessed 30 November 2020.

Pérez León, N., O. Bruzzone, and M. Easdale. 2020. A framework to tackle the synchrony between social and ecological phases of the annual cyclical movement of transhumant pastoralism. *Sustainability 12*(8): 3462.

Peters, P. 1987. Embedded systems and rooted models: The grazing lands of Botswana and the commons debate. In *The Question of the Commons: The Culture and Ecology of Communal Resources*, eds. B. McCay and J. Acheson. Tucson, AZ: The University of Arizona Press.

Rakkar, M. & H. Blanco-Canqui. 2018. Grazing of crop residues: Impacts on soils and crop production. *Agriculture, Ecosystems & Environment, 258:* 71-90.

Rhoades, R. and S. Thompson. 1975. Adaptive strategies in Alpine environments: Beyond ecological particularism. *American Ethnologist, 2*(3): 535-551.

Robinson, S. 2000. *Pastoralism and Land Degradation in Kazakhstan*. (Doctoral dissertation.) University of Warwick, Coventry, UK.

Robinson, S., Bozayeva, Z., Mukhamedova, N., Djanibekov, N., & Petrick, M. 2021. Ranchers or pastoralists? Farm size, specialisation and production strategy amongst cattle farmers in south-eastern Kazakhstan. *Pastoralism: Research, Policy and Practice, 11*(31), 1–22.

Robinson, S. and T. Guenther. 2007. Rural livelihoods in three mountainous regions of Tajikistan. *Post-Communist Economies 19*(3): 359-378.

Robinson, S., I. Higginbotham, T. Guenther, and A. Germain. 2008. Land reform in Tajikistan: Consequences for tenure security, agricultural productivity, and land management practices. In *The Socio-Economic Causes and Consequences of Desertification in Central Asia*, ed. R. Behnke. Dordrecht, The Netherlands: Springer.

Robinson, S., C. Jamsranjav & K. Gillin. 2017. Pastoral property rights in Central Asia: Factors and actors driving the reform agenda. In *Verte la Steppe?: Éditions de l'EHESS*, eds. M. Elie and C. Ferret. Paris: Éditions EHESS.

Robinson, S. and E. J. Milner-Gulland. 2003. Contraction in livestock mobility resulting from state farm reorganisation. In *Prospects for Pastoralism in Kazakstan and Turkmenistan,* ed. C. Kerven. London: RoutledgeCurzon.

Robinson, S. and M. Whitton. 2010. Pasture in Gorno-Badakhshan, Tajikistan: Common resource or private property? *Pastoralism: Research, Policy, and Practice 1*(2): 198-217.

Robinson, S., C. Wiedemann, S. Michel, Y. Zhumabayev, and N. Singh. 2012. Pastoral tenure in Central Asia: Theme and Variation in the Five Former Soviet Republics. In *Rangeland Stewardship in Central Asia: Balancing Improved Livelihoods, Biodiversity Conservation and Land Protection*, ed. V. Squires. Dordrecht, The Netherlands: Springer.

Roche, S. 2019. *The Faceless Terrorist: A Study of Critical Events in Tajikistan*. Cham, Switzerland: Springer.

Roe, E., L. Huntsinger, and K. Labnow. 1998. High-reliability pastoralism versus risk-averse pastoralism. *Journal of Environment and Development 7*(4): 387-421.

Rose, C. 2011. Servitudes. In *Research Handbook on the Economics of Property Law*, ed. Kenneth Ayotte and Henry Smith. Cheltenham, UK: Edward Elgar Publishing.

Rota, A., S. Krätli, M. Nori, A. Bellinguez, M. Bassi, and O. Mundy. 2018. *How to Do Note: Engaging with Pastoralists—A Holistic Development Approach.* Rome: IFAD.

Rowe, W.C. 2009. "Kitchen gardens" in Tajikistan: The economic and cultural importance of private property in a post-Soviet society. *Human Ecology 37*(6): 691-703.

———. 2010. Agrarian adaptations in Tajikistan: Land reform, water, and law. *Central Asian Survey 29*(2): 189-204.

Sayre, N., D. Davis, B. Bestelmeyer, and J. Williamson. 2017. Rangelands: Where anthromes meet their limits. *Land, 6*(31): 1-11.

Schlager, E. and E. Ostrom. 1992. Property-rights regimes and natural resources: a conceptual analysis. *Land Economics, 68*(3): 249-262.

Schmidt, M. 2017. Human geography of post-socialist mountain regions. *Journal of Alpine Research* 105(1). DOI: 10.4000/rga.3573

Schumacher, P., & Chorshanbiev, R. 2010. *Research on potential conflicts between forestry management and pasture use based on examples in the Roshtkala and Ishkashim districts*. GTZ: Khorog, Tajikistan.

Scoones, I. 1992. Coping with drought: Responses of herders and livestock in contrasting savannah environments in southern Zimbabwe. *Human Ecology*, 20(3): 293-314.

———. 1994. New directions in pastoral development in Africa. In *Living With Uncertainty: New Directions in Pastoral Development in Africa*, ed. Ian Scoones. London: Intermediate Technology Publications Ltd.

———. 2020. Pastoralists and peasants: perspectives on agrarian change. *The Journal of Peasant Studies.* DOI: 10.1080/03066150.2020.1802249.

Scoones, I. and A. Stirling. 2020. Uncertainty and the politics of transformation. In *The Politics of Uncertainty: Challenges of Transformation*, eds. I. Scoones and A. Stirling. New York: Routledge

Sedik, D. 2012. The feed-livestock nexus: Livestock development policy in Tajikistan. In *Rangeland Stewardship in Central Asia: Balancing Improved Livelihoods, Biodiversity Conservation and Land Protection*, ed. V. Squires. Dordrecht, The Netherlands: Springer.

Singh, N.J., Bhatnagar, Y.V., Lecomte, N. *et al.* 2013. No longer tracking greenery in high altitudes: Pastoral practices of Rupshu nomads and their implications for biodiversity conservation. *Pastoralism: Research, Policy, and Practice 3*(16).

Smith, H.E. 2000. Semicommon property rights and scattering in the open fields. *Journal of Legal Studies, 29*(1): 131-169.

——. 2012. Property as the law of things. *Harvard Law Review 125*: 1691-1726.

——. 2015. The elements of possession. In *Law and Economics of Possession,* ed. by Chang, Y. Pp. 65-102. Cambridge, UK: Cambridge University Press.

Starrs, P. 2018. Transhumance as antidote for modern sedentary stock raising. *Rangeland Ecology & Management, 71*: 592-602.

Steimann, B. 2010. *Making a Living in Uncertainty. Agro-Pastoral Livelihoods and Institutional Transformations in Post-Socialist Rural Kyrgyzstan*. (Doctoral dissertation.) Division of Human Geography. University of Zurich, Switzerland.

———. 2012. Conflicting strategies for contested resources: Pastoralists' responses to uncertainty in post-socialist rural Kyrgyzstan. In *Pastoral Practices in High Asia,* ed. Hermann Kreutzmann. Berlin: Springer.

Sullivan, S. and R. Rohde. 2002. On non-equilibrium in arid and semi-arid grazing systems. *Journal of Biogeography, 29*: 1595-1618.

Swallow, B.M., and N. McCarthy. 2000. Property rights, risk, and livestock development in Africa: Issues and project approach. In *Property Rights, Risk, and Livestock Development in Africa*, eds. N. McCarthy, B.M. Swallow, M. Kirk and P. Hazell. Washington, DC: IFPRI.

Swift, J. 1994. Dynamic ecological systems and the administration of pastoral development. In *Living With Uncertainty: New Directions in Pastoral Development in Africa,* ed. Ian Scoones. London: Intermediate Technology Publications Ltd.

TajStat. 2017. *Mintaqahoi Jumhurii Tojikiston. [Regions of Tajikistan]* (In Tajik.) Dushanbe, Tajikistan: Statistical Agency of the Republic of Tajikistan.

Takahashi, R., K. Otsuka, M. Tilahun, E. Birhane, S. Holden. 2024. Beyond Ostrom: Randomized experiment of the impact of individualized tree rights on forest management in Ethiopia. *World Development, 178*: 106586.

Tapper, R. 1979. Individuated grazing rights and social organization among the Shahsevan nomads of Azerbaijan. In *Pastoral Production and Society*. Cambridge: Cambridge University Press.

Thibault, H. 2018. *Transforming Tajikistan: State-Building and Islam in Post-Soviet Central Asia.* London: I.B. Tauris.

Turner, M. 2011. The New Pastoral Paradigm: Engaging the Realities of Property Institutions and Livestock Mobility in Dryland Africa. *Society and Natural Resources, 24*(5): 469-484.

Turner, M. and Hiernaux, P. 2008. Changing access to labor, pastures, and knowledge: The extensification of grazing management in Sudano-Sahelian West Africa. *Human Ecology, 26*(1): 59-80.

Turner, M., J. McPeak, K. Gillin, E. Kitchell, and N. Kimambo. 2016. Reconciling flexibility and tenure security for pastoral resources: The geography of transhumance networks in eastern Senegal. *Human Ecology, 44*(2):199-215.

Turner, M., and E. Schlecht. 2019. Livestock mobility in sub-Saharan Africa: A critical review. *Pastoralism: Research, Policy, and Practice, 9*(13): 1-15.

United Nations, Department of Economic and Social Affairs. Population Division. 2019. International Migrant Stock 2019 (United Nations database, POP/DB/MIG/Stock/Rev.2019). Accessed 8 June, 2020. https://www.un.org/en/development/desa/population/migration/data/estimates2/data/UN_MigrantStockByOriginAndDestination_2019.xlsx

Ur-Rahim, I., Maselli, D., Rueff, H., & Bonfoh, B. 2014. Market Access and Herders' Strategies to Pass through Lean Winter Periods in Post-Soviet Kyrgyzstan. *APCBEE Procedia 8*: 323–328.

USAID. 2017. *Tajikistan Land Reform and Farm Restructuring Project Evaluation*. Washington, DC: USAID.

Valdivia, G., M. Himley, and E. Havice. 2021. Critical resource geography: An introduction. In *The Routledge Handbook of Critical Resource Geography*, ed. M. Himley, E. Havice, and G. Valdivia. New York: Routledge.

Van Belle, G. 2008. *Statistical Rules of Thumb*. Hoboken, NJ: Wiley.

Vanselow, K.A. 2011. *The high-mountain pastures of the Eastern Pamirs (Tajikistan). An evaluation of the ecological basis and the pasture potential*. Doctoral dissertation. Faculty of Natural Sciences. Friedrich-Alexander-Universität Erlangen-Nürnberg.

Vanselow, K.A., T. Kraudzun, and C. Samimi. 2012. Grazing practices and pasture tenure in the eastern Pamirs: The nexus of pasture use, pasture potential, and property rights. *Mountain Research and Development, 32*(3): 324-336.

Veldwisch, G.J.A. 2008. Authoritarianism, validity, and security: Researching water distribution in Khorezm Uzbekistan. In *Field Work in Difficult Environments: Methodology as Boundary Work in Development Research*, eds. C.R.L. Wall and P.P. Mollinga. Berlin: Lit Verlag.

Verdery, K. 1999. Fuzzy property: Rights, power, and identity in Transylvania's decollectivization. In *Uncertain Transition: Ethnographies of Change in the Postsocialist World*, ed. M Burawoy and K. Verdery. New York: Rowman & Littlefield.

Von Benda-Beckmann, F. 1997. Citizens, strangers and indigenous peoples: conceptual politics and legal pluralism. *Law & Anthropology, 9*: 1-42.

Walsh, R. and D. Lawler. 1981. Rainfall seasonality: Description, spatial patterns and change through time. *Weather, 36*(7): 201-208.

Watanabe, T. and S. Shirasaka. 2018. Pastoral practices and common use of pastureland: The case of Karakul, north-eastern Tajik Pamirs. *International Journal of Environmental Research and Public Health*, *15*(2725).

Williams, M. and V. Konovalov. 2008. *Central Asia Temperature and Precipitation Data, 1879-2003, Version 1*. Boulder, CO: National Snow and Ice Data Center (NSIDC). doi: https://doi.org/10.7265/N5NK3BZ8. Accessed 13 August 2015.

World Bank. 2022. "GNI per capita, Atlas method (current US$)." http://data.worldbank.org/indicator/ny.gnp.pcap.cd?year_high_desc=true. Accessed 24 Apr 2024.

———. 2023. *Leveraging Diaspora Finances for Private Capital Mobilization. Migration and Development Brief 39*. Washington, DC: IBRD/World Bank.

Yu, L. and K.N. Farrell. 2013. Individualized Pastureland Use: Responses of Herders to Institutional Arrangements in Pastoral China. *Human Ecology, 41*: 759–771.

Zhaoli, Y., W. Ning, Y. Dorji, and R. Jia. 2005. A review of rangeland privatisation and its implications in the Tibetan Plateau, China. *Nomadic Peoples, 9*(1/2): 31-51.

Zimmermann, E. 1933. *World Resources and Industries*. New York: Harper and Brothers.