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RSCAS 2019/68
Robert Schuman Centre for Advanced Studies
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Herding through Uncertainties – Regional Perspectives.
Exploring the interfaces between pastoralists and uncertainty.
Results from a literature review

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Robert Schuman Centre for Advanced Studies

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ISSN 1028-3625

© Michele Nori, 2019

Printed in Italy, November 2019

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Badia Fiesolana

I – 50014 San Domenico di Fiesole (FI)

Italy

www.eui.eu/RSCAS/Publications/

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Abstract

This paper has been written as a background review for the European Research Council-funded PASTRES project (Pastoralism, Uncertainty, Resilience: Global Lessons from the Margins, www.pastres.org). Lessons from pastoralists, we argue, may help other domains to develop more effective responses to uncertain contexts. Following prof. Scoones' papers *What is uncertainty and why does it matter ?*, this is one of two papers developed with a view to analyse and reflect on the interfaces and interrelationships between pastoral societies, the uncertainties that embed their livelihoods, and the related coping/adaptive principles, strategies, and practices.

Through a structured review and a meta-analysis of existing literature, the environmental, market, and governance dimensions characterizing uncertainty for pastoralists are explored in six different settings: a) Central and southern Asia, with specific references to the Tibetan plateau in China and to Indian pastoralists; b) the northern and southern shores of the Mediterranean, with a focus on Morocco in the Maghreb-Mashreq region and a wider perspective on pastoralism in Mediterranean Europe; c) the eastern and western flanks of Sub-Saharan Africa drylands, with a specific focus on the Fulani and Borana pastoral groups inhabiting these regions.

This paper provides an understanding of the constantly changing uncertainty frameworks characterising the livelihoods of pastoralists inhabiting these different geographical areas of the globe. Very diverse and contrasting pastoral settings present relevant similarities and convergences when facing evolving uncertainty scenarios. The ecological uncertainties that inform pastoral strategies get reconfigured as connections and networks extend, and the market and governance dimensions hold growing roles in determining these livelihoods systems. The paper concludes by indicating potential ways we could learn from pastoralists, as part of a wider conversation about embracing uncertainties to meet the challenges of our turbulent world. This endeavour is complemented by *another paper* that explores the principles, strategies, and practices pastoral communities adopt with a view to cope and adapt to surrounding and embedding insecurities.

Keywords

Pastoralism, uncertainty, risk, drylands, resilience, insecurity, margins.

Table of Contents

Introduction	1
What is pastoralism and who are the pastoralists?	2
Review approach	3
ASIA	6
Central Asia - Pastoralist incorporation	6
A binding State presence	9
The Chinese experience.....	10
South Asia – Facing the green revolution	13
Indian pastoralism	15
The intertwining of livestock and farming	17
Engaging with markets and the State	19
EUROPE – The Common Agriculture rural welfare	22
A Common policy for agriculture and rural development	24
Navigating institutional territories.....	25
MENA Maghreb and Mashreq – Inverse Mobility	32
Resettling communities	33
Relocating lands	35
SUB-SAHARAN AFRICA	41
Sahel – Transhumance integrating territories	42
Mobile communities, shifting territories	44
Tackling regional economic and political agendas	47
Horn of Africa - Fragmented and contested rangelands	49
Shifting lands and herds	50
Frontiers, borders, roads and ports	53
Conclusions	57
Bibliography	59

Introduction*

We live in times of ‘crisis’. Crisis is the word that characterises debate in most domains, be it in finance, migration, climate, environment, or security, among others. The control paradigm that has informed our cultures and societies in the post-war decades seems to be over. Although probably not included in the definition and vision of ‘modernity’, uncertainty is now the prevalent dimension embedding daily lives. Societal evolutions seem to increase the levels, scale, and degrees of uncertainty. And we have to learn to live with these.

PASTRES departs from the idea that indications and lessons from cultures and societies that are typically tailored and tuned to *living with and through uncertainties* could provide new stars to direct our navigations. Such ‘windows of opportunity’ can be found amongst pastoralists for whom uncertainty is a resource, as it is the core of rangeland and livestock management, essential for livelihoods (Scoones, 1994; de Bruijn and van Dijk, 1999; Krätli and Schareika, 2010). If we accept that pastoralists are neither wrong nor ignorant in managing range resources characterized by limitedness, variability, and unpredictability (cfr. Behnke and Scoones, 1992), we could further extend this to the belief that pastoralists can provide principles and lessons to the wider society that is increasingly engaged with degrees of uncertainty that offer little room for control. These are PASTRES inspiring principles.

With a view to providing background information to PASTRES activities and reflections, we propose a systematic review of existing literature linking pastoralism, uncertainty, and coping/adaptation. This is hoped will contribute to an overall understanding of the ways pastoralists interface and interrelate with uncertainty in different regional contexts. Two papers have been developed accordingly in ways that complement each other, exploring on one side the uncertainties affecting pastoral livelihoods in six world regions, and on the other one trying to distill the common principles underpinning pastoralists’ practices and strategies.

This paper provides an understanding of the constantly changing uncertainty frameworks characterising the livelihoods of pastoralists inhabiting these different geographical areas of the globe. Specific regional analyses have been undertaken in central and southern Asia, on the eastern and western flanks of Sub-Saharan Africa, and on the northern and southern shores of the Mediterranean. The ‘uncertainty settings’ in each region are defined according to three main domains, relating to environmental, market, and governance dimensions (Nozières *et al.*, 2011; Scoones, 2019). Pastoral resource management as well as livelihood practices have in fact shaped and adapted through time to fit ecosystems characterized by an inconstantly variable resource availability, whereby pastoralists’ capacity to access and utilize these is today increasingly articulated through unstable policy and market dimensions. These factors and domains vary and diverge in the different regions and thus create fluctuating regimes of risks and constraints, but also of possibilities, and opportunities according to shifting conditions.

The other ‘*inspiring principles*’ paper assesses pastoralists’ adaptive strategies and livelihood practices in responding to the stresses and shocks generated by embedding uncertainties, with a view to teasing out the underpinning, inspiring principles. In fact, the responses displayed and applied by pastoral communities in the different settings show relevant and intriguing degrees of similarity across the regions. This helps identify a common framework and a set of overarching principles and patterns for pastoralists in dealing with risk and uncertainty (de Bruijn and van Dijk, 1999).

* We would like to acknowledge for their precious contribution to these papers: Prof. Jeremy James Swift, Saverio Krätli, Carol Kerven, Fiona Flintan, Rashmi Singh, Roy Behnke, Huatse Gyal, Gongbuzeren, Hussein Mahmoud, Antonello Franca, Emery Roe, Antonio Rota, Ilse Köhler-Rollefson, Andy Catley, Tahira Shariff Mohamed, Giulia Simula, Palden Tsering, Natasha Maru, Linda Pappagallo, Masresha Taye, Jeremy Lind, Domenica Farinella, Mohamed Noor, Anna Triandafyllidou, staff from IDS and from EUI. Special thanks to the ERC programme (<https://erc.europa.eu/>) and its Advanced Grant scheme, and to the whole PASTRES constituency (www.pastres.org).

These endeavours are believed to fill a scientific gap and provide important contributions to furthering the understanding of pastoral societies as much as to inform potential responses to wider societal challenges on strategies to enhance adaptation and resilience in face of uncertainties. Like the open pages of a book, one paper informs and completes the other in telling a story from the margins that might become central to tackling the shifting and accelerating uncertainties that increasingly characterize society as a whole.

What is pastoralism and who are the pastoralists?

But let’s start by establishing what is pastoralism and who are the pastoralists? Pastoralism is a specialised form of natural resource management adapted to ecosystems defined as marginal because their potential for agricultural intensification is structurally limited by bio-physical conditions. It is important to highlight that ‘marginality’ is defined according to a specific mode of production and development paradigm, though this eventually translates into the social and political marginalization of the communities inhabiting these territories. Extensive pastoral production occurs in some 25 per cent of the global land area in territories around the world, from African drylands to Central Asian steppes, from European mountains to Andean plateaux. In order to make use of these territories and live through these ecological dimensions and the related risks and opportunities, pastoralists critically rely on *mobile livestock rearing*, a distinguishing factor amongst rural communities (Blench, 2001:6; Johnsen *et al.*, 2019).

Pastoral resource management relies on the centrality of livestock as the main 'technology' for converting available grasslands into human food—animal protein in the form of milk and meat—and other products (hides, skins, fibres) and also for transferring them from one place to another and from one season to another. Besides being a primary means of production, livestock is also a service provider for transportation and ploughing. Animals are also important as means of transaction as they represent the primary source of exchange, income, loan, gift, and often the main instrument for saving, investment, and insurance and an asset that ensures access to primary services. Diverse pastoral societies are characterised by different animal species, according to agro-ecological conditions (IFAD, 2018) (Table 1). These, in turn, carry specific socio-economic implications; household members are involved to different degrees in animal care and management practices, as well as in other activities that support pastoralism, as it will be assessed.

Table 1 - Pastoral systems and trends in the world’s regions

<i>Zone</i>	<i>Main species</i>	<i>Status</i>
Sub-Saharan Africa	Cattle, camel, sheep, goats	Important environmental changes and shifting policy framework; patterns of sedentarisation and insecurity
Mediterranean	Small ruminants, cattle	Societal transformations reconfiguring mobility and growing territorial polarisation with under- and over-grazed pastures
South Asia	Various small and large ruminants	Declining due to advancing agriculture, though still relevant in mountainous settings
Central Asia	Various small and large ruminants	Expanding following de-collectivization that characterised Soviet and Chinese experiences
Arctic	Reindeer	Expanding following de-collectivization in Siberia, but under pressure in Scandinavia
North America	Sheep, cattle	Declining with increased enclosure of land and alternative economic opportunities
Andes	Llama, alpaca	Diverging systems due to infrastructure expansion and modern livestock production

Source: adapted from Jenet *et al.*, 2016.

Mobility is a factor central to pastoral resource management and livelihood patterns. Pastoralists move in order to make the best use of a limited and variable natural resource base while also enhancing its reproduction. Apart from its productivity aspects, mobility is also a strategy for accessing and exchanging products and services, seizing opportunities, or evading animal diseases or other trouble. The geographical dimensions of mobility vary according to conditions and cultures, as it will be assessed (Niamir Fuller, 1999).

Attachment to land thus varies from one group to another as do land tenure and access rights, which are often quite strict in principle but flexible in implementation as they are often subject to adjustment and negotiations. The capacity to access resources when needed in order to support mobile livestock represents a most critical asset for managing risks and seizing opportunities in pastoral areas. Maintaining and reproducing the resource base is another pillar on which pastoral resource management rests. Experience shows that patterns of access to resources in pastoral societies cannot be simply framed and labelled 'public', 'private', or 'open access' as a number of rights and claims co-exist and compete through livestock, water points, grazing, forest, salty areas, and other range resources, as it will be assessed. This is why social capital is particularly relevant in pastoral systems as it determines the capacity to negotiate or enforce access to critical resources (Flintan, 2012).

Apart from their relevance to local livelihoods and the national and regional economies, pastoral systems are also increasingly acknowledged for the social and ecosystem services they provide to the wider society by managing natural resources and maintaining biodiversity. The capacities of properly-managed pasturelands to absorb carbon and water also provide a most effective support for ecosystem functions that are increasingly important from a climate perspective (Caballero *et al.* 2009; Nori and de Marchi, 2015; Franca *et al.*, 2016; Jenet *et al.*, 2016.). Important socio-cultural and political roles are also associated with pastoralism. By supporting local livelihoods, pastoralism ensures that a human presence is maintained in harsh terrains and remote communities, thus helping avert socio-economic desertification, with relevant implications for the cultural heritage and territorial identity of local communities (Moreira *et al.* 2016; Nori and Farinella, 2019). Herding also represents the best way to safely occupy and secure vast, remote territories where the costs of any other form of producing, controlling, monitoring, and patrolling would be significantly higher (Nori and Baldaro, 2018; FAFO, 2016).

The conditions, risks, stresses, and opportunities characterizing and shaping pastoral livelihoods increasingly depend on a number of factors, processes, and variables beyond the environmental domain. As it will be assessed, the market and governance dimensions contribute importantly to accelerating, expanding, and diversifying the nature and degrees of uncertainties surrounding and embedding pastoral communities. Integration of pastoral economies into wider market dynamics, State interventions aimed at development or modernisation or both, sedentarisation programs, rangeland and wildlife protection, armed conflicts, insecurity at the local or regional levels, as well as technological development shortening and re-connecting distances, places, resources and communities all contribute to the reconfiguration of the uncertainties pastoralists experience in the various settings.

Review approach

This is a systematic literature review of existing literature exploring the links and the relations between pastoralists and uncertainty in different regions of the globe. Through a qualitative analysis of bibliographic materials, this work undertakes an aggregation of findings of local studies with the aim of revealing general trends and a tentative global mapping. In this respect potential factors, patterns, and pathways that typify the connections and relationships between pastoralists and uncertainties are assessed, together with the ways these are framed in the different contexts.

As indicated above, six regions where pastoralism represents an important livelihood strategy have been chosen. In accordance with PASTRES areas of activity, a specific area/group where there is a concentration of literature and documented case studies has been selected in each region for a focused

analysis. The regions include central and southern Asia (with specific focus on the Tibetan Plateau and on Indian pastoralists); the eastern and western flanks of Sub-Saharan Africa (with a specific focus on the Fulani and Borana groups); and the northern and southern shores of the Mediterranean. Other relevant pastoral regions such as the Arctic and the Americas have not been addressed in this review.

The implementation of the systematic review followed three main steps: a) characterisation of the research question; b) systematic selection of review materials; and, c) analysis through the consolidation of a qualitative database. With a view to translating the research question concerning pastoralism and responses to uncertainty into operational terms, criteria for selecting relevant bibliographical materials were defined. The criteria was the presence in the text of the following search criteria (*pastoral* OR herd**) AND (*uncertain* OR risk OR insecur**). The terms risk and insecurity were deemed more appropriate as proxies to uncertainty as the concern is more on socio-cultural patterns rather than ecosystem dynamics.

According to these criteria, literature materials specifically containing primary and empirical information on pastoral responses and adaptation to degrees of uncertainty were collected through snowball sampling by multiple sources. Primary data sources were produced or provided by PASTRES colleagues; additional bibliographic materials were then generated from the references of those initial materials through snowball sampling. With a view to collecting in a systematic way the information contained in the papers reviewed, an operational table has been developed for each paper. In each table, evidence of pastoralists' coping/adaptive responses according to the three Pastres operational domains (Environment, Markets, Institutions) have been collected in order to develop a qualitative database for analysis in comparative terms (Table 2).

Table 2 – PASTRES table for classifying pastoral strategies

Sources of uncertainty	Region / group	Period of study	New pressures/ challenges	Impacts/ implications	New/emerging responses Short term	New/emerging responses Long term
Environment/ resources						
Markets/ commodities						
Institutions/ governance						

With a view to balance a wide geographical global coverage with specific regional characterizations, a minimum of 15 bibliographical materials were selected for each region. Most of the papers were published in various scientific journals but the analysis also leant on scientific studies, reports, and grey documentations from national and international agencies as sources of information. Other selected documents have been included in the review in order to enhance the representativeness and comprehensiveness of the regional analyses. This is the reason the same bibliography applies to both papers. Amongst academic publications, the sectoral *Nomadic Peoples* and *Pastoralism* provide an important portion of contributions, but other cross-disciplinary journals have also been referenced in order to embrace a range of perspectives on pastoralism and pastoralists. These include social, agriculture, economics, and veterinary science, among others.

This review is systematic, yet it differs from those adopted in other disciplines, such as to the 1997 Cochrane guidelines. On the one hand, information related to pastoralists' responses and adaptation strategies depends, to a significant extent, on the observer, with variable degrees of quality and subjectivity. On the other, the quantity and variety of literature reviewed, and their different origin and

nature, would not allow for anything structured in a formal sense. Furthermore, the systematic review of a limited number of papers and the snowball sampling methodology cannot be representative of such complex dynamics in huge and vast areas. But as in Scoones (2019:10), the aim here is more to suggest an approach for further enquiry by bringing together diverse perspectives and encourage an onward conversation rather than to offer anything resembling a synthesis.

This work is thus neither meant to provide statistical evidence nor generate an exhaustive database of existing knowledge concerning pastoral livelihoods in their facing environmental, market, and governance uncertainties. Rather, it tries to unveil and analyse existing connections and relationships amongst these and describe them for different regional cases. It also tries to infer some broader understanding about the principles informing pastoralists' strategies and practices deployed and mobilised accordingly.

This work offers a preliminary analysis of the specificities characterizing the uncertainty domains herders experience in the different regional settings where pastoralism represents a significant livelihood strategy. The regions examined in this paper include central and southern Asia (with specific focus on the Tibetan Plateau in China and Indian pastoralists), the eastern and western flanks of Sub-Saharan Africa (with a specific focus on the Fulani and Borana groups), and the northern and southern shores of the Mediterranean (with a specific focus on Mediterranean Europe and Morocco). A complementary document provides a tentative assessment of the principles underpinning pastoralists' practices and strategies in facing uncertainties across different domains.

ASIA

Asia features the largest contiguous landmass of pastureland, stretching from the borders of eastern Europe to the Indian and Pacific Oceans. With a variety of agro-ecological and socio-economic environments and dynamics, Asia is a land of extremes in climate, elevation, resources, and socio-cultural diversity. The continent host a huge quantity and variety of pastoral resources: Russian Siberia presents the largest rangelands, China stands for the highest number of pastoral people whereas India has the largest livestock population (Kerven and Behnke, 2011; Jenet *et al.*, 2016; NBAGR, 2017).

The pastoralists and rangelands of Asia form a vast and heterogeneous complex, from the Hindu Kush Himalaya to the Altay and Pamir mountain ranges to the Tibetan and Deccan plateaux, the Siberian steppes, and the Gobi and Thar deserts. A large part of the rural population is involved in forms of agro-pastoralism, a mix of extensive livestock-keeping with seasonal migrations to pastures and cultivation, although with an increasingly diversified economy. Shifting interactions and synergies between livestock systems and expanding agricultural opportunities have reconfigured the uncertainty scenarios across the continent, generating new risks and constraints as well as opportunities.

Practices adopted and adapted locally reflect political, historical, and socio-economic changes that often result from external intervention as the Asian political setting is characterized by a State presence that has encroached on pastoral livelihoods, including on mobility and resource access (Sharma *et al.*, 2003; Kavoori, 2007; Kerven and Behnke, 2011; Kreutzmann, 2012). Centralized policies have eventually evolved through different patterns, but State ‘developmental’ or ‘environmentalist’ discourses inevitably stem from the same assumptions that pastoral resource management was supposedly ineffective and destructive (Agrawal and Saberwal, 2004; Axelby, 2007; Bauer, 2015).

The collapse of the Soviet experience has seen weakened State engagement and capacities in most countries of the former Soviet Union; accordingly, the post-Soviet transformation resulted in contrasted outputs (Wibke, 2015; Murzakulova and Mestre, 2018:1). State presence remains evident in most pastoral settings in China and India, though with different dynamics and through diverse patterns, as it will be assessed. Other more peripheral regions such as areas of Afghanistan, Pakistan, and India have been caught in regional conflicts. But rangelands are also becoming the loci of more diversified political agendas, where oftentimes controversial elements of economic growth, poverty alleviation, and ecological concerns are found together in contrasting ways, and, in turn, generating diverse uncertainty framework for local communities.

Environmental change is also a main driver of uncertainty for pastoralists. Human and livestock demography, wildlife dynamics, development interventions, and policy settings have reconfigured rangelands management. Climate-related events carrying dramatic implications for herding communities are mostly reported from the areas directly related to the Hindu Kush, a sub-region where the impacts of climatic change are more evident (ICIMOD, 2014; Gentle and Thwaites, 2016; Alfthan *et al.*, 2018).

Central Asia - Pastoralist incorporation

Central Asia comprises about one-fourth of the global rangelands, including vast territories that cannot be used for agriculture because of their ecological conditions. The climate varies from extreme dry and cold to continental, with local conditions influenced by geo-morphological factors; elevations range from over 8,000 m. in western China to 154 m. below sea level in the Turpan Basin. Grazing occurs from permafrost tundra in the north to hot sandy deserts in the south, and at altitudes of over 4,000 metres above sea level. A defining geographical characteristic of central Asian rangelands is the cold and snowy winter, with temperatures that go far below 0°C during long periods. Annual precipitation varies from 25 mm in the deserts of Central Asia to over 1,000 mm in many high mountain rangelands.

Figure 1– Map of the Asian rangelands



Source: www.mapswire.com

For millennia, these environmental extremes have given rise to a diversity of vegetation types and habitats, many of them critical for biodiversity and endangered species (Bedunah *et al.*, 2006:5); similarly, these have shaped a wide range of pastoral cultures, leading to a wealth of largely untapped and unstudied indigenous knowledge that is reflected in traditional management practices and institutions. In addition to the common domestic species of sheep, goats, horses, and cattle, more unusual types of animals are kept, including yaks, Bactrian camels, and reindeer (Kerven, 2004; Kerven and Behnke, 2011). Indeed, the important diversification of indigenous animal species and breeds typically represents a strategic asset for Asian pastoralists to manage and adapt to the large and dynamic variety of local ecosystems and the related stresses, shocks, as well as opportunities provided by the hugely diversified climate, topography, and vegetation.

Box 1 – A wide livestock resource bases (excerpt from Kerven, 2004:44)

The indigenous livestock of northern Asia have evolved and been selected through domestication to cope with cold winters. Unlike the warm rangelands of the southern hemisphere, cattle are less numerous than other species, as they are less able to forage in winter when snow covers the ground. Horses are able to kick the snow aside and forage up to 50cm deep in snow, and were the dominant domestic species of the northern latitudes in Mongolia and Kazakhstan. At very high altitudes, yaks replace horses as the best-adapted species to foraging under snow and to thrive under cold conditions, as in the Pamirs and Tibetan plateau.

The indigenous sheep breeds of the steppes and lower altitudes are particularly well-adapted to the harsh winters, with their capacity to store fat in the rump and tail for the winter period of poor nutrition, together with their ability to forage under snow and browse shrubs in winter. The Bactrian camel, with its ability to store fat in its humps for use during periods of scarcity, can also be kept in the colder regions of the Asian steppes. The reindeer herded in Siberia is physiologically adapted to temperatures as low as -30°C , surviving by reduction of energy requirements and by efficient use of poor quality forage by heavily modified guts.

Livestock of northern Asia such as the yak, Bactrian camel and the cashmere goat have also developed specialised hair and wool characteristics which, by insulation from downy undercoats, enable them to survive cold temperatures. Through a series of physiological and ecological adaptations, most of the indigenous livestock of northern Asia can survive most winters. Human interventions have greatly increased the survivability of livestock over winter through provision of shelter and fodder. Without these interventions, livestock remain vulnerable to sudden severe climate events, as is discussed below.

Table 3 - Indicative figures of livestock data in most Central Asian countries in 2005

<i>Country/heads</i>	<i>Sheep</i>	<i>Goats</i>	<i>Cattle</i>	<i>Horses</i>	<i>Camels</i>
China	170,882,215	195,758,954	115,229,500	7,641,320	262,000
Kazakhstan	11,286,700	2,122,400	5,203,900	1,110,100	123,000
Mongolia	11,686,400	12,238,000	1,841,600	2,005,300	256,600
Kyrgyzstan	2,965,220	808,397	1,034,890	361,141	
Turkmenistan	13,000,000	370,000	2,000,000	16,000	40,000
Uzbekistan	9,500,000	1,000,000	5,400,000	145,000	25,000
Tajikistan	1,782,000	975,000	1,303,000	74,600	40,000
<i>Total</i>	<i>221,102,535</i>	<i>213,272,751</i>	<i>132,012,890</i>	<i>11,353,461</i>	<i>746,600</i>

Source: FAOStat 2005 data reported in Kerven, 2006.

The rangeland and pastoral systems of central Asia thus form a huge and diversified complex. As detailed in Table 4 pastoralists include ethnic groups comprising many millions of people, as in the case of the Mongols, Tibetans, Kazakhs, Kyrgyz, Baluch, and Pashtun, with some practicing forms of agro-pastoralism and other minor groups populating other regions and countries. In Kazakhstan, Kyrgyzstan, and Tajikistan rangelands cover more than three-fourths of the landmass, with mostly arid or semi-arid plains in Kazakhstan, while in Kyrgyzstan and Tajikistan there are semi-arid mountainous areas. China stands out as having the highest number of pastoral peoples in Asia, whereas Russian Siberia presents the largest amounts of rangelands, which are however of very low productivity and support only a few million livestock and less than a million pastoralists (Kerven and Behnke, 2011).

Table 4 – Pastoral population groups in central Asia

<i>Group</i>	<i>Location</i>	<i>Main pastoral species</i>
Mongol	Mongolia, China, Russia	Cattle, camel, yak, sheep, goat
Buryat	Russia	Cattle, sheep, goat
Kazak(h)	Mongolia, Kazakhstan	Sheep, horse, cattle, camel
Kyrgyz	Kyrgyzstan	Sheep, goat
Turkmen	Turkmenistan	Sheep, goat
Tajik	Tajikistan	Sheep, goat
Satan	Mongolia	Reindeer
Baxtyari	Iran	Sheep
Pashtun	Iran	Sheep
Uzbek	Uzbekistan, Iran	Sheep
Lur	Iran	Sheep
Zuri	Iran	Sheep
Sādāt	Iran	Sheep
Baluch	Pakistan, Afghanistan, Iran	Sheep, camels
Arab	Iran	Sheep
Tāheri	Iran	Sheep
Kurd	Iran, Iraq, Turkey	Sheep
Shahsevan	Iran	Sheep

Source: Jenet et al., 2016

Accordingly, factors of uncertainty for pastoralists in Central Asia change dramatically from Siberia to Mongolia to Kazakhstan to China. No longer remote and isolated mountainous regions, desert areas and high plateaus have now become parts of the global economic and political arena, and at times pastoral communities have experienced extreme difficulties with basic survival in recent decades. As Ying *et al.* (2002:1) noted, they have been pushed “by an expanding agriculture into the least desirable habitats from the standpoint of primary productivity, faced with increasingly unfavourable trade terms, buffeted by volatile international prices for their products, pressured by competition from intensive, factory farm operations, undercut by synthetic fibres for outlets for many of their products, denied access to critical resources by hostile governments”.

In our review we have specifically addressed papers and works related to pastoralism in the Tibetan plateau as a reference for the region (10/15 papers). This choice is motivated by the consistency with Pastres research areas as well as with the author’s direct experience in the region (Nori, 2004; 2008b). The Tibetan steppe covers 165 million hectares equalling more than two-fifths of China’s grazing areas. About five million pastoralists and combined mountain farmers make a living on the Tibetan Plateau by keeping 12 million yaks—75 per cent of all yaks worldwide—and 30 million sheep and goats (Sheehy *et al.*, 2006:143).

A binding State presence

Historical, socio-economic, and political patterns characterizing each of the countries result in quite different institutional settings, with diverse degrees and processes of engagement of pastoral communities with State and market dynamics. These hold relevant implications for the livelihoods of inhabiting pastoralists (Kerven, 2006; Takayoshi, 2011). During the 20th century most pastoral populations in central Asia were incorporated into the centralised socialist economies of the Soviet Union and communist China. Under these systems, livestock products were fed into State distribution channels for national consumption and export (Scott, 1998; Kerven and Behnke, 2011). The fundamentals of pastoralists’ property rights regimes were deeply challenged since access and management of land, labour, and livestock resources was largely centralised. These patterns became more divergent as the various areas differently ventured into a market economy.

Today a range of diverse relationships between herding communities and the central State exists in the region, according to the specific historical and institutional trajectories. Livestock’s role in the national economy relative to other sectors (i.e. mining, oil, cotton, or crop farming) to an extent determines the capacity of pastoralists to influence national politics. In the case of Mongolia, livestock represents an important component of the national economy as well as of rural livelihoods, and the majority of the population is pastoralists, with a powerful political lobby (Bedunah *et al.*, 2006). However, since the 1990s mining activities have come to represent an important source of revenue for the Mongolian State. The encroachment of interests from mineral companies is reconfiguring pastoralists access to and control over range resources. A similar situation is found in Kazakhstan, Turkmenistan, and Russian Siberia where the remote rangelands are the sites of recent exploitation of oil, gas, and other minerals that generate enormous national wealth (Fernández-Giménez, 2002; Kerven, 2006).

In general, Asian rangelands are becoming the loci of more diversified political agendas, where controversial elements of economic growth, poverty alleviation, and ecological concerns are found together in contrasting ways; inconsistencies amongst these domains are important generators of uncertainty for local pastoralists (Kreutzmann, 2012; Bauer, 2015). The ongoing integration of pastoral economies into domestic and global markets is very dynamic in most countries as new opportunities open up with changes in demography as well as in socio-economic and cultural aspects of local societies, with the picture changing from one context to another. Demand for pastoral products is growing; relatively good domestic prices for meat and dairy products allow rangelands dwellers to generate income while continuing to subsist on the food provided by their animals. Animal fibres in the form of

sheep wool, goat cashmere, and camel hair also continue to provide significant income to pastoralists (Kerven, 2006). As customary mechanisms for regulating pastoral resource management have weakened, the combination of different market pressures and related herd management adaptation creates stress in the local ecological and social settings (Yu, 2016; Li et al., 2018).

Box 2 - Fluctuating herds

Mongolia is the world's second-largest producer of cashmere after China and its industry supplies about 20 per cent of this fibre's world market. Since the transition to a market economy, goat numbers more than tripled from 5.1 million in 1990 to 18.3 million heads in 2007 due to the attractive price of cashmere, leading to unsustainable grazing pressures on the Mongolian rangelands. While the price of cashmere has been fluctuating, that of main cereals that represent the most essential local food staple has constantly risen, forcing herders to increase their herds to keep up with growing household expenses. A similar situation is reported for pastoralists in the Tibetan plateau and in northern India which also importantly rely on cashmere and pashmina trade for their economy (Monisha, 2004; Kerven, 2006).

Likewise, the shifting and contradictory policy setting provides relevant challenges to herding communities in their continuous reorganizing and readapting vis-à-vis shifting State and societal demands, according to the different time and policy frames. When looking at resource access and property rights, prevalent regimes have changed dramatically from feudal systems where livestock and land were owned by a few to a centralised socialist collective management where they were owned by the State and managed collectively, to the current mixed ownership and management with varied and shifting degrees of individual rights and responsibilities (Yeh, 2005).

Sneath (1998) provides an interesting comparison of how the different political settings influenced herders' capacities to implement pastoral resource management under diverse regimes in Asia—and the effects of each for rangeland conditions and pastoralists' livelihoods. For instance, privatization and fencing of pasturelands in former Soviet Asia and Chinese Inner Mongolia led to more intense pasture degradation compared to neighbouring Mongolia, where pastoral resource management remained linked to community land control and livestock mobility. In the post-Soviet institutional setting of many central Asia countries, the State today plays little role in regulating or assisting the pastoral sector; pastoralists reorganised in user groups and re-established patterns of mobility, flexibility, and inclusive access to manage State pasturelands (Robinson *et al.*, 2016). Somewhere forms of decentralized governance and power devolution are underway, often with and through the reinstatement of traditional pastoral institutions in the new political setup (Wibke, 2015 on Kyrgyzstan; Robinson *et al.*, 2016 on Turkmenistan).

The Chinese experience

Conversely, in recent decades, pastoralists in western China (Sichuan, Qinghai, and the Tibet, Xinjiang and Inner Mongolia Autonomous Regions) have experienced successive waves of State policies and shifting property rights regimes. While land was traditionally held as common property, two land tenure paradigms have been implemented since the founding of the People's Republic of China in 1949, as exemplified in Table 5. During the Collective Era (1958 to 1984), land management and agricultural production was organized by large State-instituted agricultural collectives with shared property rights and benefits. Since 1984, collective lands have been distributed and privatized use rights have been allocated to individual households with long-term land contracts (Household Land Contract Period, HLCP). The period, pace, and trajectory of these reforms have varied widely amongst the different areas and communities (Levine, 1999; Yu and Farrell, 2016; Li *et al.*, 2018).

Table 5 – Property rights regime changes in Chinese rangelands

<i>Political Era</i>	<i>Collective farming</i>	<i>De-collectivization</i>	<i>Environmental policies</i>
<i>Period</i>	1958 to 1984	1984 to 2000, at varying pace	As from 2000
<i>Rationale</i>	Grazing lands and livestock managed collectively	Household Land Contract Period	Limitations and exclusion of grazing in ecologically critical areas
<i>Impacts on household capacities</i>	Limited room for individual rights and choice	Diverse forms and patterns of individual responsibility	Strong limitation in certain zones

Source: own elaboration from Yu and Farrell, 2016.

On the Tibetan plateau these policies intertwined with more recent environmental policy concerns from the Chinese government. As the plateau represents a strategic environmental asset for China’s primary rivers and entire regional ecological and economic settings, it has recently become the focus of important governmental policies aimed at forms of ecological re-engineering that impacts on local livelihoods (Yeh, 2005; Ptackova, 2011; Li *et al.*, 2014; Chies, 2018; Palden, 2018).

In the last two decades State-led incorporation and market integration of pastoral areas have been characterized by consistent investments in infrastructure development, loan/credit systems, insurance schemes, and programs aimed at enhancing herders’ sedentarisation (Shanatibieke, 2016). Roadways and ICTs represent relevant resources for herders in case of emergency, as animal feed and other inputs and services can be sourced through mobile phones and mechanized transportation. China’s official rural credit programs have developed swiftly in response to the country’s rapid economic development, and the use of loans is now common in China’s pastoral areas (Zhang *et al.*, 2018). These reforms and programs have greatly contributed towards ‘financialising’ and diversifying pastoral livelihoods to the extent that for some areas and communities, livestock and rangelands do not necessarily represent their main economic contributor.

While pastoralists enjoy options for diversifying their economy, they also run the risk of an increased indebtedness through vicious borrowing circles. The rigidity of financial devices provides a poor fit for pastoralists’ strategies, as their “capacity to reasonably predict repayment ability is in conflict with the fundamental uncertainties of pastoral livestock production on semiarid rangelands and their disequilibrium nature” (Zhang *et al.*, 2018:388). Formal institutional mechanisms add degrees of uncertainty to pastoralists, as herders hold limited control over climatic and market variables that influence their economy and thus find it difficult to interact and relate these with more structured and strict loan and credit schemes. Furthermore, individualisation of herders’ strategies led to increased herder demand for loans because each household had to cope with environmental and market changes independently: they lost the inherent “insurance” of being in a larger production unit (Sneath, 2012 quoted in Zhang *et al.*, 2018:383).

Box 3 – Boxed-in herders

Programs aimed at sedentarisation represent the typical case throughout the world, and especially the Asian region, whereby State structure and policy frames re-interpret pastoral resource management, with the purported objective of disrupting and reverting it along with the associated livelihood and socio-cultural patterns. The discourses associated with sedentarisation are inexorably related to supposed modernisation, development, efficient animal husbandry, effective provision of basic services, security, and protection of grassland ecology (Nori, 2004; Yeh, 2005; Ptackova, 2011; Kreutzmann and Steffen, 2011; Bauer and Gyal, 2015; Shanatibieke, 2016; Yu and Farrell, 2016; Chies, 2018).

The outcomes and implications have been various and differentiated. Sedentarisation offers herding households opportunities in terms of housing and access to public services such as education and health care. However, negative impacts of these programs include:

- herders are squeezed in their cooperation and mobility options;
- household economics worsen as expenses and debts increase, while earnings are likely to shrink due to limitations in accessing pasturelands;
- growing income inequalities and increased socio-economic disparities, with poorer households likely to move to urban areas;
- disconnection of grazing space, livestock, and mobility, as well as increased dependence on state subsidies, leading to a loss of knowledge about pastoralism;
- the younger generation is not experiencing mobile herding, thus raising concerns over generational renewal aspects.

Although there is little doubt that centralised and ‘top-down’ institutional arrangements or a ‘one size fits all’ approach are a poor fit for pastoral management, the situation on the ground seems more nuanced. Local responses suggest a wide range of adaptation strategies, which at times capitalize on State-proposed options with a view to expanding and exploiting herding communities’ ‘room for manoeuvre’ (Bauer, 2015; Yu and Farrell, 2016; Gongbuzeren *et al.*, 2018). Pastoral households and communities have adapted accordingly to the shifting uncertainties, responding to externally-driven policies with innovative schemes that exhibit considerable resilience, maintaining a form of community governance and preserving rangeland conditions while also accounting for economic and climatic changes (Takayoshi, 2011; Fernández-Giménez *et al.*, 2012; Bauer and Gyal, 2015).

Again, the pace, trajectory, and rigidity of State policies and programs have varied widely across the pastoral regions of China. In some areas, herders rank the succession of sedentarisation programmes above natural disasters as the greatest threat to their livelihoods (Chies, 2018, reporting from Qinghai); in other areas, sedentarisation is seen by pastoralists as an opportunity to improve their social welfare (Shanatibieke, 2016, reporting from Xinjian). As Bauer and Gyal note in the preface of *Nomadic Peoples* 19/2015 “it seems critical to recognise the diversity of experiences resulting from divergent implementation of resettlement policies at different scales and staggered phases (...). Even though these policies emanate directly from the centre to the peripheries, the empirical outcomes at the household level are diverse and depend on a host of factors. Instead of a one-way, top-down articulation of a policy, rather there are dynamic interactions and unexpected twists in the process” (2015:7). Despite shortcomings and criticisms, the Chinese system and its evolutions have carried great relevance for most pastoral systems in the region as they directly impact Chinese Tibetan, Kazakh, and Mongol populations and influence the policy framework and development vision for rangelands of most surrounding countries.

Remote and peripheral pastoral communities inhabiting central Asian rangelands have been incorporated into the regional political arena and global trade mechanisms in recent decades, with important implications for their livelihood patterns. Factors that frame shifting and accelerating uncertainties for pastoral communities seem to relate more to the economic, political, and social processes that are transforming local rangelands than to environmental changes, including the implications of climate change. Parallel and complementary to these processes are the evolutions in financial and physical capital that have come to replace to important degrees the contributions of natural

and social one in supporting local communities (Li *et al.*, 2018). This is not because livestock and rangelands are less relevant for pastoral livelihoods, but because the elements underlying herders' capacities to access and use them are—and will be—increasingly challenged by the growing incorporation into institutionalized mechanisms, market-driven dynamics, and the influence of non-pastoral interests.

Picture 1 – Yak grazing in Qinghai, Tibetan plateau (credit: PASTRES)



South Asia – Facing the green revolution

Pastoral livestock populations in southern Asia continue to survive and grow in an agricultural economy that has undergone contrasting dynamics with relevant implications for natural resource management patterns. Agricultural developments in the region have been intense, triggered by fast demographic growth and important financial, political, and technological investments. India is the country where the 'green revolution' has had the largest impacts, and these have indeed been controversial. Agricultural intensification has, on the one hand, dispossessed pastoralists of important rangeland resources while, on the other, evolving interactions and synergies with the expanding farming sector have provided herders with alternative resources to feed their animals (Köhler-Rollefson *et al.*, 1994; Monisha, 2004; Kassam, 2010; Kreutzmann and Schütte, 2011).

In most areas the reconfiguration of pastoral mobility represents a good indicator of the evolving interactions between farmers and herders. For several groups in specific regions, extensive transhumance remains a strategic practice for pursuing pastoralism through shrinking and increasingly fragmented landscapes with a view to accessing both rangelands and natural grazing as well as increasingly diversified marketing opportunities, including the larger regional and national trade of animal fibres (Rangnekar, 1994; Gooch, 2004; Mitra *et al.*, 2013). Likewise, extended networks and evolving relationships with farming communities, market agents, and state agencies represent important pillars on which pastoral livelihoods hinge, albeit with different degrees of collaboration, cooperation, and conflict (Agarwal, 1998; Kassam, 2010; Gentle and Thwaites, 2016).

Apart from the Indian case, which hosts the largest livestock population in the world, the livestock figures for Nepal were estimated at about 15 million, while Bhutan's livestock ranges at about 400,000 heads for cattle, yak, and horses, while goats and sheep play a minor role; yak numbers have been rising since the 1990s, while others show a decrease (Kreutzmann, 2012:19; NBAGR, 2017:15). In Afghanistan and Pakistan livestock populations are huge and mostly extensively bred according to the dry and mountainous settings characterizing large parts of these countries.

Table 6 – FAOStat data for Afghanistan and Pakistan in 2017

	<i>Cattle</i>	<i>Camels</i>	<i>Sheep</i>	<i>Goats</i>	<i>Donkeys</i>
Afghanistan	4,977,000	172,000	13,866,000	7,598,000	1,317,000
Pakistan	44,400,000	1,100,000	30,100,000	72,200,000	5,200,000

Source: FAOStat official website

Climate-related events carrying dramatic implications and impacts for herding communities are mostly reported from the areas directly related to the Hindu Kush, whereas climatic change and its impacts for pastoral livelihoods are more evident in Nepal, Bhutan, and northern India (ICIMOD, 2014; Gentle and Thwaites, 2016). Climate vagaries are nonetheless reconfiguring pastoral resource management in different parts of the region. The greater frequency of extreme seasonal events (i.e. drought in summer, *dzud* during winter, and intense wind flows) is often utilized in Mongolia as a main indicator for varying climatic conditions (Schmidt, 2006; Zhang *et al.*, 2018). Broader aspects related to environmental change include increasing competition from wildlife such as rodents and the growing presence of predators like wolves, leopards, feral dogs, and jackals. As their habitats change, these species—many of which are protected under international wildlife conventions and national laws—increasingly prey on domestic livestock, thus redefining uncertainty for local pastoralists who rely on dwindling range territories and changing biodiversity (Nori, 2008b; Singh *et al.* 2013; Mitra *et al.*, 2013).

The encroaching influence of State institutions and regulations on local resource management patterns and livelihood systems has similarly been a major driver of shifting uncertainties for herders in south Asia. The presence of the central authority has contributed to reshaping pastoral livelihoods, either by redefining resource access and management or by providing primary services and direct support for broader integration into market and tourism domains. The latter have provided herders with room to diversify and integrate the pastoral economy into the wider society. These State interventions reflect controversial and contradictory agendas for economic growth, rural development, and environmental conservation. Ultimately, the central authority's presence and pressure has offered both fresh opportunities and threats to herding systems.

The situation, however, quite consistently differs between countries where State presence and policies have been predominant in recent decades (i.e. most of India and Bhutan) and more peripheral areas where State structures and rule are absent or limited, such as areas of Afghanistan and Pakistan (Saleem, 1996; Kreutzmann and Schütte, 2011). Whatever the case, there have been limited direct benefits to pastoralists in the region from the encroaching State presence and the wider policy framework. Indeed, unfavourable marketing conditions and restricted access to basic services, including education and related alternative skills, are considered by some authors major restraints in diversifying into other livelihood options (Agrawal and Saberwal, 2004; Goodall, 2004; Singh *et al.* 2013). Overall, however, pastoral communities in South Asia have displayed important capacities to making their voice heard and their interests taken into account in the local as well as national policy arena; indeed, at times they have skilfully played through the interstices and benefitted from the gaps and inconsistencies of policy agendas (Sharma *et al.*, 2003; Singh *et al.*, 2015).

This is the broader picture for pastoralists inhabiting those areas of southern Asia that have not experienced prolonged conflict—another characterising feature of this region. Political tensions and

physical violence importantly affect pastoral livelihoods in parts of Afghanistan, India, and Pakistan where conflicts of a different nature and at different levels represent a factor of insecurity. Local political destabilization may curtail options to access and avail rangeland and market resources, but it can also provide opportunities for localized forms of governance and regional networking.

Indian pastoralism

This South Asia regional review focuses mostly on Indian pastoralists; this enables some strategic consistency to our research work in the field. Literature on this domain is surprisingly limited, even in recent times; Indian pastoralism is under-researched and poorly documented, at least until the early 2000s (Blench, 2001; Sharma *et al.*, 2003:iii). In 2015, extensive livestock-keeping where animals feed on natural grass accounted for roughly 50 per cent of the country's milk production and met 75 per cent of the national meat consumption. Smallholders' animal-keeping remains a largely sustainable activity and contributes importantly to the national GDP, generating foreign exchange through meat and fibre exports (Goodall, 2004; Singh *et al.* 2013; Köhler-Rollefson, 2017).

Pastoral systems in India are quite diverse and contribute significantly to the economy in terms of food security, either directly or by providing services and inputs for agriculture. According to the National Bureau of Animal Genetic Resources (2017:15), India has the largest livestock population in the world, including the largest buffalo population, the second-largest cattle and goat populations, and the third-largest sheep population. Kreutzmann (2012:19) notes that in the early 2000s, the livestock population in the Indian Himalayas alone was estimated at 50 million domestic animals, with a large number of livestock kept in systems of combined mountain agriculture and the upper levels of grazing occupied by mobile pastoral communities. The livestock population appears stable for the Himalayan region, whereas it is declining in the drylands of western India and rising in the Deccan plateau. While per capita livestock may be decreasing over time, the national herd is growing along with the human population, and livestock remains a primary livelihood asset in many communities (Sharma *et al.*, 2003).

Pastoralists in India are especially concentrated in the northern and western regions—Rajasthan, Gujarat, Uttar Pradesh, Himachal Pradesh, western and central Himalaya, Jammu and Kashmir—but are also present in other areas such as the central Deccan plateau. Sheep and goats are more popular in the Himalayan setting; while larger ruminants are generally more relevant to the pastoral economy in the foothills of the Himalayas' western regions, a shift to small stock is also reported there as they are easy to tend to and have fewer restrictions for marketing and slaughtering. There is an enormous variety of indigenous breeds as well as degrees and patterns of pastoral mobility. By continuously adapting to shifting and variable ecosystem conditions, diversity of livestock and mobility systems represent key strategic assets for pastoralists to proactively manage the country's great natural diversity.

According to Köhler-Rollefson, in contrast to other regions, including in other parts of Asia, “pastoralists in India are oftentimes not ethnically different from the sedentary population but there are certain castes whose traditional occupation is regarded as pastoralism. In addition, people belonging to castes not regarded as pastoral, pursue pastoral occupations. Pastoralism in India is thus more appropriately regarded as an occupational specialisation that represents one of many economic activities pursued within the village context” (1994:3; also Blench, 2001). Furthermore, pastoral groups in India cannot be easily identified with one specific territory, as most are spatially integrated and interdependent with other land use systems (Sharma *et al.*, 2003). In many cases, pastoral groups or castes do not just own livestock: many members might follow non-pastoral occupations, while others might sell their services as hired herders (Provenza and Balph, 1990; Köhler-Rollefson, 1994; Mitra *et al.*, 2013; Singh *et al.*, 2013).

Table 7 – Main pastoral groups in India

<i>Groups</i>	<i>Location of species</i>	<i>Ethnic identities</i>
Bakarwals	Kashmir (mainly goats)	Muslims. Speak Kashmin language and sometimes Hindi
Gujjars	Jammu, Himachal Pradesh & Uttranchal (mainly buffaloes)	Hindu and Muslim. Speak a language mix of Gujarati, Urdu, Dogri and broken Hindi with a Perso-Arabic script
Changpas	South-East Ladakh (Yak)	Follow a primitive form of Buddhism. Speak a mix of Ladakhi and Tibetan language with a Tibetan script
Gaddis	Kangra and Dharamsala regions of Himachal Pradesh, parts of UP and Punjab (sheep and goats)	Hindu-Rajputs. Speak Hindi language with Devanagri sript, and Pahari
Bbotias	Upper regions of Garhwal & Kumaon of Uttranchal (sheep, goats, cattle)	Hindu. Speak <i>Pahari</i> group of languages with a Devanagri script
Bhuntias	North district of Sikkim	Buddhists. Speak a Tibetan dialect
Monpas	Tawang and west Kameng district of Arunachal Pradesh	Buddhists: their language belongs to the Bodie group of Tibeto-Burman family
Kinmauras	Kinnaur district of Himachal Pradesh	Rajputs or Khosias and the Berus include both Hindus and Buddhists

Source: Sharma *et al.*, 2003

An adequate understanding of pastoral resource management and livelihood systems should be set into the Indian social and cultural context in order to properly assess and analyse the specificities of local herding systems. On the one hand, Indian culture and moral values vis-à-vis animals are inspired by a profound and intimate respect for their lives and welfare; no matter whether for Hindu, Jain, or Buddhist, a large majority of Indian citizens display unique concerns, taboos, and totems when it comes to most domesticated animals—especially, but not uniquely, cattle. Most Indian pastoralists are themselves vegetarians and opposed to the slaughtering of animals. This applies to Hindu pastoral groups such as the Raikas/Rebaris as well as others including the Sindhi in Rajasthan and the Gujjars of Uttar Pradesh, who are both Muslim (Köhler-Rollefson *et al.*, 1994). These considerations carry important implications in how animals are bred and managed, with market opportunities evolving accordingly; the demand for animal proteins in the Indian context traditionally leans towards dairy products, compared to meat.

Box 4 - The Raika and their camels (Blench, 2001:36)

The Raika/ Rebari people of western Rajasthan are specialised camel-breeders who raise camels to sell as work animals to farmers and traders. However, they maintain a remarkable number of economic restrictions on the products of camels, which is not serving them well in the changing economy of India. Raika do not slaughter camels and will not eat camel meat. Female camels cannot be sold and it is against custom to make commercial gain from milk and wool. Moreover, camel milk cannot be processed in any way. One of the consequences of this is the existence of large herds of females with almost no adult males, which is turn is leading to low reproductive rates and less than optimal bloodlines. Moreover, the restrictions on making a profit from animals are leading young people to turn away from camel production and seek jobs in towns. These cultural constraints have been strongly maintained, leading both to falling camel production and economic fragmentation rather than responsive systemic change” (quoted from League for Pastoral Peoples, 1999).

Livestock remains quite strategic in supporting and spurring farming activities in the Indian rural economy. Raising livestock for sale of bullocks (cattle but also camels) as draught animals is a traditionally as important an asset of the pastoral economy as the sale or exchange of manure, which in turn generates opportunities for income, feed, and food (Köhler-Rollefson, 1994; Cincotta and Pangare, 1994; Agrawal, 1998). But livestock is also a critical element of socio-cultural and political identity. Cattle are central to pastoral life for many groups, as are camel or buffalo for others: the Gujjar associate themselves with buffaloes, while the Raika believe they were created by the Hindu god Shiva to take care of the camel (Köhler-Rollefson; 1994; Gooch, 2004). Small ruminants have recently acquired more value due to the reconfiguration of agro-ecological and market-related factors as well as other societal aspects that are group- or place-specific.

Other elements are related to the socially-stratified system embedded in Indian society that defines specific rules and roles for groups and individuals, including within pastoral communities. Such hierarchical social structures characterized by the caste system and associated phenomena of endogamy and polyandry provide important constraints to patterns of alternative livelihoods and social mobility (Gooch, 2004; Singh *et al.* 2013). Significant demographic growth and intense financial, political, and technological investments in India have challenged pastoralists' relationships with rangelands and natural resources, as well as with the broader society. The agricultural 'green revolution' has played a major role in reconfiguring pastoral territories and livelihoods by redefining spaces for mobility. Intense agricultural growth has rapidly changed pastoral landscapes by converting rangelands into farmland through irrigation schemes, mechanized labour, and continuous cropping. Opportunities for pastoralists to contribute to agricultural production have also been constrained as modern inputs replaced manure and draught power, which represented the main terms of exchange with farmers.

The State has played a central role in reconfiguring pastoralism within Indian society through either a 'developmental' or 'environmentalist' perspective. As in other world regions, pastoralists' needs and interests were seldom the priority of state interventions and, indeed, barely taken into account (Axelby, 2007). Furthermore, the tense relations with China in the early 1960s and with Pakistan over the longstanding Kashmir dispute, have also importantly contributed to reshaping pastoral livelihoods since access to grazing and market opportunities had to be reconfigured accordingly. These conflicts have often materialized on pastoral territories, mostly along the Himalayan mountainous range; parts of local pastoral populations have become refugees as a result, for instance in Tibetan areas and the Kashmir region.

The intertwining of livestock and farming

In the diverse Indian settings, pastoral systems endure different trends and dynamics as rangelands are altered by the encroachment of other interests, groups, and uses. Herders have responded differently to these challenges and opportunities, reconfiguring resource management strategies and rearticulating relationships and arrangements with other social actors—some to their benefit, others to their detriment. These processes have generated winners and losers, as various areas, communities, groups, and households have experienced local uncertainties in different ways; some people use them as opportunities, while for others these are sources of further vulnerability.

The most far-reaching reconfiguration of land use and agriculture production in India stemmed principally from the 'green revolution': investments and policies implemented by Indian governments, often with support from international agencies. Land reform schemes introduced under 'green' policies led to the break up of village commonlands and was complemented by large investments in mechanisation and irrigation schemes as well as the establishment of dams, forestry plantations, natural conservation areas, and national parks with related programs of sedentarisation for local pastoralists (Robbins, 1994; Saberwal, 1995; Chakravarty-Kaul, 1997; Agrawal and Saberwal, 2004; Gooch, 2004).

The dramatic shrinking of lands available for pasture has had significant implications on the livelihood of most herders, due to the simultaneous increase in livestock figures (Sharma *et al.*, 2003).

“Pastoral populations who were obtaining the totality of their animals’ diets from rangeland forage during most of the year, came in just few decades to depend on agricultural residues and fallow to feed their livestock” (Gadgil and Guha, 1992, quoted in Cincotta and Pangare, 1994:18). This resource reconfiguration has affected the composition of herds, their management, and their productivity, with relevant implications for pastoral economics. Changes in animal feeding patterns also affected households relying on subsistence livestock production, leading them to diversify their diets towards more cereal-based food items (Monisha, 2004). Furthermore, the socio-political institutional settings and land use regulation have also undergone profound changes, with consequences for pastoralists’ capacities to avail and access natural resources (Cincotta and Pangare, 1994; Kavoori, 2007).

While opportunities for natural grazing have been severely limited by agricultural expansion and encroaching farming, in return farmlands have offered important alternative sources to livestock feeding (Rangnekar, 1994; Kavoori, 2007). The expansion of agriculture and related options for cultivating animal feed have enhanced livestock producers’ capacity to benefit from market opportunities generated by Indians’ growing demand for animal products (Gadgil and Guha, 1992; Gooch, 2004; Singh *et al.*, 2013). The expansion of irrigation agriculture has underpinned the important growth in the number of buffaloes and related developments in dairy cooperative systems (Cincotta and Pangare, 1994; Gentle and Thwaites, 2016). Many pastoralists also connected to more intense, peri-urban dairy systems to which they continuously provide replacement stock (Sharma *et al.*, 2003). Overall the availability of hay production and other agricultural residues contributed substantially towards boosting the dairy sector and integrating the livestock economies into markets, also triggering patterns of production intensification and social stratification that represent threats to local agro-pastoral systems (Cincotta and Pangare, 1994).

The shifting interface with farming communities has fostered both forms of integration/synergy and competition/conflict that, respectively, offer opportunities and pose challenges to tackling the uncertainties related to resource access and animal feeding. As to Chakravarty-Kaul (1997:146) this “involved making reciprocal arrangements with farming communities and this again opened up a new set of uncertainties and therefore risk”. Both have implications for pastoral survival or development or both. Agriculture-related resources and options represent an increasingly strategic asset to better tackle forage shortages related to climatic events, including emergency feeding during drought events or snow disasters (Singh *et al.*, 2013). The demand for traction and transport animals as well as their manure has substantially decreased with mechanization and the availability of chemical fertilizers (Sharma *et al.*, 2003; Singh *et al.*, 2015). However, in some areas and amongst some groups or castes there are still farmers who appreciate the manure provided by herds spending the night on their harvested fields and who compensate pastoralists in cash or in kind. This is particularly common amongst smallholders with limited capital for ‘modern’ investments (Köhler-Rollefson, 1994).

The changes in the country’s livestock demography have remoulded the pastoral landscapes, perpetuating and widening processes of territorial, social, and economic polarization and generating diverse uncertainties to the diverse groups. Wealthier households, better-connected groups, and market-integrated areas have benefitted to a greater extent from dairy developments and a strategic integration with farming evolutions by expanding their large ruminants’ herds (cattle and buffaloes, but also camels), and evolving into forms of sedentarization and intensification. At the same time, in certain areas goats and sheep, which can graze on restricted and degraded commons, have come to dominate the livelihood strategies in the lower social strata as a way for “the rural poor to utilise ecological and institutional interstices while other opportunities for stable income and access to protein continued to decline” (Robbins, 1994:6). Primary economic options for these groups include exchange of smallstock manure and fibre, occasional access to milk and dairy markets, and the sale of pastoral labour to other groups (Provenza and Balph, 1990; Cincotta and Pangare, 1994).

Box 5 – Strategic Goats

The reconfiguration of the role of goats is especially pertinent for some groups or areas. Traditionally seen as inferior, the goat has attracted renewed interest, adding to its consistent importance in the economy, ecology, and society of the Indian Western Region, including in the Thar desert, and specifically amongst poorer groups and castes (Robbins, 1994; Goodall, 2004). According to Robbins, herders and farmers, “by investing in goats, are responding to future uncertainty in traditional production systems and lack of control over grazing resources” (1994:11). The goat’s growing relevance could be ascribed to a series of intertwined factors, including:

- a) changes in the range of options available to herders as a result of broader changes in the regional ecology, with climatic patterns tending to increasing aridity (Robbins, 1994; Monisha, 2004; Singh *et al.* 2013);
- b) fewer options to access and avail grasses and annual pastures for poorer pastoral groups because of encroaching farmers or cattle-raising (Cincotta and Pangare, 1994; Axelby, 2007);
- c) the goat’s role in securing the pastoral economy by providing daily milk supply, steady cash sales as they enjoy fewer market restrictions of animals, and the important demand for goat fibre, such as *pashmina* in Ladakh (Saberwal, 1995; Mitra *et al.*, 2013);
- d) goat-rearing adjusts well to pastoral household dynamics as their herding can be performed by children in the surrounding of village areas (Robbins, 1994).

It goes without saying that in most areas the growing presence and relevance of smallstock has not pleased local governments, which tried to discourage and limit their grazing through programs and policies based on nature conservation assumptions (Sharma *et al.*, 2003).

Converting extended rangelands into irrigated farming areas and the related ecological reconfiguration has also fostered significant shifts in socio-political landscapes and uncertainty scenarios. As most herding groups and communities do not own lands, pastoralists’ capacities to negotiate or enforce land access and use have been reconfigured through new connections and relationships with other sectors and actors, including farmers, landlords, other herding groups, market agents, local authorities, police, and State agencies (Agrawal, 1998; Axelby, 2007; Kavoori, 2007).

This deep social stratification that followed territorial and societal transformations has had a significant effect on rural livelihoods. Changes in land access, control, and management, and the related social structures and institutional settings carried important impacts on pastoralists. Today, the degree of superimposition, overlying, and hybridity amongst several operators, claims, interests, and institutional systems and organizations is huge (Cincotta and Pangare, 1994; Kavoori, 2007). Formally-recognised actors claiming forms of rights and control on rangeland resources include community groupings, traditional village committees, non-governmental organisations, and State agencies (i.e., the Forest Department), with each one implementing and enforcing differing rule-systems for grazing and fodder-cutting in what Robbins describes as “a cacophony of rule systems and authority claims” (1994:10).

Pastoral moves have been reorganised accordingly, either by extending mobility perimeters, routes, and networks or by readapting herd composition, structure, and management, often with a view to synergetic connections to local farming systems (Goodall, 2004; Gooch, 2004). Some groups have expanded transhumance patterns to access more pastures while others have reduced livestock movements and shifted to more settled systems, often aimed at better exploiting farm by-products and establishing further synergies with crop producers (Agrawal, 1998; Kavoori, 2007).

Engaging with markets and the State

The market has progressively become a crucial domain for pastoralists’ subsistence, not only as a source of income needed to access basic services but as a place to exchange products and acquire increasingly-valued goods such as grains, feed, and medicines. The growing demand for animal proteins from a rising population has represented a main trigger for the market-integration of pastoral economies; in India this demand has mostly taken the form of milk and dairy products (Cincotta and Pangare, 1994; Gooch,

2004). Meat consumption is still taboo according to the dictates of most local religions; as such, meat production is not supported neither subsidized by the government, and its production is mostly export-oriented (Robbins, 1994).

Indian pastoralists' relationships with markets have been changing largely in response to cultural principles and social dynamics underpinning local society and the related options for marketing pastoral products (Agrawal, 1998; Agrawal and Saberwal, 2004). As changing cultural and social practices associated with urbanization dramatically spur domestic demand for meat, this remains a contentious issue, socially and politically, in contemporary India as its consumption is mostly associated with Muslims as well as low-caste Hindu groups (Gooch, 2004; Axelby, 2007). The growing demand for meat, especially from smallstock, generates new opportunities as well as tensions. Social and cultural divergences generate room for negotiations and interstices; most pastoral products are sold through middlemen, who at times play off the different religious backgrounds to interface with different cultural settings (Sharma *et al.*, 2003). Across time, this continuously reshapes risks, constraints, and opportunities that contribute to the shifting uncertainties surrounding and embedding herding economies in India.

State-led policies and investments have rather focused on developing the milk market and dairy industry, including through cooperative systems, which have benefitted from important synergies with the evolving agro-business in terms of animal feed supply (Cincotta and Pangare, 1994; Gooch, 2004; Singh *et al.*, 2015; Gentle and Thwaites, 2016). Likewise, State agencies in India and neighbouring countries have been established to manage and regulate trade in animal fibres in different settings (Monisha, 2004; Goodall, 2004). State policies have played a key in role in modelling the roles, rules, and relationships amongst the diverse stakeholders of these value chains. According to some authors, State intervention in these domains has only marginally favoured the interests and benefits of pastoralists vis-à-vis other groups, including traders and consumers, thus adversely affecting pastoralists' livelihoods (Agrawal and Saberwal, 2004). The case of *pashmina* fibre trade and its related political economy offers an indicative example (Monisha, 2004; Singh *et al.* 2013).

More broadly, the Indian state has intervened in rangelands with either a 'developmental' or an 'environmentalist' discourse, whereby in most cases the presence of pastoralists was negatively affecting the State agenda. Whatever the policy domain affecting pastoralists "be it the environment, the market, or property relations—changes in pastoralists' lives and livelihoods are the consequence of significant policy choices that governments make, or decide not to make" (Agrawal and Saberwal, 2004:12). While "there is no official development policy for pastoral areas, nevertheless both the Ministry of Agriculture and the Ministry of Environment and Forest are remarkable for their stances against pastoralists" (Sharma *et al.*, 2003:iii). Recently the Ministry for Tribal Affairs has been established (1991) with a view "to provide more focused approach on the integrated socio-economic development of the Scheduled Tribes (STs), the most underprivileged of the Indian Society, in a coordinated and planned manner" (from the Ministry website). The 2006 *Scheduled Tribes and Other Traditional Forest Dwellers Act* is an important piece of legislation that for the first time recognizes the rights of pastoralists to resources (N. Maru pers. comm.).

The unfavourable policy setting, marginalization at social and cultural levels, poor provision of basic services, and the scant rights recognized when it comes to resource access are important factors discouraging young generations (Sharma *et al.*, 2003). This has led to increased emigration among pastoral youth and contributed to the diversification of local pastoral livelihoods. As elsewhere in the region, pastoralists are increasingly providing their skills and labour in other areas and domains, either for farming activities or tending others' animals or as unskilled labour in urban settings (Cincotta and Pangare, 1994; Agrawal, 1998).

Pastoralists' capacities to influence the policy framework in India are contrasting. According to some authors, the limited number of NGOs and pastoral organizations have not yet been able to combine their voice and raise the subject of pastoralism at the national level (Sharma *et al.*, 2003). Other authors argue

that Indian pastoralists nonetheless have effective social structures and mechanisms and, overall, display important capacities to influence and engage with the policy arena at the local and national levels (Gooch, 2004). When conditions allow, Indian pastoralists have opportunistically internalized the potential benefits of State programs such as sedentarisation schemes, service provision, market agencies, insurance schemes, or housing programs purportedly aimed at improving their livelihoods (Robbins, 1994; Agrawal and Saberwal, 2004; Monisha, 2004; Singh *et al.* 2013).

Box 6 – Keeping everybody happy with pashmina

Monisha offers one example of Changpas producers juggling with opportunities and actors through the marketing of their precious pashmina goat fibre. (...) *“the question then is why the Changpas ever bother to sell to the Government when private traders give them higher prices and do not practise grading. The Changpas say that they always sell a bit to the Government to keep them happy, so that they continue to give them their rations, or send books for the school, or come out to the Changhang with doctors and medicines”* (2004:100).

Pastoralists have even, on occasion, used government policies’ inconsistencies and lack of internal coherence to successfully negotiate access to critical resources (Agrawal and Saberwal, 2004). Similarly, pastoralists proved able to overcome social restrictions and taboos in order to profit from emerging opportunities such as the commoditization of camel milk and the sale of meat in parts of the country (Köhler-Rollefson, 1994; Sharma *et al.*, 2003). The interfaces and interactions with the expanding presence of the State and markets have at times accelerated and remodelled the uncertainties affecting the livelihoods of Indian pastoralists. While common rangelands have been converted to other uses, pastoralists’ collective identity, networks, and actions have enabled them to forge, articulate, and implement adaptive strategies and practices accordingly, with a view to enhancing access to available resources in shifting landscapes (Axelby, 2007).

Overall Indian pastoralists skilfully interplay and create synergies amongst animal species, farming resources, mobility patterns, and market opportunities. Social capital is an important asset for the capacities to respond and adapt to new constraints and fresh opportunities. Collective engagements and arrangements are critical in facing market challenges and generating economies of scale, in organizing mobility and transhumances with a view to control territories and avail resource access, in managing and governing negotiations with farming groups and landlords, and also as a way to organizing into civil society actors, policy stakeholders and economic actors in the growingly relevant institutional and market domains (Gooch, 2004). Pastoralists have thus been able to negotiate and defend their interests vis-à-vis State structures and policies, market agents, and farming communities with a view to sustaining their diversified livelihoods and actively reshaping their presence and role in Indian society amidst new and shifting forms of uncertainty, constraining factors, and volatile opportunities (Saberwal, 1995; Agrawal, 1998; Monisha, 2004).

EUROPE – The Common Agriculture rural welfare

Pastoralism in Europe is wide and diverse, as the climatic conditions vary from cold northern Scandinavian rangelands inhabited by reindeer to Euro-mediterranean drylands and islands characterized by sheep and goat production systems. In Pastres we mostly examine southern Mediterranean Europe settings (EUMed), where extensive livestock production is a relevant practice; EUMed fits with our research sites selection and provides some regional comparative consistency with the MENA regions. Spain, Italy, Greece, and southern France present a wide range of biophysical conditions that cover main types of pastoral systems in the EUMed region (Caballero *et al.*, 2009). Portugal and the Balkans also form part of the same regional setting, albeit characterized by different trajectories when it comes to pastoralism. However, our analysis needs to consider pastoralism within the wider EU context as the framework created by the Common Agriculture Policy (CAP) characterizes institutional support to rural areas throughout Europe, with different consequences in different settings.

Figure 2 – Map of the Mediterranean region, including Mediterranean Europe, the Maghreb and the Mashreq



Source: www.freeworldmaps.net

A characterizing feature of European pastoralism is the support it receives from the policy environment in terms of direct financial funding, targeted investments, and important interfaces with the market domain. As it will be assessed, within the wider CAP framework, extensive livestock management is considered positively in terms of biodiversity maintenance and landscape management in ‘lower potential’ areas (i.e. less susceptible to agricultural intensification). Unlike the norm elsewhere in the world, the policy setting in Europe is thus in principle favourable to extensive livestock-keeping (Nori and Gemini, 2011). As in most of EUMed, it is the geomorphology rather than rainfall patterns that constrains agriculture intensification; pastoralism remains effective mostly in mountainous areas, drylands, and islands where the alternative costs for land and labour make this a convenient option compared to other forms of land use.

In CAP terms these territories are designated as Less Favoured Areas (LFA) presenting agro-ecological constraints such as lack of water, unfavourable climate, soil and terrain characteristics, short crop season, and tendencies of depopulation—as well as opportunities in terms of natural capital. Large

portions of Spain, Italy, Greece, and southern France fall in the LFA classification, and more than the half of these territories are considered High Nature Value (HNV). As an HNV farming system that insists on these territories through the extensive breeding of mostly sheep, goats, and cattle, pastoralism is thus appreciated for the so-called socio-ecosystem services (SES) it provides. It is in fact positively associated to limited but quality production and ecosystem management, while also contributing to maintaining a human presence in such territories, including mountainous areas defined as ‘Europe’s ecological backbone’ (EEA, 2010) and Mediterranean islands. As a reference example, Table 8 shows the relevance of the agro-pastoral system and economy on the islands of Crete and Sardinia.

Table 8 – Main features of agro-pastoral systems in Crete and Sardinia

<i>CRETE</i>		<i>SARDINIA</i>
0.630 million	<i>Population</i>	1.663 million
1.1 million	<i>Sheep</i>	3.15 million
4,800	<i>Sheep Farms</i>	11,213
229	<i>Average size – heads/flock</i>	280
13% flocks	<i>Transhumance</i>	Few hundreds
Autochthonous breeds	<i>Breed</i>	Sarda
Multifunctional	<i>Production focus</i>	Pecorino Romano cheese
25% at local <i>mitata</i> level	<i>Dairy processing</i>	Mostly through industries
Mostly through cooperatives	<i>Dairy Marketing</i>	32 coops exist, but mostly controlled by the industry
4 PDOs	<i>Cheese market certification</i>	3 PDOs
30%, mostly from Albania, Bulgaria	<i>Proportion of immigrants amongst salaried shepherds</i>	20% mostly from Romania

Source: Farinella *et al.*, 2017

Mosaic landscapes characterising EUMed mountainous and island territories are the result of longstanding and articulated interactions between humans and ecosystems. Evidence attests that a decreasing human presence and downscaling resource management in these areas leads to degradation of the territorial asset and the related socio-ecosystem services (Caballero *et al.*, 2009; Rodriguez Ortega *et al.*, 2014; Moreira *et al.*, 2016; Franca *et al.*, 2016). Land abandonment and under-grazing hold direct and relevant implications for societal risks and hazards, such as fires, landslides, and erosion (Hadjigeorgiou *et al.*, 2002; Caballero *et al.*, 2009). The fragility of these territories and the relevance of tailored resource management and biodiversity levels are furthermore challenged by climatic patterns, which in the last decades have seen the rise of more erratic rainfalls, with projections to 2050 indicating drought events becoming more common in southern EU (Mombiola, 2010; Schilling *et al.*, 2012b; Moreira *et al.*, 2016).

Box 7 - Pastoral cultural heritage in the EUMed

Apart from the social, economic, and environmental implications, pastoral systems in many EUMed areas are also acknowledged for important cultural contributions. A series of projects and initiatives have been launched to enhance pastoral culture and contribute to its capitalization, such as the Virtual Museum of Transumanzia in Slovenia, the Museum of Transhumancia in Guadalajar and Aigüestortes in Spain, les Maisons de Berger and de la Transhumance in France, the Ecomuseum della Pastorizia in Val Stura, and other Transhumance museums in the Abruzzi and Molise. France's Causse et Chevenne park has been recognised by UNESCO as a world heritage site for the Mediterranean agro-pastoral Cultural Landscape, specifically characterised by pastoral resource management through extensive animal keeping (Brisebarre, 2007; Fossati, 2013; Lebaudy, 2014).

These institutionalised examples of what the French call *patrimonialisation* (heritization, capitalisation of the local heritage) show the role pastoralism plays in shaping local identities (and tourist packages) in a number of EUMed regions, thus creating the room for diversifying employment and income opportunities for pastoral households. These examples also show how opportunities to expand and diversify livelihoods could be forged by playing with and through local identity and cultures (Barrachina, 2007; Brisebarre *et al.*, 2009; Vidal-González, 2014).

Within this framework, EU policies thus officially endorse low-intensity livestock management based on mobility and rooted in the territory through a set of financial subsidies to breeders in the form of market, income, and rural development support as well as with specific programmes aimed at marginal grassland areas (Nori and Gemini, 2011; Kerven and Behnke, 2011; Beaufoy and Ruiz-Mirazo, 2013; Mattalia *et al.*, 2018).

A Common policy for agriculture and rural development

The Common Agricultural Policy is the main overarching policy regulating rural development in the EU; it represents a founding pillar of the EU and involves a substantial share of its overall finances (about 40 per cent of the total EU budget in 2018). It is thus largely dependent on political agendas shaped by changing public attitudes, economic interests, and societal concerns. The principles delineated in the CAP are implemented through the subsidiarity principle that characterizes EU governance. This implies that different institutional levels play diverse and complementary roles whereby the more immediate and local level (often the national or regional one) is supposed to have better capacities to implement the principles dictated in the EU Directive (Caballero *et al.*, 2009; Nori and Gemini, 2011). The CAP's institutional architecture represents an important driver of uncertainty for EU pastoralists, who must continuously navigate multiple, fragmented, and at times contrasting, rules, requirements, and opportunities. This, however, also provides the arena for local negotiations and interfaces where herders can display their socio-political capital. As the CAP is reformed every seven years, the evolutions and changes affecting this policy frame represent relevant drivers in the institutional uncertainty surrounding pastoralism in the EU as any reforms have implications on breeders' production and livelihood strategies.

Box 8 - CAP framework and reforms

*The CAP was introduced in 1962, and for the first two decades mainly spurred agriculture productivity within a modernization framework. This approach led to excess food supply and related market distortion effects (). Overproduction, environmental problems, and consumer concerns for health and quality motivated subsequent CAP reforms through measures such as reduction of price supports (1992 MacSharry reform), cross-compliance with environmental objectives and support to multifunctionality and rural development (Agenda 2000), decoupling of direct payments from production through the single payment scheme (2003 Fischler reform). Following WTO agreements, CAP progressively moved towards stronger market orientation and agricultural sustainability. The bias remained though in favour of large farms, intensive producers but also export-oriented food traders and larger retailers, with a controversial impact on developing countries (Corrado *et al.*, 2018:17).*

A comprehensively critical assessment of the CAP today would recognise its contribution in reproducing, consolidating, and widening sectoral, social, and territorial inequalities, oftentimes to the advantage of larger farms and companies, higher-potential areas, and specialized agricultural enclaves. Conversely, and as a consequence, family farming and agro-ecologically marginal areas have undergone dramatic processes of marginalisation, abandonment, and depopulation (Nori and Gemini, 2011; van der Ploeg, 2008).

In response to changing societal demands, CAP policy support has shifted from conceiving pastoralists as mostly livestock producers to ‘guardians of nature’ or suppliers of multifunctional goods and socio-ecosystem services (Vaccaro and Beltran, 2007; López-i-Gelats, 2013; Ragkos and Nori, 2016). In such a move towards a multifunctional vision of agriculture, the importance of pastoral territories rests basically on their social and environmental values. CAP support packages and related incentive and subsidy schemes have been reshaped to take into account growing societal concerns about animal welfare, environmental and biodiversity protection, landscape management and consumer demands for safe, quality, and local products. The economy of pastoral areas is consequently undergoing a transition from production-based to service-based, with local authorities attempting to stabilize local populations and enhance socio-economic development by seeking new opportunities in rural leisure and tourist-related activities, often inherently associated to the viability of pastoralism itself (Barrachina, 2007; López-i-Gelats, 2013; Nori, 2017b; Ragkos *et al.*, 2018).

For example, recent reforms have shifted financial support from subsidy payments per head of animal owned (which prioritised farm output) to hectares of land farmers graze/manage, to land category according to its HNV value, to livestock husbandry methods practiced. For most EUMed breeders today, CAP subsidies represent about half their annual income, with trends and variations shifting from one country to another depending on local legislation and implementation of CAP schemes (Nori, 2017a; Ragkos, 2016). In some countries, notably France, further forms of support to pastoralists have been established, either through institutional and technical assistance or through supplementary financial support. An example is the *Prime Herbagère Agro-Environnementale* which specifically addresses grazing systems; this form of subsidy could raise public support to about 80 per cent of pastoralists’ revenues (Fréve, 2015).

Box 9 – Policy support in France

France represents a notable exception in the Mediterranean context in terms of an enabling environment for extensive livestock farming, with labour conditions, rights, and wage levels significantly higher than those of other countries in the region. These are the results of years of political struggle as well as social and economic investments. In France an important process of generational renewal took place in the 1970s with the arrival of urban citizens who sought an alternative lifestyle in shepherding. On the other hand, political and local authorities saw in this phenomenon an opportunity to revitalize territories at risk of abandonment. In 1972, a Pastoral Law was approved (Decree 72-12) to facilitate access to land, provide incentives to organise pastoral operators, and create the conditions for public investments. This contributed to the development of an appropriate framework for improving shepherds’ working and living conditions alike (Fréve, 2015). Today in southern France an extensive livestock breeder enjoys technical and organizational support from more than 10 public organisations and offices specifically related to pastoralism. A prospective shepherd can find training opportunities in one of five specialized schools in the country, and his or her salary might reach two or three times that of the same worker in Italy, Spain, or Greece (Nori, 2017b).

CAP support is informed by several contrasting principles and at times inconsistent rules. On the one hand, these generate ambiguity on pastoral resource management, while on the other provide for interstices and gaps whereby pastoralists could shape and forge their adaptive strategies. The disconnection between the policy dictates and field practices might give rise to forms of a sort of ‘virtual farming’ dimension that provides for lights and shadows to pastoralists’ strategies, as other more powerful groups might challenge their access to the resources they were usually associated with (van der Ploeg, 2008; Tchakerian, 2013; Nori and de Marchi, 2015; Fréve, 2015).

Navigating institutional territories

The intense polarization of the rural world that resulted from CAP implementation carries important implications in terms of resource accessibility and livelihood options for extensive livestock production systems. Plains, lowlands, and valley bottoms have been increasingly devoted to other forms of land use

and economic activity, including expansion of urban settlements, industrial and transport facilities, and intensification of agricultural production. These areas are becoming increasingly inaccessible to pastoralists, triggering their marginalization, geographical and social alike, while also generating opportunities for complementarities, exchanges, and new connections. Where these factors have been skilfully capitalized, pastoralism has proved comparatively advantageous for local land and labour; in plain areas of the Pyrenees and in Sardinia, for instance, pastures or forage production have taken over crop farming. Tourism and leisure-related activities provide further relevant options for diversifying the local economy and extending the pastoral economic base (Barrachina, 2007; Pastomed, 2007; López-i-Gelats, 2013; Little, 2013; Mattalia *et al.*, 2018).

Conversely, more remote and harsh territories are being abandoned, also as a result of policies that have targeted such areas for cuts in public spending (SNAI, 2015). Population decline and socio-economic desertification in these areas carry relevant implications on territorial management, with consequences for the ecosystem and society in general. Areas with decreased human presence in mountainous settings are also becoming increasingly populated by wild predators (wolves, but also bears and hyaenas), which jeopardise the security of extensive flocks and herds and thus represent a direct threat to the pastoral economy.

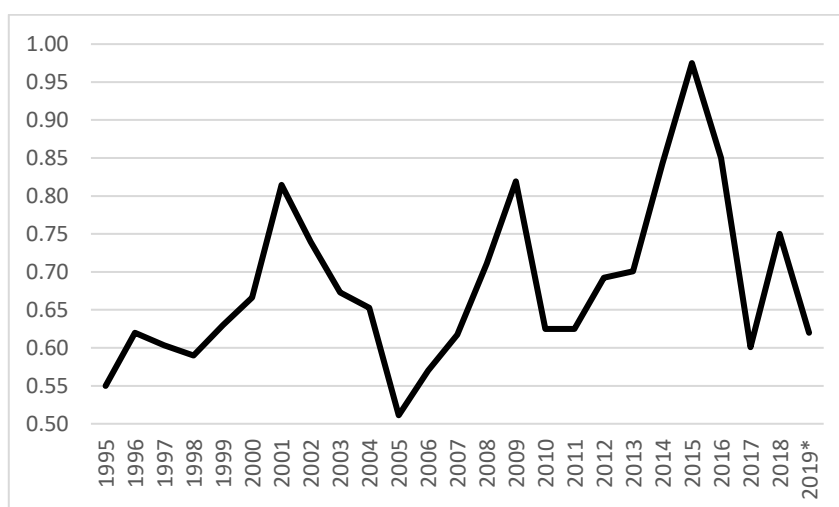
Box 10 – Protecting predators, challenging pastoralists

The status of carnivore predators in Europe is protected by the Convention for the Conservation of Wild Life and its biotopes, also known as the Berne Convention. Signed in the early 1980s when many of these predators were under the threat of extinction, the Convention concerns the conservation of wild flora and fauna and their habitats. In order to make this Convention operational and equip it with adequate instruments to safeguard animal biodiversity in its territory, in 1992 the European Union forged the Natura 2000 program by establishing a network of 26,000 protected areas. Pastoralism represents a strategic activity for the management of 58 out of about 230 of these sites (Beaufoy and Mirazo, 2013; Nori and de Marchi, 2015).

The overall policy framework supporting ecosystem services therefore provides both opportunities and challenges to EUMed pastoralists: while herders receive consistent subsidies to take care of the environment and maintain the natural resource base, the legislation in support of biodiversity and wildlife protection shrinks the room for pastoral management, causing important problems and conflicts. Overall, this polarization results in areas affected by over-grazing, where animals are kept too long, and areas that are under-grazed due to their remoteness or the presence of predators or other ecosystem threats, leading to the overall degradation of the natural resource base (Meuret, 2010; Eychenne, 2011).

The market dimension for pastoralists has also undergone important changes and restructuring. Until the last century, sheep breeding in most EUMed was prized for the quality and value of its wool. Meat and milk products have become more relevant in recent decades; their commercialisation is though made volatile by several factors, as today most livestock products demanded by consumers are supplied by more intensive production systems or sourced through imports due to trade agreements (Kerven and Behnke, 2011; Nori and Farinella, 2019). Policy requirements and societal demands are continuously changing with new dietary trends and environmental concerns (e.g. lamb is decreasingly consumed while predators are increasingly valued). Figure 3 provides an indication of the fluctuations characterising the example of ewe milk price in Sardinia, resulting from the exposure of the Pecorino Romano to the US export market.

Figure 3 - Volatility of the ewe milk price in Sardinia (€/liter)



Source: Nori and Farinella, 2019, based on ISMEA data

European pastoralists must adapt accordingly in order to navigate the uncertainties characterising institutional and market domains, and find their way to explore and exploit new marketing strategies and options (Caballero *et al.*, 2009; Nori, 2017b; Ragkos, 2016; Farinella *et al.*, 2017). Adaptive mechanisms in this respect include shortening and diversifying value chains; organizing in cooperatives; investing in the quality, identity, environmental, and health features of products; directly engaging in local processing and commercialisation (even through the internet); connecting to tourist networks; and seeking new consumer niches, for example immigrants’ demand for small ruminants’ meat (Meloni and Farinella, 2015; Ragkos, 2016; Nori, 2017a).

Pastoral assets and strategies are constantly redefined; the management of land, livestock, and labour resources are thus continuously readapting, including through expanding social and economic networks (Simula, 2015). The strategies adopted have been varied and shifting from one period and area to another. Mosaics of different strategies—defensive or aggressive, individual or collective, aimed at intensification or extensification, specialisation or diversification—have been tested and applied, depending on sites and seasons, along a continuum that enables their navigating through the conditions set by agro-ecological conditions, policy support, and market opportunities (Hadjigeorgiou, 2011; Tchakerian, 2013; López-i-Gelats, 2013; Moreira *et al.*, 2016; Ragkos *et al.*, 2018).

These strategic shifts contribute towards reshaping rural landscapes in the EUMed, playing a relevant role in constantly redefining the overall cost-benefit effectiveness of pastoral farms and, eventually, even their own socio-political identity (Caballero *et al.*, 2009; Nori, 2017a; Zerilli and Pitzalis, 2015; Ragkos, 2016; Farinella *et al.*, 2017; Mattalia *et al.*, 2018). By articulating policy efforts that encourage more ‘eco-friendly’ techniques, animal welfare, organic production, *patrimonialisation*, and tourist-appealing practices, pastoral farms are becoming multifunctional businesses that are more integrated into the wider economy. Ironically, however, this is being achieved by marketing their cultural and environmental heritage (Kerven and Behnke, 2011; Nori and Pardini, 2011; Fréve, 2015).

CAP-emanating rules, roles and regulations are operationalised through growing technical regimentation and bureaucratization of pastoral tasks and duties. Apart from their top-down nature and rigidity, these forms of institutional support have undergone intense criticism for the limited participation of farmers and other stakeholders in policy discussions and design. In more technical terms, important critiques address the fact that a comprehensive policy such as the CAP cannot grapple with the large diversity of EU territories, which also host different cultural identities. Furthermore, the difficulties in monitoring such practices and the limited effectiveness of evaluating result-oriented objectives pose questions about CAP cost-effectiveness (Caballero *et al.*, 2009; Nori and Gemini, 2011).

Such a policy framework, though favourable in principle, provides a poor fit for extensive livestock management, which requires large degrees of flexibility as well as day-to-day and on-the-spot decision-making in order to respond to conditions such as the weather, animals' needs, market prices, and subsidies. Such herd management rationale is at the heart of the profession as well as of the pastoral 'lifestyle', and these elements cannot be foreseen, anticipated, organized, or calculated as required by the official administrative requirements (van der Ploeg, 2008; Simula, 2015; Fréve, 2015).

Adaptive strategies carry relevant implications in pastoralism's reconfiguration both as a production system and as a livelihood strategy as it affects the pastoralist's daily work, identity, and role in society. Major changes include a marked separation between the managerial and the field levels, intensification of herd management, and a gradual disconnection between the effective performances of pastoral farms and their revenue. It is not unusual to hear European pastoralists say that that "a farmer today spends more time in the office than in the field", or that "we are considered as mountain gardeners rather than producers of meat and milk" (Nori, 2017:5; see also Brisebarre, 2007; Nadal *et al.*, 2010). The relationship with such institutional incorporation is schizophrenic as, on the one hand, pastoralists claim autonomy and independence while on the other hand they recognise that most pastoral farms would cease to exist without institutional support ("*sans les primes, c'est la mort du métier !*" in Fréve, 2015:7; see also Simula, 2015).

Despite criticisms and complaints, there is in fact little doubt that CAP support has been essential to maintaining pastoral territories populated and productive; without this support, herds and flocks would have already disappeared in most EU rural areas (López-i-Gelats, 2013; Fréve, 2015; Nori, 2017). Nevertheless, even though CAP aims at securing agricultural activities even in less favoured territories, the achievements of such costly 'rural welfare' have been disappointing to an extent. CAP's mandate of maintaining marginal territories alive and productive has shown serious shortcomings. Although sector data are not always consistent, medium-term trends indicate a dramatic decline in the number of animals since the 1980s (Table 9).

Table 9 – Variations in the size of national sheep and goat flocks (.000) (1985-2016)

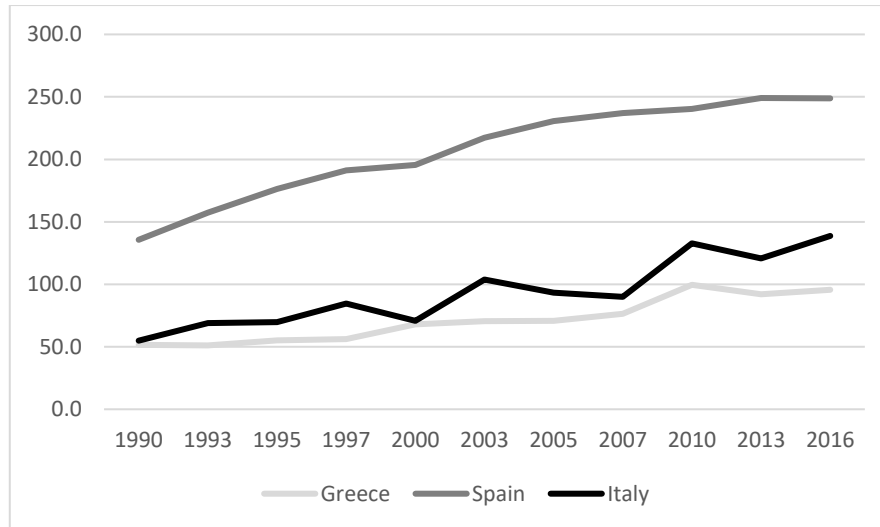
Sheep heads	1985	1995	2003	2012	2016
Spain			23,500	16,339	15,963
Greece	9,606	9,269	8,745	9,213	8,735
Italy	11,293	10,668	7,945	7,182	7,285
Goat heads	1985	2000	2003	2012	2016
Spain			3,200	2,637	3,088
Greece	5,874	5,180	4,926	4,293	3,990
Italy	1,189	1,373	945	976	1,026

Source: Eurostat

While the continued decline in total animals is evident, the decrease in the number of pastoral farms is even greater, with a marked overall reduction of about 30 per cent of the EU Med flock in recent decades (FAO database; EuroStat, 2016). In order to adapt to changing conditions, pastoralists remaining in livestock production have been forced to expand their herd consistently and reorganize land and labour resources accordingly as a way of adjusting cost-benefit ratios (Hadjigeorgiou, 2011; Meloni and Farinella, 2013; Mattalia *et al.*, 2018). The classic refrain, everywhere, is that "20 years ago with a flock

half size of the present one we had a decent life and we could even make savings and investments. Now with a double-sized flock, it is difficult to make ends meet by the end of the year” (Nori, 2017a:4). Figure 4 illustrates the expansion trend in flock size in Greece, Spain, and Italy during the last decades.

Figure 4 – Changes in average sheep farm size in Greece, Spain, and Italy 1990-2016



Source: Nori and Farinella, 2019, based on EuroStat data.

These declining figures are part of a wider trend of outmigration and abandonment of the agricultural sector and, more generally, rural areas in the EU. This phenomenon, however, is particularly intense in difficult territories and on pasturelands, where the opportunity cost of land and labour is weaker (Tchakerian, 2013; López-i-Gelats, 2013; EuroStat, 2016; Nori, 2017). Overall, despite significant increases in their tasks and responsibilities linked to changes in the socio-political and agro-ecological setting, pastoralists have seen limited improvements in their economic and social conditions as well as in their capacities to tackle dwindling livelihood options (Meuret, 2010; Nori, 2017b). Through this lens one can understand the crisis of pastoral "vocation" and problems related to both a dwindling skilled and committed workforce as well as to generational renewal (Pastomed, 2007; Caballero *et al.*, 2009; Kasimis, 2010; Nadal *et al.*, 2010; Hadjigeorgiou, 2011; Ragkos, 2016; Farinella *et al.*, 2017).

Extensive livestock farms are decreasing and the number of shepherds diminishing. The reconfiguration of pastoralism, its resource management patterns, and its identity and role in society have generated dynamics that are affecting the social reproduction of this livelihood practice. Today in most EUMed pastoral regions the growing presence of immigrants has come to offset the decline and ageing of the local rural population. The employment of young shepherds from foreign countries is a widespread strategy for overcoming the lack of a local skilled and committed workforce, and immigrants are nowadays an important source of shepherding labour throughout the EUMed (Kasimis, 2010; Pardini and Nori, 2011; Nori, 2017; Nori and Farinella, 2019).

Box 11 – Italian cheeses through immigrants’ hands (excerpt from Nori and Farinella, 2019)

Italy is a country where Made in Italy agro-food represents a strategic sector and plays a critical economic role through agricultural export and the tourism industry. The case of Italian cheese is representative of the contribution of immigrant workers to the globally recognised excellence of this sector. Apart from the better-known case of the Sikh community with the Parmesan, and the Bengali communities for the buffalo mozzarella, foreign communities play as well a strategic contribution in the value chains of Fontina and Pecorino cheeses, which are typical regional products issued from pastoral settings.

In Valle d’Aosta, almost two thirds of the workers employed in cattle breeding are foreigners. From taking care of the local breed cattle to the processing of milk in the alpine huts (*malghe*), immigrants largely contribute to the production of the famous Fontina cheese that characterises the region. Formerly almost exclusively Moroccan shepherds, in recent years they have been partially replaced by Romanians. Data from 2014 reported 303 non-EU workers (predominantly Moroccans) and 335 foreign EU workers (predominantly Romanians) officially employed, together with several irregular workers (around 100). Foreign labourers have more than doubled over the last 2 decades, representing to date about more than two thirds of the salaried shepherding workforce. Living and working conditions are quite harsh, these being main reasons local inhabitants do not seem interested in undertaking this work. In such terms immigrant shepherds do not compete thus with local workers, and their contribution can therefore be said to be essential for maintaining the traditional system of breeding for the production of Fontina DOP (INEA, 2014; Nori, 2017).

In Sardinia the presence of foreign workforce reflects on the one hand the structural problems of the Sardinian sheep dairy system, characterized by low milk profitability and dependence on Pecorino Romano, a low-cost cheese, subject to price volatility. On the other hand immigrant shepherds testify the difficulty of recruiting local people willing to live and work in the countryside. Foreign shepherds are mostly Romanians, who work in medium-sized sheep farms (around 500 sheep and intensive milk production); they get an accommodation on the farm and accept working conditions and salaries usually rejected by local people. Their aim is to earn money and come back to Romania, with a clearly temporary migrant project. Overall, the impact in terms of generational renewal is very limited as the transition from manual labor to entrepreneurship and livestock ownership shows very low rates for immigrants. Exceptional cases that confirm the rule exist though, where immigrant shepherds look into opportunities to set up their own flocks, and/or cooperate amongst themselves or with local dwellers in sharing land, subsidy or credit assets (Farinella and Mannia, 2017; Farinella et al., 2017; Nori, 2018).

Pastoralism—its resources, practices, and products—has been incorporated into a system that is embedded with and increasingly steered by institutionalised mechanisms in order to respond to changing societal demands, from market-related dynamics to the provision of public goods as defined and supported by EU society. Pastoralists are regularly forced to change their practices according to shifting societal and economic requirements as received and operationalised by State and EU policy-makers and administrators. In principle, the institutional setting favours extensive livestock systems. Nevertheless the policies, forms, and mechanisms that aim to support this livelihood have proved to be an important source of disturbance for European pastoralists. The rigidity, inconsistencies, power relations, and continuous reorienting of the CAP are major drivers of uncertainties, and these are reflected in social, environmental, institutional, and political landscapes.

Overall, and similarly to cases depicted elsewhere, pastoralism in EUMed is being squeezed, and it constantly readapts into the interstices of a continuously-transforming territory and society. Through a mosaic of diversified strategies and by drawing on resources defined as ‘marginal’ by mainstream society—from abandoned lands to immigrants’ work and market niches—pastoralists navigate the shifting patterns of uncertainty that characterize the sector as much as most of the EU rural world—in some instances adapting successfully and in others succumbing to the wind of times.

Picture 2 – Immigrant shepherd taking care of local flocks in Triveneto, Italy (credit: PASTRES)



MENA Maghreb and Mashreq – Inverse Mobility

Few clear indicative features characterize the agro-ecology of countries in the Maghreb (or North Africa, NA) and Mashreq (or Middle East, ME); these traits traditionally contribute to shaping local socio-cultural and economic developments. MENA is the region with the highest limitations in terms of soils and water; in most countries agricultural land is less than five per cent of the total land area. Further east, the Arabian Peninsula shows even lower figures. Demographic pressure in the region has risen steadily for several decades, with relevant implications of natural resource availability and management. At the current rate, it is projected that by 2020, agricultural land per capita will be 0.21ha, or half of what it was in 1961 (0.48 ha) (Zdruli 2012:5). MENA rural areas are thus largely labour-abundant (dominated by family farming characterised by low per capita productivity rates) but highly vulnerable to climatic and economic volatility (INRA, 2015).

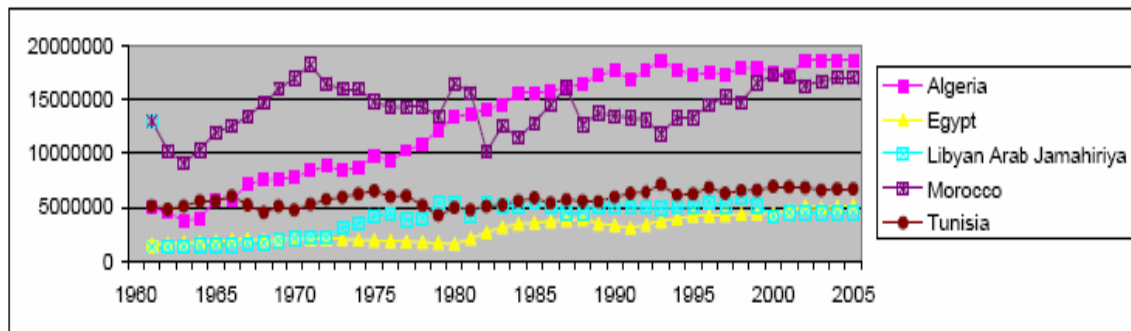
Climate dynamics represent a domain of great uncertainty as the region is projected to become hotter and drier. Growing climate unpredictability and frequency of extreme climatic events would lead to the loss of fertile soil, changes in biodiversity, and reduced freshwater availability, with projections indicating a decrease of between 10 and 20 per cent in rainfall patterns by 2050 (Mombiela, 2010; Schilling *et al.*, 2012b:14; IPCC, 2014). The implications on ecosystem functioning and livelihood dynamics are evident. Today the MENA region is the biggest importer globally of cereals and a net importer of animal products; in 2011, 40 per cent of calorie intake per capita was from international food imports (Zdruli, 2012: 5-7). Dependence on food imports is projected to increase in the coming decades, with important economic and political consequences (CIHEAM, 2014; INRA, 2015; ICARDA, 2015).

Investments in reconfiguring land regimes and agricultural patterns have therefore represented a political priority throughout recent decades, particularly for those countries that could benefit from the important financial resources generated by the exploitation of oil and minerals. While land suitable for crop production is limited, pastoral territories constitute about two-thirds of MENA regional lands, where livestock rearing still proves to be a main source of livelihood, employment, and income for most communities. Ecological settings vary widely, from mountain ranges to coastal areas to the pre-Saharan belt. This provides a natural background for diverse agro-pastoral systems that respond differently to internal and external pressures, although similar patterns and dynamics are visible. Our review mostly focused on pastoral communities inhabiting the Moroccan Atlas mountainous setting (8 papers over 15).

Indeed, parallel to the increase in the number of people, the livestock population has risen dramatically too. Growth of regional herds and flocks has been steady and continuous, spurred by the demand for animal products from an expanding population and steered by a State-induced market integration (Figure 5); Bourbouze (2017:30) notes that livestock figures having quadrupled in the last century. Forms of external support such as remittances and State aid, together with marketing options, income from tourism, hired shepherds, and forms of producers' associations (such as the *Khлата* in southern Tunisia) have contributed towards restructuring herd management and pastoral practices (Nefzaoui, 2004; Chatelard, 2005).

Through changes in mobility patterns, territorial distribution, and household or clan structures these strategies have enabled a number of local entrepreneurs and youth to find opportunities for investment, employment, and income in the lucrative businesses associated with intensification of livestock production and its marketing towards increasingly demanding urban areas (Boubakri, 2002). Likewise, expanded and diversified livelihood patterns have reduced catastrophic animal losses in drought events, making it possible to keep larger herds that grow over time thereby contributing to rising grazing pressure (Rachik, 2009; Schilling *et al.*, 2012b; Boubakri and Kadija, 2014; Sadiki, 2016).

Figure 5 – Evolutions of sheep national flocks in the North African region (1962-2005)



Source: own elaboration from Dutilly-Diane, 2006.

Local ecosystems are likely paying the costs of an extensive reconfiguration of social structures and economic dynamics in addition to the impact from environmental changes. Today mosaics of over- and under-utilised grazing resources are reported throughout the region, together with localized processes of degradation of the natural resource base (Abdelguerfi and Marrakchi, 2000; Zdruli, 2012). Range degradation remains a contested domain of conflictive relationships between pastoral communities and State structures, with important repercussions on the strategies and capacities for managing stress and shocks on local livelihoods (INRA, 2015; CIHEAM, 2016).

Literature tracks have followed two main lines, looking either into the impacts of livelihood restructuring from the perspective of the ecosystem or into socio-economic structures and the related uncertainties generated by recent dynamics. Academics and agencies taking the natural science perspective tend to highlight the ecological problems associated with a fast-growing population over a rich but fragile natural resource base. Their main concerns relate to overgrazing, soil erosion, biodiversity loss, and, more recently, the effect of climate change in accelerating desertification (Le Houérou, 1975; Maselli, 1995; Abdelguerfi and Marrakchi, 2000; UNEP, 2012; INRA, 2015). Regarding the case of Soqotra, d’Elie (2014a:3) notes that the natural symbiosis between rain, grass, and milk as constituting, at least metaphorically, a “virtuous cycle” of production and consumption within the pastoral domain has come to an end.

A more positive and optimistic perspective is offered by social scientists and economists who point to the dynamism and evolutions of pastoral communities which show important transformations of social structures, active engagements with market dynamics, and intense integration into the wider national, regional, and global societal settings (Mahdi, 2007; Gertel and Breuer, 2007; Chattou, 2016; Bourbouze, 2017). For Bourbouze (2000:16), the role of pastoral systems is decreasingly marginal in most areas as these respond to shifting and growing societal demands.

Resettling communities

Pastoral populations inhabiting the region at times present a specific ethnic identity while living together with other groups within national boundaries. The rights recognized to pastoral groups in some inhabiting countries are not necessarily those of the majority, often Arab, population. As elsewhere, their majority at localized or regional levels, does not necessarily translate into a centrality in national politics. For some groups—the Kurds and Sahrawi or more general Berber communities in Morocco and Algeria, as much as Bedouins in Israel and in Egypt—their integration within nation-states represents a major source of political and physical challenges that significantly affect their livelihoods (Sinjilawi and Nori, 2005; Volpato and Howard, 2014).

The sense of community identity and Islamic rule seem to be stronger in this region than elsewhere, and this bears an important influence on local social and political dynamics, including demography. Particularly in pastoral areas, where the presence of the State is less evident, these factors have strong influences on the norms, practices, and behaviours characterizing the reproduction of social and economic structures as well as in shaping local livelihoods. In some areas, one way of tackling this divide has been to incorporate pastoral communities into State structures through their formal reorganization into cooperatives defined along tribal or clan lines. The formalization of these *cooperatives ethno-lignageres* has been spearheaded by international agencies and accompanied by the redefinition of administrative boundaries according to the resource management patterns of local communities, including mobility for pastoralists (Tozy, 2002; Lazarev, 2008; Nori *et al.*, 2009).

Pastoralists have often used these cooperatives as arenas for collective action for organizational, identitarian, and political matters; cooperatives are instrumental for gaining recognition as political actors, specifically on land matters, but increasingly also as a means for influencing political decision-making, and lobbying for public investment in local economic development (services, schooling, extension etc...). “*Ils veulent être considérés comme des acteurs des politiques publiques en matière d’aménagement et de développement rural intégré*” (they want to be considered as political actors having their saying in public policies for what concerns local patterns of resource management and rural development (Chattou, 2016 :145).

Box 12 – When Collective Action works (excerpt from Nori *et al.*, 2009:18)

In Tataouine, Tunisia, Stipa tenacissima, an important plat resource in the area, was at risk due to its intense use by small ruminants as well as by people. Community people used to collect it for storing and contingency feeding purposes; its collection was done through eradication rather than cutting, which had implications on its regenerative capacities. It is reported that in 1950 a community decision was made to ban direct eradication of this plant. It was decided that groups should have been organised for its collect, through appropriate cutting which would have preserved the plant roots and thus enhanced regrowth. Group collection implied that one-to-another control mechanisms were applied. This decision was eventually endorsed and formalised by the government and thus became formal regulation. This simple episode shows how communities can play an active role in organising and enforcing a rule aimed at preserving the natural resource base, and how they can involve higher institutional levels in their strategy.

The wider political framework in the region is characterized by a strong presence and control from the State and its structures, particularly in the countries benefitting from revenues generated by oil and mineral exploitation. Though there is no regional policy framework around agriculture and rural livelihoods, rural development patterns have been very similar throughout MENA countries. The main differences in policy and investment trajectories mostly relate to the heritage of the colonial and cold war experiences, as well as the relevance of the oil or mineral revenue for the different States.

Following decolonisation in the 1960s, most MENA countries promoted domestic self-sufficiency through the organization and support of producers aimed at stimulating and controlling supply and favouring value-chain integration. This policy setting was dramatically reconfigured by the severe drought events that struck the region in the 1970s, ringing an alarming bell for food security paradigms. Drought events in fact highlighted the exposure and fragility of pastoral livelihoods and contributed to the weakening of communities’ socio-economic structures, eventually triggering an important resettling of herding households. State resources at the time had been allocated to govern such process, with important public support aimed at ensuring populations’ access to basic services and consumption items, including animal feed and vet services (Gertel and Breuer, 2007; INRA, 2015; Bourbouze, 2017). Subsequent waves of economic restructuring in the 1990s included market deregulation and economic integration into global trade; agreements with the WTO and the EU increased most countries’ reliance on food imports with a view to serving the needs of a growing and diversified urban population. Public expenditure in support of agricultural production and rural livelihoods was curtailed, and subsidy and investment schemes were diverted accordingly (World Bank, 2009; INRA, 2015).

The dependence on market dynamics is today particularly acute amongst MENA pastoralists for whom market relations are critical to the reproduction of the household as well as of the herd. The commoditization of livestock products has come to represent a main production objective, just as the market represents a new territory where livestock inputs (animal feed, water supply, and health services) are increasingly acquired. Under normal circumstances, ewes are described as «*mangent avec l'argent*» (feeding on money) or «*à se manger l'une l'autre*» (eating each other, Rachik, 2009:82) or «*la brebis mange sa sœur*» (an ewe feeds on her sister) (Chattou, 2016:141). Thus, in crises such as a drought or sharp prices drop, it is only through State aid or emigrants' remittances that herders can support their livelihoods and the needs of their herds (Elloumi *et al.*, 2006).

This process has been steered by national States, which basically perceive pastoralists as livestock producers having to comply with satisfying the demand of a growing population (Bourbouze, 2000; Gertel and Breuer, 2007; Tag, 2007; Daoud *et al.*, 2016). Overall political reforms and schemes have largely helped engage and integrate rural producers into market mechanisms, exposing them to the related uncertainties. The gradual fading of State support has eventually left herders often directly facing market dynamics, with controversial outcomes. Pastoral communities have reorganised accordingly to better articulate with State services and market opportunities in order to meet these challenges.

Box 13 – A false sense of security

*For pastoralists inhabiting the Mashreq rangelands, the establishment of borders between Jordan and neighbouring countries became barriers that undermined the Hima traditional land tenure systems and grazing rights associated with Bedouin tribal institutions that had been in place until then. Traditional grazing destinations could no longer be reached, and herds were confined to a limited area that nobody was managing. Herds grazed anywhere and entire areas became overgrazed. Droughts exacerbated the situation and the land was unable to recover. The Badu would normally have been concerned by such degradation of the environment. However, since the government was supplying cheap barley feed for their herds, they stopped thinking ahead. The easy feed solution lulled the Badu into a false sense of security. In the meantime, they also became more settled and began to have other income sources. For some, herding was no longer their main focus of activity (Al-Tabini *et al.* 2012:12).*

Relocating lands

While playing a critical role in steering the integration of pastoral economies into market mechanisms, most States in MENA countries have shown a limited capacity to enforce their own rule on the governance of land in most pastoral areas. Hybrid institutions prevail, whereby the inspiring principles and operating practices intertwine customary rules, Muslim dictates, and modern State law. The resulting scenario is often one of negotiated forms of shared power between State structures, local authorities, religious leaders, and the customary institutional settings (Leybourne *et al.*, 1993; IFAD, 1995; Lazarev, 2008).

Box 14 – Customary resource management amongst Berbers and Bedouins

Customary systems of pastoral resource management have been largely overcome, innovated, or rearranged to take into account diverse degrees of pressures and opportunities. These, however, provide relevant indications about principles and strategies that pastoralists apply in accessing, sharing, and utilizing resources.

A typical pastoral resource management system found amongst Berber communities in the Mashreq is the *Agdal*. This is “a generic Berber term designating areas where access rights and uses of natural resources are governed by a local institution—usually the village, inter-village or intertribe assembly—which fixes rules concerning periods and modalities of differentiated natural resource exploitation” (Auclair *et al.*, 2011:3). It represents a decentralized territorial practice embedding principles of flexibility and accountability and degrees of innovation that are all critical for local resilience.

Amongst Bedouin communities in the Mashreq, the typical *Hima* system allocated pastures to individual subgroups, where authority was exercised via a sheikh. Al-Tabini *et al.* observe that several key elements of the *Hima* system allowed it to survive for many centuries; these include: “(i) a high degree of militarization of society which allowed violent retribution against rulebreakers; (ii) the slow pace of movement to a given pasture (on foot); (iii) the fact that herding was done more directly by the owners of the animals; and (iv) actual herd sizes were smaller implying less competition for pastures. This practice ensured protection and graze management system where herders moved from place to place based on a collective understanding of where not to graze each year” (2012:13).

Important forms of farming encroachment onto rangelands and individualisation of higher-potential areas in pastoral settings have become relevant phenomena contributing to the reconfiguration of pastoral territories and access to resources. The reasons for—and implications of—this process are manifold. In most dryland areas, agricultural intensification (i.e. through crops for animal feed, such as barley and alfalfa) aims to complement and support livestock production that often remains central to the local economy. In some areas this has accompanied the development of more intensive livestock production, either through herd restructuring or changes in its management. Livestock intensification schemes in association with farming include reduction in flock consistency and mobility, fattening schemes, the integration of dairy cattle into the farm economy, and complementary animal feeding (Leybourne *et al.*, 1993; Chattou, 2016).

Local elites as well as State agencies are behind the substantial grabbing of rangelands in the region, through either private or public investments. In Syria, tree plantations have been at the heart of State intervention in the steppe since the late 1980s, while similar processes had been ongoing in neighbouring countries in previous decades (World Bank, 1995). In Egypt, since the 1980s the central government has allocated large rural land lots to the army and associated traders or wealthy managers despite the protests of local Bedouin communities (Daoud *et al.*, 2016). In Tunisia, individual ownership titles have been accelerated to allow farmers to access agriculture credit (Elloumi *et al.*, 2006; CIHEAM, 2014). At this writing, significant land reforms and development programs are underway in the region that explicitly support privatization of communal and State lands, thus generating tensions between formal authorities and customary structures.

Box 15 – The *Plan Maroc Vert*

The *Plan Maroc Vert* (2008–2020) implements government social and economic development through a series of projects designed to improve agricultural productivity by modernizing the sector and supporting new investments. Implemented by the Agricultural Development Agency, these basically include water management for irrigation; leasing State land for agricultural investment; and creating domestic distribution systems. As of mid-2010, 80,000 hectares of State land had been leased for agricultural enterprise development, requiring large investors to create local jobs and use small farmers for production. More recently, the government drafted directives aimed at increasing the productivity of collective land by removing legal barriers to individualization of farmland and simplifying the land registration system (USAID, 2011).

Interestingly, while the Moroccan government manages investments supporting modernization and economic performance, international aid agencies finance and support the 'social' pillar of the *Plan Vert* targeting small-scale farming, marginal territories, and remote areas.

Individualisation of land rights and conversion to farm production have, however, taken place at different levels—although not necessarily associated solely to crop productivity or production. In many areas, converting wetter pastures to farmlands has represented a way to purposely appropriate portions of communal lands and secure (or operationalize) rights of use to a specific group or family. Apart from reported cases of élites or the State grabbing collective resources, this is rather a widespread accepted practice implemented in local communities by the different social groups, usually without major complaints. Overall, these dynamics seem to aim at safeguarding the local community and its social-tribal interests by securing land rights (Tag, 2007; Lazarev, 2008; Ben Saad and Bourbouze, 2010; Kreuer, 2011).

These processes contributed substantially to redefining uncertainty for local populations since restructuring pastoral territories—in both physical and socio-political terms—implies relevant and diverse consequences for the different communities and groups. Mobility of pastoralists and of their livestock has also been profoundly reshaped; important degrees of sedentarisation have taken place in urban centres as well as rural towns and settlements. On the one hand, this brought pastoral communities under stronger State control, while on the other it provided opportunities for integrating livestock production into marketing dynamics and for diversifying out of pastoralism. Sedentarisation has also accelerated as a means for satisfying the growing demand for children's education, access to religious services at mosques, and an overall new sociality (IFAD, 1995; Bourbouze, 2000; Lazarev, 2008).

Livestock mobility has changed as a result of remodelled territories and technological advancements. Mechanised transport and water pumps extended pastoralists' capacities to access and manage distant resources and opportunities, from dryland pastures to faraway markets. Roadways, trucks, cars, and motorbikes, and mobile phones have dramatically shortened distances between herding households, range resources, and market opportunities. This, in turn, triggered a complete reconfiguration of pastoral mobility, which some authors have redefined as 'inverted' or 'transformed mobility' or 'mobile sedentarisation' (Gertel and Breuer, 2007; Rachik, 2009; Bourbouze, 2017; Vidal-González and Nahhass, 2018).

In evolving settings where water and forage are mobilized towards animals and range resources are decreasingly critical to livestock production, people are also implementing new forms of mobility. Migration out of rural areas intensifies rural-urban links as well as international patterns whereby members of pastoral families move to European or Arab countries in search of greener pastures (Mahdi, 2007; 2014; Chattou, 2016; Nori, 2017b). Due to its geography, the region is well-exposed to mobility and migratory flows that involve populations and resources from inner African and Asian territories on one side, and Europe on the other.

Box 16 – Pastoral mobility and international migration

In the rangelands of eastern Morocco and southern Tunisia, emigration is a mass phenomenon that has shaped the movement of rural populations. In most cases it concerns pastoralists who have lost their flock and hope to rebuild it in order to regain their status in the pastoral setting. But the opposite also applies, as the sale of livestock and flocks might also represent the source for financing the migratory project.

Emigration usually starts with patterns of internal, temporary migration with a circular dimension. Should conditions allow—typically a friend, relative, or neighbour who has already crossed the Mediterranean—it evolves through international trajectories. In Settat, for example, the migration of young shepherds towards Italy and Spain is very important; families without emigrated members are very few. Cases exist whereby emigrants find themselves engaged in as salaried wage shepherds under a different, higher salaried status than in Morocco (Nori, 2017a). Frequently the remittances sent back to the pastoral household contributes to the reconstitution or expansion of flocks in the origin community, often in association with other relatives. This investment is perceived as a social promotion to the extent of feeding the migratory project of a whole generation of pastoral youth seeking, amongst other things, to flee the patriarchal setting (Chatty, 2006; Boubakri, 2011; Chattou, 2016:43).

The implications of such migratory patterns are visible in parts of the region, with direct consequences for the reproduction of local social and economic structures and, more broadly, in reshaping local uncertainty settings, particularly in the Maghreb. On the one hand, in some areas remittances represent a primary strategic financial source in support of pastoral livelihoods, specifically to face droughts or reconstitute herds afterwards. Cases are reported in mountainous Morocco and in Tunisian drylands where remittances may represent up to 75 per cent of the pastoral revenue (Boubakri, 2002; Mahdi, 2014; Sadiki, 2016). On the other hand, local availability of shepherding labour is admittedly a limiting factor for most pastoral systems: “*les bons bergers ils sont tous partis chez vous*” (good shepherds have all emigrated to your countries [in the EU], Nori, 2017a:11) thus jeopardizing effective pastoral production and its generational renewal (Chattou, 2016).

Apart from absentee landlordism, this situation also gave rise to phenomena of ‘substitutional’ pastoralism (*nomadisme par bergers interposés*), whereby the livestock owner emigrates while his herd and the related control/appropriation of local natural resources is conducted through wage herders paid with remittance money (IFAD, 1995; Boubakri, 2002; Ben Saad and Bourbouze, 2010). Cases are reported where the wage herders are themselves migrants from other countries, thus reproducing and reinforcing patterns of mobility and migration. The case of the Nigerian shepherds tending Libyan herds before the recent conflict is just one such example (Meddeb, 2012).

Crossing borders within the region also represents challenging options for local pastoralists, with growing degrees of difficulties or returns in different areas. The establishment of national frontiers impacted pastoral livelihoods throughout the region by seriously affecting natural resource management and trade patterns. Some pastoral communities are primary actors in longstanding conflicts, such as the Sahrawi and Kurds fighting for political independence and territorial control. Contrary to what has been the process elsewhere, in the Maghreb and Mashreq regional integration and coordination have advanced to limited extents and the inter-relationships amongst many States remain tense. National borders have recently tightened or collapsed according to the local conditions. This has generated new uncertainties and constraints but also opportunities and options for local livelihoods (Mahdi, 2014; Daoud *et al.*, 2016). Due to the administrative, economic, and political differentials that characterize the different national territories, crossing borders has become for some groups a ‘value-adding’ activity as it provides opportunities for illegal trade and illicit exchanges (Lazarev, 2008; Meddeb, 2012).

Box 17 - Re-sale rings in the Mashreq

The gradual development of national borders and the increasing difficulty of seeking pasture in other countries has stimulated the emergence of a number of subterfuges to circumvent the inevitable restriction on access to pasture through re-sale rings. If an owner wishes his herd to make use of pasture in another country, he "sells" it to another pastoralist, who herds it while the pasture is available. When the pasture is exhausted, the herd is "sold" back to the owner. Such rings may involve more than one country, and animals may move in large circles crossing from Syria to Jordan, Saudi Arabia, and Iraq (IFAD, 1995). Playing with and through State and market mechanisms, pastoralists thus forge spaces for manoeuvre that enable them to tackle the political ecology of borders and mobility restriction by making extensive use of social networks.

Elsewhere cross-border trafficking has evolved from challenging the monopoly of the State in controlling trans-frontier exchanges towards challenging its own presence, control, and authority. Through these dynamics, insurgent movements have navigated pastoral territories, to an extent capitalizing on the sense of disillusionment, resentment, and abandonment local populations feel towards central governments, State structures, and international institutions (Nori *et al.*, 2008; Nori and Baldaro, 2018). Apart from political recognition, participating in insurgency movements represents an important source of income for rural youth in search of autonomy.

Moreover, recent conflicts that have ravaged the region—the wars in Iraq, Syria, and Libya; the conflict in Sinai and in Palestine—hold important implications on pastoralists' livelihoods as violence and discord affect production, exchange, and trade patterns. Related patterns of insecurity accrue local uncertainties in economic, social, and political terms, providing different challenges and opportunities to the diverse groups inhabiting pastoral territories in the region (Sinjilawi and Nori, 2005; Daoud *et al.*, 2016).

At the interface between the Sahara and the Mediterranean, MENA is amongst the regions most exposed to climate change and characterised by a fast-growing human presence. These processes take place at a rapid pace on a rich but fragile resource base, with acknowledged limitations in terms of land, water, and food production (UNEP, 2012; IPCC, 2014). At the crossroads between three different continents, the region is increasingly transited by flows of people, animals, trucks, migrants, commodities, and political agendas that contribute to reshaping local agro-ecological as well as socio-economic landscapes, and also remodel patterns of uncertainties. The outstanding economic performances experienced in recent decades by most countries in the region have not trickled down to rural settings, where most communities have instead seen their livelihood conditions degrading; levels of rural income and employment have constantly declined, while their exposure to market and climatic uncertainties has grown (INRA, 2015; CIHEAM, 2016). States' capacities to govern these processes have been fading to large degrees and communities have had to reorganize accordingly.

In pastoral areas complementary trends are visible, as livestock-rearing is specialising while livelihoods are diversifying in response to internal and external pressures. Pastoralism remains central to rural development in large areas of the region, and the pastoral economy's integration into national and regional markets represents a major driver of local dynamics. Livestock performances are, however, increasingly disconnected from the natural resource base and increasingly supported by external inputs and resources. Moreover tourism, emigration, cooperatives, State services, remittances, and the deep intensification of rural-urban links and exchanges combine to provide consistent opportunities to amplify and diversify the pastoral economy in what is defined as a "*binary economic system*" (Chatelard, 2005:44), "*un pied en steppe, l'autre en ville*" (one feet on the range, the other in town, Bourbouze, 2000:9)

Marketing and mobility patterns have reconfigured in type as well as scale as mechanised transportation and mobile phone options shorten distances and facilitate links. New social groups emerge: commercial livestock entrepreneurs, cooperative leaders, employable shepherds, petty traders, migrants' households, and tourist agents, among others (Chatelard, 2005; Volpato and Howard, 2014;

Vidal-González and Nahhass, 2018). These in turn reinforce the growing interconnections with the national and international arenas and contribute to redefining landscapes and resources accessible to pastoralists, reconfiguring social networks at different levels. The resultant reshaping of territories and livelihood systems generates new patterns of insecurity and vulnerability in tandem with fresh opportunities for pastoralists to diversify and integrate their strategies as they adapt to new uncertainties as well as to the related complexities, changes, and stresses (Elloumi *et al.*, 2006; Gertel and Breuer, 2007; World Bank, 2009).

As a whole, the livelihoods of most MENA pastoral communities are increasingly shaped by processes unfolding outside the realm of animal production and very often also outside regional boundaries (Tag, 2007; Boubakri and Kadija, 2014). Most pastoral households today make a living in a multi-base economy through a multiplicity of activities undertaken by different members and divided between the traditional tent, farm, and village, town or city or Europe—or all of these (Gertel and Breuer, 2007; Mahdi, 2014; Bourbouze, 2017). Such social and spatial restructuring challenges traditional mechanisms that govern pastoral resource management and societies. Customary institutions aimed at redistributing resources and risks, roles, rights, and responsibilities have faded to a large degree in the evolving settings, while new relationships, connections, and networks are being forged. These generate new room for tensions and alliances along social, ethnic, geographic, gender, and generational cleavages, and contribute differently to how pastoralists adapt to and face uncertainties in the Maghreb and Mashreq pastoral territories.

Picture 3 – Sheep breeding in the West Bank, Palestine (credit: PASTRES)

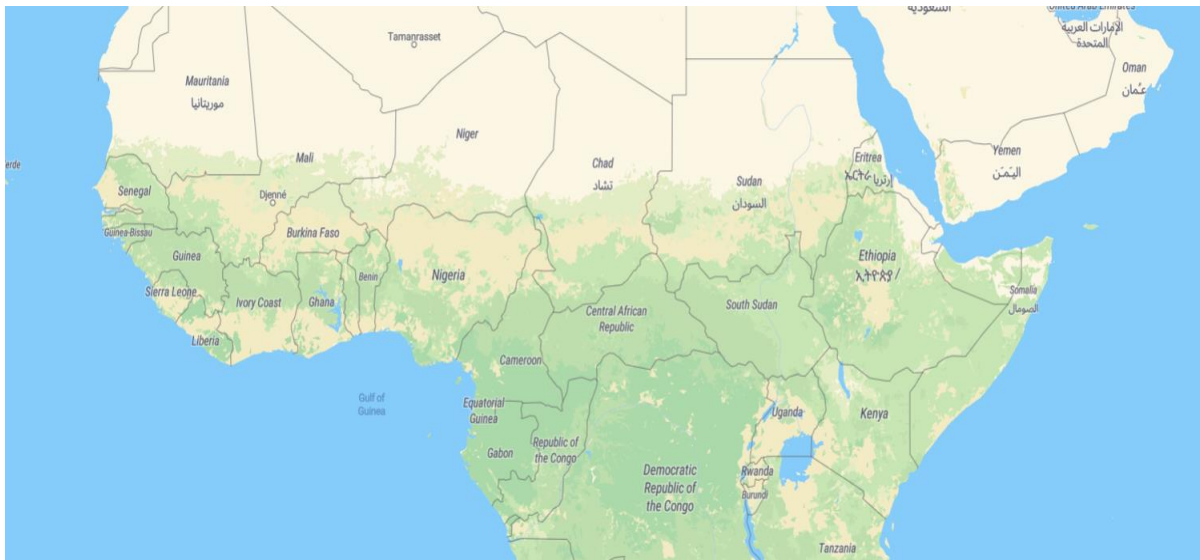


SUB-SAHARAN AFRICA

The uncertainty framing pastoral livelihoods in Sub-Saharan Africa (SSA) mostly comprises important environmental changes, forms of social and political tensions and evolutions, and increased integration into regional and global trade that coexist with high and diversified levels of poverty in rural areas. The region is simultaneously affected by the interconnected effects of shifting agro-ecological and socio-economic landscapes, diversifying policy agendas, and trade evolutions. These carry relevant impacts on the rural livelihood of the estimated pastoralist and agro-pastoralist population of Sub-Saharan Africa which is estimated at 260 million (ICRC, 2004:14) or 130 million (Cervigni and Morris, 2016:54).

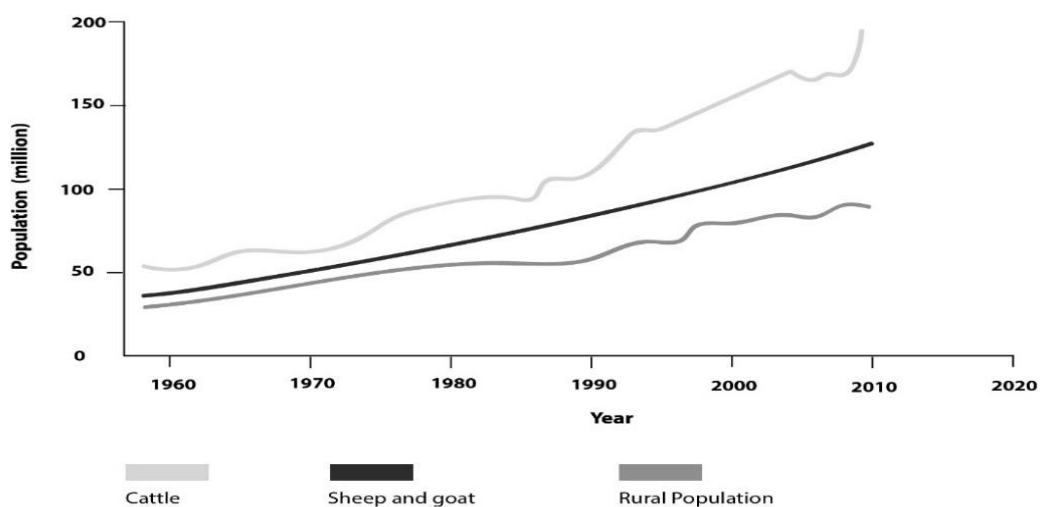
Rural livelihoods have undergone important changes in recent decades. Drought events have intensified, local economies have undergone important restructuring, human and livestock demographics have grown consistently, and new actors and interests have been encroaching on rangelands. An important development and humanitarian machinery has been established to contain the costs and impacts of these processes, but ecosystem and social dynamics are being importantly affected by processes that are deeply reshaping the territories and societies throughout the drylands belt spanning the Atlantic coast to the Indian Ocean.

Figure 6 – Map of Sub-Saharan Africa, including Sahel and the Greater Horn of Africa



Source: www.maptiler.com

Climate change projections and scenarios indicate patchy and variable rainfall patterns that might favour pastoral resource management compared to other land uses in specific areas, provided the institutional setting is enabling (Nori and Davies, 2007). Although the main climatic threats to Sub-Saharan herders are drought phenomena, concentrated rainfall and flooding events are also reported as principal threats to local livelihoods as pastures might become inaccessible and animal health exposed to water-borne disease, vectors, and parasites (e.g. *Rinderpest* and *Trypanosomiasis*). (Jacobs and Coppock, 1999; Majekodunmi, 2014; Kima *et al.*, 2015). Indications of shifting environmental and climatic patterns are already visible in pastoralists' strategies such as restructuring herd composition and management as well as mobility patterns according to prevalent conditions and perceived trends (Thornton *et al.*, 2009; Turner, 2011; Catley *et al.*, 2013).

Figure 7 – Growth of livestock and rural human population in African drylands – 1960-2010

Source: own elaboration from FAOStat, 2015 as to de Haan *et al.*, 2016b :49

Throughout the region pastoral economies are benefiting from the growing demand for animal protein and the related expansion of market networks, which increasingly connect inner drylands with coastal urban settings and global trade facilities. Millions of smallstocks are shipped every year from the Horn of Africa to the Gulf States and millions of cattle are trekked or trucked from the Sahel to coastal countries in West Africa. Other commodities, people, finances, and information are increasingly moving along pastoral pathways thus connecting communities in the region and beyond.

The political setting in Sub-Saharan Africa is constantly shifting; parallel and complementary processes are redefining power relationships, institutional architecture and governance systems at different levels and through diverse dynamics. On the one hand mechanisms of democratization and power devolution are taking place, providing fresh room for local communities and customary institutions. On the other, processes of regional integration are evolving and connecting different territories and opportunities, both through the establishment of formal organizations and civil society networks as well as the emergence and settlement of insurgent groups in certain areas.

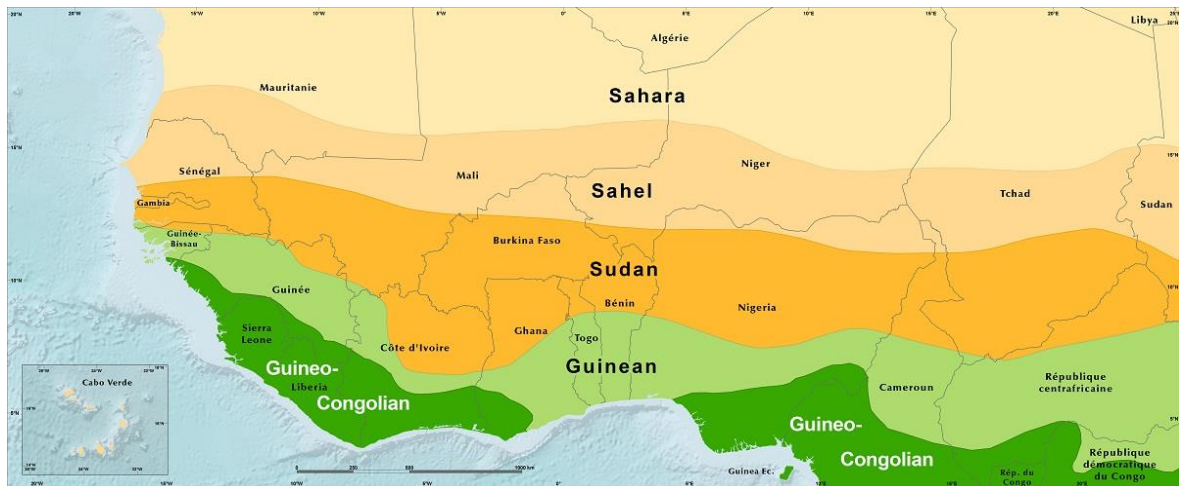
These dynamics and pressures contribute to reconfiguring the ecological, socio-political, and economic landscapes of pastoral communities in the Sahel and the Great Horn of Africa, with relevant implications for the institutional territories and uncertainty settings pastoralists navigate. Our analysis is limited to these two regions, which host the largest share of Sub-Saharan Africa pastoralists thus offering relevant and consistent elements for our global comparative perspective. Although they share many commonalities, the two regions are crossed and challenged by diverse forces and dynamics, pertaining mostly to their diverse geo-ecological features and historical exposures. The implications in terms of risks and opportunities are diverse in accordance with the different social, ethnic, generational, and gender groups.

Sahel – Transhumance integrating territories

The area considered in this analysis is the semi-arid sub-region stretching from the southern Sahara to the Sudano-Sahelian belt and extending eastward from Senegal to Chad, including northern portions of Nigeria, Cameroon, Ghana, Benin, and Ivory Coast. This is in fact the region that hosts the most pastoral communities inhabiting this part of Africa, though at times these mobile communities might be found in other areas. It is estimated that about 50 million people in the region rely on pastoralism for their livelihoods (IIED and SOS Sahel, 2010:7; De Haan *et al.*, 2016:1).

With a herd of over 60 million cattle and 160 million small ruminants, this West African sub-region is a privileged area for pastoralism, gathering about 25 percent of cattle, 33 per cent of sheep, and 40 per cent of goats in Sub-Saharan Africa (CEDEAO, 2008). A major climatic feature of the region is the sharp gradient of declining rainfall as one moves northward from the open savanna woodlands in the south (600–800 mm/year) to the desert steppe to the north (100–300mm/year). Another important feature is that rainfall is seasonal, falling from June through September. These two features strongly shape the regional and intra-annual distribution of grazing resources (fodder, water) and explain the historical patterns of north-south transhumance characterizing the region—an effective social and political construction continuously redefined and readapted (Bonnet *et al.*, 2010; Turner, 2011).

Figure 8 – The ecological gradients characterizing the Sahelian region



Source: CILSS, 2016

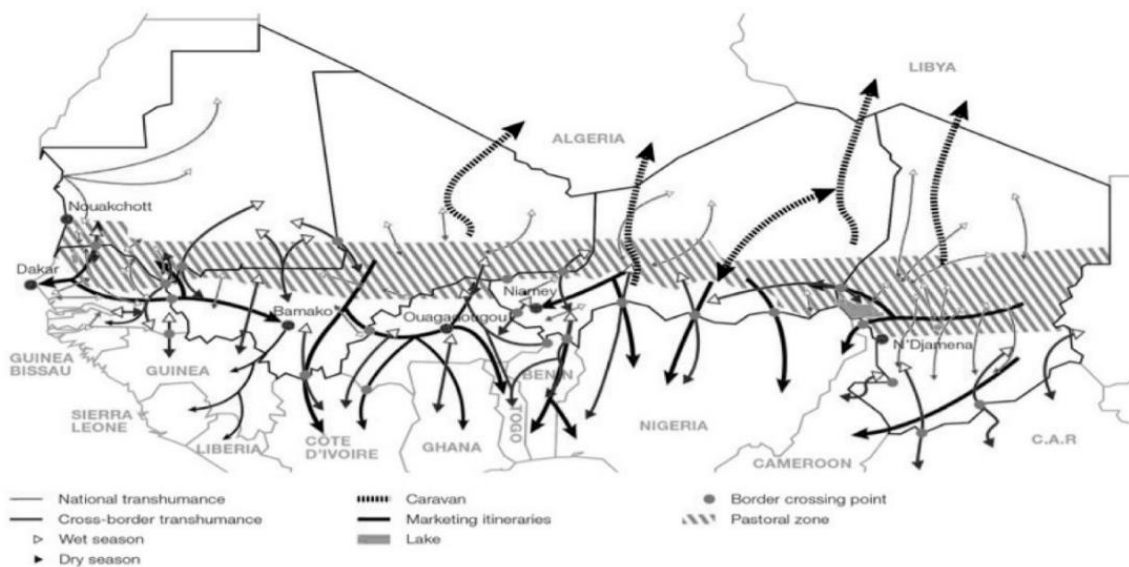
Extensive livestock breeding remains one of the dominant economies of the Sahel and is by far the main economy on the fringes of the Sahara. Though official figures barely capture pastoralists' contribution to the economy, these indicate that the extensive livestock sector represents about half of the regional agricultural GDP, while it contributes about 10 to 15 per cent of the national GDP for Sahelian countries such as Niger, Chad, Burkina Faso, and Mali (CEDEAO, 2008; IIED and SOS Sahel, 2010:8). The main ethnic groups practicing various forms of pastoralism with different herding and mobility patterns are the Berbers (including the Tuareg), the Moors, and the Saharawi in the Sahara-Sahel regions; the Toubous living between Chad, Sudan, Libya, and Niger; the Baggara in the Darfur and Kordofan Sudanese regions; and the large Fulani population in an area that extends from Senegal and southern Mali to northern Nigeria and Cameroon (Nori and Baldaro, 2018).

Some of these communities represent majority groups in certain parts of the region (e.g. the Fulani, or the Tuareg), but remain minoritarian in the national state settings where they are confined. Their presence in the State structures and policy agendas, as well their capacity to influence political debate, is normally relevant, although this varies by case, group, and country. These capacities are controversial, however, as they have not always proceeded through democratic and diplomatic means (De Bruijn *et al.*, 2016), nor necessarily translated into a more favourable policy frame for pastoralists (Gonin and Gautier, 2015). In some areas these dynamics eventually led to disenfranchisement, violent confrontation, and limited political integration with the rest of the country (Nori and Baldaro, 2018). Political engagement and participation are nonetheless important strategies that Sahelian herders pursue at different levels in order to cope with the diverse uncertainty drivers in the region (De Haan *et al.*, 2016; Benjaminsen and Ba, 2018).

Mobile communities, shifting territories

Regional livestock mobility for production and marketing purposes alike from the Sahelian drylands towards greener southern pasturelands and coastal urban consumers take place through transhumance corridors that cut across borders and areas devoted to other land uses (including farming lands and national parks), creating at times trouble, opportunities as well as conflicts (Apolloni *et al.*, 2018; Motta *et al.*, 2018). Transhumance represents a main driver for regional integration at various levels despite often being a reason for local skirmishes, tensions, and event conflicts with other land users, State structures, and other societal actors (Bonnet *et al.*, 2010; Apolloni *et al.*, 2018). Tighter connections and relationships with farming and urban communities as well as with market agents have been critical in framing the adaptive strategies of Sahelian pastoralists, as new constraints and risks, and possibilities, have also been generated in the new uncertainty scenarios.

Figure 9 – Transhumance and nomadism in Sahelian countries



Source: FAO-CIRAD, 2012

These traditional movements and routes have recently seen efforts to formalise their management and governance. *Pastoral Codes* and *transhumance passports* have been drafted and legislated in most Sahelian countries to support the integration of the different political and land use systems, with a view to reduce potential drivers of local tensions and conflicts (Nori *et al.*, 2008). However, the effective implementation of these institutional devices and the related governance of the pastoral space are reportedly still limitedly effective, as these still provide an unfair recognition of herders' rights (Turner, 2011; De Haan *et al.*, 2016).

Box 18 - The Pastoral Codes

Countries like Mauritania (in 2000), Mali (2001), Burkina Faso (2003), and Niger (2010) have established a 'Code Pastoral' that aims to systematize pastoral land use rights within a system of legal protection, often through the assistance of international agencies. The Codes aim to guarantee access rights to resources for all stakeholders, in a negotiation and shared framework. In order to reduce the risks of tensions and conflicts related to competition over resources amongst diverse land users (i.e. mostly herders and farmers), these Codes seek to regulate longstanding rights related to forms of mobility and access to rangeland resources, while also taking into account modern legislation protecting individual and group-specific land rights. Main principles inspiring the Codes evolve "from a greater recognition of customary tenure arrangements, including the principles of decentralised natural resource management, the multiple and sequential use of resources by different actors at different times of the year (e.g., herders' access to harvested fields) and the need to manage conflict at the local level" (Thébaud and Hesse, 2008:16).

Within the perspective that pastoral systems need to be modernised, Sahelian governments basically tried to replace apparently irrational and messy processes of resource access with a more orderly and technical system. Tuner (2011) warned about the risks associated with formalizing pastoral institutions into codes where flexibility is key for managing access to common-pool grazing resources whose availability and distribution through time and space depend largely on unpredictable climatic variability. Formal and rigid mechanisms, devices, and institutions adopting “a very technocratic and bureaucratic approach” (Thébaud and Hesse, 2008:16) that replaces social and political bargaining between actors might constrain mobility and flexibility, thus carrying potentially negative consequences for adaptation, resilience, and the overall capacity to manage uncertainties.

While the Codes were originally conceived to safeguard pastoralists’ rights and interests, these arrangements hold the potential to eventually disempower pastoral communities and further marginalise them by reducing their negotiation capacities in the political sphere. “Customary systems, for all their apparent ‘messiness’, allow pastoralists to respond in a very flexible and opportunistic manner to the unpredictable Sahelian environment where pastures and water resources are highly dispersed in time and space. Social networks and offers of reciprocal arrangements allow herders to negotiate access to a wide range of resources in any given year, while maintaining their social capital. Replacing this system with a more orderly one in which pastoral areas and their rules of access and manage” (Thébaud and Hesse, 2008:16). Furthermore, pastoralists’ vulnerability is often exacerbated by the fact that herders are often the least informed about formal legal provisions and the least aware of related duties and rights.

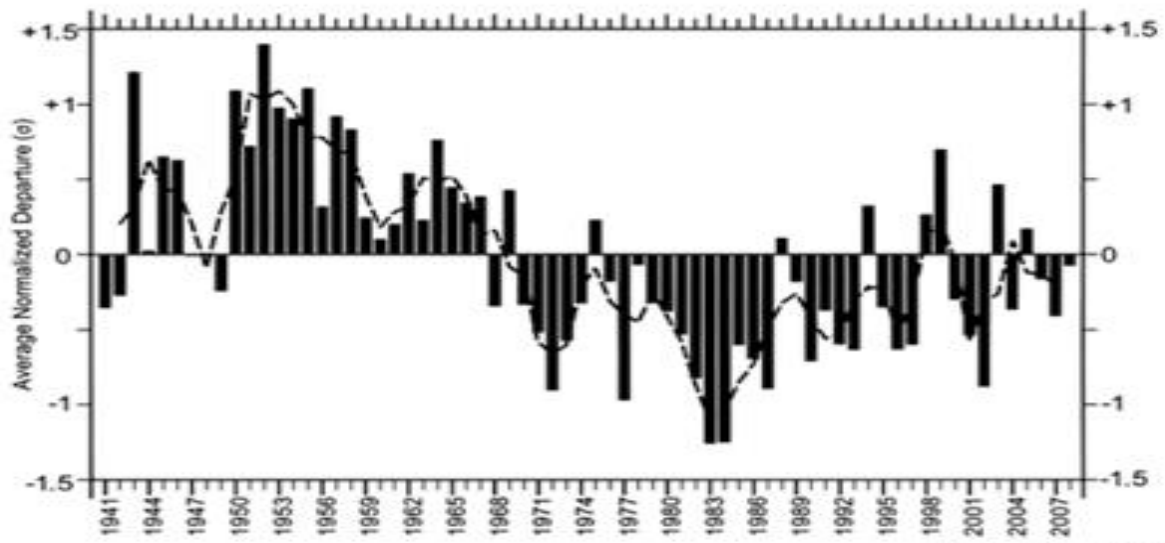
These institutional evolutions are also the results of the droughts of 1973 and 1984. The impact of those events on rural livelihoods and adaptive strategies were particularly dramatic as they followed periods of relatively intense rainfall in the previous decades that had triggered agriculture intensification and its expansion into pastoral territories (Figure 10). The long droughts eventually induced food crises in both herding and farming communities, stretching inter-relationships and resource competition to the point of triggering armed conflicts. These events had profound economic and political implications and required extensive international assistance (Batterbury and Warren, 2001:1).

Box 19 - Climate change for the Sahel

A study by the World Initiative for Sustainable Pastoralism provides an analysis of significant rainfall variations characterizing the Sahelian region in recent decades and related land use implications. “*Scientific simulations suggest that in the short term, the Sahel might actually benefit from climate change through a greening of the Sahel and southern Sahara. However, given our knowledge of long-term global and regional climate change and the driving factors behind such change it is possible that any greening of the Sahel and Sahara in the near future may eventually be reversed, if not during this century then at some time in the (possibly distant) future*” (Nori and Davies, 2007:6).

The issue though remains as to whether this ‘greening’ will benefit pastoral and agro-pastoral communities or whether this would rather “attract the attention of new outside interests and opportunistic agricultural expansion, thus sparking more potential for conflict” (Thébaud and Batterbury, 2001:77).

The intensification of drought phenomena in the region contributed to deeply reconfigure herders’ capacities and strategies as well as the institutional response from the national and international communities to contain the effects of these events. The related investments in water resources through the introduction of modern hydraulic systems have held important implications for the reconfiguration of pastoral resource management, including on herd composition, mobility and the interactions with local farming systems (Manoli *et al.*, 2014; Kima *et al.*, 2015; De Bruijn *et al.*, 2016; Apolloni *et al.*, 2018). In a region of unpredictable and shifting climatic patterns and overlapping systems of resource exploitation the intensification of rangelands utilisation has carried relevant consequences in ecosystem and social terms alike.

Figure 10 – Variability in west African rainfall – 1941-2001

Source: Lelé and Lamb, 2010

Apart from changes in regional livestock mobility, evolutions in land use indicate an increasing combination of farming and herding activities, whereby farmers are including livestock in their assets, while herders move towards forms of agro-pastoralism. This convergence provides for forms and patterns of collaboration and cooperation within the continuum of these systems, including interesting evolutions in terms of exchanges and sharing of land, livestock, and labour resources as well as collaborations through several crop-livestock interactions (Toulmin, 1992; Moritz *et al.*, 2011; Turner, 2011; Gonin et Gautier, 2015). Such convergence also provided through for intensification of competitions over agricultural land and pastures: the spatial reach of the grazing perimeters of transhumant herders has been constrained and feeding resources for their animals reduced as farmers tend to keep their harvest residues and fallows for themselves (Thébaud and Batterbury, 2001).

Together with those with other rural land users, the relationships and the exchanges with urban dwellers have also evolved, leading to a much deeper and articulated integration of pastoralists into market mechanisms and networks. The reorganization of the relationships between livestock, land, and labour Sahelian herders apply to continuously adapt to prevailing trends and conditions is underpinned by new articulations of social networks, institutional arrangements and political structures (van Dijk, 1997; Turner, 2011; Manoli *et al.*, 2014; De Bruijn *et al.*, 2016). These new reconfigurations and engagements have in turn generated new uncertainties, challenges, and opportunities, contributing to the further diversification and expansion of local livelihoods within the wider territorial and societal frameworks (Bonnet *et al.*, 2010; Turner, 2011). Overall, accrued poverty and vulnerability also meant increasing social stratification and shifts in the ownership and control of pastoral resources, with the growing phenomenon of absentee land and livestock owners, and an increase in the presence of hired herders (Moritz *et al.*, 2011; Manoli *et al.*, 2014).

In the literature we find two main trends regarding these events: one argues that indigenous capacities are to be trusted and supported to maintain rural livelihoods; the other advocates radical changes in rural development paradigms and patterns (Batterbury and Warren, 2001; Fokou and Bonfoh, 2016). Indeed, recent political evolutions have seen a clear preference for the former stance, with the governments of Chad and Mauritania issuing, in 2013, important *Declarations* in that respect (FAFO, 2016).

Tackling regional economic and political agendas

A growing integration into and dependency from market opportunities have also been pursued to adapt to the new dynamics characterizing the biophysical environment as well as the rural political and economic settings. This has meant a growing diversification of pastoralists' revenue sources, both inside (through the growing commodification of livestock and their products) and outside pastoral activities, including by transferring manpower into other economic sectors and important shifts in their income-generation as well as dietary regimes (Wane, 2006; Manoli *et al.*, 2014).

Evolving trade networks that hinge on traditional commercial routes have been strategic in connecting livestock raised in the Sahelian drylands to the growing consumer demand of coastal urbanised populations in west Africa (Ghana, Ivory Coast, Togo, Benin, and Nigeria) and northern Africa. IIED and SOS Sahel estimated “the official crossborder livestock trade in West Africa worth in excess of \$150m, with an even greater potential for expansion; a 250% growth in demand for livestock products is anticipated for the Sahel and West Africa region by 2025 due largely to a growing urban population particularly in the coastal countries” (2010:23).

This lucrative business represents a crucial and increasingly relevant source of income for most pastoral communities in the region. This has enabled herders to source basic staples and other commodities through the same routes and networks (OECD, 2014). Eventually these routes and networks have been instrumental for recent evolutions of illegal trafficking and smuggling throughout the region and beyond. Transhumance patterns and regional trade routes have been important drivers of regional economic and political integration while also exposing the Sahel to wider geo-political interests and agendas (De Bruijn *et al.*, 2016; Nori and Baldaro, 2018).

Further and deeper engagement in the policy arena at various levels has been another strategy undertaken and implemented by pastoral communities to enhance their capacities to tackle the uncertainties that impact on their livelihoods. This has involved a deep reconfiguration of the economic, political, organizational, and institutional infrastructure within which pastoralists operate (Bonnet *et al.*, 2010; Majekodunmi, 2014; Fokou and Bonfoh, 2016). Since the colonial period, pastoral groups in the Saharo-Sahelian region have had a tense history with the State apparatus due to the imposition of forms of governance that clashed with traditional structures and identities. The specific nature of their economic activities and socio-political identities has frequently triggered and fuelled conflict with both central governments and other ethnic groups (OECD, 2014; De Haan *et al.*, 2016;). On the one hand, intense mobility, trans-border exchanges, and ethnic loyalties represented a serious threat for the newly-independent Sahelian states, which sought to affirm their full sovereignty over the national territories (Drozd and Pliez, 2005; Benjaminsen *et al.*, 2012). On the other, access to land and other natural resources periodically generated tensions between pastoralists and farmers or other sedentary populations (Nori and Baldaro, 2018:160).

Even progressive movements and governments—for instance Modibo Keita in Mali and Thomas Sankar in Burkina Faso—looked upon pastoralism as an obstacle to development in general. Major policies and investments were viewed through a lens biased in favour of crop producers and sedentary populations, and thus aimed to convert pastoralists into ‘productive’ citizens by taking up farming or intensive livestock systems (Gonin and Gautier, 2015). More recent efforts to include and integrate pastoral groups in State structures by co-opting their elites have characterized the political discourse in some countries, largely because pastoralists’ numerical weight has become critical in democratic elections—a recent achievement in many Sahelian countries. However, the results of this strategy have been controversial as power balances have leaned towards different sides, while co-opting customary leaders into formal politics has often contributed to distancing them from their pastoral constituencies, which have eventually become the target of wider, regional actors (De Bruijn and Van Dijk, 1999; De Bruijn *et al.*, 2016; Nori and Baldaro, 2018).

The State’s fading presence in its peripheral territories after the Structural Adjustments Programs (SAPs), the challenges associated with democratization, the processes of decentralization, and shifting

geo-political agendas (i.e. military regimes and insurgency movements) have all challenged border regimes and undermined stability in the region (Bonnet *et al.*, 2010). Areas exist where pastoral groups opportunistically play the insurgent card to secure access to trade routes and illegal trafficking, or to regain access to land, or to claim a political visibility. Some even seek to secure revenue by joining militias, translating a global insurgency discourse to a local context reflecting social and political demands (De Bruijn *et al.*, 2016; Nori and Baldaro, 2018; Benjaminsen and Ba, 2018).

Box 20 – The appeal of the illicit

*“Deciding whether to abandon livestock herding in favour of illicit activities may depend on a process of trade-offs between economic (that is, which activity pays better), social (that is, which activity fits best in the social fabric of my group), and geopolitical and security considerations (that is, which activity yields appropriate livelihood and social status at the lowest security risk). However, motivations will fluctuate according to the type of group joined: for example, the motivations behind participating in illicit activities such as smuggling and trafficking could be motivated by economic rational considerations, whereas identity (whether ethnic, religious, or other) could be the key factor in mobilizing certain types of armed rebellions, like those led by the Tuareg in Mali and Niger” (De Haan *et al.*, 2016:11).*

While these dynamics have contributed to a growing instability in the region—which in turn affects pastoral livelihoods—they have also contributed to recognizing the centrality of pastoralists in bringing and managing peace in the region (for example, the Declarations of N’djamena and Nouakchott in 2013). A wider recognition of the rights and interests of pastoral communities in State and regional structures and agencies is deemed critical to enable Sahelian herders to better tackle the various uncertainties affecting their livelihoods (FAFO, 2016).

Furthermore, these processes are favoured by rising degrees of regional integration that include pastoralist organisations and networking. Aiming to strengthen their visibility and advocacy in the various political arenas, pastoral communities show outstanding capacities for establishing alliances that link community-based organization across borders through effective regional mechanisms, where women and youth interests are specifically represented too, such as in the *Billital Maroobé* reseau. Ongoing processes attest to pastoralists’ capacities to developing the *necessary* “leverage to ensure that improved knowledge and understanding is actually used to improve policy and legislation in support of pastoralism as a livelihood system” (Thébaud and Hesse, 2008:22) in the complex, highly dynamic and politicised process surrounding and embedding their livelihoods as well as through the related ever-changing uncertainties these generate.

The Sahel today is simultaneously affected by the interconnected effects of changing environmental conditions, and the reconfiguration of economic and policy agendas within an expanding regional framework. Factors influencing uncertainty in the region included growing degrees of interconnections, mobilities, and networks that often transcend national boundaries and frontiers; increasing exposure to trans-regional and global trade and traffic; and the related impact of different transnational interests and actors. The evolutions of traditional pastoral transhumance and trade patterns and the associated physical as well as socio-political infrastructure underpin the evolutions of Sahelian territories, societies, and economies.

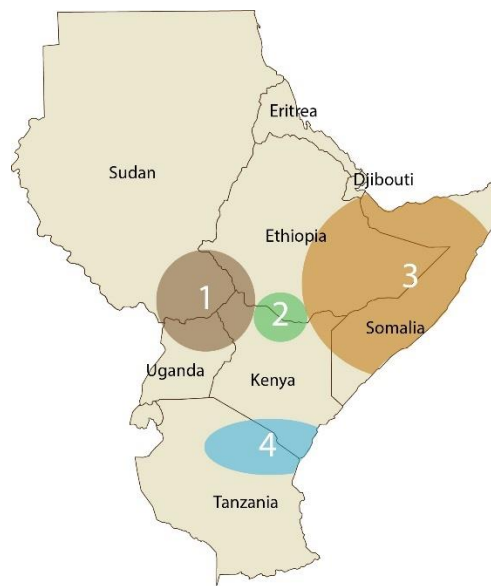
While extensive livestock production and its commercialization remain a driving livelihood source and economic force in the region, evolutions of resource management have opened up opportunities for new and encroaching forms of economic activity and political engagement for Sahelian pastoralists fighting for their place in the evolving national and regional settings. These processes have generated different dynamics for and within the diverse communities and groups, producing winners and losers that endure transformation, development, and uncertainty dynamics in quite contrasting patterns.

Horn of Africa - Fragmented and contested rangelands

The Greater Horn of Africa (GHA) covers six million square kilometres, most in dryland settings. It comprises Sudan, southern Sudan, Eritrea, Ethiopia, territories of the former Somalia, Djibouti, Kenya, and northern parts of Tanzania and Uganda. In most of these countries, pastoralists represent an important share of the national population, both in terms of populace consistency and socio-cultural diversity. Herding is the main source of income and employment for large segments of communities inhabiting extensive areas of Somalia, Ethiopia, northern Kenya, Djibouti, and southern Sudan. By taking care of most of the region's livestock, pastoralists contribute substantively to the agricultural GDP and regional food security (COMESA, 2009; Catley *et al.*, 2013; Lind *et al.*, 2016).

Dryland territories and populations in the Horn of Africa are characterised by important differences that fragment the pastoral setting. As a result, its resources are often a source of contention; the entire region has experienced conflict or disturbances in some form during the past decades.

Figure 11 - Cluster groups in the Greater Horn of Africa



Source: elaborated from ICRC, 2004

According to ICRC (2004), pastoralists in the GHA region can be sub-divided into four main groups. The degrees of consistency, unity, and alliance amongst these varies and can shift from one period to another. 1) The Karamojong cluster comprises 14 ethnic groups in north-eastern Uganda, south-eastern Sudan, north-western Kenya, and south-western Ethiopia. In Uganda these are the Karamojong (Matheniko, Boora, Pian, Upe, Jie, Tepes, Dodoth), and Teso; in Kenya, the Pokot and Turkana; in Sudan, the Toposa, Nyangatom and Didinga; and in Ethiopia the Merille. 2) The Oromo cluster includes the Borana, Arsi, Sakuye, Gabbra and Garreh straddling the southern Ethiopian border, and northern Kenya. 3) The Somali cluster covers Somalia, Somaliland, Puntland, Djibouti, the Ogaden (Region 5) of Ethiopia and north-eastern Kenya. Six major clans or families are represented, namely Darod, Hawiye, Rahanweyne, Isaq, Digil and Dir. The Afar are also of the same Cushitic origins. 4) The Maasai cluster is found in southern Kenya and northern Tanzania, plus one or two smaller agro-pastoralist groups affiliated to the Maasai.

To this diverse pastoral community one must add a number of huge agro-pastoral groups inhabiting the region; the largest include the Dinka, the Nuer, and the Dassanach. In terms of livestock, the GHA hosts an estimated 11 million camels (76 per cent of the world's population), 94 million cattle (8 per

cent), 93 million sheep (9 per cent), 80 million goats (30 per cent), and 5 million equines (5 per cent) (ICRC, 2004:15). The presence here of such a large proportion of the world's camel and goat populations indicates the relevance of browsing resources in the region, as well as the potential impact of Rinderpest epidemics, a main killer of cattle and sheep (Jacobs and Coppock, 1999).

Shifting lands and herds

An important part of the literature on pastoralism in the GHA is concerned with the environmental changes that have affected natural resource management in the region, with many and varied implications for local livelihoods. Factors brought to this debate include population growth on one side and climate change on the other. Estimations are that the population of pastoralists have doubled in the last two decades, and will grow from 25 million in the year 2000 to 63 million by 2050—an increase of 250 per cent with important consequences on local settings (Thornton *et al.*, 2000; Little, 2013). Growing pressures, diversified interests, and encroaching actors have gradually triggered changes in land use, ecosystem management, and livelihood systems in GHA rural world.

Important forms of encroachment have converted rangelands to other land uses. External interests targeting rangelands have materialised either for extractive (mining and drilling), conservation (natural reserves as well as conservancy schemes), productive (irrigation enclosures, commercial livestock rearing, agro-fuel production), or recreational purposes (game reserves, tourist resorts) or through major infrastructure investments such as dams that changed the availability and accessibility of local natural resources (Nori *et al.*, 2009; Nunow, 2013). Traditionally, development investments in drylands have favoured the conversion of wetter zones, such as valley bottoms or riverbeds, into farming areas, often through irrigation schemes.

Box 21 – LAPPSET cutting through northern Kenya rangelands (excerpt from PASTRES blog)

The LAPSSET (Lamu Port-South Sudan-Ethiopia-Transport) corridor connecting inner drylands with the Indian Ocean is planned to come through Isiolo, with the town earmarked for major investments. While the LAPSSET corridor remains more on paper than on the ground, its effects are real as speculation increases. As the northern 'frontier' is opened up by infrastructure and development as well as conservancy efforts, many see opportunities for speculation and investment, while pastoralists feel increasingly dispossessed of their own lands.

Policy attention to the northern dryland areas has been the improvement of roads and communications connections, including with to the interior areas. Mobile phone networks coverage has extended, and, combined with the availability of cheap motorbikes, contributes to improved dramatically the prospects for marketing. The county is criss-crossed by motorbikes carrying camel milk, live animals and other products to urban areas and consumer goods back again, with mobile phones instrumental to check supply, demand, and prices.

No doubt these developments will throw up many uncertainties—and conflicts—over the coming years; opportunities arise and communities organise accordingly amidst land grabbing, external pressures and overall growing uncertainties.

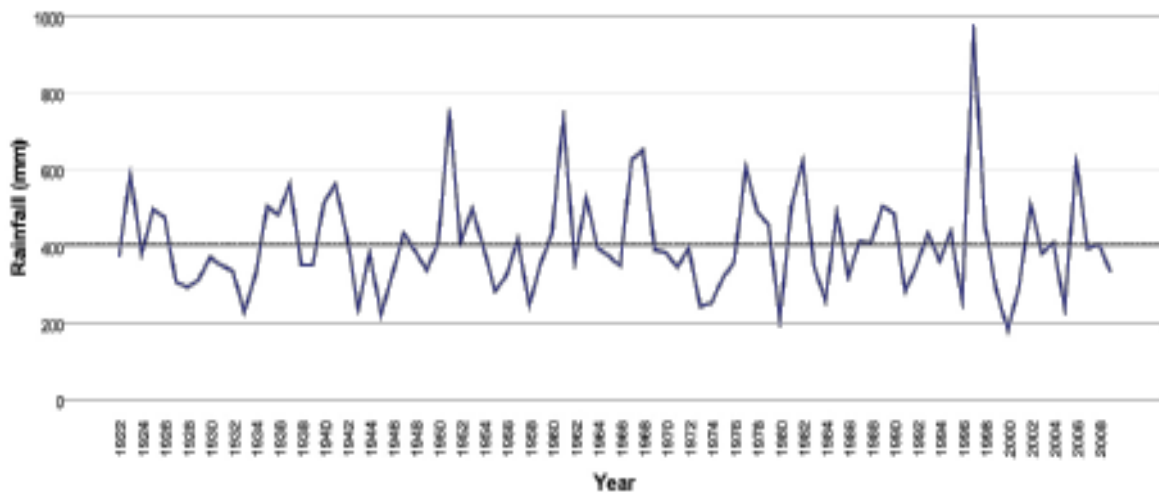
Other important pastoral territories have been converted into protected areas or national reserves, either for tourism, nature conservation, or hunting. A more recent pattern along these lines features private Nature Conservancy schemes which are appropriating pastoral resources in parts of the region (Flintan, 2012; Staro, 2013; Bilha Njeri, 2015). While the impact on pastoral resource management and livelihoods is evident, the extent to which revenues and services generated through these activities benefits pastoralists is unclear (WISP, 2009; Little, 2013; Johnsen *et al.*, 2019).

National states, international agencies, and policy frames allied in pushing the conversion of pastoral territories and livelihoods into something else: the experiences of land alienation amongst Maasai and of forced mobility reduction in Karamoja are clear examples in these respects (Simonise, 2005; Bilha, 2015; Lind *et al.*, 2016; Kioko, 2017). International land lease schemes whereby international investors encroach onto local rangelands are just another step forward in this process of alienation and fragmentation, resulting in local people losing access to the resources on which they depend for their livelihoods (Nori *et al.*, 2008a).

This is not without cost. In pastoral terms, losing access to small pockets of highly productive land such as a low plain pasture is critical for animal feeding during dry seasons and is a significant threat to livelihood systems tailored to perform in ecosystems characterised by oscillating climate dynamics—a main traditional source of uncertainty to GHA pastoralists. This represents a dramatic challenge for the livelihood of an entire community and might hamper the utilisation of the entire valley’s grazing resources, thus reducing overall food production in the areas (Krätli *et al.*, 2013; Behnke and Kerven, 2013). These dynamics further amplify the vulnerability of local livelihoods by hampering access to and use of critical natural resources, often favouring more powerful or better-connected groups or individuals, thus triggering divisions and conflicts within communities. Furthermore, the conversion of rangelands also involves constraints to mobility and reduces the variability and diversity of local ecosystems—basic strategic assets for pastoralists to cope with varying and unpredictable conditions. It also magnifies the negative effects of droughts, whose present impacts relate both to these land use changes and climate (Little, 2013; Lind *et al.*, 2016).

The large variability, erraticism, and unpredictability of rainfall events and temperature patterns represent key features of the regional agro-ecological settings (Figure 12). Pastoralists throughout the region are typically able to successfully manage climate variability and unpredictability to enable them to continue to maintain their livelihoods. While they have developed skills, practices, and strategies to manage and survive climatic vagaries, the intensification of extreme climatic events or the worsening of their impacts might affect their capacity to adapt and respond accordingly (Lind *et al.*, 2016; Karanja *et al.*, 2016; Berhe *et al.*, 2017).

Figure 12 - Mean annual rainfall, border areas of Ethiopia, Kenya, and Somalia, 1922 to 2009



Source: Catley 2017:16

Drought events are indeed a typical feature of the region; more recurrent droughts and shortening of drought cycles are reportedly leaving pastoralists with little time to recover from the impacts of previous events as animal mortality rates rise and reproductive performance of adult females decline, potentially resulting in lower numbers of offspring and shrinking herd size (Thornton *et al.*, 2009; Fenta *et al.*, 2018). When rains come they might provide opportunities as well as threats to animal conditions and pastoral economics; excessive or concentrated rainfall events might convert rangelands into unhealthy ecosystems with inaccessible pastures where water-borne disease, vectors, and parasites proliferate and affect the health of both herds and households (Kima *et al.*, 2015; Fenta *et al.*, 2018). In climate change scenarios, there are indications that some parts of east Africa will become drier, with considerable reduction in the length of the growing season; other areas, including southern Kenya and northern Tanzania, may become wetter, thus increasing the potential for farming (IPCC, 2007; Thornton *et al.*,

2009; WISP, 2009). Climatic patterns continue to represent a main driver of ecological uncertainties throughout the region and a factor that importantly shapes pastoralists' decision-making.

Indications of shifting climatic patterns are visible in the strategies of pastoralists, who are restructuring herd composition, structure, and management according to prevailing conditions and perceived trends as well as according to technological options, market conditions, and opportunities (Krätli *et al.*, 2013; Catley, 2017). Literature reports some Borana groups shifting from cattle to camels (Coppock, 1994; Watson *et al.*, 2016; Volpato and King, 2018), southern Somalis shifting from camels and smallstock to cattle (Al-Najim, 1991), and the Afar and Maasai from cattle to smallstocks (Eriksen and Marin, 2011; Kima *et al.*, 2015; Bilha, 2015; Berhe *et al.*, 2017). These strategies imply relevant challenges at the different individual, household, and community levels as they require costly initial investments in the new animals as well as in the knowledge and skills necessary to manage them. Such shifts may also challenge labour and marketing patterns, involve cultural and identitarian aspects, and necessitate shaping new networks and alliances.

Box 22 – Shifting knowledge and skills from cattle to camels (excerpt from Volpato and King, 2018).

Informants widely recognized that acquisition and development of knowledge and associated skills were keys to successful camel adoption. Interviews revealed three processes through which knowledge was developed: 1) acquiring new knowledge from external sources, such as camel herders of other tribes and institutional sources; 2) self-generating knowledge through trial-and-error, observation, and discussion with other new herders; and 3) translating and adapting existing knowledge of other livestock species to camels. Herders used a combination of all three modes of knowledge acquisition. Herders noted that prior herd management and externally acquired veterinary knowledge was an advantage, and was usually obtained through experience working on private ranches and, more importantly, from the initial Somali residents. Yet both prior to and after the Somalis' departure from Koiya, interviewees regarded knowledge as a persistent limiting factor in camel adoption. (...) Two main domains of knowledge-related factors imposed constraints and led to camel losses: herd management and veterinary care. Interviews frequently revealed efforts to adapt and translate veterinary knowledge from cattle, and secondarily goats and sheep, to camels (Volpato and King, 2018:8).

Environmental changes rapidly taking place in the region are primary drivers of uncertainty for pastoralists, constraining access to range resources and opening up options for diversifying, expanding, and intensifying pastoral resource management as well as integrating market dynamics. The options for implementing these different strategies depend on the specific capacities of each group and household, with contrasting implications for local livelihoods. As Volpato and King (2018:1) observe, "adaptation unfold as a heterogeneous, multi-phase process, contingent on individuals' different sources of adaptive capacity utilized at different junctures in their adaptation experience, as well as on temporal shifts in the broader social-ecological context".

Degradation of range resources is reported in certain areas as a result of changes in land use patterns and localized intensification, reduced livestock mobility, development of water points, overgrazing, inappropriate cultivation, and other diversifying livelihood options such as forest clearing and charcoal production; indications are in the changes in vegetation cover, encroachment of *Prosopis* and other shrubs, woody or inedible or unpalatable plants (Jacobs and Coppock, 1999; Tache, 2013; Staro, 2013; Mwamidi *et al.*, 2018). Conflict is another outcome of these processes that weaken and destabilize customary institutional systems charged with resource management and dispute resolution amongst the diverse communities and groups (Catley, 2017). According to some authors there is evidence in GHA drylands that climate variability and environmental changes are closely linked to insecurity, conflict, and wars (Burke, 2009; Harris *et al.*, 2013).

In this uncertain setting where environmental change and conflict intertwine, another form of encroachment has been taking place. Formal and informal military groups have taken control of parts of the region, adding another dimension of insecurity on rangelands; in most cases this reduces pastoralists' 'safe operational ground' and directly affect their production, trade, and livelihood strategies alike. Forms of banditry, livestock raiding, and more politically-motivated armed militancy have resulted in patterns of further shrinking, fragmentation, and inaccessibility of range resources (Simonise, 2005;

Sagawa, 2010; Schilling *et al.*, 2012a; Kioko, 2017). Changes in climatic patterns and rangeland management will be either problematic or favourable to pastoralists, depending to a large extent on their capacities to influence the policy frame and participate in reshaping local institutional settings such as regional integration and local power devolution (Nori and Davies, 2007).

Frontiers, borders, roads and ports

A rapidly-reconfiguring political setting also represents important domain-generating uncertainty in the GHA. As is the case for most herders in Sub-Saharan Africa, pastoral territories have often been chosen for setting frontiers at the colonial partition; many national boundaries, often drawn in straight lines, pass right through pastoral areas, effectively splitting the same community across two or more countries (Nori *et al.*, 2009). In the Horn this applies specifically to the Somalis, the Borana, the Afar, the Maasai, and herding populations inhabiting the Karamoja cluster. This partition results in a) pastoralists usually being a national minority, and b) pastoral territories being peripheral to the country, located along national borders, with relevant implications for trade networks, policy engagement, service provision, and security.

Pastoralists' marginality in national policies and mainstream society is evident in most GHA countries; however, the limited capacity to influence and engage with policy agendas that represents a main driver for pastoralists' institutional uncertainties has been challenged recently, as will be assessed. An indicator of the limited degree of social and economic integration is the rate of poverty, which remains higher in pastoral areas than elsewhere in most GHA countries. In 2005, the seven pastoral districts in the north of Kenya showed a Human Development Index (HDI) 0.20-0.30 points below the national average—lower even than Sierra Leone, the bottom-ranked country in the world (UNDP, 2005).

Moreover, the region's recent post-colonial history has often been one of violence and conflict, between and within the different countries. Inter-state disputes often involve pastoral lands because of their location along the frontier. Transboundary movement of livestock and herders are among the first activities to be restricted when tensions arise between two countries, together with the political manipulation and militarization of pastoral communities—often with dramatic consequences on local livelihoods. The same applies to conflict-related refugees, who often move through, settle in, and insist on contested rangelands. The Ogaden, Kordofan and the Darfur wars offer vivid examples as does the recent conflict along the Ethiopian-Eritrean borders (Nori *et al.*, 2009; Staro, 2013; Mahmoud, 2016).

In several countries local tensions have often escalated in periods of civil strife: Uganda at the end of the Amin regime; Ethiopia at the end of Menghistu's Derg; Somalia after the collapse of Barre's regime; the longstanding conflict in southern Sudan (Sagawa, 2010). Apart from disrupting civilian and economic infrastructure, these conflicts have contributed to the escalation of weapon availability in the region. Reports indicate that in the early 2000s, an estimated five million small arms were circulating in the region and that many of them are illegally used by pastoralists (Simonise, 2005:244; Schilling *et al.*, 2012a). Indeed, insecurity and conflict are main factors for GHA pastoralists. uncertainty

More recently the political frame in the region is characterised by parallel and complementary processes that are redefining the institutional architecture and governance systems at different levels. On the one hand, most GHA countries have undergone political processes aimed at reconfiguring the relationships between the central State and local levels: in Ethiopia, the federal Constitution (1994) defined a regionalised setting; in Kenya, the new Constitution (2010) established processes of decentralisation. Similar processes been ongoing in the Sudan following the country's partition. In Somalia, the central State collapsed in 1990 and diversified forms of authority and governance are emerging in different areas. These political processes hold relevant implications in reconfiguring the institutional uncertainty domain at the different levels.

While power decentralisation might bring opportunities in terms of local representation and accountability and more tailored investments, the forging of new administrative boundaries and

institutional structures might revive conflicts and claims along ethnic or identitarian lines, or could be manipulated and instrumentalised by more powerful actors to further their own interests (Flintan, 2012; Little, 2013; Mutsotso, 2018). These processes have sometimes evolved specific State structures and agencies devoted to pastoralists' affairs, such as with specific Ministries for pastoral regions in Kenya and Uganda and the Pastoralist Standing Committee in Ethiopia. In the interstices created by these overlapping agendas and policies, pastoralists find opportunities to carve out and implement their strategies, often within a supra-State regional dimension.

On the other hand, efforts and initiatives towards further regional integration are evolving. Today there are specific regional institutions and structures concerned with policies that directly affect pastoralists as they deal with land governance, trade agreements, frontier regimes, and conflict resolution. Apart from their redefinition as citizens of reshaping State structures and national identities, fundamental aspects with a direct implication on pastoralists include cross-border movements, rangeland access, taxation, conflict management (at diverse levels), animal health services, and market and trade agendas. Through the "Policy Framework for Pastoralism in Africa", the African Union has developed a continent-wide policy initiative to help secure the livelihoods and rights of African pastoralists while also establishing the framework for a greater recognition and inclusion in policy and regional trade frameworks. Also at the regional level, the Intergovernmental Authority on Development (IGAD) has taken the lead in relevant initiatives addressing conflict issues in different pastoral regions (South Sudan, Karamoja, Somalia), while the AU Inter-African Bureau for Animal Resources plays an increasingly relevant role in coordinating the management of animal health aspects in the region.

Box 23 – The AU Inter-African Bureau for Animal Resources (IBAR)

The Inter-African Bureau for Animal Resources (IBAR, www.au-ibar.org) was specifically established to coordinate the African response to animal health challenges. Important initiatives in the region included the Pan-African Rinderpest Campaign (PARC) and the following Pan-African Program for the Control of Epizootics (PACE). Innovative instruments and methodologies were spearheaded for mobile communities living in remote areas like participatory epidemiology, thermostable vaccines, the strengthening of veterinary services and the use of community animal health workers. These technical devices have shown important capacities to respond to pastoral settings and to cope up with the flexibility and mobility required by pastoral management. Eventually community animal health workers have been recognized by the veterinarian community and the mention of "paraveterinarian" has been included in the code of the Office International des Epizooties (OIE) code to perform certain tasks (Catley et al., 2003).

Paradoxically an important factor that has contributed to enhancing regional integration is the Somali trade infrastructure, which has enabled expanding, extending, and projecting Horn pastoral territories, networks, and products into the international commercial and political arenas. With its extended coastline and well-nested commercial institutions, the Somali trade infrastructure provides pastoralists from many parts of the Horn with important opportunities to access and serve the growing Arabic and MENA demand for animal proteins. It also represents a critical asset for the import of most commodities traded in deep inland rangelands to serve the needs of local pastoralists (Nori, 2010; Little, 2013).

Due to its recent history—marked by the collapse of the central State in 1991—the Somali setting in broader terms represents a 'laboratory' and vanguard for economic and institutional innovations. The different regions of previously-united Somalia are nowadays governed through different systems of more or less hybrid institutional architecture that arrange for the principles and structures inspiring the customary system, accommodating a clan-based social structure and more centralized forms of a representative democracy (FSNAU, 2013; Nori and Baldaro, 2018).

Box 24 – Institutional innovations in the Horn

The State building process in Somaliland represents a case in context; here an original and locally-tailored hybrid system of democracy mixes customary systems with the precepts of the nation-state in an Islamic context. In the Somaliland case the institutional arrangement did not come to complement or supplement, but rather to replace the (non) existing central State. In such process civil society, the Somali global diaspora, and international agencies have played a relevant role by using new forms of identity and organization (Walls and Kibble, 2010).

The intensifying integration into market dynamics characterising most pastoral economies of the region bears important consequences on local livelihoods. Market systems provide consistent and continuous links with the urban environments and economy, which in turn offer important opportunities for income-generation and wider access to services and assistance. These factors provide vital options that enhance the capacities of herders and their households to reconfigure and extend livelihood strategies vis-à-vis shifting uncertainties (Lind *et al.*, 2016).

Box 25 – Evolving milk market networks

Pastoralists' integration into market dynamics is mostly addressed through the lens of trade in meat products, involving male agents. Pastoral milk, mostly traded by women, is often ignored. Effective production of milk is central to the livelihood of pastoral households, and increasingly its commercialisation represents an important pillar in their capacities to proactively cope with and adapt to change (Saddler *et al.*, 2009; Nori, 2010). Once solely consumed within the household or community, dramatic increases in urban populations have made pastoral milk competitive in many local markets. As a result nowadays thousands of litres of fresh milk and dairy products move from remote rangelands to growing markets in most pastoral regions. The seasonal fluctuation of milk production and commercial patterns, are good indicators of local rangeland productivity, animal conditions, and pastoral household economies. The commoditization of pastoral milk has in turn spurred dramatic reconfigurations of local economies and livelihoods across pastoral regions.

The case of camel milk marketing in the Horn of Africa provides a good example in this respect (Nori, 2010). Although its commercialisation was once a social taboo and it seemed technically unfeasible (Welsh *et al.*, 1991), camel milk marketing is now a major strategy for diversifying the pastoral economy and supporting food security in the region. Its commoditization started in Somalia in the 1980s; in a context characterised by conflicts and insecurity, drought events, and poor public investment; milk marketing eventually developed into a regional business as Somali-inhabited areas of Djibouti, eastern Ethiopia, and northern Kenya also developed their networks and systems. Neighbouring Afar, Arsi, Borana, Gabra, and Rendille communities have undergone the same pattern.

Milk is enveloped in social relations and networks that are highly influenced by gender dynamics, and its marketing requires a highly complex and skilled decision-making system within the family. Milk can feed calves thus spurring herd growth, or be used in the household to feed its members, or shared or bartered with relatives or neighbours. It can also be processed and stored or commercialised in its different forms. Very often it is pastoral women who must take these decisions, trying to strike a balance amongst the different milk use values and the between the interests of the herd, those of the clan, and those of the household. Pastoral women, often with limited access to formal education or financial capital, are also usually in charge of milk marketing; they run and operate extended and complex networks of contacts and relationships linked to intricate webs of exchanges and credit systems. In most pastoral areas, such systems are quite informal yet very efficient and highly reliable. Women-managed pastoral milk value chains are often short and decentralised. Traceability systems are in place to ensure milk quality is checked and quantities are properly reported. Transportation systems with air-conditioned cars, motorbikes, and trucks convey milk from production to consumption areas, while mobile phone networking allows for sharing communication and information on a timely basis (Nori, 2010).

As pastoralists navigate a changing environment, innovative market engagement is essential for coping with uncertainties and supporting livelihoods. Women are taking up new roles around milk marketing, creating new niches and operating a complex social infrastructure that supports the marketing of pastoral milk from rangeland production areas to urban consumption markets.

One aspect where most authors seem to converge is that together with the dramatic drought events of the 1970s and 1980s, this process has helped concentrate wealth and economic opportunities among affluent groups. The resultant growing integration into market dynamics has further contributed to social differentiation, stratification, and social exclusion, in turn weakening communities' social and cultural capitals (Aklilu and Catley, 2010; Krätli *et al.*, 2013). Poorer groups lose out from this process as they appear to become more insecure and vulnerable while increasing their dependence on marketing. They might then attach themselves to wealthier groups or provide services, including labour, to more affluent pastoralists (Krätli and Swift, 2013). While traditional egalitarian structures and cooperation devices might fade, new mechanisms to provide social support and cooperation evolve and adapt (Mahmoud, 2008; Catley *et al.*, 2013; Mburu *et al.*, 2017).

The growing fragmentation of pastoral territories and societies represents a major driver of uncertainty for herding communities in the GHA. Triggered by profound political, sociocultural, and economic changes, environmental and social conditions are shifting rapidly, reconfiguring room and time for manoeuvre. Indications of stress are evident in parts of the region, with significant rates and dynamics of poverty, conflict, and marginalisation as well as range integration. Pastoral communities are adapting accordingly, engaging with markets, restructuring their herds, and extending social and economic networks. More and more pastoralists living on the edge of pastoralism are reconfiguring their pathways to resilience and are increasingly reliant on a range of diversified activities (Catley, 2017). Ongoing changes reshaping GHA drylands offer constraints as well as opportunities, as population expansion and urbanisation mean growing demand for pastoral products.

Picture 4 – Mixed livestock watering in Isiolo district (credit: PASTRES)



Conclusions

Pastoralists are accustomed to navigating uncertainties and living through and off them. The ecological unpredictability that traditionally informs pastoral strategies is reconfigured by factors and dynamics interplaying in technological, economic, and political domains. The market and institutional dimensions hold growing roles in determining their livelihood practices, as extended networks, technical innovations, evolving economic spaces, and shifting governance systems generate new risks and constraints but also options and possibilities.

Mobility persists as a key strategy for pastoralists, though it adapts in the different contexts according to the reconfiguration of geographical and socio-political territories and the related engagements and arrangements with other land users and societal groups. The growing commoditization of pastoral resources—livestock and land, but also labour—appears inevitable, as the market integration of their economies progresses, often driven by national policies and State structures. The scale and pace of these processes proceed through different tracks and patterns throughout the globe, giving rise to as risky as potentially profitable opportunities for extending and diversifying herders' livelihoods. These dynamics in turn contribute significantly to reshaping pastoral societies from within, as cultural norms, social structures, institutional arrangements, and power relations respond to emerging uncertainties, and interrelate differently for the various ethnic, social, generational, and gender groups.

In the Asian contexts, pastoralists facing different revolutions—Soviet, Chinese, and Green—find themselves deeply framed and embedded into development paradigms and governance systems that limitedly account for their capacities, interests, and needs. Underpinned by the assumption that pastoral resource management is supposedly ineffective and destructive, centralised States have deeply encroached in rangelands through policies targeting economic development, national security, or environmental conservation. Physical and financial assets have been deployed and developed with a view to buffer and complement ecosystem-related risks and opportunities. Centrally-led discourses, reforms, and investments importantly influence the arrangements linking herding communities to State structures and other societal actors. The incorporation of pastoralists into institutionalized mechanisms has, in turn, reconfigured the role and relevance of natural and social capital in shaping their livelihoods.

In the Sub-Saharan African context, environmental change remains a widely-reported factor triggering uncertainties for pastoral communities. Demographic dynamics and shifting climatic vagaries provide an ever-shifting frame for local livelihoods, which traditionally benefit from and pay for the large ecological and social diversity and fragmentation of dryland territories. The strategies and practices of Sub-Saharan pastoral communities are being greatly affected by the intensifying impacts of drought events and conflictive settings, as much as their relationships with other sectors and social actors in the region and beyond. Change in climate patterns could favour more extensive land use and crop-livestock interactions, or it could trigger tensions and conflicts amongst the diverse groups. Intense encroachment and grabbing of rangelands in some areas play an important role in furthering patterns of poverty and insecurity.

The growing integration into regional settings, extended socio-political networks, and international trade and development has played an important role in expanding pastoral resources and diversifying their economy. The interplay between national and international structures and agencies have importantly assisted and accompanied these processes; institutional settings are currently shifting, through processes of regional integration on the one hand, and local power devolution on the other. These dynamics hold important potentials for generating new risks as well as opportunities for pastoralists to sustain their resource management, governance mechanisms, and livelihood strategies in Sub-Saharan Africa.

On the different shores of the Mediterranean basin similar dynamics are taking place through diverging and contrasting patterns. During recent decades the institutional incorporation of pastoral resource management has been pervasive in the EU and MENA settings; regional and national policies, programs and investments have largely contributed to reconfiguring the very principles that inspire

pastoral livelihoods. More than elsewhere, herding communities in this region depend today to large degrees on the policy and financial support provided by the formal institutional establishment. The important attention to, and dependence on, the policy domain has inevitably generated new uncertainties as societal demands change, State resources and priorities vary, economic opportunities shift, and landscapes are transformed accordingly. Pastoral economies are dwindling and herding communities are continuously compelled to redefine their place and role in society. Mosaics of over- and under-grazed pastures and rangelands characterise the Mediterranean setting today, indicating that resources, opportunities, and capacities are unevenly distributed, accessed, and utilised.

Everywhere, pastoral livelihoods reflect and react to territorial transformations, changing statehoods, expanding markets, and shifting global agendas. Together with environmental change, the overall reconfiguration of institutional and market forces and actors in the wider societal context continuously redefines the uncertainties surrounding pastoralists, providing renewed constraints, transformed risks, but also offering fresh opportunities for sustaining their livelihoods.

Picture 5 – Camel camp in Kordofan, Sudan (credit: PASTRES)



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