HERDERS' TERRITORIALITIES AND SOCIAL DIFFERENTIATION IN WESTERN BURKINA FASO

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Abstract

Some authors have linked the question of inequalities among pastoralists to rights of access to pastureland, but their analyses of pastoralists' rights of access generally focused on the privatisation of pastureland. We reveal that a wider range of power relations between farmers and herders, local and national institutions affects pastoralists' rights of access to pastureland. We demonstrate that socio-economic inequalities among the Fulbe people are linked to the unequal capacity of pastoralists to manage territorialisation processes to their own advantage. Reciprocally, the entrenchment of the territories that results from these processes reifies inequalities between pastoralists.

KEYWORDS: Territorialities, pastoralism, social inequality, FulBe, Burkina Faso.

Introduction

Pasturelands are currently shrinking at a dramatic rate due to the continuous expansion of cultivated fields as well as to land grabbing by urban elites and industrialists. This process has triggered a very large body of literature (Hagmann and Ifejika-Speranza 2010) with evidence from East Africa (see among others McCabe et al. 2010, Beyene 2009, Desta and Coppock 2004, Homewood et al. 2004) and West African savannas (see among others Moritz 2012, Gonin and Tallet 2012, Van Steenbruggen 2005). The immediate causes of the reduction in the extent of pastureland are well documented: population growth, extensive cropping practices, land reserved for conservation or agribusiness, and technological innovations (ox-drawn ploughs, herbicides). Here we take a different viewpoint, as we focus on the social and territorial consequences of these changes for the pastoralists themselves. Although access to pastureland was never free-for-all, it was previously relatively open (Kintz 1982, Thébaud 2002). Now, in addition to the reduction in the extent of pastureland, access to existing pasturelands is being restricted.

The consequences of the decrease in pastureland available for pastoralists are dealt with in two separate bodies of literature. The first concerns pastoral

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land tenure in agricultural areas. The degree of 'territorial integration' (Gautier, Ankogui-Mpoko et al. 2005) reveals the ability of local farmers to discuss rules of access to land in a way that enables pastoralists and farmers to pursue their main activities side by side. Conflicts can be considered as the failure of territorial integration of herding and farming (Breusers et al. 1998, Moritz 2006). However, conflicts also can be considered as a strategy to negotiate access to resources (Le Meur and Hochet 2010, Turner 2004). Indeed, in a context of high pressure on land, access to resources depends on power relations between farmers and pastoralists (Ribot and Peluso 2003).

The second body of literature deals with inequalities among pastoral communities. Until the end of the 1990s, certain anthropologists continued to refer to social and economic equality among pastoral communities (Salzman 1999), with reference to Evans-Pritchard's classic work on the Nuers (1940). However, since the end of the 1980s, this paradigm has been the subject of harsh criticisms (Borgerhoff Mulder et al. 2010, Rigby 1988, Sutter 1987). After the 1972–3 and 1983–1984 droughts, some pastoralists succeeded in rapidly rebuilding their herd while others sank into poverty (De Bruijn 1999, Fratkin and Roth 1990). Other authors argued that solidarity and redistribution among both rich and poor pastoralists is limited to the kin group and fails to preserve equality (Faye 2009). In the 2000s, some authors began to bridge the gap between pastoral land tenure and socio-economic inequality among East African pastoral communities (Fratkin 2001, Homewood et al. 2004, Lesorogol 2008, McCabe et al. 2010). These papers established a causal relationship between formal and almost complete privatisation of pastureland and increasing inequality. They focused on the privatisation of pastureland by a minority of rich agro-businessmen, which is undermining the rights of access to pastoral resources by an increasingly impoverished majority of pastoralists. Pastoral land tenure in West Africa is very different. Politics concerning access to pastureland are not limited to privatisation, but are embedded in a broader 'tenure building process' (Bassett 2009).

Here, we focus on other territorialisation processes which result in the appropriation of resources by certain powerful stakeholders and to the restriction of the access rights of others. Following Peluso (2005), we define territorialisation as the 'creation and maintenance of spatialized zones within which certain practices are permitted based on the explicit or implicit allocation of rights, controls and authority', which should be seen as the result of the articulation between the 'sedimentation of daily practices and overarching institutional/cultural processes' (Gautier et al. 2011). Territories are defined as the result of power interactions in the process of territorialisation (Painter 2010). Territoriality is defined as the socio-spatial relations resulting in modes of resource management, actions, practices, motives, intentions, personal histories

and cognitive representations that lead to the production of territories. This broad definition enables us to use the term 'pastoral territorialities', which have fuzzy boundaries and are not fully controlled by pastoralists.

We hypothesise that socio-economic inequalities among pastoralists are linked to their unequal capacity to manage territorialisation processes to their own advantage. Reciprocally, we hypothesise that the entrenchment of the territories that results from these processes reifies inequalities between pastoralists. This possible outcome calls into question land-use planning policies that challenge the pastoralist way of life and practices, and even the very existence of mobile livestock rearing that has proved to be the most efficient way to cope with rainfall variability in semi-arid environments (Niamir-Fuller 1999).

Based on the case study of western Burkina Faso, we analyse how territorialisation processes are increasing differentiation between FulBe people, depending on the assets of each households. This is an important matter that is glossed over by the bodies of literature on pastoral land tenure and inequalities. We first address changes in pastoral territorialities and the origin of FulBe's weakness in negotiating access to pasturelands. We argue that the social differentiation of FulBe is the result of the strategies they adopt when they negotiate (or fail to negotiate) rights of access to pastureland. We then discuss the trajectories of three groups of pastoralists linked to their ability to maintain their pastoral territorialities.

Study area and methodology

A field survey was conducted in the western part of Burkina Faso, which is made up of four *régions,* the largest administrative subdivision of the country. The area is still sparsely populated and rich in uncultivated lands grazed by mobile herds. However, it is regarded as the country's agricultural breadbasket, whereas the northern and eastern parts of the country and the Sahel are regarded as the great herding regions. Although, since the 1970s, many farmers have migrated from the Mossi plateau, the population densities of rural areas are lower here than in the heart of the country, and range from twenty to forty people per square kilometre versus sixty to eighty people per square kilometre on the Mossi plateau. Since Independence, both first-comers (called 'natives' or autochthonous people) and late-comers (referred to as 'migrants' by local populations) have cleared the bush and extended croplands. The introduction of draft animals at the end of 1980s (Tersiguel 1995) allowed more land to be cropped. During the agricultural season (from June to December), pastoralists have to cope with shrinking pastureland due to the expansion of cotton and cereals (Bassett 2001, Schwartz

1997). Land under cotton increased from an average of 317,000 hectares per year between 1990 and 1994 to an average of 492,000 hectares per year between 2005 and 2009.[1] During the dry season (from November to May), pastoralists have also to cope with a decrease in pastureland due to the expansion of cashew nut orchards (the nuts are harvested from February to April). They may also encounter local difficulties in accessing watering points in the early dry season (from December to February) due to the expansion of irrigated gardens.

At the same time, cattle breeding by both farming and pastoral households has become a crucial stake in the region (Botoni Liehoun et al. 2006, Augusseau et al. 2004, Petit 2000). A household is defined as pastoral in relation both to the degree of its economic dependence on livestock (usually more than fifty per cent of the family's income) and its practice of mobility as the core of its system of production (Krätli and Swift 2014). Pastoralists can have three functions – livestock owner, herd manager and herder – which do not necessarily overlap. In western Burkina Faso, the overwhelming majority of pastoralists are FulBe, for whom farming is a secondary activity. We distinguish pastoralists from farmer-herders. The latter's livelihoods are mainly based on cropping but they are increasingly investing in livestock. Farmer-herders entrust a pastoralist with the management and the herding of their animals. The first pastoralists began settling in western Burkina in the 1950s, but population densities rarely reached ten people per square kilometre (Savonnet 1968) and extensive pastureland was still available. The FulBe generally came from the north, i.e. from the FulBe kingdom of Barani and the Mossi plateau. After the 1950s, they started a very progressive migratory drift southward (Bassett and Turner 2007, Diallo 2008, Van Steenbruggen 2005, Benoit 1978). Nowadays, FulBe pastoralists account for only for 55 per cent of livestock in Burkina Faso versus 45 per cent that belong to farmer-herders (Anonymous 2010).

Our field survey was conducted in 2012 and 2013. Four villages in western Burkina Faso were sampled along a north to south transect based on rainfall and agricultural occupation of land (Figure 1): Barani has annual rainfall up to 600 mm, a high rate of cropland but includes a protected pastoral zone *(zone pastorale)* covering 50,000 ha, which is recognised by local communities and registered by the State); Samorogouan has 1,000 mm annual rainfall, a pastoral zone created and delimited by the State in 1975 but where cultivated fields already accounted for forty per cent of the area[2] in 2010; Niambrigo and Diarakorosso (municipality of Mangodara), has 1,200 mm rainfall, and a low but increasing rate of cropland. All in all, we visited fifteen villages, eighteen hamlets and thirteen Fulani compounds and organised a total of 38 workshops with livestock owners. We then conducted individual interviews

1. Source: Ministry of Agriculture
2. According to our own remote sensing analysis of Landsat 5 images. USGS.

with 150 actors (66 pastoralists and 84 farmer-herders) in the four villages. In addition to the workshops and the surveys conducted in the villages, seventy pastoralists were interviewed along a 600 km transhumance route, including ten in-depth interviews with pastoralist families (we interviewed the father, sons, uncles and brothers across the study area).

Concerning the workshops, focus groups were organised with livestock owners in all four villages, which included any hamlets and FulBe compounds in the vicinity. We organised separate workshops for the pastoralists and for the farmer-herders.[3] The objectives of these workshops were to trace the history of the settlements and to identify tenure issues, to inventory the herds belonging to the settlement and to transpose information about the mobility of the herds in space and over time onto maps drawn by the local people. To build a relationship based on trust between the research team and the interviewees, and to improve the quality of the information we collected in the workshops, some actors were interviewed twice or three times. Additional workshops were held in other villages, hamlets and compounds belonging to the same municipalities as the four villages, to confirm the trends we observed in the four original villages we surveyed.

In parallel, we reviewed Burkinabé laws, policy reports, and national and colonial archives. Top civil servants in the Ministry of Livestock ('*Ministère des Ressources Animales*', MRA) were interviewed along with forty 'experts' (NGO staff, livestock administration agents, private consultants, local political representatives). These interviews helped understand the context, ongoing policies, and policy makers' representations of mobile herding. In this paper, we compare the information we gathered in these interviews and information compiled from reports and interviews with experts with our own field observations to ensure accurate assessment of current cattle-breeding practices and territorial processes underway in western Burkina Faso. Finally, for an overview of the pasturelands (Figure 1), we performed supervised classification of Landsat images acquired in 2010[4] on the basis of samples of cropped areas, orchards, pasturelands in the plains, pasturelands in the hills and woodlands.

Appropriation of pastureland and building of FulBe's territorialities

'Pastoral territorialities' are built through repeated practices in the same space, which lead to a kind of appropriation of the bush by FulBe people, and an

3. We mainly spoke to men, because the women were less committed to policies for accessing pastureland.

4. Images were downloaded from http://earthexplorer.usgs.gov/

acknowledgement of this appropriation, even seasonal, by other social groups (Brottem et al. 2014, Gautier et al. 2011, Gautier and Hautdidier 2012, p 242) where livestock production is the main livelihood system. High spatiotemporal variability of rainfall and forage resources are seen to require flexible rules and porous social boundaries to facilitate pastoral mobility – characteristics that run counter to conventional views of the requirements for effective common property institutions. We seek to explore this paradox by investigating the spatiotemporal variability of forage availability (using satellite derived vegetation indices as a proxy for green forage. By way of example, cutting branches to feed cattle is a daily practice in the hot dry season; each pastoralist appropriates particular trees on a particular pastureland, and other actors do not exploit these trees because they know they are used by a particular group of pastoralists (Gautier, Bonnerat et al. 2005). As a result, at local scale, FulBe's territorialities comprise all the pasturelands a group of pastoralists uses regularly. At regional scale, these local grazing patterns are organised along a transhumance route, which Moutari and Giraut (2013) define as 'multi-sited territory'. The north–south mobility in these pastoral territories is well described in the literature (Benoit 1979, Boutrais 1994, Brottem et al. 2014, De Bruijn and Van Dijk 2003, Gallais 1984, Marty et al. 2009, Stenning 1957, Turner et al. 2014). However, we go further by exploring the extent to which the multi-sited pastoral territories are adjusted according to the assets and empowerment of the pastoralist's extended family.

In the 1960s, cropped areas were less extensive than today and access to pastureland was taken for granted. In the local territories, the pastures[5] between villages were not explicitly appropriated. However, the FulBe's access to these pastures was not challenged because there was no shortage of fodder resources. Access to pastures was not formalised by customary norms. According to our interviews with older pastoralists who had practiced transhumance from the 1970s to the 1990s, FulBe people looked for a 'sponsor' (a house provider called *djatigui* in dyula, the local language) in the villages located on their transhumance route. For the pastoralists, this practice was more a way to forge alliances with local farmers than to gain formal access to pastureland. Despite the absence of formal access to pastureland, pastoralists built up networked territories along the regions they crossed on their transhumance route. The associated territorialities varied in strength depending on their link with their sponsors.

The combination of a series of local territorialities, which are progressively built up by members of one family and their relatives, and the territorialities in

5. We distinguish 'pasture', which refers to tracts of land located between the fields of two villages, from 'pastureland', a generic word which defines the herding areas within a village territory.

the transhumance zone, are part of a regional territorial network in which the home villages of their sponsors are major anchor points. This network is the key to accessing livestock resources along the transhumance route. In the past, FulBe people tried to strengthen their right to settle in their regional network by creating a status of 'helpful stranger' for themselves (Hochet 2006). Trading milk and manure or selling draft oxen to farmers could justify their presence in a village. But today, as we ourselves witnessed during our field survey, such relations between pastoralists and farmers are increasingly difficult to establish. Conflicts between pastoralists and farmers can be triggered by damage caused to crops by the herd in a context of social and political tensions between communities, which vary in extent depending on the villages concerned (Bassett 1988, Tonah 2003). The expansion of land used to grow crops and to plant orchards increases the number of conflicts; when these become violent, or when crops are damaged too frequently, the FulBe feel compelled to quit their anchor settlements along their transhumance route and try to find a replacement.

FulBe territorialities challenged by a decrease in pastureland and an increase in farmers' livestock

In Burkina Faso, an eighteen per cent decrease in pastureland was predicted between 1984 and 2015 (Anonymous 2013). In parallel, the Ministry of Livestock ('*Ministère des Ressources Animales*', MRA) estimated a two per cent annual increase in the number of livestock in western Burkina Faso. Although this is only a rough estimate, it is likely that this increase is mainly due to farmer-owned livestock. At the regional scale, analysis of satellite images showed that rainy season pastureland decreased from 58 per cent (54,400 km²) of the total area of the four administrative *régions* in western Burkina Faso in 1992 to 48 per cent (45,200 km²) in 2002 (IGB 2002). Comparison of the two land-cover analyses confirmed a seventeen per cent decrease in pastureland over a period of ten years. These figures include game reserves, where pastoralists are not authorised to take their herds but in practice do; the reserves account for twenty per cent (8,900 km²) of the total extent of pastureland. However, this regional description masks major differences (Figure 1). For example, the increase in cashew orchards in southern Burkina Faso explains the extension of cultivated land since the 1990s rather than cotton.

North of Bobo-Dioulasso, the only remaining pastureland available during the agricultural season is barren hills, whereas the hills along the border with Mali provide good grazing in the rainy season. South of Bobo-Dioulasso, many fallow fields provide fodder between the first rains in March and harvest in November.

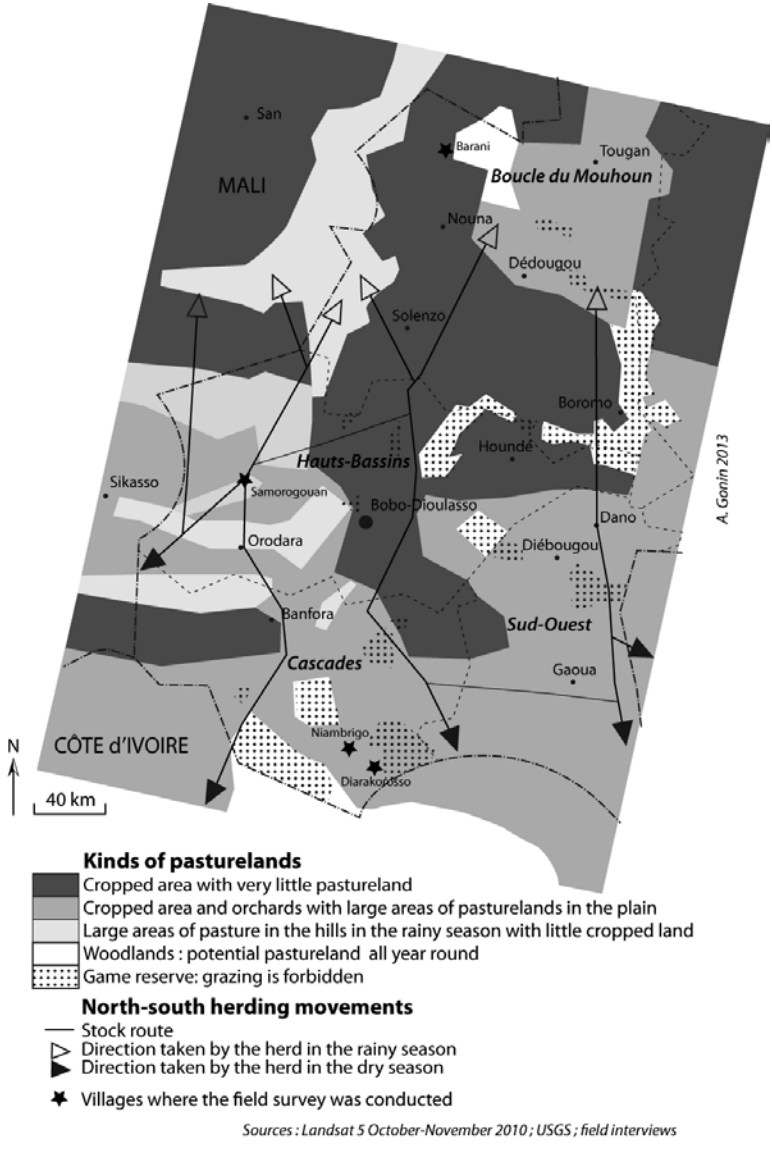

Figure 1. Pasturelands and herding movements in Western Burkina Faso.

The data we collected during our field inquiries confirmed our analysis of the satellite images. These data revealed that beyond a reduction in the extent of pastureland, the increase in croplands and orchards (cashew and mango) in the south-west clearly challenged FulBe territorialities. Grazing systems are upset by the disappearance of strategic pasturelands in the food sequence (Dongmo et al. 2012). For instance, the farmers plant rain-fed rice at the very beginning of the rainy season in the bottomland (*coofol*), which is indispensable for pastoralists at this period as grass has not yet grown in other pasturelands. *Guyfan* are small fallows that form a network in the spaces between fields. They are exhausted land and do not produce much fodder, but they enable the herd to move from one pastureland to another during the rainy season. Today, fields are encroaching on *guyfan* in the south of the region. In the north, *guyfan* have completely disappeared, thus making it very difficult for the herds to move from one place to another. Finally, in the area of Banfora and Orodara, the increase in cashew orchards hampers livestock movements in the dry season when the fruit is harvested. Cashew orchards are scattered throughout the bush. The ripe fruits attract cattle and the herders have to avoid any isolated orchards located in the middle of pasturelands, otherwise they risk serious conflicts with orchard owners, as we ourselves witnessed.

Redistribution of rights of access to pastureland to the detriment of FulBe people

Territorialisation processes are triggered by increased land tenure pressure

The decrease in pastureland is not only a mechanical consequence of population growth; at local scale, it can be seen as a territorialisation process in which FulBe's territorialities are weakened because their free access to pastureland is implicitly denied. Two examples from our field research illustrate this process. In Samorogouan, the land is divided into lineage estates. The eldest of each lineage therefore has considerable autonomy in planning the territory that belongs to the lineage. In 1975, the State signed written records of palavers (*procès verbaux de palabres)* with customary chiefs who gave the land to the State. It then officially settled pastoralists in new compounds within the territory belonging to each village, but without the support of customary chiefs, who were formally deprived of their rights to settle migrants on these lands. However, after Sankara's *coup d'État* in 1983*,* the World Bank stopped funding the pastoral zone project. The State failed in its mission to plan the use of pastoral land in the area and did not support pastoralists' claims to lands. According to first-comers, pastoralists had no legitimate right to access lands.

As a result, pastoralists never exercised control over the land. Since the 1980s, chiefs of first-comer lineages have settled late-comer farmers in hamlets in the bush, in the heart of the pastoral zone. The first migrants in each hamlet also obtained the right from their sponsors to settle other late-comers themselves. The first-comers to the area do not have a big enough family workforce to crop all their lineage estates and consequently settle late-comers to make sure their control over their land is public knowledge (Jacob 2003). Chiefs of first-comer lineages and late-comers are thus both responsible for the extension of croplands at the expense of pastureland in the pastoral zone. However, many have themselves become farmer-herders, and are consequently also interested in saving some pastureland for their own cattle. They therefore fight unofficial sponsors who settle new migrants away from hamlets, i.e. scattered in the bush, without the authorisation of the customary land managers. This process of real-location of rights and reaffirmation of control over the land, which increases farming sprawl in former pastureland, is clearly a re-territorialisation process. First-comer farmers explicitly reclaim lands of which they were dispossessed in 1975 by the State, by planting crops or by settling migrant farmers, to the detriment of FulBe's formal territorialities. In Niambrigo and Diarakorosso, farmer-herders occupy former pastures by planting cashew trees. During the harvest season, from February to April, pastoralists' herds are not allowed to enter the pastures to which they have a formal right because of the presence of cashew trees and the risk of the herds damaging the fruit. Farmer-herders plant cashew trees with the agreement of customary authorities, and pastoralists have no way of preventing them from planting trees. Again, what we observed in Niambrigo and Diarakorosso is a process of territorialisation consisting in new claims to land and rights of access to resources. The FulBe people who settled in these villages in the 1970s gained implicit rights of access to the pastoral resources based on an agreement with a local sponsor and repetition of same practices on the same pasturelands. Then, in the 1990s, other pastoralists practiced transhumance around Niambrigo, and looked for a local sponsor to make sure they were welcome. But neither local FulBe's nor transhumant FulBe's territorialities based on the pasturelands were sufficiently protected. The rights of local pastoralists and other pastoralists to transhumance are now explicitly denied by the farmer-herders. Farmers, including migrants from other areas, aim to advertise their authority, and their strict control over the land, by planting trees (Fortman 1985, Berry 1988), after which they apply their own rules of access. Not only do some farmer-herders forbid other herds to graze under the trees during the harvest period, they also forbid access to their orchards during the rainy season, when the harvest is over and the grass has grown; instead they only graze their own herds there. Some even build a fence around their orchard to prevent other herds entering. As a result there has been no more

transhumance in Niambrigo or Diarakorosso since the 2000s, and the process of territorialisation we witnessed in these villages is representative of spatial dynamics in the south of the region.

In the pastoral zone of Samorogouan and in the orchards of Niambrigo and Diarakorosso, territorialisation processes are leading to the reallocation of land from pastures to cropping, at least during certain periods of the year. In the same villages, other land is subject to territorialisation processes in which the 'pastureland' status has not changed, but farmer-herders have access, to the detriment of FulBe pastoralists. For instance, during the rainy season in Samorogouan, the extent of pastureland decreased from ninety to sixty per cent,[6] which is not enough for all the herds. Although Samorogouan was exclusively reserved for livestock raising by the State in the 1970s, today FulBe herds are the ones who have to leave, while local farmers' herds are allowed to remain during the rainy season. Similarly in Niambrigo, where there are very few remaining pastures because cultivated fields and cashew orchards cover almost the entire village territory, the last herds which have access to the few remaining pastures are owned by farmer-herders, whereas herds owned by FulBe pastoralists are now obliged to avoid the village. Field surveys in the villages also revealed a tendency to break down pastures into several small plots whose access is restricted to the herd belonging to an individual farmer. During harvest, farmer-herders in Samorogouan, Diarakorosso and Barani now forbid other pastoralists to let their herds graze crop residues in their fields, and reserve them for their own herd. As a result, in the villages we surveyed, new rights of access are implicitly or explicitly enforced: a territorialisation process of pasturelands is underway which clearly benefits farmer-herders.

Farmer-herders control ongoing territorialisation processes

At the national scale, the lack of legislation on rangelands and a bias toward sedentary livestock raising form a political framework which gives the farmer-herders control over the process of territorialisation (Gonin and Gautier 2015). At the local scale, ongoing territorialisation processes are underpinned by the assertion of authority or control over space (Berry 2009). In this section, we show that the ability of farmer-herders to mobilise their assets and take control of land is greater than that of pastoralists. Fulbe pastoralists formerly did not need to question their acquired rights because resources were abundant. But in a context of land pressure, their presence is 'too fleeting to result in a noteworthy spatial footprint that would allow them to resist farming pressure' (Thébaud 2002). In other words, they do not 'appropriate' pastureland by creating visible landmarks, while farmer-herders are in the process of tightening

6. Landsat 1986, 2010. USGS. Results of a supervised classification analysis.

their control over pieces of land. Even though FulBe pastoralists belong to the high income bracket of a village population, they seem unable to transform their economic capital into more political clout, and are consequently unable to control territorialisation like the farmer-herders. The farmer-herders' economic capital is linked with land holdings and an abundant family workforce (Gray and Dowd-Uribe 2013). Both first-comer and late-comer farmers take advantage of the social prestige represented by their wealth and landholdings to occupy the majority of seats on the municipal councils and village development councils ('CVD').[7] Thanks to these local organisations, they play an influential role in land planning in local territories, unlike the FulBe, who are under-represented in political councils, because of their lack of political clout among villages communities (Bassett 2009, Bary 2005).

The results of our surveys showed that, as a consequence of these power relations, first-comer and late-comer farmer-herders control the local territorialisation processes. FulBe are partly responsible for their political and social disadvantages. When decreasing pasturelands reduce their 'home territory', they too often choose to emigrate rather than to stay and defend their rights and stand up for themselves in power conflicts concerning land access. Open conflicts are the visible manifestation of relations concerning access rights (Le Meur and Hochet 2010). Both farmer-herders and pastoralists may start a conflict as a way of turning the territorialisation process to their own advantage. When a herd enters a cropped field, the conflict is usually resolved amicably: the owners of the cattle reimburse the farmer if the damage caused by the herd is serious. Sometimes, farmer-herders or pastoralists call the municipal employee in charge of livestock and farming (who is under the authority of the prefect), to assess the amount of damage to the crop. Each hopes the municipal employee will rule in his favour. It is remarkable that the question of whether the damaged field is located in a pastureland or in a livestock corridor never appears to be raised. The pastoralist is generally held responsible for the damage caused by the herd and has to pay the farmer for the damage. Sometimes, pastoralists, especially the richest ones, use their wealth to ensure a favourable decision is made by the official, as Benjaminsen and Ba (2009) showed in the Niger inner delta in Mali. Hochet and Guissou (2010) reported on a trial in the provincial court in 2009 on damage caused in the pastoral zone of Samorogouan. Pastoralists were convicted of causing damage to the crop in a field located at the heart of the pastoral zone delimited by the State. In addition to the State's negligence in failing to secure a pastoral zone it had itself established, this example reveals the pro-farming attitude of the state administration. Lack of control over encroachment is both a sign of State failure and of the erosion of the broader public benefits of

7. Organisation comprising influential people in the village and which is the reference for any village land planning project.

Table 1. Socio-economic indicators of the FulBe we interviewed.

Criteria / *Categories*	Cattle	Number of family members	Average of heads of cattle by family member
Big FulBe families (n=29)	> 80	15-40	10.3
Small FulBe families (n=23)	20-80	5-20	4.6
Hired herders (n= 14)	< 20	< 10	1.6

n = 66.

livestock mobility to the benefit of local farming interests (Niamir-Fuller 1999). It also shows that farmer-herders have more political clout than pastoralists, which allows them to control the negotiation processes and the consequence of their outcome for land tenure.

Different answers to the fragmentation of FulBe territorialities

Herd size is usually the main criterion used to measure a pastoralist's wealth (Adriansen 2008), although reliable data on the size of the herd are often difficult to obtain from cattle owners, who are always reluctant to say how many animals they own. Another reason for this difficulty is that animals owned by different people may be part of a herd, which can best be counted when it is being watered. Despite this methodological difficulty, two discriminating assets emerged from the analysis of data on herds we collected to categorise pastoralists in western Burkina Faso, which go beyond the simple criterion of the number of animals owned by a pastoralist. One is the size of the socio-economic unit responsible for managing a herd: this may be a nuclear family or a family in which several brothers form an association with their father. The second criterion is the size and the spatial organisation of the territory used by the pastoralists; this may be a continuous territory at local scale or a networked territory at regional scale. One of the landmark results of our survey is that these two criteria are closely correlated and that three different groups of FulBe pastoralists can be clearly distinguished.[8] Table 1 lists the number of cattle and the size of the family in each of the three groups.

8. Turner (2009) emphasises the role of urban owners (traders, imams, government officials, etc.) who invest their savings in livestock in Sahelian regions. In western Burkina Faso, cropping is preferred by urban investors to livestock raising.

Big FulBe families: a regional network of pastoral territory that compensates for weakening local anchorage

Although transhumance is the continuation of a traditional strategy to track water and pasture resources along a north-south rainfall gradient, only the wealthiest pastoralists have the means to pursue this practice at regional scale. Only the wealthy can adapt their transhumance routes to new constraints and find new routes to ensure continued mobility. We focused on one of the three main transhumance corridors in western Burkina Faso from Solenzo to Djigoué, which resembles a braided rope (Turner 2011) (Figure 1). Along this corridor, we interviewed pastoralists who formerly practiced transhumance and young pastoralists who continue to practice it today. We compared the transhumance routes with the routes described by Benoit (1978) in the late 1970s. The results showed that the destinations of the herds have shifted southward over the last forty years, but that, since the 2000s, the transhumance routes have had to adapt to land-use constraints. Although Bassett and Turner (2007) demonstrate that southward movement of herds in West Africa does not follow a mechanical stimulus–response model, the shift in the destinations of the herds in the 1970s and 1980s can be partly interpreted as an adaptation to the Sahelian droughts of 1973 and 1983–1984, the southward shift of isohyets, and to better resistance to trypanosomiasis thanks to treatments and mixed breeding with the indigenous southern cattle (*taurins)*. However, from the 2000s on, the southerly shift is rather due to changes in land cover such as land degradation and disappearance of pastureland in the northern part of the region rather than to a decrease in rainfall. As a matter of fact, Ibrahim (2012) showed that rainfall increased by fifteen per cent in Burkina Faso between 1990 and 2009 compared to rainfall in the period 1971–1990.

Audouin and Gazull (2014) reported an increase in cashew orchards in the south of the region since 1995. Our own observations led us to conclude that the increase in orchards has altered transhumance destinations and the transhumance routes within this main corridor. However, only the big FulBe families can continue to practice transhumance. Only they can afford the necessary logistics of regional movement of their herds. The close links between the members of these big families allows them to create and exploit a flexible regional territory of pasturelands, as demonstrated by the case of the Bari family (Figure 2).

The story of the Bari family illustrates how a wealthy family builds regional networked pastoral territories to face the decrease in available pastureland. The Bari patriarch lives with two of his sons in Gomboli. This is their 'home territory', but the family's cattle have not grazed in the village for thirty years. The Bari family manages a herd estimated at 1,000 cattle at a regional scale.

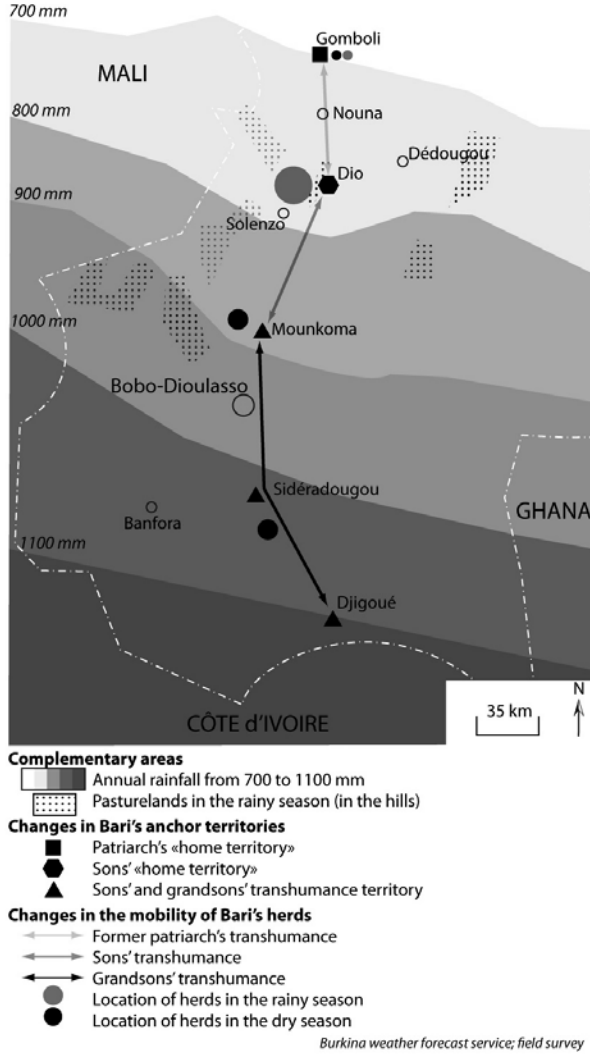

Figure 2. The Bari's regional reticular territory.

Only eighty dairy cows and a few draft oxen are kept near the homestead in Gomboli all year round for the family's needs. The rest of the herd relies on transhumance. To this end, a family network was created. Two sons settled in Dio, the former transhumance destination of the patriarch. Herds are moved to the Dio hills in the rainy season and are managed by these two sons. During the dry season, half the cattle (three herds) are moved to Mounkoma, where another son lives with his family. The other half is moved southward, to Sideradougou and Djigoue, where a grandson lives.

This type of pastoralist tries to circumvent any problems that may arise in obtaining secure access to pastureland and water during transhumance. The aim of this behaviour is more to stay ahead of the increase in croplands than to find an efficient response to the shrinking pastureland. Some pastoralists are trying new strategies, including livestock fattening. Others purchase and enclose pastureland to secure access for themselves, but very few can afford to. According to the information we collected during our surveys, when their access rights to pastoral resource are weak, pastoralists tend to adopt an avoidance strategy. For example, FulBe who practiced transhumance tended to avoid the area of Sideradougou because of the expansion of cashew orchards, and instead went to Djigoue; they did not try to prevent the expansion of the orchards invading the pastureland to which they had right of access. To maintain their flexible regional territory, FulBe exploit their extended family network, multiply their search for new pastureland, and settle members of their family in as many of the villages not affected by these developments as possible. In so doing, they are trying to avoid two risks. First the risk of drought: the brothers always exchange information on rainfall or on the markets by mobile phone; if there is no rain in a particular area in one year, they will send the herd to another area known to the family. The second risk concerns land tenure: if access rights to pastureland become too difficult in one part of the regional network where former pastures have been converted into fields or orchards, the members of the family will try to find alternative pastureland in another area. This avoidance strategy is coupled with a strategy that aims to take advantage of the patchy growth pattern which characterises semi-arid pastureland (Krätli and Schareika 2010). The importance of the role played by the family's regional network of territories depends on the number of brothers who work together and the number of trusted herders on whom they can rely, the more of each there are, the more sub-herds containing the family's cattle there will be. Consequently, big families who choose to disperse their cattle at regional scale starting from a secure 'home territory', and who dispose of an extended family network, also dispose of a wider range of adaptive strategies to face climate and land tenure changes than the FulBe who are trapped in their home territory.

Poor hired herders trapped by local territorialisation

At the opposite end of the scale from rich Fulbe families with their reticular territorialities, another group of FulBe are herders hired by big FulBe families or farmer-herders. Their life trajectory shows that they are have long been deeply rooted in poverty. They are socially isolated, live far from their extended family and do not have much contact with their brothers. In their case, geographical isolation and impoverishment are linked. They usually own fewer than twenty cattle, but many own none. As they only own a few animals, it is difficult for them to increase their capital. These FulBe are often the youngest sons of families who did not have enough cattle to be divided among all the sons when the patriarch died. As they are disadvantaged when the cattle are shared between brothers, they prefer to break away, to leave their home and search for adventure. They look for work as a herder in another village, and, as mentioned above, many of them are poor. The farmer-herders who hire them usually do not want their hired herders to leave the local territory and, as the hired hands have no power to negotiate access rights to pastureland for themselves, they add their animals – if they own any – to the herd that belongs to their employer. If they lose this access, or during periods when rainfall is not sufficient, they have neither the labour resources nor the financial means to practice transhumance (Bassett 2009): they are thus even more vulnerable than mobile pastoralists during periods with insufficient rainfall, and can easily lose any livestock they may have accumulated over time, along with their herds' productivity, in March and April. They are trapped in their local territory where they have few rights, but have no 'exit option' to find access other pastoral territories in the region.

The story of A. Diallo illustrates the social and geographical isolation of poor hired herders. A. Diallo arrived from Tougan, in northern Burkina Faso, in 2006. When his father died, he moved with his two brothers to Padéma, a village located seventy kilometres north of Bobo-Dioulasso. He and his brothers cultivated a plot of land given by the first-comers; at the time, they were not entrusted with care of a farmer-herder's herd. They succeeded in acquiring thirty cattle. However, their cattle either died from diseases or were sold to buy cereals because the land cropped by the three brothers was not sufficient to feed their family. During their three years in Padéma, A. Diallo and his brothers lost their entire herd. In 2009, they left Padéma. Two brothers moved to southern Mali. A. Diallo migrated to Tiefesso, a village located thirty kilometres south of Bobo-Dioulasso, in the hope of receiving help from one of his uncles. However, he did not stay in Tiefesso for long. With his wife and his two children, he rapidly moved to Niambrigo, where a farmer-herder hired him to take care of his herd. He was loaned a small plot of land (0.5 ha), which, as

he told us, was not sufficient to feed his family. Each month, the farmer-herder gives him 7,500 F CFA and a portion of corn or millet. During the four last years, he succeeded in buying eight cattle. However, A. Diallo's situation is still very precarious. He is completely dependent on his employer.

The majority of FulBe between isolation and big families

The distinction we make between two groups does not imply social fragmentation of this pastoral community. During the course of their lifetime, FulBe pastoralists may shift from one category to another. The majority of FulBe we met own between twenty and eighty cattle. This is too few to support several households, but too many for herders. Among these pastoralists, very few can practice transhumance because it is too costly for those with only a small herd. They have neither the money nor the labour force to care for the herd during transhumance. They do not have the financial means to send a son to look for other distant pasturelands. Families who do not have sufficient labour may combine their herds for transhumance. But this usually only happens when a serious crisis occurs (drought, starvation, major rainfall deficit, conflict with their employer, death of cattle), which obliges this category of pastoralists to look for another village. In a sense, they are 'small big families' confined to a local pastoral territory like the 'poor' category, which has consequences for the health and productivity of the herd during the dry season. They are either members of big families whose members are scattered, or herders who are trying to lift themselves out of poverty. One way for these FulBe to access local pasturelands is to herd their own cattle with cattle belonging to the village farmer-herders. By forming relationships with local farmers, they expand their rights of access to pastureland. For instance, in Tenasso, a village located close to Samorogouan, FulBe pastoralists manage a few animals belonging to the village farmer-herders along with their own herd. Thanks to this agreement, they are able to use the village pasturelands during the rainy season. However, in a neighbouring village, pastoralists do not look after animals belonging to farmer-herders. During the rainy season, most of the FulBe in this village have to leave because they have no right of access to local pasturelands, which can only be grazed by animals belonging to farmer-herders. These relationships are not without obligations: firstly, the FulBe rely on only one sponsor and depend on their good relationship with him for their land access rights, salary, accommodation, etc.; secondly, they generally have to remain within the village territory as the farmer-herders are reluctant to send their own herds on transhumance. It is consequently difficult for the FulBe to acquire new rights of access to pastureland outside the territory belonging to their village.

A. Sangaré came from a big family of Lahirasso, a village located 100 kilometres north of Bobo-Dioulasso. He left his family when he got married in 2006 and moved to Samorogouan. His cousin welcomed him and introduced him to the first-comers of the village, who allowed him to settle and to plant a 2 ha plot. He now owns thirty cattle and manages the herd of a farmer-herder who pays him 10,000 F FCFA a month. Since 2010, the herd (containing his thirty cattle and those belonging to his employer) uses a village territory located fifty kilometres away for a short transhumance in the dry season. All these activities provide him with enough income to live in Samorogouan with his wife, his five children and his younger unmarried brother. The case of A. Sangaré illustrates the dynamics of pastoralists between isolation and big families. His separation from his father and brothers weakened him, but settling in Samorogouan can be considered a success. He is becoming increasingly secure as his herd increases in size.

Conclusion

In this paper, we demonstrate that (1) the reduction in pastureland is not just a land-cover process which affects the economy of pastoralists but also plays a role in local power relations and has a huge impact on actors' territorialities; (2) territorialisation of pastoral land increases inequalities among rural communities; (3) more specifically, within the FulBe community itself, inequalities are increasing between big families entrenched in regional territories and individual FulBe who are hired by farmer-herders. Our main contribution to the literature is showing that the social fragmentation of pastoralist communities is mainly due to the unequal capacity of pastoralists to gain access rights to pastureland, first at a local scale and second at regional scale, depending on their financial capacity, on the family labour force and on the relations required to create flexible regional pastoral networks.

Farmer-herders who, over the years, have invested in livestock, are emerging as the winners in the competition for local pastureland, since they restrict the FulBe's right of access to any remaining pastureland to their own advantage. Farmer-herders have become the leaders of the process of territorialisation of pastureland, even though they themselves are captives of the ecological and economic contradictions entailed by sedentary stock breeding in confined village territories with limited pastoral resources. These contradictions require the production or purchase of fodder, or the entrustment of the majority of their herds to the FulBe, who are left to fend for themselves in the search for pastoral resources.

Although the FulBe are the losers in this process, depending on their assets, they are not equal losers. The poorest are trapped by local territorialisation while big FulBe families develop regional networks to circumvent the problem of shrinking pastureland. Thanks to their relationships with members of their extended family, and with cattle traders or butchers throughout the region, they are able to set up flexible networks of territories at regional scale, meaning they can avoid being trapped in the fragmented local territory created by farmer-herders. Even so, as the reduction in the extent of pastureland continues, and now also concerns the south of the study area and northern Côte d'Ivoire, if the balance of political power between pastoralists and farmer-herders does not change, it is likely that in a few years, all the space will be occupied by fields, orchards or game reserves and, as a result, the regional pastureland network of big FulBe families will be dismantled. Today, one question remains: is the regional territorial strategy of big FulBe families a long-term winning strategy for all pastoralists or just a headlong rush to deal with the rapid expansion of cultivated fields? The fact that today only the wealthiest Fulbe families can profit from a regional transhumance network may be the premise of the failure of a very efficient herding system in sub-arid areas of Africa in a context of climatic change. Without a strong pastoralist political organisation at local, regional, and national scale, big FulBe families will probably be unable to continue using this strategy. The State's unwillingness to preserve mobile pastoralism and related territories, and its inability to control extensive cropping processes, challenge the very existence of pastoralism, despite the fact intensive herding has failed to prove its sustainability in highly variable environments. In the medium term, large pastoralist families with their network of regional territories may become settled pastoralists who work for themselves, for farmers or as middlemen in the meat value chain. This outlook is not only harmful for the rich Fulbe families but for all pastoralists who are key players in an important value chain. In this context, there is an urgent need for policies that move territorial negotiations concerning livestock management up to the regional scale to secure FulBe's territorialities.

References

Anonymous. 2010. *Plan d'actions et programme d'investissements du sous-secteur de l'élevage 2010–2015*. [*Action plan and investment programme of livestock sector*]. Ouagadougou: Ministère des ressources animales.

Anonymous. 2013. *Programme national de développement pastoral*. [*National programme of pastoral development*]. Ouagadougou: Ministère des ressources animales.

Adriansen, H.K. 2008. 'Understanding pastoral mobility: the case of Senegalese Fulani'. *The Geographical Journal* **174**(3): 207–222. http://dx.doi.org/10.1111/j.1475-4959.2008.00278.x

Audouin, S. and L. Gazull. 2014. 'Les dynamiques d'un système d'innovation à travers le prisme des diffusions spatiales. Le cas de l'anacarde au Sud-Ouest du Burkina Faso'. [Dynamics of an Innovation System through the Prism of Spatial Distribution. The Case of Cashew in Southwestern Burkina Faso] *L'Espace Géographique* **43**(1): 35–50.

Augusseau, X., J.-P. Cheylan and E. Liehoun. 2004. 'Dynamiques territoriales de l'agropastoralisme en zone de migration: niveaux d'organisation et interactions'. [Territorial Dynamics in the agro-pastoral zone migration: organizational levels and interactions] *Cahiers Agricultures* **13**(6): 488–494.

Bary, H. 2005. 'Dealing with mobility in decentralisation: risks and opportunities for pastoralists'. *Bulletin Royal Tropical Institute* **356**: 49–60.

Bassett, T.J. 1988. 'The political ecology of peasant-herder conflicts in the Northern Ivory Coast'. *Annals of the Association of American Geographers* **78**(3): 453–472. http://dx.doi.org/10.1111/j.1467-8306.1988.tb00218.x

Bassett, T.J. 2001. *The Peasant Cotton Revolution in West Africa*. Cambridge: Cambridge University Press.

Bassett, T.J. 2009. 'Mobile pastoralism on the brink of land privatization in Northern Côte d'Ivoire'. *Geoforum* **40**(5): 756–766. http://dx.doi.org/10.1016/j.geoforum.2009.04.005

Bassett, T.J. and M.D. Turner. 2007. 'Sudden shift or migratory drift? Fulbe herd movements to the Sudano-Guinean region of West Africa'. *Human Ecology* **35**(1): 33–49. http://dx.doi.org/10.1007/s10745-006-9067-4

Benjaminsen, T.A. and B. Ba. 2009. 'Farmer–herder conflicts, pastoral marginalisation and corruption: a case study from the inland Niger delta of Mali'. *Geographical Journal* **175**(1): 71–81. http://dx.doi.org/10.1111/j.1475-4959.2008.00312.x

Benoit, M. 1978. 'Pastoralisme et migration Les Peul de Barani et de Dokui (Haute-Volta)'. [Pastoralism and migration. FulBe of Barani and Dokui]. *Etudes rurales*: 9–49. http://dx.doi.org/10.3406/rural.1978.2390

Benoit, M. 1979. *Le chemin des Peul du Boobola: contribution à l'écologie du pastoralisme en Afrique des savanes*. [*FulBe of Boobola's track: contribution to the ecology of pastoralism in Africa of savannas*]. Paris: Orstom éditions.

Berry, S. 1988. 'Property rights and rural resource management: the case of tree crops in West Africa'. *Cahier des sciences humaines* **24**(1): 3–16.

Berry, S. 2009. 'Property, Authority and Citizenship: Land Claims, Politics and the Dynamics of Social Division in West Africa'. *Development and Change* **40**(1): 23–45. http://dx.doi.org/10.1111/j.1467-7660.2009.01504.x

Beyene, F. 2009. 'Property rights conflict, customary institutions and the state: the case of agro-pastoralists in Mieso district, eastern Ethiopia'. *The Journal of Modern African Studies* **47**(02): 213. http://dx.doi.org/10.1017/S0022278X09003814

Borgerhoff Mulder, M., I. Fazzio, W. Irons, R.L. McElreath, S. Bowles, A. Bell, T. Hertz and L. Hazzah. 2010. 'Pastoralism and Wealth Inequality: Revisiting an Old Question'. *Current Anthropology* **51**(1): 35–48. http://dx.doi.org/10.1086/648561

Botoni Liehoun, E., P. Daget and J. César. 2006. 'Pasture activities, biodiversity and pasture vegetation in the Western Area of Burkina Faso'. *Revue d'élevage et de médecine vétérinaire des pays tropicaux* **59**: 31–38.

Boutrais, J. 1994. 'Eleveurs, bétail et environnement'. [Herders, cattle and environment]. In *A la croisée des parcours*, ed. C. Blanc-Pamard and J. Boutrais. Paris: Orstom éditions. pp. 304–319.

Breusers, M., S. Nederlof and T. Van Rheenen. 1998. 'Conflict or symbiosis? Disentangling farmer-herdsman relations: the Mossi and Fulbe of the Central Plateau, Burkina Faso'. *The Journal of Modern African Studies* **36**(3): 357–380. http://dx.doi.org/10.1017/S0022278X98002808

Brottem, L., M.D. Turner, B. Butt and A. Singh. 2014. 'Biophysical Variability and Pastoral Rights to Resources: West African Transhumance Revisited'. *Human Ecology* **42**(3): 351–365. http://dx.doi.org/10.1007/s10745-014-9640-1

De Bruijn, M. 1999. 'The pastoral poor: hazard, crisis and insecurity in FulBe society in central Mali'. In *Pastoralism Under Pressure, Fulbe Societies Confronting Change in West Africa*, ed. V. Azarya. Leiden: Brill. pp. 285–312.

De Bruijn, M. and H. Van Dijk. 2003. 'Changing population mobility in West Africa: Fulbe pastoralists in central and south Mali'. *African Affairs* **102**(407): 285–307. http://dx.doi.org/10.1093/afraf/adg005

Desta, S. and D.L. Coppock. 2004. 'Pastoralism under pressure: tracking system change in southern Ethiopia'. *Human Ecology* **32**(4): 465–486. http://dx.doi.org/10.1023/B:HUEC.0000043516.56037.6b

Diallo, Y. 2008. *Nomades des espaces interstitiels: pastoralisme, identité, migrations (Burkina Faso–Côte d'Ivoire)*. [*Nomadic people of interstitial spaces: pastoralism, identity and migrations*]. Vol. 8. Rüdiger Köppe Verlag.

Dongmo, A.-L., E. Vall, M.A. Diallo, P. Dugue, A. Njoya and J. Lossouarn. 2012. 'Herding territories in Northern Cameroon and Western Burkina Faso: spatial arrangements and herd management'. *Pastoralism* **2**(1): 1–21.

http://dx.doi.org/10.1186/2041-7136-2-26

Evans-Pritchard, E.E. 1940. *The Nuer: A Description of the Modes of Livelihood and Political Institutions of a Nilotic People*. Oxford: Clarendon.

Faye, B. 2009. 'Pauvreté et solidarité chez les peuples pastoraux'. [Poverty and solidarity in pastoral peoples]. In *L'élevage, richesse des pauvres*, ed. G. Duteurtre and B. Faye, pp. 77–87. Paris: Quae. http://dx.doi.org/10.3917/quae.duteu.2009.01.0077

Fortman, L. 1985. 'The tree tenure factor in agroforestry with particular reference to Africa'. *Agroforestry systems* **2**(4): 229–251. http://dx.doi.org/10.1007/BF00147036

Fratkin, E. 2001. 'East African pastoralism in transition: Maasai, Boran, and Rendille cases'. *African Studies Review* **44**(3): 1–25. http://dx.doi.org/10.2307/525591

Fratkin, E. and E.A. Roth. 1990. 'Drought and economic differentiation among Ariaal pastoralists of Kenya'. *Human Ecology* **18**(4): 385–402. http://dx.doi.org/10.1007/BF00889464

Gallais, J. 1984. *Hommes du Sahel. Espaces-Temps et Pouvoirs. Le Delta intérieur du Niger. 1960–1980.* [*Men of Sahel. Spaces, time and powers. Inner delta of Niger*]. Paris: Flammarion.

Gautier, D., G.-F. Ankogui-Mpoko, F. Réounodji, A. Njoya and C. Seignobos. 2005. 'Agriculteurs et éleveurs des savanes d'Afrique centrale: de la coexistence à l'intégration territoriale'. [Farmers and Herdsmen in Central Africa: From Coexistence to Territorial Integration]. *L'Espace géographique* **05**(3): 223–236.

Gautier, D., A. Bonnerat and A. Njoya. 2005. 'The relationship between herders and trees in space and time in northern Cameroon'. *Geographical Journal* **171**(4): 324–339. http://dx.doi.org/10.1111/j.1475-4959.2005.00170.x

Gautier, D., B. Hautdidier and L. Gazull. 2011. 'Woodcutting and territorial claims in Mali'. *Geoforum* **42**(1): 28–39. http://dx.doi.org/10.1016/j.geoforum.2010.08.008

Gautier, D. and B. Hautdidier. (2012). 'Political ecology et émergence de territorialités inattendues : l'exemple de la mise en place de forêts aménagées dans le cadre du transfert d'autorité de gestion au Mali'. [Political ecology and emergence of unexpected territorialities: example of the implementation of managed forests in the framework of the transfer of authority on natural resource management in Mali]. In *Environnement, discours et pouvoir: L'approche Political Ecology*, ed. D. Gautier and T.A. Benjaminsen. Versailles: Quae. pp. 241-257.

Gonin, A. and D. Gautier. 2015. 'Shift in herders' territorialities from regional to local scale: the political ecology of pastoral herding in western Burkina Faso'. *Pastoralism* **5**(7). http://dx.doi.org/10.1186/s13570-015-0023-z

Gonin, A. and B. Tallet. 2012. 'Quel avenir pour l'élevage dans le bassin cotonnier de l'Ouest du Burkina Faso ? Dynamiques agro-pastorales et recompositions territoriales.' [What is the future of livestock husbandry in cotton basin of western Burkina Faso ? Agro-pastoral dynamics and territorial restructuring]. *Autrepart* **60**(1): 95–110. http://dx.doi.org/10.3917/autr.060.0095

Gray, L. and B. Dowd-Uribe. 2013. 'A political ecology of socio-economic differentiation: debt, inputs and liberalization reforms in southwestern Burkina Faso'. *Journal of Peasant Studies* **40**(4): 683–702. http://dx.doi.org/10.1080/03066150.2013.824425

Hagmann, T. and C. Ifejika-Speranza. 2010. 'Introduction: New Avenues for Pastoral Development in sub-Saharan Africa'. *European Journal of Development Research* **22**(5): 593–604. http://dx.doi.org/10.1057/ejdr.2010.46

Hochet, P. 2006. 'Migrations, agro-élevage et développement parmi les Minyanka du sud-est du Mali'. [Migrations, Agropastoralism and Development among the Minyanka of South Eastern Mali]. *Cahiers d'études africaines* **183**(3): 615–631. http://dx.doi.org/10.4000/etudesafricaines.6045

Hochet, P. and C. Guissou. 2010. 'Une Politique D'adaptation Climatique Inachevée Mais Persistante Le Cas de la Zone Pastorale du CEZIET de Samorogouan (Burkina Faso)'. [An unfinished but persistent policy of adaptation to climate change]. *Sustentabilidade em Debate* **1**(2): 30–78.

Homewood, K., E. Coast and M. Thompson. 2004. 'In-migrants and exclusion in East African rangelands: access, tenure and conflict'. *Africa* **74**(4): 567–610. http://dx.doi.org/10.3366/afr.2004.74.4.567

Ibrahim, B. 2012. 'Caractérisation des saisons de pluies au Burkina Faso dans un contexte de changement climatique et évaluation des impacts hydrologiques sur le bassin du Nakanbé'. [Characterization of rainy seasons in Burkina Faso in a context of climate change and assessment of hydrological impacts on the basin Nakanbé]. Ph.D. thesis, Paris: Université Pierre et Marie Curie-Paris VI.

IGB (Institut Géographique du Burkina Faso). 2002. 'Base de Données de l'Occupation des Terres (BDOT)'. [Database of Land Occupation].

Jacob, J.-P. 2003. 'Imposer son tutorat foncier. Usages autochtones de l'immigration et tradition pluraliste dans le Gwendégué (centre-ouest Burkina)'. [Imposing land tutoring. Natives' uses of immigration and pluralist tradition in Gwendégué (center-west Burkina Faso)]. In *Histoire du peuplement et relations interethniques au Burkina Faso*, ed. C. Lentz, C. N. Somda and R. Kuba. Paris: Karthala. pp. 77–95.

Kintz, D. 1982. 'Pastoralisme, agro-pastoralisme et organisation foncière: le cas des Peuls'. [Pastoralism, agro-pastoralism and land tenure organisation: the case of the FulBe]. In *Enjeux fonciers en Afrique Noire*, ed. E. Le Bris, É. Le Roy and F. Leimdorfer. Paris: Orstom éditions. pp. 212–217.

Krätli, S. and N. Schareika. 2010. 'Living off uncertainty: the intelligent animal production of dryland pastoralists'. *European Journal of Development Research* **22**(5): 605–622. http://dx.doi.org/10.1057/ejdr.2010.41

Krätli, S. and J. Swift. 2014. *Counting Pastoralists in Kenya*. Nairobi: DLCI/REGLAP.

Lesorogol, C.K. 2008. 'Land Privatization and Pastoralist Well-being in Kenya'. *Development and Change* **39**(2): 309–331. http://dx.doi.org/10.1111/j.1467-7660.2007.00481.x

Marty, A., A. Eberschweiler and Z. Dangbet. 2009. *Au coeur de la transhumance: Un campement chamelier au Tchad central*. Paris, Orléans: Karthala, Iram, Antea.

McCabe, J.T., P.W. Leslie and L. DeLuca. 2010. 'Adopting cultivation to remain pastoralists: the diversification of Maasai livelihoods in northern Tanzania'. *Human Ecology* **38**(3): 321–334. http://dx.doi.org/10.1007/s10745-010-9312-8

Le Meur, P.-Y. and P. Hochet. 2010. 'Property Relations by other Means: Conflict over Dryland Resources in Benin and Mali'. *European Journal of Development Research* **22**(5): 643–659. http://dx.doi.org/10.1057/ejdr.2010.44

Moritz, M. 2006. 'Changing contexts and dynamics of farmer-herder conflicts across West Africa'. *Canadian Journal of African Studies/La Revue canadienne des études africaines* **40**(1): 1–40.

Moritz, M. 2012. 'Pastoral intensification in West Africa: implications for sustainability'. *Journal of the Royal Anthropological Institute* **18**(2): 418–438. http://dx.doi.org/10.1111/j.1467-9655.2012.01750.x

Moutari, E.M. and F. Giraut. 2013. 'Le corridor de transhumance au Sahel: un archétype de territoire multisitué?' [Is the international transhumance corridor in Sahel an archetype of multi-sited territory?]. *L'Espace géographique* **4**:306–323.

Niamir-Fuller, Maryam, ed. 1999. *Managing Mobility in African Rangelands*. London: Intermediate Technology Publications. http://dx.doi.org/10.3362/9781780442761

Painter, J. 2010. 'Rethinking territory'. *Antipode* **42**(5): 1090–1118. http://dx.doi.org/10.1111/j.1467-8330.2010.00795.x

Peluso, N.L. 2005. 'Seeing property in land use: Local territorializations in West Kalimantan, Indonesia'. *Geografisk Tidsskrift-Danish Journal of Geography* **105**(1): 1–15. http://dx.doi.org/10.1080/00167223.2005.10649522

Petit, S. 2000. 'Environnement, conduite des troupeaux et usage de l'arbre chez les agropasteurs peuls de l'Ouest burkinabé. Approche comparative et systématique de trois situations: Barani, Kourouma, Ouangolodougou.' [Environment, herding and using trees in FulBe agro-pastoralists of western Burkina]. Ph.D. Thesis, Orléans: Université d'Orléans, Cirad, IRD, Cirdes.

Ribot, J.C., and N.L. Peluso. 2003. 'A Theory of Access'. *Rural Sociology* **68**(2): 153–181. http://dx.doi.org/10.1111/j.1549-0831.2003.tb00133.x

Rigby, P. 1988. 'Class formation among East African pastoralists: Maasai of Tanzania and Kenya'. *Dialectical Anthropology* **13**(1): 63–81. http://dx.doi.org/10.1007/BF00244351

Salzman, P.C. 1999. 'Is inequality universal?' *Current Anthropology* **40**(1): 31–61. http://dx.doi.org/10.1086/515800

Savonnet, G. 1968. *Atlas de Haute-Volta*. [*Atlas of Upper-Volta*]. Ouagadougou: CVRS.

Schwartz, A. 1997. 'Des temps anciens à la dévaluation du franc CFA, les tribulations de la culture du coton au Burkina Faso'. [From old times to the devaluation of the franc CFA, tribulations of cotton cropping in Burkina Faso]. *Annales de géographie* **106**: 288–312. http://dx.doi.org/10.3406/geo.1997.20779

Van Steenbruggen, J. 2005. 'Movements in a new world: Fulbe mobility and survival in Southern Mali'. In *Sahelian Pathways, Climate and Society in Central and South Mali*, ed. M. de Bruijn, J. van Dijk, M.A.A. Kaag and A. van Til. African Studies Centre. Leiden: Bruijn, Dijk, Kaag. pp. 213–246.

Stenning, D.J. 1957. 'Transhumance, migratory drift, migration; patterns of pastoral Fulani nomadism'. *Journal of the Anthropological Institute of Great Britain and Ireland*: 57–73. http://dx.doi.org/10.2307/2843971

Sutter, J. 1987. 'Cattle and Inequality: Herd Size Differences and Pastoral Production among the Fulani of Northeastern Senegal'. *Journal of the International African Institute* **57**(2): 196–218. http://dx.doi.org/10.2307/1159821

Tersiguel, P. 1995. *Le pari du tracteur. La modernisation de l'agriculture cotonnière au Burkina Faso*. [*Bet the tractor. The modernization of agriculture cotton in Burkina Faso*]. Paris: Orstom éditions.

Thébaud, B. 2002. *Foncier pastoral et gestion de l'espace au Sahel: Peuls du Niger oriental et du Yagha burkinabé*. [*Pastoral land tenure and management of space in Sahel : FulBe of eastern Niger and Yagha in Burkina Faso*]. Paris: Karthala.

Tonah, S. 2003. 'Integration or exclusion of Fulbe pastoralists in West Africa: a comparative analysis of interethnic relations, state and local policies in Ghana and Côte d'Ivoire'. *Journal of Modern African Studies* **41**(1): 91–114. http://dx.doi.org/10.1017/S0022278X02004160

Turner, M.D. 2004. 'Political ecology and the moral dimensions of "resource conflicts": the case of farmer–herder conflicts in the Sahel'. *Political Geography* **23**(7): 863–889. http://dx.doi.org/10.1016/j.polgeo.2004.05.009

Turner, M. 2009. 'Capital on the move: The changing relation between livestock and labor in Mali, West Africa'. *Geoforum* **40**(5): 746–755. http://dx.doi.org/10.1016/j.geoforum.2009.04.002

Turner, M. 2011. 'The New Pastoral Development Paradigm: Engaging the Realities of Property Institutions and Livestock Mobility in Dryland Africa'. *Society and Natural Resources* **24**(5): 469–484. http://dx.doi.org/10.1080/08941920903236291

Turner, M.D., J.G. McPeak and A. Ayantunde. 2014. 'The Role of Livestock Mobility in the Livelihood Strategies of Rural Peoples in Semi-Arid West Africa'. *Human Ecology* **42**(2): 231–247. http://dx.doi.org/10.1007/s10745-013-9636-2

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