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## Land rights issues in Africa: the contribution of agrarian systems research in Burkina Faso

Sébastien Bainville

The standard approach to land issues is to consider that private property rights are more efficient because they encourage investment. Therefore, it is imperative to institute modern land rights to meet agricultural challenges in sub-Saharan Africa. Other authors stress the importance of the social role of customary law in farming communities. Establishing modern property rights would have exclusive discriminatory effects, especially on the poorest. This contribution attempts to clarify the links between land rights, technological change and social disparity using the agrarian system approach. Both the above-mentioned theories are put to the test here. The emergence of private property appears to be not the cause but the consequence of technical changes that arose as a specific result of the maintenance of customary rights. However, these same customary rights also paved the way for growing social disparity within farming communities.

**Keywords:** land rights; Africa; agrarian systems; cotton production; social disparity

### Introduction

Land issues in Africa have been a controversial subject for a number of decades. During the colonial period, out of misunderstanding or self-interest the colonial authorities tended to call any land tenure system that did not resemble the private property rights that prevailed in Europe at that time ‘customary’ (Peters 2004).

During the Cold War, the nascent African governments implemented two kinds of land policy. Following the World Bank’s advice, most countries introduced private ownership over customary rights which were considered too ‘collective’. On the other hand, the socialist governments, such as in Burkina Faso under Sankara’s presidency, declared all land state property (Faure 1995). In either case, however, these statements by the central government had little effect on land allocation within villages.

More recently, land issues have been tabled once again in the context of structural adjustment plans, poverty reduction programmes and, lastly, ‘land-grabbing’. Today, despite the great diversity of views, it is possible to classify the authors who have dealt with the subject into two broad categories.

The first category, consisting mostly of neo-classical economists, is more or less inspired by the evolutionary approach of E. Boserup (Boserup 1970): land rights evolve ‘naturally’ from traditional customary systems to modern private property systems as demographic pressure gives rise to technical change (fewer fallow periods). This analysis is thus close to the theory of endogenous institutional innovation, which emphasises variations in relative factor prices as a cause of institutional change, including land tenure (Ruttan and Hayami 1984).

Thus, the demand for private property rights emerges spontaneously, after which it is up to the state to set up an appropriate legal framework (World Bank 1989). The most radical authors advocate rapid reform to address the contradictions arising from customs inherited from a period of low population pressure and the present situation, in which production would need to increase rapidly (De Soto 2000). Regardless of their school of thought – spontaneous evolution or radical reform – all these authors agree that private ownership is more efficient. The traditional rules may be relevant in certain situations: when there are externalities or high risks, there can be a justification for collective rights, for instance (Deininger 2003). However, the majority consider individual property rights and long-term ownership more effective than customary rights. Group-based rights kill individual incentive (Johnson 1972) while individual rights ensure that farmers get a return on their investment. Since they facilitate land transactions, private rights give increased access to credit. Lastly, the land market allows for an efficient allocation of resources to the most productive farmers (Feder 1988).

The second category, made up rather of sociologists, anthropologists and institutional economists, points out that customary law is often akin to the private property system, as demonstrated by the old land transactions (Chimhowu and Woodhouse 2006). Therefore, the customary system is not an obstacle to investment (Brasselle, Gaspard, and Platteau 2002). This second approach emphasises the social embeddedness of land issues. It takes the view that it is very difficult to separate relationships between people from that between land and people. Property rights define not only farmers' access to this resource, but also the distribution of wealth and the consequent power relationships: 'Who gets what' and 'Who has power over whom' (Schmid 1987; Bromley 1989 cited by Colin and Ayouz 2005). From this perspective, it is argued that replacing customary rights with private rights would be very destabilising for communities and could have the effect of excluding the most vulnerable social groups: women, pastoralists or former slaves (Platteau 1996). The consequences are particularly harsh for the poor, either because they cannot afford to buy land titles or because their precarious situation forces them to sell their land. Traditional systems, however, give even the poorest access to land and constitute a kind of social safety net (Toulmin and Quan 2000). For the most radical, the only way to promote equity and transparency is to strengthen land management by customary authorities (Amanor 2008).

Unfortunately, it is difficult to evaluate these theories on the basis of empirical studies. There is abundant literature on the links between investment and tenure security. Recent articles have attempted to synthesise all this research but have difficulty in reaching a conclusion. For example, Brasselle and colleagues (Brasselle, Gaspard, and Platteau 2002) compared the results of more than 10 studies on this topic, and land ownership seems to have had an impact only in a few situations. Often, no link was found between these two variables. Their own study even concludes an inverse relationship: investment leads to greater security of tenure. Place (Place 2009) took the analysis further and showed that it is possible to find as many studies which conclude that more investment leads to greater tenure security as studies which conclude the opposite. Reviewing the existing literature on the relationship between property rights and agricultural investment in Africa, Fenske showed that results are often confusing and contradictory (Fenske 2011).

The cotton zone in Burkina Faso is a good case study to analyse the relationships between land rights and technical changes. Agricultural investments and intensification have been significant over past decades, and demographic pressure has been strong, particularly as a result of Mossi migration (Gray and Kevane 2001). Research has shown that farming practices did not significantly depend on land rights (Ouédraogo et al. 1996; de Zeeuw 1997), while various cases of land sales have been reported (Mathieu, Zongo, and Paré 2002).

### **Conceptual framework**

The difficulty of resolving this theoretical debate may reside in the selected methodological framework. Most empirical studies are based on a statistical approach, which has several major shortcomings. The use of statistics requires the reduction of the number of variables to be measured. The type of soil, for example, is not taken into account, or this is done in a very approximate way: 'good, medium or low quality' (Deininger and Ayalew Ali 2007). However, the soil remains key in land issues, especially in Burkina Faso, where climatic constraints are strong and where the nature of the soil greatly impacts agricultural activities. Similarly only one year of data is usually used and multiannual crop rotations are ignored, while investments can affect this kind of practices. In a meta-analysis of 54 studies that used regression analysis to show the possible link between land tenure and investment in Africa, Fenske found only six that looked at fallow duration (Fenske 2011). Furthermore, farmers' investment decisions depend not only on their land rights but also on the expected economic return. Land or labour productivity has to be assessed to understand technical changes. The same applies for agricultural income which helps to assess socio-economic differentiation. Unfortunately, this kind of economic evaluation is very difficult on large statistical samples. Finally, these studies are based on comparative static analysis and aim to highlight correlations between current land rights and current levels of intensification. History is widely ignored while family size and composition, market prices or climate have changed considerably in Western Africa in the past 50 years. All those events have contributed to the current situation.

The agrarian system approach is particularly suited to analyse land issues in a wider context, taking account of all the complex factors involved. This holistic approach attempts to reconcile the two schools of thought that dominated agricultural and rural research during the last few decades. The farming system research is based on the study of the technical processes at the scale of the agricultural production unit (Colin and Crawford 2000), and peasant or agrarian studies which focused on social dynamics, history, economic and political context and emphasised social relations, socio-economic differentiation and market integration (Bernstein and Byres 2001).

It combines different scales of analysis. At the regional scale, the agrarian system concept encompasses (1) the characteristics of one agro-ecosystem (climate, soils, vegetation, etc.); (2) the agricultural practices (tools, knowledges, etc.), especially those regarding soil fertility renewal mechanisms; and (3) the social relations of production, particularly the conditions influencing access to resources (land, water, etc.). Agrarian systems research requires an accurate analysis of those three elements, but the focus should also be on their interconnectedness (Cochet 2012). An agrarian system is not a stable structure; internal dynamics (demography, social differentiation, conflicts, etc.) as well as external factors (market prices, economic policies, etc.) can provoke crises which lead to a new agrarian system. An agrarian system is 'historically defined' (Mazoyer and Roudart 2005), and identifying past agrarian revolutions, when one system gives birth to a new one, is inherent to agrarian systems research. Analyzing long-term patterns of agrarian change in Africa was common until the 1990s (Hill 1963; Berry 1975, 1985), but has rarely been used in subsequent work. However, it helps to understand the differentiation mechanisms and to identify the resulting diversity of farms. In agrarian system theory, the inequalities between farmers depends not so much on their individual skills or choices but more on their access to resources (land, water, workforce, etc.), inherited from the past. The modalities of access to land in particular are diverse and are not as clear cut as the public-private dichotomy. The plurality and overlapping of rights on the same land influence the

production systems practised by the different categories of farmers, and greatly affect the distribution of value added and the resulting incomes (Cochet 2011).

The second level of analysis is the basic production unit, most often the family-owned farm in Western Africa. The ‘production system’ concept represents a set of production units with access to comparable resources and making a given combination of productions (Cochet and Devienne 2006). Analysing this combination requires the use of other concepts whose relevance is measured at more restrictive scales. The cropping system is an agronomic concept which designates a group of plots treated in a homogeneous manner, e.g. characterised by a rotation of crops and possible associations of crops, and by the set of techniques applied to them (Sébillotte 1978). Similarly, livestock farming systems refer to ‘a set of dynamically interacting elements organized by man to valorize resources through the intermediary of domestic animals in order to obtain various products (milk, meat, skin and leather, manure, ... ) or to respond to other objectives’ (Landais 1994, 20).

For economic assessment, it is important to make a clear distinction between the efficiency of the production system and the specific situation of a farmer. Two farmers practicing the same production system can have different agricultural incomes if, for instance, the first one hire workers or has a loan to pay while the second one works only with his family and has no debt. That is why in agrarian systems research the economic assessment is twofold: first, the added value measures the efficiency of the production system, then the agricultural income measures the share of this value that the farmer receives.

For cropping systems and livestock farming systems, deducting the value of inputs from the value of productions (including the share consumed by the farmer and his family), one gets the gross added value (GAV). The relationship between the GAV and labour force requirements measures the productivity of labour and the GAV per surface unit, the ‘productivity of land’. At the production system level, deducting from the total GAV the annual economic depreciation of equipments, one gets the net added value (NAV). Finally, deducting the portions allocated to payment of land rent (if the producer is not the land owner), wages (if labour is hired), interest on borrowed capital where applicable, and payment of taxes, one gets agricultural income (Dufumier 1997; Aubron et al. 2009).

The agrarian system concept is too broad to be implemented within the framework of a mono-disciplinary research project. It requires a close collaboration between technical and social sciences (Cochet 2012). That is why, for the present research which deals with the relationships between land rights and technical changes in Burkina Faso, some collected data and part of a literature review could seem not directly connected with the subject but are critically important. Considering land issues within the complexities of agrarian changes enriches the debates.

## Methodology

The present research was conducted in two stages between 2009 and 2011. First the research focused on long-term evolutions of agrarian systems at the regional scale. Then, based on these first results, a sample of farms has been selected for further investigations on present production systems.

For the first methodological step, nine villages were chosen with UNPCB.<sup>1</sup> These villages are split all over the cotton region which covers the southern Sudanese belt, where

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<sup>1</sup>UNPCB: Union Nationale des Producteurs de Coton du Burkina Faso (Burkina Faso Cotton Producers National Union).

annual rainfall (April–October) is over 900 mm, and the Sudano–Sahelian belt, where the rainy season is shorter (June–September) and rainfall lower (600 to 900 mm) (Figure 1).

In each of these villages, the field work started with landscape analysis. The objective was to identify areas that are relatively homogeneous in biophysical (topographical position, nature of bedrock, soil type, natural vegetation) and agronomic (cropping and grazing systems practised) terms, mainly by observation. Then, semi-structured interviews were conducted with the oldest farmers to understand the major historical developments in the use of these areas (social groups with access to various soils, nature of their rights, production systems). Between five and eight interviews were conducted on each site, this information then being complemented by targeted research in the literature (particularly scientific papers from the second half of the last century). In each of these villages, the spread of cotton-growing has brought about major changes in the agrarian system over the past century. Producing cotton, farmers were able to intensify their production systems, but those changes were coupled with a growing differentiation between regions and between families. The crop was not introduced everywhere at the same time. It first started during the 1960s and 1970s in the west (Koumana, Koloko, N’Dorola, Koutoura and Pompoi). There, the technical change is the most complete. In the centre and east (Kombili, Zampa, Nadiagou and Natiabouani), cotton-growing began only in the 1980s and 1990s. In those regions, the process is still ongoing. Furthermore, during the historical interviews old farmers explained that large families had benefited more from the opportunity offered by cotton than the smaller ones had.

Proceeding further with the analysis of these evolutions relying solely on past events was difficult. But each area of the cotton region could be understood as being part of the same overarching process. For the second stage, this diachronic approach of the agrarian

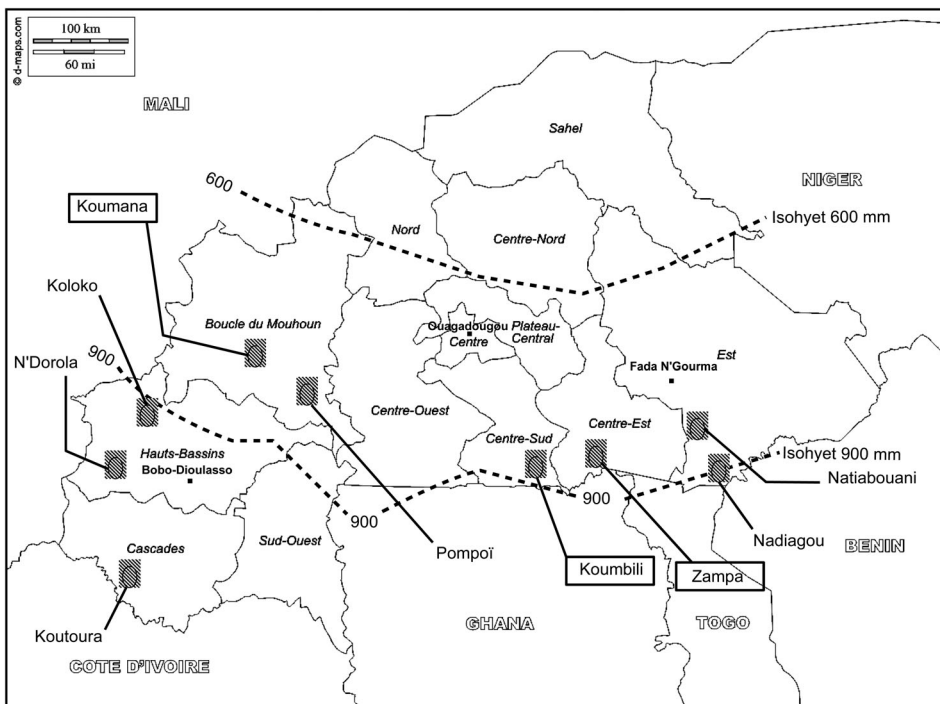


Figure 1. Climatic zones, regions and location of the villages.

systems succession over time has been paired with a comparative study of present agrarian systems using a synchronous approach. Three contrasted villages where cotton growing started, respectively, in 1967, 1975 and 1997 were selected: Koumana in the western part of the cotton region, Zampa in the central part and Koumbili in the eastern part (Figure 1). In each village, three types of farms were chosen: those belonging to small, medium and large families (Table 1).

According to the complexity of the different production systems, in each village and for each type, between five and 10 farms were surveyed. In this way, 25 farms were surveyed in Koumbili, 35 in Zampa and 38 in Koumana. The interviews covered families' history, the different areas they had access to, the nature of their rights, their production system management (tools, cropping systems, livestock farming systems, work schedule) and the technical and economic results (input and output quantities and prices). One or two interviews were finally conducted with the poorest families to calculate the survival threshold – that is, the minimum income to cover the basic needs of a family (food, clothes, medicines).

## Results

### *Soils, uses and traditional rights: the 'original' agrarian system (1940–1960)*

#### *Lineage and rights*

During the historical interviews, the old farmers explained that before independence, land was divided up between the different lineages of the village. The founding lineages who had been the first to settle were the only ones to have the right of attribution. This right of attribution was also a duty: the land chiefs were obliged to give a plot to anyone who needed it, even foreigners. All the lineage chiefs, whether founders or not, had to manage the area they were in charge of, assigning a right of use to the family of each lineage (Boutillier 1964).

There was a primary attribution right for the first lineages and usage rights for each family unit, whether from the founding lineages or from lineages which arrived later. In this, customary law differed greatly from 'modern' private property rights which are individual, durable and unconditional (Mathieu, Zongo, and Paré 2002): firstly because these customary rights of use could not be assigned to a third party whether by inheritance, gift or sale without the explicit approval of representatives of the founding lineages, and secondly because it was a temporary right. Each family was allowed to cultivate 'its' plot as long as it regularly attested its submission to indigenous lineages by donating a small part of the harvest. This right could be suspended if the 'borrower' committed crimes in the village, which is why traditional owners refused the 'borrowers' the right to plant trees, so as to prevent any doubt regarding the ownership of the trees and the

Table 1. Characteristics of the farms interviewed.

Farm types	Number of family workers	Cultivated area (ha)	Number of pair of oxen	Number of donkey	Number of cows	Number of farms surveyed			
						Koumbili	Zampa	Koumana	Total
Small families	≤ 3	< 3	0	0	0	5	11	5	21
Medium families	4–8	10–15	0–1	1–2	< 5	7	18	16	41
Large families	≥ 9	15–30	1–3	1–2	≥ 5	13	6	17	36
Total						25	35	38	98



ownership of the land. Land could also be withdrawn at any time if the plot was not regularly used. That meant that for the beneficiaries, the right of use was also an obligation. Lastly, a family had the exclusive right to use a plot only during the growing season. After this period, during the dry season, the plot returned to the collective domain. Furthermore, it should be remembered that the right to temporary use enjoyed by families applied only to part of the land: the most 'fertile'. The other part remained within the collective domain and was managed as a common, 'pooled' resource, for firewood, hunting, etc.

*Nature and use of land: diversity of soils*

The information received from old farmers confirms the well-known basic principles of customary land rights in Burkina Faso (Ouédraogo and Sorgho Millogo 2007), and in most western Africa countries where the distribution of rights is based on the socio-political system (Berry 1993). But land right is not only a socio-political issue, and the nature of soils matters. In all the villages studied, the landscape presents a basic catena: a regular alternation between lowlands where streams flow, and interfluvial areas with very gentle slopes (Figure 2). Most of the village areas are covered by tropical ferruginous soils. The main features of those leached soils are a low organic matter content and a variable texture (ISSS Working Group RB 1998). The depth of the ferruginous crust varies but it is generally shallow in the upper parts of the relief (plateau and upper slopes). Below, a pediment was formed by the disintegration of the crust, and rainwater runoff. From the upper to the lower slopes, soil texture becomes progressively finer, changing from gravel to silt and clay. Depth, moisture availability and mineral fertility improve along this toposequence, but in the lowest parts physical characteristics are less favourable (Stoop 1987). In addition, in Pompoï, N'Dorola, Koumana and Koloko, rocky escarpments (sandstone or granite) overlook the upper slopes. In Koumana, or N'Dorola, where a floodplain crosses agricultural lands, clay soils cover larger areas.

Older farmers explained that before the spread of cotton production, food crops were located on the upper slopes as the sandy, gravelly texture made hoeing and weeding easier (Vierich and Stopp 1990). The plots used to be structured in two *terroirs*<sup>2</sup>, respectively called 'house fields' and 'bush fields' (Boutillier 1964).

Grown near homes, the 'house fields' were regularly fertilised with waste and the dung of small ruminants (sheep and goats) kept every night in or near villages. They could be cultivated every year without fertility loss.

Farmers had few animals at that time and were unable to fertilise big areas with manure. Most of the cereals were therefore produced using slash-and-burn cropping systems in the 'bush fields'. The clearing of those fields was only partial: some useful species like shea trees were saved from burning. Furthermore, the stumps were left in the ground to promote rapid re-growth. Different crops were grown together on a freshly cleared and burned plot. Grain (white sorghum, maize, millet) was the responsibility of the family head and occupied the field for two or three years. Then, the plot was cultivated by women, who sowed leguminous crops (peanuts, peas) in a soil already depleted in nitrogen. Each year, a plot was left fallow for 10 to 15 years and an equivalent new piece of land was cleared. These cropping systems, analysed by researchers in the 1960s (Sautter 1962; Remi 1967), could still be observed in the mid 1990s in the southeast (Howorth and O'Keefe 2000).

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<sup>2</sup>*Terroir*: agricultural lands with similar agronomic features and dedicated to the same crops (Dufumier 1997).



In the lowlands, the clay-rich soils are often compacted during the dry season and waterlogged in the rainy season; consequently, their use was more limited. The plots could be worked only after several weeks of rain, intensive preparation was required and, depending on the floods, outcomes were uncertain. Near the streams, rice was sown, but with varying yields. On the alluvium of the river banks, maize, sweet potato or yams were grown on mounds to protect these crops from heavy flooding. Taro was cultivated in the ponds. These products were occasionally eaten by the family at feasts, but most of the time they were sold.

At the beginning of the dry season, Fulani herders arrived from the northern regions and their livestock (cattle, sheep and goats) were allowed to graze crop residues. The animals were then placed on the grasslands on the plateau and lower slopes, lowlands and alluvial plains in the late season. But throughout the dry season, these animals were penned in on the 'bush fields' during the night to deposit their dung. The herders were allowed to benefit from the local fodder, but in return they had to give manure to fertilise the villagers' fields (Remi 1967).

#### *Land distribution within families*

The performance of this kind of cropping system is known to be sufficient to provide just enough food for a small family (Boutillier 1964); surpluses are rare and bad years can be disastrous. It is easy to see the interest in maintaining a large family base which allows a relatively favourable and at the same time constant ratio of dependents per worker. Among the Bwa, the family often included 40 to 60 people, and more than 100 in some cases (Capron 1973). To manage so many workers called for effective organisation. This was based on the principle of seniority, this system of gerontocracy involving the ritual submission and subordination of the young generation to the elders (Tersiguel 1995).

The head of the family attributed the tasks of production and distribution of goods (including grains) to people whose function was recognised by all. Thus the organisation of field work was entrusted to the head of the workers who directed and controlled all the collective activities of the men of the house, and occasionally the women, during

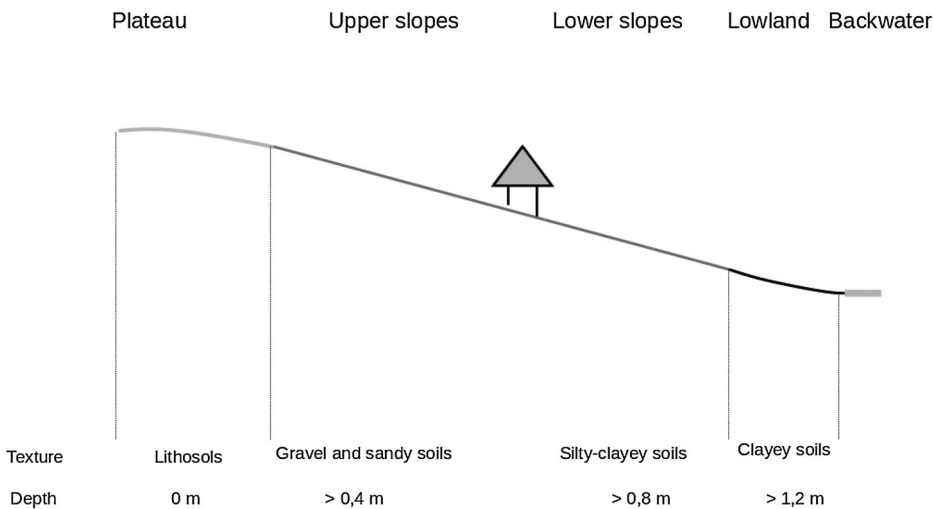


Figure 2. Typical toposequence of a village in the cotton region.

sowing and harvesting. This function was generally the responsibility of the eldest son, who was destined to become head of the family himself. Grain distribution was entrusted to a leader who decided the granary opening dates and the daily rations of each person (Tallet 1984). This was usually an elder man who no longer worked in the fields. He monitored the grain storage and was sometimes able to sell surpluses. Numerous studies have shown similar family organisations for the Mossi (Marchal 1987). Finally, as the head of the family had to pay the dowry when the youngest got married, he was also in charge of the few cattle (Savonnet 1970).

This type of organisation, in which power is concentrated in the hands of the elders, was burdensome for young people who owed obedience to their fathers, uncles or older brothers (Tallet 1984). There was a real desire for independence, but it was not easy to break out of the system. Thus, within each family, agricultural production was based on two types of fields: collective and individual. The former, divided into 'house fields' and 'bush fields', were managed by the father, uncle or older brother. Most of the family diet depended on these plots. The secondary fields were attributed to the dependents by the family head. These small individual plots were farmed by the young men or by women. They were only allowed to grow cash crops like rice and yams (Savonnet 1970). Thus, the plots were often located in the lowlands (Lavigne Delville 1998) so that this work did not encroach too much on the tasks to be performed on the large plots. On these plots, the young men enjoyed full autonomy, but production was insufficient to allow them to leave the household and feed their own family (Tersiguel 1995).

#### *Customary land law, the keystone of the agrarian system*

Customary land law provided access to various types of soil by different populations depending on the season. On certain soil types collective use prevailed, while on others family or individual rights alternated with collective rights for periods of variable duration.

The less fertile lands on the plateau were common: any villager could let his small ruminants graze there, or hunt and gather timber throughout the year. In the bush fields located on the upper slopes, family cropping in the rainy season alternated with the common grazing in the dry season. After three or four years, these plots were left fallow. For 10 to 15 years, they were used for a combination of group and individual purposes. All the animals of the village were allowed to graze there during the dry season, and the fruit pulp of the shea trees could be consumed by anyone, but the seeds had to be left in place to ensure that tree cover was maintained (Alexander 2003). The house fields were cultivated every year by the same family, but grazing was a common right during each dry season. Lastly, on lowland plots, private cropping was followed by common grazing. Grazing rights in the bush fields and house fields and on the individual plots applied both to the animals of the sedentary farmers and to the transhumant Fulani cattle.

The system was built on strong social constraints imposed by the elders: the harvest date was decided collectively to avoid any conflict with the Fulani during the grazing season, the picking of fruit from trees in the fields was limited, and working hours were imposed on the young men on the collective plots. But it gave a wide range of people access to local resources: sedentary farmers and herders, different lineages, and successive generations of the same family lineage.

The major changes brought by cotton-growing show that customary law, being a mixture of collective and individual rights, did not prevent these production systems from becoming intensive.

### ***Cotton production, an agricultural revolution under customary land rights (1960–1990)***

#### *New equipment and more livestock for continuous cropping*

The production of cotton was introduced at the beginning of the colonial era. However, large-scale production only really started after the creation of the French Textile Company (CFDT) in 1949, which set up a stabilisation fund that guaranteed remunerative and stable prices for farmers. At the time of independence (1960), cotton production was considered to be the primary source of revenue for financing the country's development. The Voltaic Society of Textiles and Fibres (SOFITEX), created in 1979, was in charge of this sector. The pricing policy was maintained and supplemented by the distribution of improved seeds and fertilisers at subsidised prices.

This commercial crop allowed farmers to earn more cash income and acquire a more powerful tool: the donkey-drawn weeding hoe. This lightweight tool was sufficient to work the sandy soils of the upper slopes. Coupled with row planting, this item of equipment greatly facilitated weeding. It therefore became possible to extend the crop sequences in rotations, allowing an initial expansion of the area that one single farmer was capable of working each year. These cropping systems are still frequent in Kombili, Nadiagou or Natiabouani. From 1980, the National Fund of Agricultural Credit (CNCA) granted loans to cotton producers. In the absence of 'modern' property rights, these loans were granted with the guarantee of the Village Associations (GV<sup>3</sup>). These GV were in charge of the primary collection and weighing of cotton, and in return received a sum of money from SOFITEX. This sum was then used as a deposit for loans. The money was repaid when the cotton was sold (Schwartz 1993). With these loans secured on cotton production, farmers were able to quickly acquire more efficient equipment than that drawn by donkeys. The volume of animal draught equipment increased from 135,000 to 425,000 items between 1980 and 1990 (Havard et al. 2004). By providing proper tillage, together with the weeding hoe ploughs drawn by a pair of oxen became a key tool in the fight against weeds. More specifically, this new equipment allowed the lower slopes, which had better moisture availability, but where the physical characteristics and weed pressure previously limited farming, to be cultivated. At a time when annual precipitation was tending to decline (Lodoun et al. 2013), this was a considerable advantage.

However, to use the plough easily farmers had to eliminate the stumps, and rotation with long fallow periods was no longer possible. Prior to ploughing, farmers had to find another way to replenish the organic matter. Mineral fertilisers alone were inadequate: they are much less efficient in the absence of a clay-humus complex, and the soil's moisture availability was insufficient to prevent the development of parasitic weeds like Striga (*Striga senegalensis*). Cattle were the only source of organic matter. After the campaigns organised by the government against the tsetse fly in the late 1970s, trypanosomiasis was declining and some farmers began to buy one or two cows from passing Fulani herders, but it was not enough to restore the fertility of their fields. This is why in most villages during this period, Fulani families were allowed to settle permanently. Like Mossi farmers from the north, they had been deeply affected by the severe droughts, and their annual trips to the southern regions were becoming much longer. They were given plots on the outskirts of villages, mostly on the upper parts of the slopes abandoned by farmers and now used exclusively for animal grazing (Vall and Diallo 2009). The

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<sup>3</sup>GV: *Groupements Villageois*.

contact between herders and farmers was already well established, but until then, trade in small ruminants and manure in exchange for grains and crop residues was made only during the dry season. Now, the seasonal movement of herds between the upper and lower slopes ensured regular feeding. During the dry season, cattle were kept on the plots at night, and during the rainy season they spent the night in adjacent parks. Farmers were getting substantial amounts of manure, which accumulated throughout the year. With carts, it became possible to transport manure from the parks to the plots.

*Private intensification enabled by the extension of common lands*

Very substantial investments were made at that time (teams of oxen, weeding hoes, ploughs and carts) without any modification to the rules of tenure. There was absolutely no need to establish individual property rights. Quite the opposite: this increase in investment was made possible by the extension of commonage. The cultivated areas had undergone fundamental modification, and the concepts of *saltus* and *ager* are useful to describe the new organisation. Those two concepts found in French agrarian history and geography (Georges 1978; Mazoyer and Roudart 2005) are very similar to the ‘infield’ and ‘outfield’ concepts used in Anglo-Saxon academia: ‘Infield–outfield farming is broadly defined as a type of farming system utilizing its area at two different levels of intensity: an intensively farmed infield and an outfield exploited at a low intensity’ (Christiansen 1978, 1). But the difference between *ager* and *saltus* relates not only to the more or less intensive use of the land but also to how it is used: the *ager* is cultivated while the *saltus* is grazed: ‘the “saltus” is a concept ... which refers to the use of uncultivated, non-forested communal land used for grazing agricultural livestock. The “saltus” thus stood in contrast to the “ager” (cultivated agricultural land)’ (Poux, Narcy, and Romain 2009, 25).

Those concepts highlight what happened in Burkina Faso like in many western African countries (Ridder et al. 2004): the substitution of an horizontal transfer of fertility from the *ager* to the *saltus* through animals for the former vertical transfer resulting from the tree roots’ activity during fallow periods.

On the one hand, the more fertile lower slopes could now be cultivated using the new tools. These plots were cultivated every year without any fallow period, constituting a true *ager*. However, on the other hand, the upper slopes were no longer cultivated (Vierich and Stopp 1990) and large areas of ‘bush’ returned to the common domain. These, combined with the rocky escarpments, constitute a *saltus*. The transition from manual tools to animal-drawn equipment allows farmers to increase the area that they work each year. But at the same time, the transition from slash-and-burn to continuous cropping results in a reduction of the area that a farmer needs. With 14-year rotations, a farmer needs 15 hectares each year (one hectare cultivated and 14 in fallow); under the continuous cropping system, to cultivate one hectare he only needs – one! The widespread use of animal traction has thus resulted in an increase in plots that are cultivated annually, and more free space. This is an intensification of the farming of certain soils (*ager*) coupled with a radical extensification of the use of others (*saltus*).

Individual property rights over the *ager* have been strengthened, but post-harvesting common grazing still prevails in the dry season. Conversely, collective rights have been strengthened on the *saltus*. The extension of communal grazing lands was necessary to intensify production systems. With the new fertilisation techniques, the villagers needed vast pastures to feed their animals during the rainy season. And those animals could only be herded collectively. Most of the time, the cattle were entrusted to the Fulani. The farmers were as yet not well versed in breeding techniques; moreover, they could

not afford to employ a worker to keep so few animals. The Fulanis herded large flocks, gathering the villagers' animals with their own. It would have been difficult for them to operate in this way if pastureland had been individually owned.

It is no surprise that new cropping systems have been implemented so quickly by families who had access to credit and income from cotton production. With continuous cropping systems, not only were yields 20 to 30 percent higher than those previously obtained (Hauchart 2006); labour productivity also increased substantially, doubling with the advent of the weeding hoe and tripling with the advent of the plough, as found in Kombili where rotations with fallow are still practiced (Figure 3).

Contrary to what is often argued (Gray and Kevane 2001), this technical change has nothing to do with demography. The case of Zampa is significant. This region was affected by the prevalence of onchocerciasis and remained sparsely populated until the mid 1970s (Hervouët 1987; Reenberg and Lund 1998). After the eradication of the disease, the Authority for the Development of the Valleys of the Volta (AVV) settled Mossi farmers here. Arriving with oxen and ploughs, these farmers immediately implemented continuous cropping systems. They did not wait to be forced by demographic pressure to engage in continuous cropping. Here, we find changes similar to those already observed in the Malian cotton region (Bainville and Dufumier 2007).

### *The agrarian system crisis, social differentiation under customary land rights (since 1990)*

#### *From large to small families*

Even though common lands were key to intensifying production systems, all families did not succeed in increasing their productivity. During the historical interviews, old farmers confirmed what scholars had already demonstrated: this differentiation was not the result of different land tenure (Ouédraogo et al. 1996; de Zeeuw 1997) but followed family

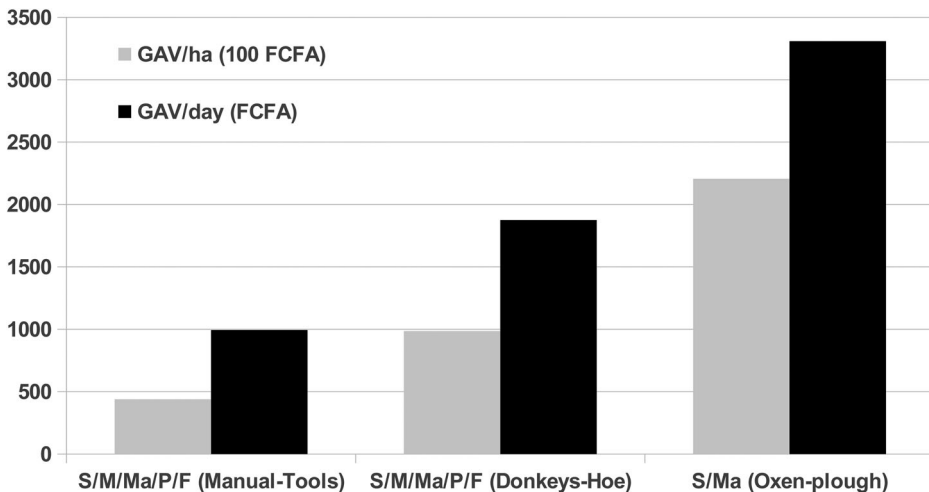


Figure 3. Comparative productivity (gross added value, GAV) of cropping systems in rotation with fallow, and continuous cropping systems in Kombili in 2009.

Notes: S/M/Ma/P/F = rotation of sorghum, millet, maize, peanuts and fallow; FCFA = Franc de la Communauté Financière Africaine, 1 Euro = FCFA 655.95.

divisions. Large families have benefited more from the opportunity offered by cotton than the smaller ones have (Saul 1993).

Family divisions happened back in the colonial period, but they seem to have become much more frequent with the expansion of cotton. In the early 1990s, only a third of the families were still large families with more than 15 people (Schwartz 1991). In Burkina Faso, as in other African countries (Dey 1981), the organisation of family labour, which was based on a subtle combination of obligation in collective fields and autonomy on individual plots, was frail. Any change in the production system was capable of affecting family relationships.

With a longer cycle than traditional cereal crops, the cotton, cultivated in the collective fields, greatly reduced the time that the young people devoted to their individual plots (Fok 2006). The new work schedules made it difficult to continue lowland crops. Building mounds for yams or sweet potatoes, transplanting taro and weeding rice were laborious tasks which coincided with the cultivation of cotton. Harvesting of yams and taro encroached on the cotton harvest, which is the busiest period because once cotton boles are open, the cotton must be harvested quickly to avoid any weight loss by drying. The entire family was now mobilised throughout November and December, which previously were periods available for individual crops (Vierich and Stopp 1990).

As has been demonstrated in other contexts (Amanor 2010), cotton and the resulting commodification of agriculture have played an important role. They have introduced a concentration of control of cash incomes; individual private cash-crop fields were abandoned while cotton production was increasing in the 'collective' fields, controlled by the oldest men (Boutillier 1964). Sharing food crops had caused few problems thus far, but distributing the cash incomes from cotton was much more difficult.

Furthermore, serving as 'piggy banks', the number of livestock increased but remained under the responsibility of the eldest. The cattle, which had no access to the cereal residues before the end of the cotton harvest in December, were moved to the lowlands in November and December. Young men had no choice but to cease to cultivate their plots to allow grazing in the early dry season.

Lastly, in Burkina Faso as in neighbouring countries (Chauveau and Richards 2008), these intergenerational tensions were taken up by the political discourse of the time. The allegations of Sankara against traditional leaders and the establishment of the Committees for the Defence of the Revolution, the CDR, have certainly conferred a new legitimacy on these young people (Dacher 2005).

Conflicts between youth and elders became more numerous within families, and many nuclear families became emancipated at that time. But although freed from family constraints, these young families had great difficulty in getting established. They usually obtained a share of the land, but the animals and equipment remained the property of the eldest. Until the 1990s, migration to the cocoa plantations in the Ivory Coast was an attractive alternative for these young farmers, but after 2005, the civil war in this country has meant that this opportunity is no longer viable.

Initially, the flexibility of the GV nevertheless allowed the remaining young households in the village to become established. However to get credit for equipment, the CNCA demanded 20 percent of the total, and this was unattainable for most of them (Tersiguel 1995). Many of these small family units were highly indebted (Gray and Dowd-Uribe 2013) or unable to honour their debts, and in the early 1990s their access to credit was progressively reduced. Nowadays, the levels of equipment are highly contrasted according to family size (Table 2).

Table 2. Social inequalities of equipment.

	Manual tools	Donkey-drawn weeding hoe	Oxen-drawn ploughs
Number of farms	88,031	122,331	66,909
Farm proportion (%)	32	44	24
Average number of households by farm	1.2	1.7	2.1
Average number of people per farm	6.4	11.4	16.1
Average number of workers per farm	4.2	4.5	10.8

Source: Gouvernement du Burkina Faso 2011.

### *From cotton to cattle and trees*

Price regulation mechanisms have persisted and have limited cotton price variations, but these policies have been unable to stop the downward world market trend over the last 40 years (Kaminski, Headey, and Bernard 2011). Gradually, the cotton prices paid to producers have become less and less remunerative compared to those for maize or sorghum (Figure 4).

The gap is even greater if one takes into account the late payment of cotton production. Payment is often made at the beginning of the rainy season, when the granaries are empty and grain prices are highest. For farming families who have acquired enough equipment and do not depend on the aid related to this type of production, reducing cotton production is perfectly justifiable, even if only to grow cereal crops (Figure 5). Today cotton is only grown once every 4 or 5 years in N'Dorola, or has disappeared completely, as in Koloko.

Reducing the surface areas used for cotton also makes it possible to produce more fodder resources. The cotton stalks are burned after the harvest to prevent the proliferation of pests, while the cereal straw has a high fodder value. This fodder is also available earlier: cereals are harvested in October and not in December, like cotton. The number of animals

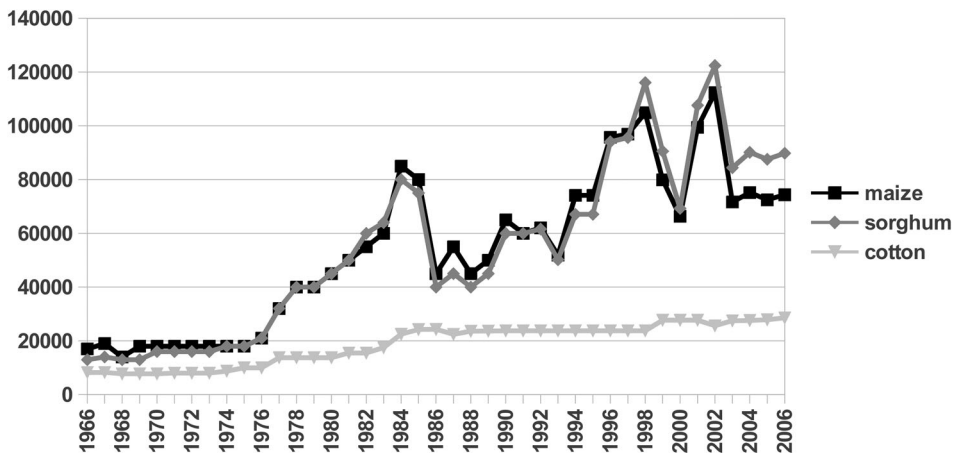


Figure 4. Cotton and grain price evolution in Burkina in current Francs de la Communauté Financière Africaine (FCFA).

Source: Author's calculation based on FAO database: FAO 2014.



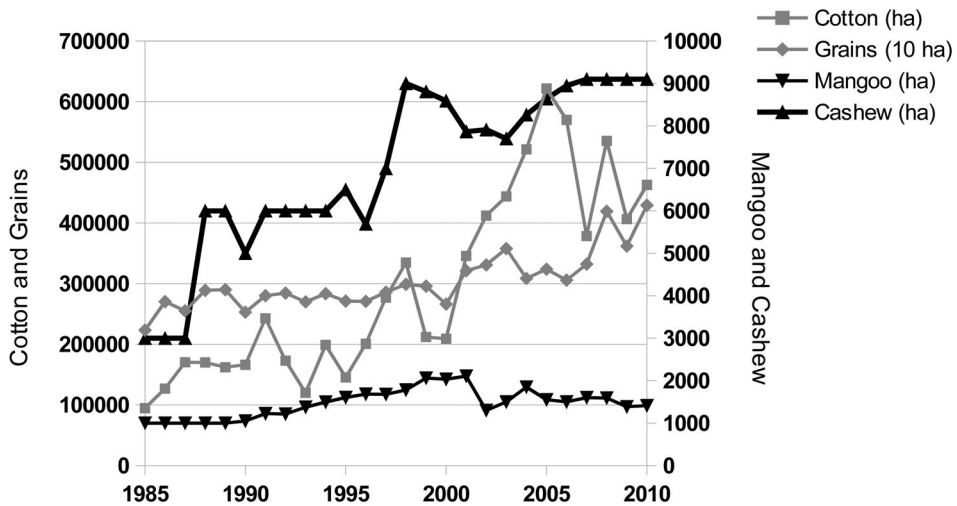


Figure 5. Annual and perennial crop areas evolution in Burkina Faso. Source: Author’s calculation based on FAO database: FAO 2014.

has risen significantly in the cotton region over the last 40 years (Lhoste 1987). Until the 1980s, cattle breeding was practised mainly in the Sahelian regions, whereas 70 percent of animals are now in the Sudanian band where cotton is produced (Ministère des Ressources Animales 2000). Today, in the western villages (Koumana, Koloko, Pompoï) farmers own cattle herds frequently in excess of 20 cows, and scholars call them ‘agro-pastoralist’ (Vall and Diallo 2009). Ploughing and manure production are no longer the only reasons to keep cattle. The annual added value obtained with three cows (about FCFA 150,000) is equivalent to that obtained with one hectare of cotton and maize rotation.

Reducing the surface area devoted to cotton production also frees up family labour for dry season crops. After the rise in agricultural prices in the mid-1970s, the government dedicated substantial resources to increasing national grain production. It sought above all to develop the floodplains in order to implement the rice-cropping systems developed during the Asian green revolution. After building dams, the developed plots were assigned to larger families which had enough workers to cultivate rice as well as rainfed crops (Basga 2002). Such hydraulic installations were constructed in the floodplains in Koutoura and N’Dorola, but farmers quickly neglected these parcels, where water control was still inadequate and for which production prices quickly fell. But with the fall in relative prices recorded in the second half of the 1990s, families who did not need the aid related to cotton production returned to these areas to cultivate rice, yams, taro, potatoes, corn or vegetables. In recent years, with the aid of motorised pumps, many families are producing maize (Koumana) or vegetables (N’Dorola) in the dry season, and gain from the higher prices. Numerous farming families have also planted perennial crops, and orchards are now overtaking the areas used for annual crops (Figure 5).

Requiring little work and allowing inter-cropping in their non-productive stage, orchards present a high economic incentive (Figure 6).

*Income disparity and social exclusion enabled by common lands*

The ‘cotton revolution’ has picked winners and losers. Many families have invested in new equipment and increased their productivity, but their number varies widely according to the

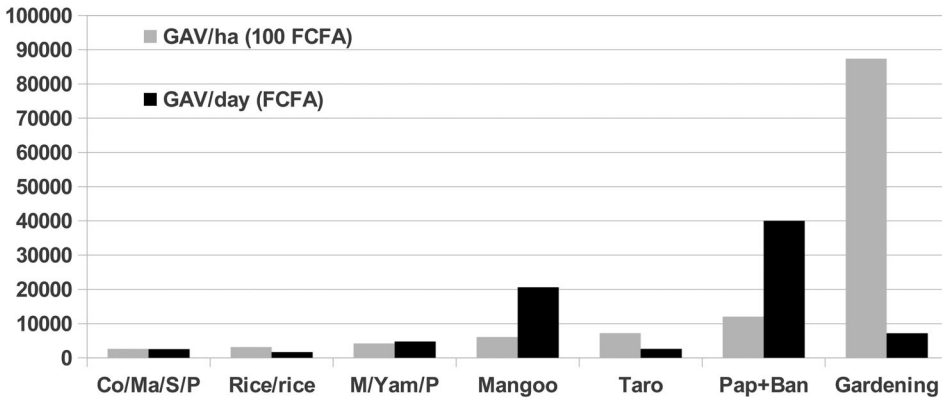


Figure 6. Comparative productivity of cropping systems in Koumana in 2009.  
Notes: Co = cotton; Pap+Ban = papayas and bananas; GAV = gross added value.

date of cotton introduction. The three villages selected in the second stage of the present study are located in three contrasted provinces: Koumana in Mouhoun provinces, Zampa in Boulgou and Koumbili in Nahouri (Table 3).

The earlier cotton was introduced, the higher the proportion of those ‘winners’. But in each province, for the young nuclear families, those improvements remained inaccessible. The income gap between families has widened throughout the cotton history, as shown by the economic assessment (Figures 7–9). With animal-drawn equipment, large and medium families have higher agricultural incomes than small families, while the cultivated areas per worker are similar or smaller. The agricultural income gap is on the order of four to one in Koumbili where cotton was introduced in 1997, to seven to one in Zampa where cotton growing began in 1975, and to one to 10 in Koumana where it started in the early 1960s.

Such a socio-economic differentiation between large and small families has already been demonstrated by other studies (Gray and Dowd-Urbe 2013; Hauchart 2006). But here, a synchronic income assessment in the three selected villages completes the diachronic analysis. Large families that have persisted until now have seen their incomes rise sharply thanks not only to their cotton production, but also to their orchards, dry season crops and, first and foremost, cattle breeding. As has already been reported (Dongmo et al. 2010), for many farmers, livestock now represents a major part of their income (Table 4).

A major part of the income increase of the richest families has thus been made possible through the use of common land (*saltus*). It is on collective grasslands that large families have been able accumulate capital and to increase their income. Collective *saltus* allow

Table 3. Geographical inequalities in the level of equipment of families.

Provinces	Beginning of cotton production	Families with oxen-drawn equipment (%)	Families with donkey-drawn equipment (%)	Families with carts (%)	Families with no cattle (%)
Mouhoun	1966	32.80	6.70	35.40	51.50
Boulgou	1975	27.10	5.60	20.00	64.30
Nahouri	1996	14.80	1.70	6.10	78.30

Source: Gouvernement du Burkina Faso 2009.

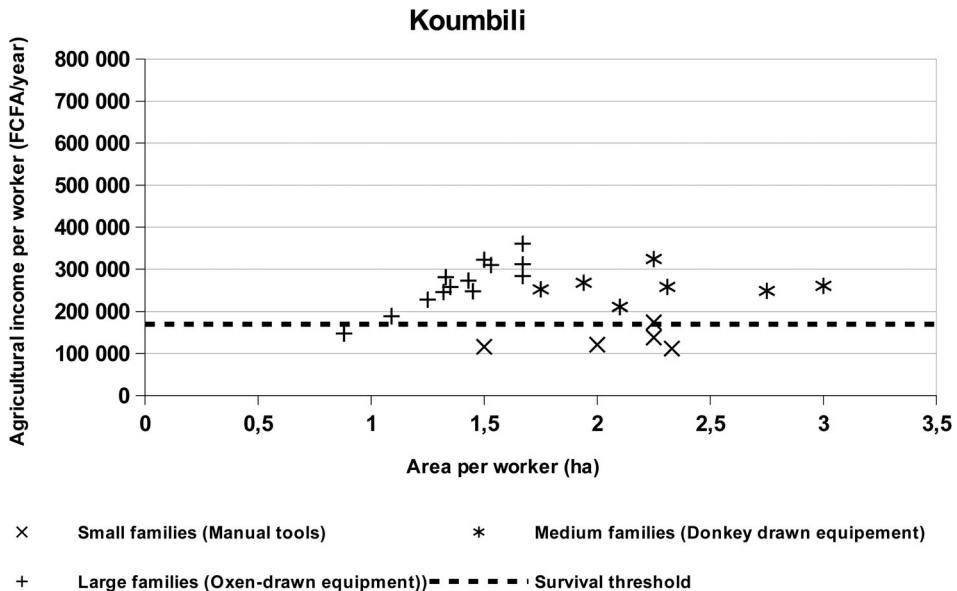


Figure 7. Agricultural income of the 25 farms interviewed in Koumbili in 2009.

everyone to raise a few cows, but to use this common land one obviously has to own cattle. Yet for young families born of large family separations, raising even the smallest herd is quite impossible. With no access to credit and using only manual tools, it is very difficult to build up capital: in the three villages, their income is close to or below the survival threshold (Figures 7–9). As other empirical studies have suggested (Woodhouse 2003), customary tenure does not guarantee security for the poor in Burkina Faso. Major social disparity has emerged, resulting from people's ability to capitalise on collective spaces.

The gap between winners and losers is set to widen, because some of these areas are being privatised. Many families now have enough animals to be herded by a family member or an employee; it is becoming rare that they entrust their cattle to the Fulani herders. On the *ager*, this individualisation of animal management is having numerous repercussions on land rights. The animals spend the night in private parks located on the owner's plots, and this is sufficient to fertilise his fields. As a result, the trade in manure in exchange for crop residues has stopped. Furthermore, with the recultivation of the lowlands, the straw from millet, maize or sorghum constitutes the daily cattle ration during the dry season. This forage is now collected and stored on an individual basis. This was studied by livestock specialists. Savadogo (2000) showed that when farmers still entrust their animals to Fulanis, some residues are left in the fields, but in larger families owning more animals and carts, most of the residues are now collected and stored. Cart ownership is an advantage, because it allows rapid transportation of crop residues, while most family labour is needed for grain harvest. The individualisation of animal management is thus resulting in the privatisation of manure and crop residues, and the final collective rights on the *ager* are disappearing. On this *terroir*, right of use is becoming individual and permanent, including in the dry season. That is how the private cattle give birth to the private plot. As Gray and Kevane (Gray and Kevane 2001) have demonstrated, 'intensification facilitates continuous cultivation, and continuous cultivation changes land rights' but only on the *ager* and thanks to the collective *saltus*!



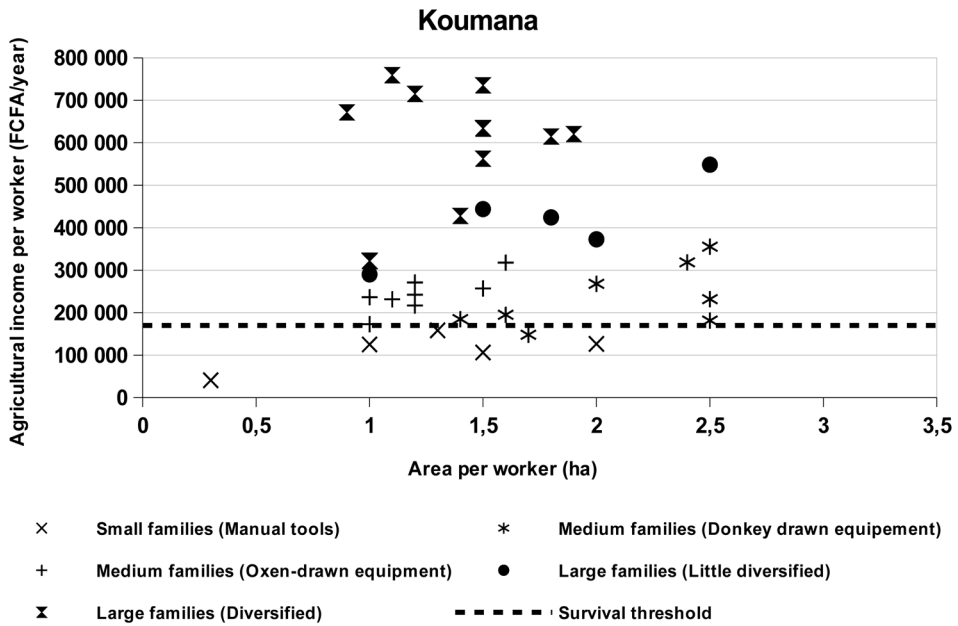


Figure 9. Agricultural incomes of the 38 farms interviewed in Koumana in 2009. Note: Diversified: orchards, market gardening, livestock.

Table 4. Contribution (%) of the different activities to the gross added value depending on the level of income in 2009.

	Cotton	Grains	Gardening	Orchard	Husbandry
Less than survival threshold	8	81	0	0	12
Between 1 and 2 survival threshold	15	64	2	1	18
Between 2 and 3 survival threshold	21	58	3	3	15
More than 3 survival threshold	10	30	1	39	21

Note: Average for different income categories – 98 farms.

as well (Gausset 2004). Conflicts with the Fulani are also increasing (Hagberg 2001). Now, they herd only their own cattle and are therefore perceived as foreign competitors, especially if, having no access to crop residues, they herd their cattle in the lowlands where dry-season crops are now cultivated. They have no choice but to look for other pastures during the dry season and practise transhumance. It is feared that this imposed seasonal movement is the prelude to long-term exclusion of Fulani families. Similarly, for small families, raising even the smallest herd is made more difficult with enclosures, as their small plots do not provide enough residues.

### A market for land, finally?

Since the 1990s there has been an increase in land purchases and sales, and the conflicts that arise as a result of these transactions demonstrate how confused the current situation is. It is

not rare for lineage chiefs to sell plots to non-natives at the expense of local youth and, conversely, young villagers are sometimes tempted to sell plots of which they are in no way customary owners (Mathieu, Zongo, and Paré 2002). The state recently amended its land policy, the RAF (Agrarian Land Reform), to take these developments into account. Under the RAF, which was enacted in 1984 during the Sankarist revolution, all the land in the country became the property of the state, and both private property and customary rights were formally abolished. In the National Policy on Rural Land in Rural Areas (PNSFMR), adopted in 2007, the state rehabilitated all these rights, especially in Axis 2 and 4 of the Framework Act 1 (Gouvernement du Burkina Faso 2007). Axis 2 recognises the customary land rights and emphasises the importance of common land. But it also specifies that this recognition does not assign all rural land to traditional leaders and customary institutions. Axis 4 focuses on the security of tenure of ‘new actors’, such as businessmen who invest in land in rural areas. To avoid any conflict, any land transaction must clearly set out the terms and conditions of compensation to local land owners (price of the sale, rent, etc.).

Yet many researchers into land rights in Africa have shown that it is absolutely impossible to ‘clearly set out’ the terms and conditions of compensation, because the different social groups have different conceptions of land rights. Colin and Woodhouse stressed that ‘vernacular’ land markets greatly differ from conventional economic markets (Colin and Woodhouse 2010). For the villagers, the sale does not free the purchasers (or their heirs) from their social obligations. This is how Chaléard (Chaléard 1979) and Colin and Ayouz (Colin and Ayouz 2005) analyse the conflicts arising from a sale in which the seller still expects the buyer to fulfil certain customary social obligations, whereas the buyer considers himself to be freed of them once the financial transaction has been completed. By ignoring this, the new political framework serves no purpose, and land disputes of different magnitudes can be expected.

## Conclusion

The relationship between agricultural intensification and land rights is much more complex than the concepts generally used to analyse this issue. Underlying the word ‘land’ are a number of very heterogeneous realities. In the cotton region of Burkina Faso, soil characteristics vary widely from one place to another within a single village. Similarly, the concept of intensification does not adequately describe the actual situation. In the south-west of the country, where the cotton revolution has been completed, intensive practices (continuous cropping on the *ager*) coexist with extensive practices (grazing on the *saltus*). In the south-east, where the cultivation of cotton started later, intensive practices (annual crops) during the rainy season are followed by extensive practices (grazing of crop residues) during the dry season. This is why it is so difficult to clarify the debate between ‘evolutionism’ and ‘social embeddedness’ using only statistical approaches.

The agrarian system approach taken in this study shows that the land issue theoretical controversy cannot be resolved for the simple reason that it is incorrectly stated. Juxtaposing customary right, which supposedly discourages investment but ensures social cohesion, with private property rights, which supposedly boost investment but generate exclusion, is not a relevant argument.

Customary right did not prevent investment and technological change in Burkina Faso. On the contrary, continuous cropping only became possible thanks to the complementarity of collective and individual land. Private property is not a prerequisite for investment. Nowadays, many families have a permanent usage right only because they invested in new equipment several years ago. But investment is not a prerequisite for the emergence of individual

rights either: the permanent right to use the *ager* only came about through the maintenance of the commons. Lastly, the commons are also the source of deep social disparity; many young farmers have been excluded and many Fulanis will probably have to leave the villages soon.

Unlike private property right, which is individual and does not depend on location, time or agricultural practices, customary law is based on usage. It is not only socially embedded; it is also geographically and technically embedded. It defines individual and collective rights depending on location and season. The only conditions placed on this right are respect of the village rules and regular cultivation. Behind its seeming lack of rigour, customary law is in fact remarkably flexible. This flexibility is what fundamentally distinguishes customary rights from private property rights.

This study showed a historical link between private and customary rights in the case of the cotton region of Burkina Faso. With the reduction and then disappearance of a fallow period, permanent usage rights emerged on the *ager*. However, neither demographic pressure nor the price of production factors caused this evolution. Rather, it came about as a result of the provision of farmers with tools allowing them to implement cropping systems that better catered to their own interests. Although agricultural credit has played a crucial role, it was based on guarantees other than land titles. In actual fact, no change in land rights either preceded or followed the intensification of farming systems. The same customary right applies to continuous cropping today as previously, when long fallow was a common practice. It is simply that now, farmers are able to practise continuous cropping and their temporary usage right very closely resembles a permanent right.

It would seem that customary right and private property rights are becoming compatible. It is now possible to buy and sell land, and settlement by investors is also possible, as required by the government. These current changes are worrying. Two different concepts of land rights come head to head in these land transactions, and after the sale, many ambiguities, a future source of conflict, remain.

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### References

- Alexander, D.Y. 2003. Planté, semé, protégé. Statut domestique des arbres du parc burkinabé. In *Peuplements anciens et actuels des forêts tropicales*, eds. A. Froment and J. Guffroy, 227–234. Paris: IRD.
- Amanor, K.S. 2008. The changing face of customary tenure. In *Contesting land and custom in Ghana. State Chief and the Citizen*, eds. Ubink J.M. and K.S. Amanor, 55–81. Leiden: Leiden University Press.
- Amanor, K.S. 2010. Family values, land sales and agricultural commodification in Ghana. *Africa* 80, no. 1: 104–125.
- Aubron, C., H. Cochet, G. Brunschwig, and C.H. Moulin. 2009. Labor and its productivity in Andean dairy farming systems: A comparative approach. *Human Ecology* 37: 407–419.
- Bainville, S., and M. Dufumier. 2007. Les transformations de l'agriculture et la reconfiguration des terroirs au sud-Mali. *Revue Belge de géographie* VIII, no. 4: 403–13.



- Basga, E.D. 2002. La sécurité foncière sur les périmètres irrigués du Burkina Faso: le cas de la vallée du Sourou. *Afrique et Développement* 27, no. 1-2: 62-83.
- Bernstein, H., and T.J. Byres. 2001. From peasant studies to agrarian change. *Journal of Agrarian Change* 1, no. 1: 1-56.
- Berry, S.S. 1975. *Cocoa, custom, and socio-economic change in rural Western Nigeria*. Oxford: [s.n.].
- Berry, S. 1985. *Fathers work for their sons: Accumulation, mobility and class formation in an extended Yoruba community*. Berkeley: University of California Press.
- Berry, S. 1993. *No condition is permanent, the social dynamics of agrarian change in subsaharian Africa*. Madison: The University of Wisconsin Press.
- Boserup, E. 1970. *Évolution agraire et pression démographique*. Paris: Nouvelle bibliothèque scientifique, Flammarion.
- Boutillier, J.L. 1964. Les structures foncières en Haute-Volta. *Études Voltaïques*, 5. ORSTOM, Ouagadougou.
- Brasselle, A., F. Gaspart, and J.P. Platteau. 2002. Land tenure security and investment incentives: Puzzling evidence from Burkina Faso. *Journal of Development economics* 67: 373-418.
- Bromley, D., 1989. *Economic interests and institutions. The conceptual foundations of public policy*. Oxford: Basil Blackwell.
- Capron, J. 1973. *Anthropologie Economique des Populations Bwa*. Paris: CNRS.
- Chaléard, J.L. 1979. Structures agraires et économie de plantation chez les Abè (Département d'Agboville, Côte d'Ivoire). Thèse de doctorat. Paris: Université de Paris X-Nanterre.
- Chauveau, J.P., and O. Richards. 2008. West African insurgencies in Agrarian perspective: Côte d'Ivoire and Sierra Leone Compared. *Journal of Agrarian Change* 8, no. 4: 515-552.
- Chimhowu, A., and P. Woodhouse. 2006. Customary vs private property rights? Dynamics and trajectories of vernacular land markets in Sib-Saharan Africa. *Journal of Agrarian Change* 6, no. 3: 346-371.
- Christiansen, S. 1978. Infield-outfield systems - characteristics and developments in different climatic environments. *Danish Journal of Geography* 77: 1-5.
- Cochet, H. 2011. *L'Agriculture Comparée*. Editions Quæ « Indisciplines », Versailles.
- Cochet, H. 2012. The *système agraire* concept in francophone peasant studies. *Geoforum* 43: 128-136.
- Cochet, H., and S. Devienne. 2006. Comprendre l'agriculture d'une région agricole: question de méthode sur l'analyse en termes de systèmes de Production. *Cahiers Agricultures* 15: 578-583.
- Colin, J.P., and M. Ayouz. 2005. *Emergence, enchâssement social et involution du marché foncier. Perspectives ivoiriennes*. Document de travail de l'Unité de Recherche 095. Montpellier: IRD.
- Colin, J.-Ph., and E.W. Crawford. eds. 2000. *Research on agricultural systems: Accomplishments, perspectives and issues*. Huntington, NY: Nova Science Publishers, Inc.
- Colin, J.P., and P. Woodhouse. 2010. Interpreting land markets in Africa. *Africa* 80, no. 1: 1-13.
- Dacher, M. 2005. *Cent ans au village, chronique d'une famille Gouin*. Paris: Karthala.
- Deininger, K. 2003. *Land policies for growth and poverty reduction. A World Bank policy research report*. Oxford: Oxford University Press.
- Deininger, K., and D. Ayalew Ali. 2007. *Do overlapping land rights reduce agricultural investment? Evidence from Uganda. Policy Research Working Paper, 4310*. Washington, DC: World Bank.
- De Soto, H. 2000. *The mystery of capital: Why capitalism triumphs in the west and fails everywhere else*. New York: Basic Books.
- Dey, J. 1981. Gambian women: Unequal partners in rice development projects? *The Journal of Development Studies*. 17, no. 3: 109-122.
- Dongmo, A.L., E. Vall, P. Dugué, A.N. Kossouma, A. Bechir, and J. Loussouarn. 2010. Le territoire d'élevage : diversité, complexité et gestion durable en Afrique soudano-sahélienne. Cas du Nord-Cameroun, Ouest Burkina Faso, Mali-Sud et Sud-Tchad. In *Savanes africaines en développement : innover pour durer*, eds. L. Seiny-Boukar and P. Boumard. Montpellier: CIRAD. CD-ROM.
- Dufumier, M. 1997. *Les projets de développement agricole. Manuel d'expertise*. Paris: Karthala.
- FAO. 2014. *Production and production prices*. Rome: Food and Agriculture Organisation. <http://faostat.fao.org> (accessed April 12, 2014).
- Faure, A. 1995. *Private land ownership in rural Burkina Faso*. London: IIED, Paper N°59.
- Feder, G. 1988. *Land policies and farm productivity in Thailand*. Baltimore, Maryland: John Hopkins University Press.

- Fenske, J. 2011. Land tenure and investment incentives: Evidence from West Africa. *Journal of Development Economics* 95: 137–156.
- Fok, A.C.M. 2006. Ajustements nationaux de mécanismes prix face aux fluctuations du prix mondial: les leçons du coton en Afrique Zone Franc. In *La régulation des marchés agricoles internationaux : un enjeu décisif pour le développement*, eds. J.M. Boussard and H. Delorme, 91–112. Paris: Khartala.
- Gausset, Q. 2004. Le foncier et les arbres dans le sud-ouest du Burkina Faso. In *Bridging research and policy. Proceedings of the Workshop, 2–3 December 2004*, eds. A. Reenberg and H.S. Marcussen, 37–60. Ouagadougou: Sahel Sudan Environmental Research Initiative.
- Georges, P. 1978. *Précis de géographie rurale*. Paris: PUF.
- Gouvernement du Burkina Faso. 2007. Décret N°2007–610/PRES/PM/MAHRH, du 04 Octobre 2007 portant adoption de la politique nationale de sécurisation foncière en milieu rural.
- Gouvernement du Burkina Faso. 2009. Stratégie Nationale sur la Mécanisation Agricole. Ministère de l'Agriculture, de l'Hydraulique et des Ressources Halieutiques. Service des statistiques agricoles. Centrale d'information agro-pastorale, Ouagadougou.
- Gouvernement du Burkina Faso. 2011. Analyse économique du secteur coton, liens pauvreté et environnement. Ouagadougou, Burkina Faso : Ministère de l'Environnement et du Cadre de Vie (MECV), Projet Initiative Pauvreté Environnement (IPE).
- Gray, L., and B. Dowd-Urbe. 2013. A political ecology of socio-economic differentiation: Debt, inputs and liberalization reforms in southwestern Burkina Faso. *Journal of Peasant Studies* 40, no. 4: 683–702.
- Gray, L.C., and M. Kevane. 2001. Evolving tenure rights and agricultural intensification in Southwestern Burkina Faso. *World Development* 29, no. 4: 573–87.
- Hagberg, S. 2001. À l'ombre du conflit violent. *Cahiers d'études africaines* 161: 45–72.
- Hauchart, V. 2006. Le coton dans le Mouhoun (Burkina Faso), un facteur de modernisation agricole. Perspectives de développement ? *Cahiers Agricultures* 15, no. 3: 285–291.
- Havard, M., A. Traoré, A. Njoya, and A. Fall. 2004. La traction animale et son environnement au Burkina Faso, au Cameroun et au Sénégal. *Revue d'élevage et de médecine vétérinaire des pays tropicaux* 57, no. 3–4: 133–141.
- Hervouët, J.P. 1987. Les grandes endémies : l'espace social coupable. *Politique Africaine* 28: 21–32.
- Hill, P. 1963. *The migrant cocoa - farmers of Southern Ghana: A study in rural capitalism*. Cambridge: Cambridge University Press.
- Howorth, C., and P. O'Keefe. 2000. Drought-induced resettlement: A case study from Burkina Faso. *Regional Environmental Change* 1, no. 1: 15–23.
- ISS Working Group RB. 1998. *World reference base for soil resources*. Atlas, ed. E.M. Bridges et al. 1st ed. ISS/ISRIC/FAO. Acco, Leuven, Belgium.
- Johnson, O.E.G. 1972. Economic analysis: The legal framework and land tenure systems. *Journal of Law and Economics* 15: 259–276.
- Kaminski, J., D. Headey, and T. Bernard. 2011. Burkinabè cotton story 1992–2007: Sustainable success or sub-saharan mirage? *World Development* 39, no. 8: 1460–1475.
- Landais, E. 1994. Système d'élevage. D'une intuition holiste à une méthode de recherche, le cheminement d'un concept. In *Dynamique des systèmes agraires: à la croisée des parcours, pasteurs, éleveurs, cultivateurs*, eds. C. Blanc-Pamard et J. Boutrais, 15–49. Paris: ORSTOM.
- Lavigne Delville, Ph. 1998. Logiques paysannes d'exploitation des bas-fonds en Afrique soudano-sahélienne. In *Aménagement et mise en valeur des bas-fonds au Mali, bilan et perspectives nationales, intérêt pour la zone de savane ouest-africaine*, eds. N. Ahmadi and B. Teme, 77–93. Montpellier: CIRAD.
- Lhoste, P. 1987. *Étude de l'élevage dans le développement des zones cotonnières (Burkina Faso, Côte d'Ivoire, Mali)*. Montpellier: CIRAD-IEMVT.
- Lodoun, T., A. Giannini, P.S. Traoré, L. Somé, M. Sanon, M. Vaksmann, and J.M. Rasolodimby. 2013. Changes in seasonal descriptors of precipitation in Burkina Faso associated with late 20th century drought and recovery in West Africa. *Environmental Development* 5: 96–108.
- Marchal, J.Y. 1987. En Afrique des savanes, le fractionnement d'exploitations agricoles ou le chacun pour soi. L'exemple des mooses du Burkina Faso. *Cahiers Orstom, série Sciences humaines* 23, no. 3–4: 445–454.
- Mathieu, P., M. Zongo, and L. Paré. 2002. Monetary land transactions in Western Burkina Faso: Commoditisation, papers and ambiguities. *The European Journal of Development Research* 14, no. 2: 109–28.

- Mazoyer, M., and L. Roudart. 2005. *A history of world agriculture: From the Neolithic age to current crisis*. New York: Monthly Review Press, 480 p.
- Ministère des Ressources Animales. 2000. *Plan d'action et programme d'investissements du secteur de l'élevage au Burkina Faso*. [http://www.hubrural.org/IMG/pdf/burkina\\_papise.pdf](http://www.hubrural.org/IMG/pdf/burkina_papise.pdf) (accessed June 6, 2015).
- Ouédraogo, R.S., J.P. Sawadogo, S. Volker, and T. Thiombiano. 1996. Tenure, agricultural practices and land productivity in Burkina Faso: Some recent empirical results. *Land Use Policy* 13, no. 3: 229–232.
- Ouédraogo, S., and M.C. Sorgho Millogo. 2007. Système coutumier de tenure des terres et lutte contre la désertification en milieu rural au Burkina Faso. *Natures Sciences Sociétés* 15: 127–139.
- Peters, P. 2004. Inequality and social conflict over land in Africa. *Journal of Agrarian Change* 4, no. 3: 269–314.
- Place, F. 2009. Land tenure and agricultural productivity in Africa: A comparative analysis of the economics literature and recent policy strategies and reforms. *World Development* 37, no. 8: 1326–36.
- Platteau, Jean-Philippe. 1996. The evolutionary theory of land rights as applied to Sub-Saharan Africa: A critical assessment. *Development and Change* 27, no. 1: 29–86.
- Poux, X., J.B. Narcy, and B. Romain. 2009. Le *salut*: Un concept historique pour mieux penser aujourd'hui les relations entre agriculture et biodiversité. *Courrier de l'Environnement de l'INRA* 57: 23–34.
- Reenberg, A., and C. Lund. 1998. Land use and land right dynamics. Determinants for resource management options in Eastern Burkina Faso. *Human Ecology* 26, no. 4: 599–620.
- Remi, G. 1967. Yobri, étude géographique du terroir d'un village gourmantché de Haute-Volta. *Atlas des structures agraires au sud du Sahara*. 4. Paris: ORSTOM.
- Ridder, N., H. Breman, H. Van Keulen, and T.J. Jan Stromph. 2004. Revisiting a cure against land hunger: Soil fertility management and farming systems dynamics in the West African Sahel. *Agricultural Systems* 80: 109–131.
- Ruttan, V., and Y. Hayami. 1984. Towards a theory of induced institutional innovation. *Journal of Development Studies* 20, no. 4: 203–223.
- Saul, M. 1993. Land custom in bare: Agnatic corporation and rural capitalism in Western Burkina. In *Land in African Agrarian systems*, eds. Thomas Bassett and Donald Crummey, 75–100. Madison: University of Wisconsin Press.
- Sautter, G. 1962. A propos de quelques terroirs d'Afrique Occidentale, essai comparatif. *Études Rurales* 4: 24–86.
- Savadogo, M. 2000. *Crop residue management in relation to sustainable land use: A case study in Burkina Faso*. *Tropical Resource Management Papers* (30). Wageningen: Wageningen Agricultural University.
- Savonnet, G. 1970. Pina (Haute Volta). *Atlas des structures agraires au sud du Sahara*. 4. Paris, ORSTOM.
- Sébillotte, M. 1978. Itinéraires techniques et évolution de la pensée agronomique. *Compte Rendu de l'Académie de l'Agriculture, France*. 11: 906–913.
- Schmid, A. 1987. *Property, power and public choice. An inquiry into law and economics*. New York: Praeger.
- Schwartz, A. 1991. *L'exploitation agricole de l'aire cotonnière burkinabé: caractéristiques sociologiques, démographiques, économiques*. Ouagadougou: ORSTOM.
- Schwartz, A. 1993. Brève histoire de la culture du coton au Burkina Faso. In *Découverte du Burkina, Tome I*, 207–237. Paris, Ouagadougou: Sépia, A.D.D.B.
- Sjaastad, E., and D. Bromley. 1997. Indigenous land rights in Sub-Saharan Africa: Appropriation, security, and investment demand. *World Development* 25, no. 4: 549–562.
- Stoop, W.A. 1987. Variations in soil properties along three toposesquences in Burkina Faso and implications for the development of improved cropping systems. *Agriculture, Ecosystems & Environment* 19, no. 3: 241–264.
- Tallet, B. 1984. Une société rurale en mutation: les exploitations agricoles familiales en Haute-Volta. In *Le développement rural en questions: paysages, espaces ruraux, systèmes agraires: Maghreb-Afrique noire-Mélanésie*, eds. C. Blanc-Pamard, Bonnemaïson Joël, Boutrais Jean, V. Lassailly-Jacob, and Lericollais André, 389–402. Paris: ORSTOM.
- Tersiguel, P. 1995. *Le pari du tracteur. La modernisation de l'agriculture cotonnière au Burkina Faso*. Paris: ORSTOM éditions, Collection «A travers champs».

- Toulmin, C., and J. Quan. 2000. *Cattle, women and wells: Managing household survival in the Sahel*. Oxford: Clarendon Press.
- Vall, E., and M.A. Diallo. 2009. Savoirs techniques locaux et pratiques: la conduite des troupeaux aux pâturages (Ouest du Burkina Faso). *Natures Sciences Sociétés* 17, no. 2: 122–135.
- Vierich, H.I.D., and W.A. Stopp. 1990. Changes in West African Savanna agriculture in response to growing population and continuing low rainfall. *Agriculture, Ecosystems & Environment* 31, no. 2: 115–132.
- World Bank. 1989. *Sub-Saharan Africa - from crisis to sustainable growth*. Washington, DC: The World Bank.
- Woodhouse, P. 2003. African enclosures: A default mode of development. *World Development* 31, no. 10: 1705–1720.
- de Zeeuw, F. 1997. Borrowing of land, security of tenure and sustainable land use in Burkina Faso. *Development and Change* 28: 583–595.

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