



Nature, work, culture: labour utilisation in agriculture and off-farm employment among the Fulani in northern Burkina Faso

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Abstract

The article is an interdisciplinary study of the interaction between man and nature with work as a central focus. Work is understood both in relation to agricultural production and in relation to the social and cultural aspects of society. Using the case of Fulani Rimaybe agro-pastoralists in northern Burkina Faso, the broader objective is to understand the conditions and dynamics of agriculture and livelihood in the Sahel. The article combines ethnographic fieldwork with a comprehensive labour allocation survey of 33 male adults. Farm and off-farm work are examined as to 1) the Rimaybe's socio-political status in Fulani society, and 2) family status related to age and seniority. Labour allocation strategies employed to cope with uncertainty and resource scarcity are also discussed. The study showed that the Rimaybe have a pragmatic attitude to both millet cultivation and livestock husbandry in that the most able-bodied workers in practice spend little time in these activities. Relatively low efforts are associated with the Rimaybe's historical emphasis on off-farm work. Off-farm incomes earned by junior males in the local gold-mines are a key factor for agricultural performance and economic well-being. Cash incomes have also been central to the Rimaybe's attainment of higher status in Fulani society in that they

have enabled the purchase of land from their former Fulbe masters and landlords.

Keywords

Labour allocation, work, ethnicity, age, millet cultivation, livestock husbandry, off-farm employment, livelihood, Fulani, Burkina Faso, Sahel.

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In recent years many attempts have been made to integrate natural and social perspectives in the study of natural resource management and livelihood in the Sahel (e.g. Mortimore, 1989; Turner, 1993; de Bruijn & van Dijk, 1995; Batterbury, 1997; Raynaud, 1997; Reenberg & Paarup-Laursen, 1997). These efforts are part of a broader debate on the divide between the 'two cultures' of science (Snow, 1960) concerning their differing views on the relationship between nature and society. Latour (1993) identifies two opposing conceptions of the relationship between man and nature. Either man is subject to an objective and acting Nature, as studied in the natural sciences, or man is a signifying being, defining or 'constructing' the nature he lives in, as studied in recent social science

approaches. In conventional scientific understandings of the man - nature relationships the two perspectives are defined against each other and no 'cross-cultural' perspectives are allowed (ibid.). However, in reality social practices invariably transcend 'natural' and 'social' perspectives: they are 'hybrids' (ibid.). To capture a multifaceted reality, Latour therefore suggests that we in our analysis follow the actual networks between man and object, man and nature.

In this perspective one of the exciting activities of man is his work. Work is both the appropriation of nature in the biblical term ('In the sweat of thy face shalt thou eat bread', Genesis 3: 19), and an activity constituting society. 'The primaevial purpose of work is the human need to

control nature, to wrest a living from it and to impose culture on it' (Wallman, 1979: 1). In rural agricultural societies this aspect of work is very visible. Here work is a social practice that involves the manipulation of nature with the purpose of producing goods for human consumption. On the other hand, work is a social activity aimed at the upkeep of certain social forms and relations. Work can therefore be understood both in relation to an interaction with nature and in relation to the social and cultural aspects of society. Yet man's interaction with nature is never 'unembroidered'. Social and cultural relations between people inform their interaction with nature, in particular the 'control of one person or category of people over another - whether direct control by means of command over the actions of others, or indirect control achieved either by limiting their access to resources or benefits, or by devaluing the resources and benefits which they have' (Wallman, 1979: 1).

In Latour's sense work can therefore be considered a hybrid that exceeds the boundaries of the two cultures of science. Our ambition, however, is not to solve the problem of the two cultures nor to outline network theories. Following Strathern, we believe that the very concept of hybrid signals a critique of separation and of categorical division but we do not use networks as a concept 'which works indigenously as a metaphor for the endless extension and intermeshing of phenomena' (Strathern, 1996: 522). We focus on work as a kind of social action that dissolves the divisions between several theoretical perspectives, exactly because it at one time relates to the physical transformation of nature, social transactions, economic activities, and personal identities (Wallman, 1979). Hence, the phenomenon we describe as 'work' tends to exceed any single scientific perspective as it straddles the distinction between nature and society. The study of work is therefore ideal for an interdisciplinary enquiry into the interaction between man and nature. Drawing on the two perspectives outlined above we will analyse work as a hybrid: as a means to the transformation of nature and a key constraint in agricultural production, and as the central focus for the construction of social identity. We emphasise here the analytical category one may term productive work. This precludes social and political work (Riesman, 1977), that is, activities directed at establishing and upholding social relationships as well as enhancing a person's status.

Focussing on work as a hybrid also stresses a 'performa-

tive' view on agriculture in which the capacity to innovate and respond to changes in agronomic or economic conditions is a skilled social accomplishment that can make the difference between success and failure (Richards, 1993). In the Sahel, the extreme uncertainty of environmental and political-economic conditions favours a 'flexible performance' (ibid.: 75) in a broad range of economic activities and social arenas. Paul Richards' analogy that 'the capacity to keep going, and to avoid a complete breakdown, is always an important musical skill' (ibid.: 69) is thus particularly useful for studying Sahelian livelihood and agriculture. Central to the notion of performance is the social embeddedness of agriculture: 'Agriculture as a performance is part of the wider performance of social life .. [and] members of the farm household .. therefore judge the success of their on-farm actions by whether they further their social projects more generally' (ibid.: 72).

Work and its embodiment in labour are in our view important concepts for understanding patterns and dynamics of agriculture and livelihood in the Sahel. Here the mobilisation of labour resources is a key factor for agricultural intensification and expansion because of capital scarcity and the absence of major labour-saving technologies (Mortimore, 1989; Raynaut, 1997). Moreover, the extreme variability of rainfall and other environmental factors favours a timely and skilled work performance in agricultural production (Fafchamps, 1993; Scoones, 1996; Adams & Mortimore, 1997).

In line with the latter decade's focus on man's interaction with the environment, the meta-narrative of this study concerns how social practices (work) straddle the conceptual divide between culture and nature. This analytical perspective embodies another central dichotomy in the study of social and economic life in the Sahel, i.e. that of the *domestic* versus the *capitalist market* economy (Sahlins, 1972). Neoclassical economists see domestic or personalised forms of economic organisation as substitutes for imperfect or missing markets (Berry, 1993) and so representing a low stage of economic development. In reality, however, rural people in the Third World engage in *both* domestic and market relationships in their strategies to increase incomes and cope with uncertainty through diversification. In the Sahel low and insecure agricultural production means that rural households try to smooth and increase incomes by engaging in off-farm activities, often by seeking employment in local and regional labour markets (Reardon et al., 1988; Swinton, 1988; Curry, 1989;

Painter et al., 1994). Also, research on peasant households has demonstrated that domestic and market economies are dialectically and dynamically related (Folbre, 1986; Hart, 1986; Cheal, 1989; Guyer, 1992; Berry, 1993). It has thus been shown that rural people's involvement in labour markets is structured by their age and gender status in the domestic household, and by the household's size and economic capability. Conversely, extra-household alliances and incomes earned through market participation tend to increase a person's relative position in the household. Elaborating upon this line of thought, the article examines the ways in which life-cycle stage (age) and household size influence the allocation of labour across farm and off-farm activities (Chayanov, 1966; Peters, 1986). It also explores historical linkages between people's status and economic participation in the wider society, and patterns of production and work at the household level.

A key means to understand Sahelian agriculture and livelihood systems is to study the ways in which people recruit labour and allocate it between different activities. In this regard we must examine how 'natural' and 'social' considerations combine to shape patterns of work and socio-economic strategy. Central to these considerations is the analysis of work in terms of people's involvement in both domestic and market socio-economies. In view of the marked uncertainty and resource scarcity in the Sahel, we should expect that an efficient and flexible allocation of labour is decisive for peoples' ability to adapt to, and cope with, changes in biophysical and socioeconomic conditions. In the following case study of the Fulani Rimaybe in northern Burkina Faso, patterns of work are studied in terms of 1) regional political-ethnic relationships, and 2) household size and domestic status differences. The study examines the ways in which Rimaybe work and livelihoods are patterned by the dynamic interaction of social relationships and historical changes in farming system and economy, and it identifies short-term strategies employed to cope with resource scarcity and environmental uncertainty by analysing labour allocation in a year of severe food shortage.

Materials and methods

Evidence for this article is based on fieldwork conducted by the authors between 1995 and 1997 among the Fulani in northern Burkina Faso. A range of methods and ap-

proaches were used during the field work: participant observation; in-depth interviews with groups and with household heads and juniors; natural resource mapping; a labour allocation survey of 33 male individuals in 13 households; and a socio-economic baseline study of 39 households. Women's work and livelihood were not investigated in any depth. One reason is that Rimaybe women in the study area were little involved in farm and off-farm work. Another is the methodological problem related to the fact that the authors themselves are men. The analysis of work benefits from the use of both quantitative and qualitative data (Descola, 1994). Ethnographic evidence and socio-economic profiles of selected households were organised in a narrative form. Quantitative data (household baseline and time-series) were entered into a hierarchical data base ranging from individual to village level. Households are in this study defined narrowly as work units in millet production. Most such units were also units of food consumption; when this was not so it usually indicated that the household was in the process of division.

The case study

The study village, Petekole, lies within the former Fulani Liptaako Emirate, in present day northern Burkina Faso. It is peopled by pastoral Fulani, the Fulbe (sing.: Pullo), and by Fulani millet cultivators, the Rimaybe (sing.: Dimajo). The Rimaybe are the descendants of slaves captured in raids or subjugated by the Fulbe at their conquest of Liptaako around 1810. Nowadays both groups combine agriculture and livestock rearing, although in different proportions. The Rimaybe make up 85% of the village's 335 inhabitants and the present article focuses on this group. (The village's five Bella households are counted among the Rimaybe as their work patterns are very similar to the Rimaybe's. The Bella are former slaves of the Tuareg but are now fully assimilated into Fulani society and speak Fulani.) The history of Petekole is closely linked to the political and economic changes in Liptaako due to the village's proximity (10 km) to the former Emirate's capital, Dori. From the 1830s onwards Dori developed into one of the most important commercial centres in the region due to the expansion of trans-Saharan and regional trade in artisan goods, grain, slaves, and livestock (Barth in Merlet, 1995; Ouedraogo, 1997). While its importance as a trading town has greatly diminished, Dori is today the admini-

strative centre of Burkina Faso's three Sahel provinces. Petekole lies at the edge of a ten-kilometre wide east-west going sand dune which is permanently cultivated with millet and sorghum. To the south and north of the sand dune the landscape is dominated by an extensive pediplain used mainly as pastures and intersected by seasonal rivers. The area around the Petekole is densely populated compared with the region as a whole because of the proximity to Dori and the Fulani's preference for sand dune cultivation. Land scarcity has resulted in labour-intensive farm practices but has also prompted out-migration and the cultivation of bush fields some 10 km from the village. Average annual rainfall is 430 mm (1970-1994).

The diversity of income sources is a well-known feature of livelihood in the Sahel (Reardon et al., 1988) and the Rimaybe are no exception to this. The three major components in Rimaybe livelihoods are millet production, livestock husbandry, and off-farm employment. Table 1 gives the absolute and relative values of those activities in a year with below-average rainfall. Millet production is most important followed by off-farm work and livestock sales. The figures hide significant variations between households and

years, but point to the necessity of including both farm and off-farm activities in the analysis of work.

Work and political-ethnic status

Fulbe pastoralists

In Fulani society there is no general term for the various types of productive work people do, nor a uniform perception of what work is. The major division in the understanding of work relates to the distinction between Fulbe and Rimaybe, and the subsistence forms traditionally related to the two groups. Generally the Fulbe see themselves as an aristocratic people in control of themselves and not dependent on physical work. Their perception of work is related to identity and the concept of *pulaaku* (Riesman, 1977; Bolwig & Paarup-Laursen, forthcoming). To the Fulbe pastoral work is considered work in different terms than farmwork. Although pastoralism may involve twenty-four-hours of work when the cattle are grazed at night, it is generally not considered straining or tiring. The Fulbe regard pastoralism as the relation to cattle more than they see it as work (*gollal*). Cattle produce for humans if humans are able to relate to and 'read' the cattle and the pasture. Caring for cattle is not goal-directed in the same way as cultivating a field or working for hire (Riesman, 1990). Work in the field (*golle ngeese*) is different for the Fulbe as it involves the exercise of physical force, the bending of one's back. The Fulbe may thus rest for days after having worked in the field, and certain tasks they leave undone. For example, unlike the Rimaybe, the Fulbe do not collect manure on the pastures but rely on farmyard and pen manure for soil fertility regeneration. Most types of off-farm work are also physical work which the Fulbe abhor. When Fulbe youths at times work in the gold-mines they return home within short time. When they do carry out off-farm work, it is often related to cattle or trading. A large part of Fulbe off-farm incomes is related to social work; both in the upkeep of relations to kin that can support a household in times of crisis, and in relation to political and religious structures. The Fulbe thus still monopolise the relations to higher level political and religious authorities.

Rimaybe cultivators

The Rimaybe, on the other hand, were as slaves used to transform the bush and gain an income through hard phy-

Table 1: Income sources in Petekole (FCFA per household and percent)¹.

Income sources 1996-97	Household income 1996-97 (FCFA) ²	Share of total income (percent)
Grain harvest 1996 (monetary value)	212.300	49
Livestock exchange (sales - purchases)	76.500	18
Crop residue sales	5.300	1
Farm activities (sub-total)	294.100	68
Gold-mine remittances	100.300	23
Migration work remittances	4.500	1
Trading profits (estimated)	22.700	5
Weeding for others	2.300	1
Other off-farm activities	7.700	2
Off-farm activities (sub-total)	137.500	32
Farm + off-farm activities (total)	431.600	100

¹ The table lists aggregated averages for 11 monitored households. The period considered runs from 14/10 1996 to 13/10 1997. The relative share of millet production in household income would be larger in both 1995-96 and 1997-98 because the 1996 harvest was the lowest in those years. On the other hand, the poor harvest in 1996 also induced farmers to earn larger cash incomes and sell more livestock thus increasing the contributions of those income sources.

² 100 FCFA = 1 French franc.

sical labour. Physical labour is therefore an integrated part of their identity and they see no problem in doing farm work and other types of physical work, such as goldmining, water carrying, weaving, etc. The historical origin of the Rimaybe can also account for their emphasis on millet cultivation. As slaves of the Fulbe the Rimaybe were placed in separate villages (*debere*) near the Emirate's capital where they produced grain and cotton textiles for export or local consumption (Lovejoy, 1983: 208). The Rimaybe's inferior status also precluded their control over resources; they could not own cattle or other wealth nor did they control the access to the land they cultivated. Even their offspring could be apprehended by their Fulbe master. In terms of work and socio-economic status Rimaybe slaves were thus the negative image of the Fulbe (Riesman, 1977).

Following the French conquest in 1895 the Rimaybe have striven for higher social and economic status in Fulani society. A key element in this struggle has been to secure control over agricultural land. Rimaybe land struggles illustrate well the linkage between changing labour relations and control over land in the context of colonial penetration in the Sahel (Olivier de Sardan, 1984: 219; Raynaud, 1997: 240). In many places increased control over land was achieved partly through successive inheritance of continuously cultivated fields in the political context of weakening Fulbe power and the passing of modern land laws (Matlon, 1994; Lund, this issue). Yet, in central parts of Liptaako the Rimaybe obtained exclusive rights in their land mainly by buying it from the Fulbe. Land purchases were financed by migrant incomes and the sale of grain and livestock. Today land in this area has become privatised and fully commercialised, and ethnicity appears to yield little influence on land transactions. At the Emirate's periphery land is much less commercialised and the Fulbe in some places retain a partial control of the land cultivated by the Rimaybe (Reenberg & Paarup-Laursen, 1997). During this century the Rimaybe have gradually emancipated themselves from their feudal labour relations with the Fulbe. The colonial power officially abolished slavery but the cultivation by the Rimaybe of the fields of the Fulbe, as well as other labour prestations, continued into post-colonial time. How much work was done, and for how long, varied between localities. In Petekole today Rimaybe labour services are only of a symbolic size and serve to maintain a good relationship with certain influential Fulbe families. Labour exchanges have developed between Rimaybe cattle owners and Fulbe herdsman as the

Rimaybe have come to own more livestock. The Rimaybe increasingly benefit from this relationship as the herders' wages have decreased and their rights in Rimaybe livestock have become less secure.

The Rimaybe do not see off-farm work as a central part of their identity despite its great economic importance. This mismatch between the practical significance of off-farm work and the symbolic value attached to it by the Rimaybe may be attributed to the fact that off-farm work originally was enforced upon them by the French. Measures imposed on Sahelian communities include the monetisation of the economy, taxation, forced labour, and coerced mobilisation of migrant labour for export crop production in the Coastal colonies (Baier, 1980; Gregory et al., 1989; Ouedraogo, 1997). The collection of 'head taxes' in French and British currencies, often with the use of force, was a key measure by which local people were integrated into the cash economy. For people in Liptaako, the Gold Coast was the first and for many years also the most important place of migrant work. Nearly all elderly men in Petekole had worked in Ghana in the 1950s and 1960s, seasonally or for several years on end, and their fathers before them as early as the 1920s. Migration to Ghana was dramatically reduced in 1970 when the Ghanaian government expelled more than 200,000 migrant workers (Adomako-Sarfouh, 1974). From the late 1960s and onwards most Rimaybe in Liptaako worked in the dry season as weavers in small workshops in western Niger. In the early 1980s gold mining replaced weaving as their primary off-farm activity. At that time the decline of the Nigerien economy coincided with the discovery of gold in Liptaako where a true gold fever raged in the mid 1980s. Competition from imported goods has also affected the livelihoods of the Rimaybe by undermining their position as makers of clothes and textiles in the area.

Today the identity of the Rimaybe is indeterminate. They are in the process of being at least formally integrated into a general Fulani identity. They speak *fulfulde* and are identified by the government as Fulani. Yet, within Fulani society the former opposition between master and slave is still strong. The Fulbe distinguish themselves from the Rimaybe through the concept of *pulaaku* and they do not allow marriages between Fulbe women and Rimaybe men. A few Rimaybe apply Fulbe strategies and invest their surplus in cattle. They adopt Fulbe values and identify with Fulbe pastoralists through the work with cattle (Bolwig & Paarup-Laursen, forthcoming). Yet most Rimaybe are not

able to build up a large cattle herd and so stick to Rimaybe strategies which emphasise crop production and off-farm employment. Due to the character of this work they cannot adopt Fulbe values which are linked to pastoralism and the political manipulation of resources. Instead they establish a positive Rimaybe identity based on a relationship to the farming of land and their economic success in off-farm activities, as well as the practice of Islam.

The socio-political status of the Rimaybe also impinges on the way work is organised within lineage, family and household. The Rimaybe have not developed strong lineage structures based on the control of land. This is due to their historical dependence on Fulbe clans for cultivation rights and their origin as slaves brought together from different areas (Pollet & Winter, 1978; Matlon, 1994). The limited economic power of the lineage is important for the control over, and use of, male labour among the Rimaybe. Large corporate work units have possibly never existed among the Rimaybe. This is in contrast to lineage-based societies which were organised around the cultivation of a common household field by junior members (Lewis, 1981; Raynaut, 1997). Instead Rimaybe slaves cultivated in common the fields of their Fulbe master, which might be why the Rimaybe nowadays do not divide male work between 'private' and 'common' fields. As for the gender division of work, there are differing opinions or experiences as to the engagement in farm work by female slaves in this part of the Sahel (Lovejoy, 1983; Olivier de Sardan, 1984). No historical evidence on this issue is available for Liptaako. Yet, a comparison between villages within Liptaako shows that contemporary Rimaybe women in Petekole follow the Fulbe by not taking part in the weeding and harvesting of millet, nor in the collection of firewood, nor in physically demanding off-farm work. This way the Rimaybe communicate a Fulbe identity related to the social division of work and the Islam-related practice of wife seclusion. The remaining sections of the paper refer exclusively to the Rimaybe.

Work and domestic status

Farm work

The Rimaybe consider agropastoralism, in particular the cultivation of millet and sorghum, to be their central activity both in economic and identity terms.

Livestock husbandry Half of Petekole's 33 Rimaybe

households own cattle but in very unequal numbers. Livestock revenues constituted 18% of total household incomes in 1996-97, equally divided between cattle and small stock (Table 1). By tradition Fulbe herders residing in the village guard the Rimaybe's cattle in return for labour services, milk and manure. Among the Rimaybe small-stock is a far more important source of income and object of investment than cattle for all except a few wealthy households. Small-stock is guarded mainly by children, ranging from nine to 16 years, typically boys aged 12-13. Small-stock labour requirements are highest in the latter part of the wet season (*ndungu*) when animals must be guarded to avoid crop damage, and during the hot season (*ceedu*) when frequent watering is necessary. Women rear sheep and goats for fattening and help tend small-stock kept in the yard. The reliance on women and children's labour for livestock husbandry shows that the Rimaybe give low priority to this activity, compared with Fulbe and Bella pastoral groups.

The livestock work performed by Fulbe herders and Rimaybe women and children allow Rimaybe men to spend more time in millet cultivation and off-farm employment. Yet, this division of work is neither static nor unproblematic. Herding contracts with the Fulbe lead to conflicts and management problems. The obligations of Rimaybe adolescents regarding small-stock sometimes conflict with their desire to work and earn cash in the gold-mines where they can find employment already at the age of 14-15. Extensive cooperation in livestock husbandry work between the young herders helps to alleviate this problem. Still, some youth must guard other people's livestock for several years while their age mates have time to earn cash and often also accumulate individual wealth in livestock and fields.

Crop cultivation The Rimaybe produce vegetables and small grains (millet and sorghum) mainly for auto-consumption. Vegetables are grown in home gardens (*ngiwa*) or are inter-cropped with millet and sorghum. They are sown at the 2nd or 3rd rain. Women are the main producers of vegetables but men also participate and many have their own gardens. Quantitative data on vegetable production are not available. Grain production made up roughly half of the total household incomes in 1996-97 (Table 1). It accounted for 70% of in-house food consumption in 1995 and 1996 combined, while the 1997 harvest was at or above self-sufficiency levels. These figures conceal important differences between households which are con-

sidered only in passing in this article. The major work tasks in millet cultivation are sowing, weeding, harvesting and manuring. Below these tasks are discussed regarding labour allocation and access. There is little land preparation before sowing. Only in lowland cultivation is the land prepared with a hoe before sowing, but these soils were not cultivated by the farmers in Petekole. Old stubbles are removed from the soil during the hot season (*ceedu*) when other farm activities are at their lowest. Fencing of vegetable gardens and the few fields bordering the pastures take place at the onset of the rains. The timeliness of sowing is critical to crop growth because of high temperatures, erratic rainfall, and a short rainy season. For sowing the ready availability of many farm hands is more important than physical strength or endurance. Women and children participate regularly in sowing, and because they are always present in the village men enjoy greater flexibility as to when they must return from migration work. This flexibility is important as the start of the rainy season (*gataaje*) may vary by two months or more (see below).

Weeding is the major labour bottleneck in millet cultivation. Weeding is most intensive in the first half of the rainy season (*ndungu*) and failure to do the first weeding usually results in total crop failure. The timeliness and perfection of weeding directly determine crop yields, and labour availability for weeding largely decides the maximum size of the cultivated area (Fafchamps, 1993). The use of the Dutch hoe (Fr: *iler*), a long-handled weeding tool used standing in an upright position, for weeding the light sandy soils enables the cultivation of larger fields than if using an ordinary hoe (Raulin, 1967). Endurance, strength and skills are important for weeding performance. Women never participate in weeding millet. Instead they thin out the millet plants (3-4 days of work), thus releasing scarce male labour for weeding. Generally males do not contribute significantly to weeding until about the age of 13, but in some households and situations even small boys engage in this task. Male adolescents perform a substantial part of weeding work in the household (Table 2): they form a relatively large share of the village's population and their labour input per person is only slightly smaller than that of their elders. Men in their thirties are the most active in weeding. This reflects men's growing responsibility in farming as they become heads of their own households and the fathers of children not yet able to work. Later, when they move into their forties and their children grow into working age, men's burden of weeding declines.

Millet harvesting is done mostly by young and middle-aged men and often in reciprocal work groups (no accurate harvesting labour data exist). In contrast to weeding, harvesting may also be carried out by young teenagers and elderly men. This was the case during the era of widespread long-distance migration when young men left the village already at the end of weeding. A greater use of crop residues for animal fodder has increased labour requirements for harvesting. In the early 1970s the duration of the harvest (*yamde*) was thus extended by about two weeks when farmers started to harvest and store crop residues. More recently the collection and storing of grass for animal fodder have prolonged 'harvesting' well into the first part of the dry season (*dabuude*).

Manuring is the dominant type of labour investment in millet production undertaken by the Rimaybe. Manuring is critical to sustain yields on the sandy village fields which are permanently cultivated. The distant and more fertile bush fields are manured only by those farmers who have moved there to live (in which case they are no longer bush fields). Farmers believe that manure gives the field 'strength' and makes the soil more humid. Animal manure is often mixed with farm yard debris or crop residues before taken to the field. It is applied in heavy concentrations on the least fertile plots. The Rimaybe collect animal manure on the pastures around the village by head load or donkey cart. Manure is also applied directly to fields by penned animals. In the year 1996-97 Rimaybe farmers applied an average of *ca.* 1600 kg manure per hectare village field ($n = 11$ households encompassing 28 workers). To this figure must be added manure applied by penned and roaming animals. Manure collection is a low intensity work demanding patience and perseverance. It is done throughout the year but the most intensive periods are between the second weeding and the onset of the millet harvest, and again from the end of the harvest until the start of the hot season (*ceedu*). In these periods cow dung is more accessible and its collection least fatiguing. In the hot season when manure is most scarce farmers walk up to eight kilometres to collect it. Donkey carts are used in manure collection but only one-fifth of households owned one. Middle-aged and elderly heads of households collect the bulk of the manure applied to fields (Table 2). In contrast, junior household members very rarely collect manure. Labour investments in soil fertility by men aged 15 - 29 are thus very small in both relative and absolute terms. The performance and division of agricultural work among

the Rimaybe are closely related to men's rights, obligations and needs according to their domestic status and stage in life ('career'). We return to this discussion later. On the other hand, Rimaybe work patterns also reflect the area's agricultural history which has structured present-day agronomic requirements to household labour.

Off-farm work

Rimaybe off-farm employment encompasses mainly gold-mine work, long-distance migration, local and cross-border trading, and weeding for wealthier farmers on a daily basis (Table 3). Gold-mine work is by far the most important source of off-farm incomes for the Rimaybe in Petekole. Young gold-mine workers do piecework consisting of beating rocks to dust in iron mortars. This work yields a relatively high wage of between one-thousand and fifteen-hundred CFA francs per day. It is physically very hard and can cause health problems. Workers aged 25-30 and older prefer gold digging and the oldest work as watchmen in the mines. Gold digging involves working in unprotected and very deep mine-shafts. It is a skilful and hazardous task, and drugs are frequently used to suppress fear and increase performance. The time spent by the Rimaybe in gold-mine work is substantial: in 1996-97 two-thirds of households had at least one person working in the gold-mines where they spent on average three months. Gold-miners may also work during the cropping season due to the nearness of the mines (see Table 3). Trading is likely to be the second most important source of off-farm income

Table 3: Off-farm incomes earned by Rimaybe households in 1996-97¹ (income per household and number of persons undertaking the activity)

Type of Activity	FCFA ²	Percent	No. of persons
Gold-mine work	69,100	71	41
Migration	12,400	13	11
Weeding	2,700	3	16
Trading	na	na	9
Other	12,700	13	30
Total	96,900	100	113

¹ N = 33 households encompassing 89 workers. The period considered is the 12 months following the end of the harvest in 1996. Trading incomes are not included as they were only available for two households. There are three 'cross-border' traders (one of whom is a petty trader) and six local traders among the Rimaybe in Petekole. 'Other' off-farm activities refer to (in order of frequency): donkey-cart transport (12), weaving (7), charcoal burning (4), brick making (2), butchery (1), construction (2), gardening (1), begging food (1).
² 100 FCFA = 1 French franc.

Source: questionnaire and labour and income survey 1996-97.

for the village as a whole (precise income data are not available for this activity). There were two 'large' and seven 'petty' traders among 33 Rimaybe households. The importance of trading reflects the village's nearness to a town and an international border. Migration work is nowadays important only for a few households in Petekole and yielded very variable incomes; yet, in some villages in the region migration work is the most important off-farm activity. Restrained mobility prevents many men from mi-

Table 2: Rimaybe male labour input in weeding (unweighted days) and manure collection (kg), according to age¹

Age-group	Male persons in age-group ²	Weeding HH fields 1996	Weeding HH fields 1997	Weeding HH fields av. 96 & 97	Weeding HH fields av. 96 & 97	Weeding non-HH fields ³ 1996	Weeding non-HH fields ³ 1997	Manure collection 1996-97	Manure collection 1996-97
		days	days	%	days per person	days	days	kg (%)	kg per person
0 - 14	6	103	166	10	22	0	0	0 (0)	0
15 - 19	11	423	389	30	37	62	28	3,100 (4)	280
20 - 29	6	248	183	16	36	45	20	7,280 (10)	1,210
30 - 39	5	227	277	18	50	47	41	14,490 (19)	2,900
40 - 49	7	256	277	19	38	73	35	44,440 (58)	6,350
50 -	2	87	110	7	49	0	0	720 (9)	3,600
All	37	1344	1402	100	37	227	124	76,500 (100)	2,070

¹ N = 11 households ('HH'). ² The highest and lowest age-group include only the persons who were reported to be active in either activity.

³ 'Weeding non-HH fields' denotes paid and unpaid assistance given to other households.

Source: Labour and income survey 1996-97.

grating or working in the gold-mines, and only few have access to sufficient capital to engage in trading. Old age, disability, or poor health constrains others in their capacity to earn off-farm incomes. 'Local' activities (Weeding and Other in Table 3) are therefore particularly important to resource-poor individuals and households, although they are insignificant in aggregate income terms. Local activities yielded low returns compared with goldmining and trading. Farmers also earned cash through minor farm-based activities, notably by selling fattened small-stock and to a lesser extent crop residues and collected hay (not included in Table 3). Age and domestic status are decisive for the type and amount of off-farm work done by a person and so for his capacity to earn cash incomes. The age-composition of male workers in a household is therefore a key factor in its access to cash. Labour allocated to off-farm work was examined in terms of the age-groups listed in Table 4. These data reveal that male adolescents account for a very large share of Rimaybe off-farm work. Men aged 15-19 thus contributed with 29% of the days spent in major off-farm activities (migration, goldmining, weeding for cash) by all Rimaybe men in 1996-97, and with 43% of the days spent in the gold-mines. Seventy-two percent of the men in this age group worked in the gold-mines in

1996-97, each for three months on average. Men in age-group 20-24 spent the most time per person in goldmining (80% of men in the group), but because they are markedly fewer workers their total contribution to this activity was smaller than men in the younger age-group. Migration work is also important for this group but is concentrated on a few migrants. For the age-group 25-29 migration work is the most important activity, both in days and persons. Only two men in this age-group worked in the mines during the wet season, suggesting that they have a greater responsibility in weeding than do younger men. Goldmining dominates among men aged 30-39 but, like the 25-29 age-group, they worked little in the mines during the wet season due to their farm responsibilities. Only two persons in this age-group migrated. The many 'weeding for cash' days were performed by men in poor and single-worker households. The age-group 40-44 is dominated by heads of wealthy households. It includes all the cross-border traders, the most cattle-wealthy, and some of the most productive millet producers. All migration and gold-mine work were thus done by the two poorest farmers in this age-group. Men aged 45-49 have a high incidence of goldmining and weeding for cash (we include here the only off-farm-active man in age-group 50-54). This is possibly related to the

Table 4: Days spent in 1996-97 in major off-farm activities by Rimaybe men in different age-groups¹

Age-group (men)	Male persons in age-group	Gold-mine (dry season)	Gold-mine (wet season)	Gold-mine (all seasons)	Migration work	Weeding for cash	All activities	All activities percent	Gold-mine (all seasons) per person	Migration work per person	All activities per person
10-14	14	5	0	5	0	0	5	0	0	0	0.4
15-19	25 ²	1317	262	1579	0	10	1589	29	63.1	0	63.6
20-24	10	627	137	764	405	1	1170	21	76.4	41	117.0
25-29	10	187	27	214	1080	0	1294	22	21.4	108	129.4
30-34	9	384	31	415	120	16	551	10	46.1	13	61.2
35-39	3	150	13	163	0	21	184	3	54.3	0	61.3
40-44	8	150	20	170	120	2	292	5	21.3	15	36.5
45-49	7	314	80	394	0	63 ³	457	8	56.3	0	65.3
50-54	3	0	0	0	0	8	8	0	0	0	2.7
All	89	3134	570	3704	1725	121	5550	98 %	41.6 (av.)	19.4 (av.)	62.4 (av.)

¹ N = 89 male workers in 33 households. ² The 15-19 age-group in the sample/village includes an disproportional large share of the population compared to census¹ in the area using larger samples (see Hampshire & Randall 1995). The reason for this is not known. ³ 40 of the 63 days were performed by one, unmarried man. Source: labour and income survey 1996-97.

fact that a disproportionate large share of poor households is headed by men in this age-group. Elderly men who, moreover, are poor in agricultural resources are particularly disadvantaged. Many are thus compelled to secure food in the wet season by doing local off-farm work such as weeding, while only a few have better paid jobs as watchmen in the gold-mines. For example, a man aged 67, who had been abandoned by his only son, was the poorest farmer in the village. He relied on charcoal and fodder sale, and on alms and begging, to supplement the always deficient food production.

Living: work and career

The patterns of farm and off-farm work described above are related to the ways in which men's domestic and economic careers intersect at different stages in their life. As they grow older men's status changes and so do their rights and obligations to family and farm. We have seen how the formal responsibility for household food provision associated with seniority was expressed in practice by men's increasing work efforts in millet cultivation as they grew older and became heads of their own households. Conversely, with increasing age most men lessened their involvement in off-farm work as they became more occupied by farm and domestic responsibilities and, finally, by religious and political 'work'. However, the course that these careers take among the Rimaybe is not static (nor uniform) but intersects with historical changes in the farming system and economy, changes which structure agronomic labour requirements and the allocation of labour to off-farm activities.

Male adolescents in Fulani society in principle enjoy some leeway from collective obligations which can be attributed to their intermediate status between child and adult. At this stage in life men are difficult to control; they are socially 'dangerous' and are looked upon as irresponsible and 'wild' (Peters, 1983; Pinnock, 1997). Customs and norms as well as resources are therefore directed at controlling 'the transition of young men to social adulthood and thence to the exercise of authority over their labour' (Peters, 1983: 121). One means by which the Rimaybe seek to control men's passage to adulthood is to encourage marriage at an early age (*ca.* 20 years). Paradoxically, however, this practice also promotes an early division of the household - by accelerating procreation - and so the fragmentation of work units (Arnould, 1984). Society's

preoccupation with 'managing' the youth is also reflected in Rimaybe work patterns which show a systematic 'under-utilisation' of junior labour in local production, a phenomenon also known from other societies (Sahlins, 1972: 52; Lewis, 1981; Descola, 1994: 310). In principle, junior males' work obligations in agriculture are restricted to sowing and weeding. Sowing may be done in two or three days and weeding only involves about forty days of work annually. However, presently their labour inputs are somewhat higher as they frequently participate in harvesting and sometimes manuring. A similar lack of formal obligations can be observed with respect to juniors' off-farm work. In *fulfulde* a general term for off-farm work is *filioy jawdi*, the pursuit of wealth. The root of the term *filioy* (to search for) refers to the fact that the activity may not be related to a specific goal; that the youth may merely drift about, deviate from a straight course. The youth may thus undertake off-farm work for socio-cultural reasons of emancipation from elder authority and initiation into adulthood, and not only for economic gain (Bardem, 1993). Hence, when young migrants returned to Petekole, their family did not expect to receive more than small gifts of money or clothing. On the other hand, if a youth stayed away for too long, much time and money were invested by the family in bringing him back to the village so as to benefit from his 'capabilities' (*barke*). In recent years, however, the allowances enjoyed by the male youth in Petekole have been eroded by economic and ecological pressures. New demands are placed on agricultural labour by the effects of increased natural resource scarcity and reduced rainfall. Moreover, the change from long-distance migration to local gold-mining allows for a more time-efficient alternation between farm and off-farm work. (On the other hand, when young gold-mine workers returned temporarily to the village during the dry-season it was mainly to rest and not to engage in hard farm work.) In recent decades off-farm work in the dry-season has become almost compulsory for Rimaybe youth. In practice this group finances a large part of household food deficits which have worsened due to reduced rainfall. At the same time they must buy agricultural land, the prices of which have increased, and also livestock, to prepare their career as independent farmers. Likewise, young men have become increasingly responsible for their domestic careers; marriages are nowadays often financed through the youths' off-farm earnings, and not, as prescribed by custom, by the father or another elder. This reflects the elders' lack of

means (cattle and cash) and also a certain impatience on the part of the youth to establish his own family and gain higher status in society.

Socially imposed limits on labour utilisation (Descola, 1994) also concern Fulani men's right to retire from productive work when their sons become full adults (Riesman, 1977: 67). Yet, under the present economic and natural resource conditions manuring tends to become the responsibility of elderly men because juniors are occupied in off-farm employment. This mechanism prolongs the actual working life of the man well beyond the cultural ideal of when a man can retire. In this situation the low life-expectancy in the area (Hampshire & Randall, 1995) is a constraint to labour availability for manuring and related farm tasks.

Combining farming with off-farm employment while also managing the family and household is not an easy task, particularly under conditions of uncertainty and increased resource scarcity. Successful navigation through the different passages of life thus demands skilful social and economic management; planning but also performance - as in Richards' (1993) musical analogy.

Coping: work and uncertainty

A key characteristic of agriculture in the Sahel is the uncertainty and extreme variability in environmental conditions, in particular regarding rainfall. The performance of farming in the Sahel therefore depends on day-to-day adjustments of farm practices to the unfolding of circumstances within the cropping cycle, and also between years (Mortimore, 1989; Fafchamps, 1993; Scoones, 1996). The unpredictability of events in the cropping cycle means that 'it is in the interest of farmers to opt for flexible farming strategies, i.e. strategies that allow for the postponement of action until shocks have been observed' (Fafchamps, 1993: 1177). Below a reconstruction of the sequence of events during two agricultural seasons shows how farmers in Petekole responded to pressures on their labour resources induced by food scarcity by reallocating household labour, and by mobilising extra-household reciprocal and hired labour. The account reveals the centrality of economic diversification for agricultural performance and survival. It also suggests that small households are less flexible and efficient in the way they cope with situations of labour scarcity and food shortage.

The 1996 and 1997 seasons were quite different regard-

ing both labour availability and work patterns. In both years each worker spent on average 40 days in weeding but the timing and social distribution of labour inputs differed markedly. Food availability and rainfall patterns were main factors. The 1996 rainy season was delayed and short. Farm work was marked by repeated sowing, caused by recurrent dry-spells, followed by a great time pressure in weeding (overlapping first and second weeding) due to contracted and intense rains. The period of weeding lasted on average 63 days. This rainfall pattern also meant a very uneven maturing of crops and so a prolonged harvest. The poor rains meant that grain production was well below average levels. This prompted farmers to increase their efforts in off-farm work in the following dry season thus using less time in manuring. In 1997 the cropping season started two months earlier than the year before. There was only one main sowing due to the stable rains. Prolonged and high levels of rainfall stimulated weed growth, especially in the latter part of the growing period; yet a dry spell in mid-season alleviated the time pressure in weeding. The weeding period lasted 90 days on average. Harvesting was contracted and demanded intensive labour inputs, also because of very high yields. Most households experienced severe food shortages because of a poor harvest in 1996, and because early rains reduced the time available for dry season off-farm work. Food scarcity meant increased pressure on household labour resources because of the need to earn cash. In a few cases food scarcity also resulted in under-consumption and a reduced physical ability to work. In 1997 young men's (aged 15 - 29) total labour input into weeding was 20% lower than in 1996 as a result of the time they spent in the gold-mines (Table 2). For many households, sending a junior member to the gold-mines was an effective means to generate the large amount of cash needed to cover their food deficit. This strategy involved exploiting the slack periods within the cropping season; the incidence of gold-mine work was thus highest at the time of sowing and between the completion of the first weeding and the onset of the main harvest.

Interviews revealed that most households were able to accomplish both the first and second weeding in 1997, despite vigorous weed growth and the absence of junior workers in the mines. The village as a whole was therefore able to benefit from the opportunity offered by the abundant rains. This 'success' was partly a result of various strategies employed to alleviate the effects of reduced

farm-labour availability. One type of response was to increase the working hours of those men remaining in the village (not quantified), and to mobilise the 'marginal' labour of children and elders for weeding (Table 2). Second, there was a 43% decrease in the weeding assistance given to other households compared with 1996 (Table 2). Nevertheless, labour assistance to households in acute need (*faaba*) was upheld despite the general pressure on labour resources. A third type of response to household labour shortage was hiring labour for weeding and to a lesser extent harvesting. Wealthy households thus hired more labour than usual as a response to vigorous weed growth and the decline in unpaid assistance. Part of this labour was supplied by 'client' cousins and nephews who in other years would work for their wealthier agnates without remuneration. In one case a farmer hired his brother and cousins and paid with the cash earned by his son in the gold-mine, so that elders found themselves being indirectly employed by their junior kin.

The different responses to stress just described reveal the 'slack' or flexibility of the production system regarding the mobilisation of labour resources. This flexibility can partly be attributed to a conservative sowing strategy (Fafchamps, 1993: 1174), and partly to a high labour-supply elasticity (*ibid.*). Flexibility in labour supply was achieved by established institutions, such as *faaba*, and by more innovative methods of labour recruitment, such as wage labour and patronage. Both forms of labour mobilisation enhanced the ability to cope with an uncertain food supply but they benefited two extremes of the economic spectrum. And while *faaba* is based on a principle of group solidarity, wage labour and clientilism involve an emerging commercialisation and individualisation of agricultural work based on cash transfers from other livelihood activities.

The study also showed that not all households in Petekole coped equally well with food insecurity. Household size, i.e. labour availability, turned out to be a key factor influencing the ability to respond to this source of uncertainty (Toulmin, 1992: 255-7). The average size of Rimaybe households was 8,5 persons. Seventy percent of households were 'simple' households consisting of a man and his unmarried son(s) or nephew(s), while 30% were 'complex' fraternal or paternal households. The small household-size among the Rimaybe has a complex history, including an adherence to the Fulbe ideology of independence (Riesman, 1977), the weakness of Rimaybe lineages related to their lack of control over land, and nearly

a century of migration work, taxation and other forces which tend to disintegrate large corporate units (Goddard, 1973; Lewis, 1981; Marchal, 1987). Confirming the importance of such broader forces, records of recent household divisions in Petekole show that household 'viability', in the form of a secure and sufficient access to farm labour, was not a sufficient reason to remain together in a large household. Most men thus became independent producers while they still had small children not yet able to work on the farm. The analysis of work in 1997 showed that the individualisation of work and livelihood among the Rimaybe has a cost. Small households were clearly disadvantaged as to a flexible and remunerative use of labour, particularly in situations of food shortage. This disadvantage arose from reduced mobility inhibiting economic diversification due to the need for a constant presence in both farm and family. Farmers in single-worker households could therefore not undertake the high-paid work offered by the gold-mine but engaged instead in village-based activities. Only a minority of the small households had sufficient capital to hire labour or otherwise deal with the effects of food shortage and many therefore sold out of their assets. In one extreme case land was sold to cover food needs, in another food was begged from relatives and friends. Because of their reduced mobility, many small households opted for a farm-biased livelihood strategy involving large work efforts in manuring. They thus achieved relatively high average levels of food self-sufficiency precisely because their absolute shortage of labour impeded economic diversification. Yet, as we have seen, such a strategy is risky and associated with low incomes in this area where rainfall levels are low and uncertain and crop production is below subsistence needs.

Conclusion

In this article we have examined the ways in which the Fulani Rimaybe earn incomes and manage natural resources, that is, how they interact with nature and with the wider political economy. Through the analysis of work as a social practice we have shown that Rimaybe agricultural and off-farm strategies reflect both 'objective' resource constraints and also 'cultural constructions' of nature and social identity. In other words, their material and social life are intrinsically and dynamically linked. So, to understand how the Rimaybe and other small-holders manage their land and labour resources, we as observers must also straddle

dle this divide between the natural and the social and not limit our analysis to a single scientific perspective.

Labour is a critical factor of agricultural production among the Rimaybe. Time is always felt as a constraint, and labour allocation decisions often involve important tradeoffs between economic possibilities. Labour allocation analysis showed that the Rimaybe have a pragmatic attitude to both millet cultivation and livestock husbandry in that the most able-bodied workers in practice spent little time in these activities. Rimaybe 'part-time' agriculture was associated with their historical emphasis on off-farm work. This division of work effort is a common and rational strategy in the Sahel where the agricultural season is short and production levels are uncertain. The advantage and necessity of economic diversification have been accentuated by increased land scarcity and worsened rainfall conditions (since 1970). Decreased natural resource availability has also meant a need to increase labour inputs into farming and herding to maintain output. The Rimaybe in Petekole have intensified their use of labour in both on-farm and off-farm activities and so prevented an ecological and economic breakdown. Farm practices directed at a closer integration of crops and livestock have been essential, as has the commitment to goldmining. We have also seen how Rimaybe households cope with variability and scarcity in the short term. Through economic diversification and a flexible mobilisation of labour resources - drawing on a variety of social relationships - most Rimaybe households succeeded in coping with food shortage without seriously jeopardizing production. Their experience illustrates that keeping up production and livelihood in the Sahel is indeed a skilled social accomplishment, a performance. However, this is not to say that poverty and vulnerability do not prevail in the Sahel. The discussion of household size suggests that important differences exist in the ability to cope with adversity. An emphasis on household wealth would give a similar picture of inequality in performance and income level (Bolwig, forthcoming).

A key message in this paper is that work is inherently social, and that labour therefore cannot be reduced to a physical resource which is mechanically deployed in response to changes in farming system and economy. The allocation by the Rimaybe of labour and other resources is mediated by culture and identity. We have focussed on two types of social relationship or sources of identity. At the regional level, the historical relation to the Fulbe is central to Rimaybe strategies. The indeterminate or 'weak' iden-

tity of the Rimaybe originating in their slave status has turned out to be an economic asset in the sense that it allows them greater scope for economic and agricultural diversification, adaptation and flexibility. In contrast, many Fulbe have stuck to a strong identity which appears to be out of touch with present political and economic realities and thus hinders their economic betterment (Bolwig & Paarup-Laursen, forthcoming).

At the domestic level, age and family status are key factors determining Rimaybe men's rights, obligations and needs, and so their use of labour time. The low returns to millet production in the Sahel have led some authors to suggest that young men's work efforts in agriculture reflect society's need to control this segment of the population, more than they are a rational use of resources (Lewis, 1981; Raynaut, 1997). In other words, millet cultivation serves organisational purposes as well as economic ones. The Rimaybe youth exhibit a conspicuous discrepancy between their commitment to weeding and their disinterest in manuring and other farm tasks. This is a compromise between social and economic considerations. First, labour availability for weeding is the most limiting factor in millet production, while the lack of effort in manuring has 'only' partial and long-term consequences. Second, male youth enjoy some freedom from obligation because they are in a social position where they are easily lost to the community, especially in the Sahel where external labour markets offer attractive incomes compared with farming. At the same time, however, their participation in weeding is a clear moral obligation and ensures their regular return to the village. Third, young men's engagement in off-farm work is decisive for their future farming career due to the need for cash investments in land and livestock. Off-farm incomes also relieve elders from economic obligations in the household, and are the key to household economic viability - particularly in securing an adequate food supply. In a historical perspective, the participation of Rimaybe youth in the wider economy has been a major factor in the weakening of elder authority and the fragmentation of work units. Rimaybe youths' off-farm incomes have also been an important means by which the Rimaybe as a group have enhanced their status vis-à-vis the Fulbe, notably by enabling land purchases from Fulbe landlords. New forms of socio-economic inequality produced by economic capability and market participation have thus emerged and intersect with old divisions based on socio-political status in the family and regional political economy.

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