**The
Use and
Perception of
Mobility among
Senegalese Fulani:
New Approaches
to Pastoral Mobility**

Hanne Kirstine Adriansen

IIS/Gl. Kongevej Working Paper

03.1

February 2003

IIS Working Paper 03.1

IIS/Gl. Kongevej Working Paper is a continuation of the CDR Working Paper Series, which ceased to exist on January 1, 2003, with the merger of CDR to IIS.

© The author and Institute for International Studies, 2003

Published and distributed by IIS/Gl. Kongevej

Printed in Denmark by Institute for International Studies (IIS)

ISBN 87-90681-79-7

Keywords:

Mobility

Nomadism

Pastoralism

Resources management

Ferlo

Senegal

IIS/Gl. Kongevej Working Papers, green series, contain discussion and seminar papers, reports and working papers with important documentation which is not necessarily published elsewhere. The series disseminates results and reflections from on-going research work and a primary objective is to rapidly make available such materials even if the presentation may be less than fully polished.

Working Papers are available on an exchange basis and individual titles are supplied free of charge

Contents

Abstract	1
1. Introduction	1
2. Pastoral mobility within the new rangeland paradigm	2
2.1 Main arguments of the ‘mobility paradigm’	3
2.2 A critique of the ‘mobility paradigm’	5
3. Introduction to the study area and fieldwork	7
4. The use of mobility in Ferlo	9
4.1 Types of mobility	11
4.2 Herding	13
4.3 Relations and conflicts	14
4.4 Perceptions of mobility	15
4.5 Mobility and cultural construction of identity	16
4.6 The shaping of space into place	17
4.7 Sum up of the case study	18
5. The ‘mobility complex’	19
5.1 Mobility and the dryland environment	20
5.2 The influence of tenure on mobility	20
5.3 Types of mobility	21
5.4 Labour input and mobility	21
5.5 Perceptions of mobility	22
5.6 Mobility and the cultural construction of identity	22
5.7 The shaping of space into place	23
5.8 The influence of commercialisation on mobility	23
5.9 Quantitative and spatial assessments of mobility	24
5.10 Sum up of the mobility complex	25
6. Conclusion	25
References	27

Abstract

According to the ‘new rangeland paradigm’, which developed in the early 1990s, pastoral mobility is a flexible strategy that balances the variability in natural resources. Today this view is widely acknowledged. However, in order to understand future dynamics of the pastoral way of life, the pastoralists’ own perceptions of mobility need to be understood. Furthermore, pastoral mobility should be studied in the broader context of livelihood strategies. The purpose of this paper is to provide a more comprehensive understanding of pastoral mobility than the one offered by the ‘new rangeland paradigm’. The empirical point of departure is a case study of Fulani pastoralists of northern Senegal. On the basis of this study, analytical entry points for discussing mobility in a broader context are outlined. These seven points are: types of mobility, labour input and mobility, perceptions of mobility, mobility and the cultural construction of identity, the shaping of space into place, the influence of commercialisation on mobility, and quantitative and spatial assessments of mobility. In combination with aspects of the ‘new rangeland paradigm’ these form the ‘mobility complex’, which is suggested as an analytical tool for studying pastoral mobility.

1. Introduction

Recently, pastoral mobility in Africa has been discussed as part of the ‘new rangeland paradigm’ for dryland ecosystems and pastoral production systems¹. Within this paradigm, mobility is perceived as ecologically rational in an environment characterised by high variability of natural resources (Niamir-Fuller 1998; Thébaud & Batterbury 2001). While the positive perception of mobility is new among researchers of drylands, this is not a new line of thought among anthropologists studying pastoralists (e.g. Dyson-Hudson & Dyson-Hudson 1980; Stenning 1957). Today, the positive view of pastoral mobility has become a hegemonic discourse. This paper is an attempt to deconstruct this discourse and provide a critical approach to the study of pastoral mobility.

The theoretical point of departure for the paper is the ‘new rangeland paradigm’ and especially its view on pastoral mobility called the ‘mobility paradigm’. Within the ‘new rangeland paradigm’, the point of departure is the environment. In this paper, however, the perspective is changed and pastoralists’ ‘construction of reality’ is the point of departure. Aspects such as motives, values and preferences are included in order to understand how and why pastoralists use mobility today. Based on the pastoralists’ perception and use of mobility, dynamics of pastoral mobility are analysed and it is discussed how this may change in the future. As explained by Milton (1997), the focus on people’s own views and understanding began in the 1960s, when researchers, mainly

¹ The ‘new rangeland paradigm’ first emerged in the late 1980s. It has been discussed in a number of papers; some concern dryland ecosystem functioning only, but most include aspects of pastoral management (e.g. Ellis & Swift 1988, Warren 1995, Westoby et al. 1989).

anthropologists, ‘became increasingly interested in understanding people’s own perceptions and interpretations of the world... because they form the appropriate context in which to analyse people’s actions and decision-making process’ (1997: 484). The pastoralists’ perspectives should be included in research and development processes in order to understand (future) dynamics of the pastoral way of life and their natural resource management. Consequently, with this paper I want to go beyond the somewhat rigid understanding of pastoral mobility that occurs in the literature, and provide a more complex view: ‘the pastoral mobility complex’.

The empirical basis of the paper is a case study from the Ferlo, which is the pastoral region of Senegal. Ferlo can be said to house an ‘extreme’ version of the Sahelian pastoral way of life. By extreme I mean a pastoral way of life that is not subsistence-oriented, where the choice of livestock is influenced by market opportunities, and where pastoralists become increasingly more commercial. The increased commercialisation has led to a marked improvement in pastoral incomes (Touré 1988). Further, the pastoralists of Ferlo have been exposed to a number of development projects and they have adopted new technology, e.g. the tube (Juul 1999).

The paper is divided into three main sections. First, mobility is analysed within the context of the ‘new rangeland paradigm’ and shortcomings of the so-called ‘mobility paradigm’ are pointed out. The second section concerns the case study of the use of mobility based on a more complex approach. After an introduction to the study area and fieldwork, the use of mobility among the pastoralists of Ferlo is analysed. In the third section, the ‘mobility complex’ is outlined. Based on the ‘new rangeland paradigm’ and the case study from Senegal, aspects of importance for understanding pastoral mobility are identified and these constitute the ‘mobility complex’.

2. Pastoral mobility within the new rangeland paradigm

The ‘new rangeland paradigm’ has been thoroughly analysed in the three books *Range ecology at disequilibrium*², *Living with uncertainty*³, and *Managing mobility in African rangelands*⁴. While the first book mainly concerns the ecological aspects of dryland ecosystems, the second one elaborates on management implications for pastoral production systems, and the last one emphasises one aspect of pastoral systems, namely mobility. The first two of these books have been, and probably still are, of major significance for research and development in (African) drylands.

The third book on pastoral mobility (*Managing mobility in African rangelands*) is quite new and its implications are still to be seen. In this book, the so-called ‘mobility paradigm’ is developed. It

² Behnke, R.H.; Scoones, I. & Kerven, C. (eds.) 1993 *Range ecology at disequilibrium: new models of natural variability and pastoral adaptation in African savannas*.

³ Scoones, I. (ed.) 1995a *Living with uncertainty: new directions in pastoral developments in Africa*.

⁴ Niamir-Fuller, M. (ed.) 1999a *Managing mobility in African rangelands: the legitimization of transhumance*.

is an attempt to provide a framework for understanding pastoral mobility based on the findings of the ‘new rangeland paradigm’ and to examine the various aspects of mobility. However, I find there are shortcomings of the ‘mobility paradigm’. This section is devoted to a discussion of these shortcomings and how they can be dealt with. The point of departure is the ‘new rangeland paradigm’, with which the reader is expected to be familiar. It should be noted that some of the issues raised here are valid for the ‘new rangeland paradigm’ in general.

2.1 Main arguments of the ‘mobility paradigm’

The ‘mobility paradigm’ is discussed in the book by Niamir-Fuller (1999a). In the second chapter of the book, Niamir-Fuller and Turner (1999) develop an integrated analytical framework that should act as a checklist for understanding pastoral mobility. The authors have the sympathetic aim to ensure appropriate measures that can ‘allow self-evolution of pastoralism towards an economically, socially and environmentally sustainable livelihood system’ (1999: 31). They find the following four aspects salient for understanding mobility: the **resource base**, the **resource users**, their **adaptive strategies**, and their **common property regimes** (Niamir-Fuller & Turner 1999: 32-45). For each aspect, key words are mentioned. These will be discussed briefly in the following.

The key words for **the resource base** are high variability and uncertainty, non-equilibrium theory, ecological resilience, and socio-ecological pasture units. Hence, these are the elements of the ‘new rangeland paradigm’. I acknowledge this understanding of dryland environments and will not discuss rangeland ecology *per se*.

The key words for **the resource users** are heterogeneity, indigenous technical knowledge system, social capital, reciprocity, interdependence, and political alliance. Of these words, social capital is the most interesting one. The contemporary usage of and debate on social capital is inspired by Bourdieu (1993), Coleman (1988), and Putnam (1993). These social science researchers have all used the concept within a western context. Although their conceptualisations vary, the term is used to denote the aspects of social structure and relations that provide actors with resources they can use to achieve their interests. Further, social capital can usually be converted into economic capital through certain mechanisms (Winter 2000). However, Niamir-Fuller and Turner use social capital similarly to the term ‘culture’ to denote ‘shared norms...cultural and religious mores and values... knowledge systems... conflict-management mechanisms’ (1999: 35). It is left to the reader to imagine how social capital is ‘built’ and ‘lost’, and how it functions in the interaction between people and relates to individual behaviour. Consequently, it suffers from the same flaws as the term ‘culture’ as pointed out by Barth (1995). This means that behaviour is removed from its context and is no longer interpreted as interaction between persons. Further, the usage of the term social capital suffers from the problem of generalisation, which the authors explain very well: ‘Normal science has a propensity for aggregation, which then washes over important differences that determine the socio-political dynamics of any society’ (Niamir-Fuller & Turner

1999: 34). Unfortunately, the authors point this out without pursuing the consequences of their argument, neither in relation to social capital nor in the wider debate on resource users.

Adaptive strategies of the resource users concern the types of mobility as well as the decision-making and management aspects of mobility. The key words include: opportunistic mobility, tracking, micro-mobility, macro-mobility, negotiation, indigenous communication, and safety nets. Besides the increasingly trivial rejection of carrying capacity and sedentary ranching, the authors point to the importance of micro-mobility; an aspect that is often overlooked. In continuation of this, it is important to distinguish between mobility of humans and livestock. This aspect is pointed at in the first chapter of the book, where the editor mentions that ‘livestock movements can be considered separately from movements by humans’ (Niamir-Fuller 1999b: 1) and elaborated in the conclusion. Concerning the key words, I want to question the emphasis on safety nets and risk spreading. Several papers have shown that with increased commercialisation, there is a tendency for these mechanisms to disappear (Batterbury & Warren 2001; Sutter 1987; Swallow 1994). Further, the notion of pastoral strategies as risk spreading has been questioned and ‘high reliability’ suggested as an alternative framework for understanding pastoral strategies (Roe et al. 1998).

Finally, **common property regimes** have these key words: common-pool resources, nested property, fluid boundaries, inclusive rights, transboundary resources, informal institutions, co-management, conflict management, and popular enforcement. This is the most extensive section, where each key word is discussed at length. When reading the individual papers in the volume, this makes sense as most of the papers concern tenure regimes and management in some way. The section relates to the ‘classic’ discussion of ‘the tragedy of the commons’ (Hardin 1968) as well as to the concern for institutional issues seen in environmental research in the mid-1990s (Rhoades 1989). Although it is important to create tenure regimes and institutions that accommodate a sustainable development, this discussion would benefit from including the perspective of the pastoralists themselves, which will be elaborated later.

The idea of making a ‘checklist’ is inspiring and I will return to the concept after discussing my empirical findings. It is evident, however, that I do not agree with this checklist. Especially the aspects ‘the resource users’ and ‘their adaptive strategies’ seem rudimentary or at least incomplete. The accounts leave out the dynamics of the pastoral livelihood strategies. For instance, there is not much room for discussing the influence of commercialisation. This word does not occur in the text, neither under the heading of the resource users or under the adaptive strategies. Still, as pointed out by Swift (2000), commercialisation may well be of outmost importance for future pastoralists.

To sum up, the ‘mobility paradigm’ is useful as it provides us with an understanding of pastoral mobility from the perspective of range ecology. Further, it attempts a more complex under-

standing of mobility than usually seen, although not complex enough. It highlights aspects of importance for ensuring mobility in dryland environments.

2.2 A critique of the ‘mobility paradigm’

The ‘mobility paradigm’ is part of the ‘new rangeland paradigm’, which has provided a new understanding of the dynamics of dryland environments. The debate and research following the first papers on disequilibrium environments point out how to achieve resource management that takes the highly variable and unpredictable character of drylands into account. Consequently, concepts such as degradation and desertification have been reinterpreted and it has been shown that ‘sustainable resource management’ is far from equivocal. The ‘new rangeland paradigm’ has also instigated a reinterpretation of pastoralists’ resource use and management, institutions and tenure regimes. When analysed in the light of disequilibrium ecology, management practice, institutions, etc. that previously have been characterised as destructive, are now seen as ecologically rational.

While I appreciate the new understanding of ecological dynamics in drylands, I find the reinterpretation of pastoralist practice inadequate and argue that pastoralist behaviour should be understood outside the context of the ‘new rangeland paradigm’. Hence, the point of departure for studying pastoralists should be their ‘construction of reality’ and include aspects such as motives, values and preferences for understanding e.g. management practice. Consequently, I have some reservations concerning the ‘mobility paradigm’. These reservations also apply to other studies that use the framework of dryland dynamics for understanding pastoralists’ behaviour.

The objections to the ‘mobility paradigm’ are twofold; they concern the ‘ethno-centric’ and the ‘eco-centric’ or environmentalist⁵ perspectives on which it is based.

The ethno-centric approach can be illustrated by the definition of ‘a pastoralist’ used by Niamir-Fuller: ‘The term ‘pastoralist’ is defined as a mode of production where livestock make up 50 per cent or more of the economic portfolio of a small holder’ (1999b: 1). Not only does it seem strange to define ‘a person’ as ‘a mode of production’, but I have not found this definition operational for my own fieldwork. Furthermore, it is doubtful that it would make sense to most pastoralists as it is based on Western concepts and ‘construction of reality’. This ethno-centric perspective means that we run the risk of misinterpreting (using chaotic conceptualisations (Sayer 1998)) when we try to understand the pastoralists’ actions, practice, motives, values, and culture without taking their ‘construction of reality’ as the point of departure.

In this paper, a constructionist approach has been used for defining concepts. A ‘pastoralist’ is understood as someone who defines himself (or herself) as being a pastoralist. According to the

⁵ The perception of environmentalism is based on Milton (1996).

local perceptions in Ferlo, a pastoralist is somebody who owns and breeds animals. Hence, a pastoralist cannot be measured by the amount of time spent on livestock breeding, or the percentage of the income or nutrition coming from animals. Further, the pastoralists in Ferlo explain that for the ethnic group Fulani, to which they belong, cattle are the most important animals⁶.

Further, the term ‘the pastoral way of life’ is preferred to ‘pastoralism’ because ‘isms’ can have essentialist connotations not giving way to a perception of pastoral societies as dynamic and in constant interchange with the surrounding societies. Subsequently, ‘the pastoral way of life’ is understood as a way of living that includes animal breeding, and where animals usually constitute an important part of the pastoral identity.

My second major objection is of a similar nature. It concerns the eco-centric or environmentalist approach. A thorough understanding of dryland functioning forms the basis of the ‘new rangeland paradigm’; unfortunately, the environment remains the point of departure when the analysis concerns the pastoralists and their use of mobility. In some ways this could be considered an ethnocentric approach. After all, concepts such as ‘environment’ and ‘ecosystem’ are social constructions from a western (ecology) discourse. However, the emphasis on ‘environment’ can be seen as part of the wider discussion of ‘environmentalism’. According to Milton (1996), there is a belief of ‘primitive ecological wisdom’ within the environmentalist discourse. This means that non-industrial people, including pastoralists, supposedly have an environmental understanding that renders them capable of living in a fine adaptation to the environment. Milton explains that this notion of ‘primitive ecological wisdom’ is not true: ‘Some of them may live their lives in ways that are environmentally sound, but ecological balance, where it exists, is an incidental consequence of human activities and other factors, rather than being an ideal or a goal that is actively pursued’ (Milton 1996: 113)⁷. Still, it is important to acknowledge the local knowledge, which pastoralists have accumulated over generations. This knowledge is built on a conceptualisation that is unlikely to correspond with ours, e.g. how is ‘nature’ perceived? Can humans affect ‘nature’ by employing a certain practice? Hence, the key to understanding the local knowledge is to deconstruct the pastoralists’ worldview. When discussing resource management, the cultural construction of ‘nature’ is very important.

An example is pastoralist behaviour in case of drought. In an arid, highly variable and unpredictable environment, a large number of animals cannot be sustained on a permanent basis. In case of drought, livestock can be moved out of the drought prone area either through mobility (people move with their herd) or through destocking (sale of stock); or livestock can be maintained in the area by fodder. According to the ‘new rangeland paradigm’, the best response is mobility. This has been the response of pastoralists. They are attributed a ‘primitive ecological wisdom’ because they behave in a way that is ecologically rational according to the contemporary understanding of

⁶ Eickelman (1989) has also employed an understanding of ethnicity as people’s own characteristics of themselves on the basis of language, race, place of origin, shared culture, values, etc. Further, Zaal (1999) has pointed to the relevance of using pastoralists’ self-definition as a way of defining pastoral communities (1999: 23).

⁷ This quote does not relate to pastoralists in particular, but to ‘non-industrial people’ in general.

dryland functioning. However, this behaviour may not be the preference of all pastoralists. With increased commercialisation, import of fodder becomes an attractive possibility while mobility is considered a burden – at least among the pastoralists of Ferlo, as will be illustrated later.

It is important to distinguish between the practice of pastoralists and the underlying motives and ideas. Previously, pastoralists have been accused of having a ‘cattle complex’⁸, i.e. an irrational attachment to cattle demonstrated by their desire for acquiring large herds. Within the ‘new rangeland paradigm’, this desire for high stocking number is explained as opportunistic management and considered an adaptive strategy in dryland environments. The large number of livestock means that pastoralists can make the most of natural resources in good years (Niamir-Fuller 1998) or create high reliability systems (Roe et al. 1998). In disequilibrium environments, a high stocking density will not cause overgrazing because droughts and diseases occur frequently, thus ensuring that the system is regulated in a density independent manner (Scoones 1993). Even though pastoralists have developed opportunistic management, this may not imply that they acknowledge opportunistic management as optimal. The death of livestock caused by drought and diseases is a fact built into the life experience of the pastoralists. However, this does not mean that they will not try to avoid these deaths. In relation to people’s experience of famine and life-threatening challenges, Davis explains that these are ‘things which may be part of life but which they wish did not occur (Davis 1992: 150). Hence, pastoralists have developed opportunistic management to survive in drought prone areas, not to accommodate the pasture.

To sum up, with the ‘new rangeland paradigm’ a comprehensive understanding of drylands has been provided, but this cannot be used to understand pastoralist behaviour. The ‘mobility paradigm’ argues that pastoral mobility should be ensured. However, the arguments are not based on the voices of African pastoralists, but on the ‘needs of nature’. Further pastoralists’ actions and mobility practice are explained using our understanding of drylands and not their own explanations or conceptualisations of ‘nature’. In this way the ethno- and eco-centric approaches intermingle. Finally, the absence of pastoralist perspectives means that the importance of mobility for the wider social and cultural life is left unsolved. For instance, how does the importance of mobility manifest itself in the cultural construction of identity? This and similar issues are discussed in the following.

3. Introduction to the study area and fieldwork

The empirical basis of this paper is a study of Fulani pastoralists in the Ferlo region of Senegal. Before the establishment of boreholes in the 1950s, the rangelands of Ferlo were utilised as a pastoral area due to the low and variable precipitation and lack of permanent water supplies,

⁸ Herskovits (1926) originally described the ‘cattle complex’. This denotes the ‘cultural area’ of East Africa where the importance of cattle shapes the everyday life of people. However, the concept has been abused and has come to represent an ‘irrational attachment’ to cattle (e.g. Barfield 1993).

which made cultivation and permanent settlement difficult. In the rainy season, when pasture in the area was abundant, Ferlo served as a grazing reserve for mobile pastoralists pursuing large-scale migrations. As temporary water holes (ponds) dried out during the dry season, pastoralists moved north to the Senegalese River valley or south and west to the so-called peanut basin (Weicker 1993). In the 1950s, the French colonial administration made the first boreholes in Ferlo, which meant that the area could be used on a permanent basis. The possibility of staying in the area during the dry season meant that pastoralists became semi-sedentary (Ba 1986). Rainfed agriculture was taken up, especially in the southern part of the area, and more boreholes were established (Touré 1990). Villages have grown around the boreholes. However, the pastoralists live in the bush where they have permanent rainy season camps. During the dry season, they may go on transhumance in search of pasture and water. Recently, parts of Ferlo have been divided into resource management units following the boreholes; these are called pastoral units (*unité pastorales*). While the use of water from ponds is free, a payment is charged for water from boreholes (Alissoutin 1997). The price is decided at meetings in the pastoral units.

Before the drought in 1973, the majority of the pastoralists were subsistence-oriented relying on a combination of herding and rainfed agriculture. The herd mainly consisted of milking cattle, and a few sheep and goats (Sutter 1987). The drought years in the mid-1970s and mid-1980s profoundly influenced the livelihood strategies of the pastoralists. Moreover, since the 1970s, the desiccation of the climate, which is a problem all over the Sahel (Agnew & Chappel 1999; Hulme 2001), has also stricken Ferlo (Equipe ECOSSEN 1997) and many pastoralists do not find cultivation worthwhile anymore. This has also redirected the strategies towards more livestock rearing, especially with a greater reliance on sheep and an increased commercialisation. Evidently, this also changed the use of mobility.

Fieldwork was carried out in five pastoral units with the main emphasis on Tessekre in the middle of Ferlo, which has been characterised as the '*zone pastorale par excellence*'. Tessekre was visited on several occasions from October 1997 to April 2000. The village of Tessekre is located around a borehole established in 1954. In 1997, two secondary water outlets, called antennas, were made. In the pastoral unit of Tessekre, the majority of the inhabitants are Fulani (92 per cent); the rest are Wolof (5 per cent) and Moor (3 per cent). The people living in the village itself are Moor and Wolof; they are merchants and some have animals as well. Some of the Fulani have shops and houses in the village even though they live in the bush. The fieldwork was based on the Fulani pastoralists living in the bush.

Besides interviews with key persons of the area and questionnaire interviews with all Fulani households present at the time⁹, nine pastoralists were selected to participate in a GPS study for the purpose of studying mobility in practice. The local administrator chose the nine pastoralists based on two criteria. First, they should be living in different parts of the pastoral unit, with

⁹ A total of 62 Fulani heads (*jomoro*) of households (*galle*) were interviewed using a structured questionnaire with a combination of qualitative and quantitative, open-ended questions.

varying distance to the borehole. Second, the pastoralists should be interested in and capable of learning how to use a GPS. Besides the GPS measurements, which went on for a year, I made participatory herding and spent time at the camps. Further, qualitative, in-depth interviews were made based upon the construction of a life history¹⁰. The interviews were quite different, but they all evolved around issues related to livelihood strategies in general and mobility in particular.

Further, participatory observations were made in the village of Tessekre; I was often at the borehole or sitting outside the shops chatting. The participatory observations provided insight into the socio-cultural fabric of daily life in the village and the camps.

4. The use of mobility in Ferlo

The purpose of the fieldwork in Ferlo was not only to study mobility, but also to understand the use of mobility in the wider context of livelihood strategies. For this purpose, a number of other data collection methods were used. This has been described in Adriansen 2002, in which four ‘ideal types’ of livelihood strategies are developed. The strategies are called ideal types because they are ‘pure’ types and cannot be transferred directly from the interviews or questionnaires; i.e. the types are constructions and not empirical categories. Further, it should be noted that the ideal types are described as ‘individuals’, but all pastoralists are members of a household and their actions should be interpreted within this context. The four ideal types form the basis for understanding the use of mobility under increased commercialisation, because the differences in mobility practice appear to be related to the livelihood strategy. Therefore, the strategies are briefly introduced in the following. The four types are ‘the subsistence pastoralist’, ‘the Tabaski pastoralist’, ‘the commercial pastoralist’, and finally ‘the non-herding pastoralist’:

The subsistence pastoralist has a mixed herd and cultivates. The production is mainly for subsistence and based on risk spreading. A subsistence pastoralist is not involved in livestock trade unless it becomes necessary for buying e.g. millet or clothes. The older generation herds the cattle all year, while the younger lets the cattle roam freely and rest instead. The children herd the small ruminants and this is not a labour-intensive activity. Finally, the use of mobility is limited and transhumance is caused by push effects i.e. lack of water or pasture.

The Tabaski pastoralist does not cultivate. He has specialised in sheep production for the Tabaski¹¹. The most important thing is to find the right pasture for the Tabaski sheep. Therefore,

¹⁰ Please refer to Mikkelsen 1995 for further discussion of the use of life histories.

¹¹ Tabaski is the Senegalese word for the Muslim feast called *id-al-adha* in Arabic. It is the tenth day of the Muslim pilgrimage month, *dju-l-hijja*. *Id-al-adha* is a sacrificial feast in remembrance of Ibrahim, who was told by God to sacrifice his son (Qur’ân, sura 37, 103-108). This day Muslims bring an offering, usually a sheep. Both pilgrims in Mecca and Muslims ‘at home’ celebrate *id-al-adha*. This means that the demand for rams all over Muslim Africa and the Middle East is high at this time of the year. Consequently, Tabaski sheep are raised for commercial purposes and sold just before the Tabaski. They are fed well so they can earn a good price at the right time. In this respect, the

he is willing to walk as far as to Gambia with them or pay a herder to do the job. Herding of the sheep is the job of adults even when they stay within the pastoral unit. Cattle are part of the strategy, but they are not herded and only taken on transhumance when forced thereto. The Tabaski strategy is the most specialised and risk-prone of the four as most of the work is directed towards the sale of sheep during very few weeks of each year.

The commercial pastoralist has specialised in buying and selling livestock. He goes to the market several times each week in the neighbouring pastoral units. While the commercial pastoralist cannot herd the cattle full time, all year himself due to labour constraints, he may be able to cultivate, because this only demands labour input for three to four months. Children herd the small ruminants. This strategy is different from the Tabaski strategy, as it is short term and more labour extensive. The commercial pastoralist does not keep the animals for months nor does he go out of his way to find the right pastures for them. Transhumance to Gambia, for instance, is a phenomenon only seen among Tabaski pastoralists.

The non-herding pastoralist has found other ways, i.e. ways different from livestock tending, of generating an income mainly through non-animal commerce. He may have a shop in the village, have found 'a job' as president for the pastoral unit or the rural community, or have found some other way of generating an income outside the pastoral economy *per se*. Still, he owns a mixed herd; the cattle roam freely and his children may herd the small ruminants. The income-generating activities mean that paid herders can be used for the livestock both within the pastoral unit and for transhumance.

It should be kept in mind that most of the pastoralists live in large families where a combination of strategies is employed. The applicability of the different strategies depends upon the availability of labour, the number of animals, and the preferences of the household. As household and herd sizes can change from year to year, so can the combination of strategies. In the following analysis of issues of importance for understanding mobility, the four ideal types have been used whenever these provide the best way of explaining differences in the answers or practice.

On basis of the fieldwork, different issues were found to be of relevance for understanding mobility. Although the use of mobility varies, the pastoralists usually agree on the perception of mobility. This means the answers concerning the types of mobility, the reasons for going, etc. are more or less the same. Among the pastoralists there is a common understanding of the changes in the use of mobility and importance of mobility in the area, despite the different practice. Generally, the ideal types represent different ways of using mobility. Hence, the differences in practice can often be ascribed to differences in strategy. However, 'preference' is another reason for difference in practice. Some pastoralists simply prefer a certain practice. Sometimes, this is

Tabaski sheep are quite different from the rest of the livestock, which are considered part of the reproductive herd and usually not cared for in the same way.

reflected in the whole livelihood strategy, yet sometimes preference just shows up in one or two aspects.

4.1 Types of mobility

The pastoralists in Tessekre distinguish between the following seasons¹² that are related to different types of mobility:

- Rainy season ~ *Ndungu*¹³ (June-August)
- Dry season (September-May)
 - Cold dry season ~ *Dabudé* (September-January)
 - Hot dry season ~ *Thiédu* (February-April)
 - Near rainy season ~ *Cen sedlé* / *Deminaré* (May)

Among the Fulani of Tessekre, there is a clear distinction between going on transhumance and moving around within the territory of the pastoral unit. Transhumance is a matter of leaving the pastoral unit. Hence, it does not entail making a new (temporary) camp. The reasons for this are discussed later. The different types of mobility can be divided into two main types based on the local perception of mobility: mobility outside the pastoral unit (transhumance) and mobility within the pastoral unit.

Transhumance

Concerning mobility outside the pastoral unit (hereafter called transhumance), the pastoralists identified on the following types:

¹² The seasons are similar to the findings from other studies from Ferlo (e.g. Ba 1986, Barral 1982) and from other Fulani communities (e.g. de Bruijn & van Dijk 1995).

¹³ The spelling is the work of my translator as most of the pastoralists are illiterate.

Table 1

TYPE	SEASON	DIRECTION	DURATION
Meeting-the-rain	Near rainy season, <i>cen seldé</i>	South, where the first rain falls	Until the rain begins
Better-pasture-elsewhere	Usually dry season, <i>dabaude + thiédu</i>	Anywhere	Anytime
Lack-of-pasture	Any season, but usually dry season, <i>thiédu</i>	Anywhere	Until the rainy season
Bush fire ⇒ lack of pasture	November-December, mainly <i>dabaude</i>	Anywhere	Until the rainy season
Disease	Any season	Anywhere	Anytime
Lack-of-water	Any season	To nearest borehole in function	Until the borehole functions

Depending on the reason for going on transhumance, it can include all or some of the animals. If there is a lack of water or pasture, it is necessary to bring along all the livestock. In case of ‘better-pasture-elsewhere’ or ‘meeting-the-rain’, it is common only to take the cattle or the small ruminants or even only the sheep. Which type is taken depends on the need of the livestock and the strategy of the household.

For the ideal type ‘Tabaski pastoralist’, sheep are the real capital, hence most work concern making this capital grow. Tabaski pastoralists will make sure that the sheep are well fed before sale and therefore want them to benefit from the best pastures either by going on transhumance themselves or by paying a herder to take the sheep with him. An interesting point concerning Tabaski sheep mobility is the changing of the time of the *id-al-adha*. The Muslim calendar is a lunar calendar and does not follow the solar calendar. This means that the timing of the *id-al-adha* changes by 10-11 days every year. In the late 1990s, when the fieldwork was conducted, Tabaski was in the hot dry season where the pasture availability was limited and the quality had declined. Therefore, quite a few Tabaski pastoralists went on transhumance (or used a paid herder) in this season and explained that they were in search of better pastures for their Tabaski sheep. However, *id-al-adha* is approaching the cold dry season and eventually it will take place in the rainy season. Consequently, the Tabaski pastoralists’ willingness to go on transhumance with the sheep is likely to change. In this way, market opportunities provided by religious events may influence mobility.

Mobility within the pastoral unit

Concerning mobility within the pastoral unit, this can be quite complex. In Ferlo, the pastoralists have a rainy season camp called *rumaano* in Pulaar. During the dry season, they may move around, but they return to the *rumaano* in the rainy season. Often, the *rumaano* is located near a pond, which means that water is available to the livestock until the pond dries out. As there is

usually plenty of pasture during the rainy season, the livestock can stay close by the camp (Barral 1982).

Generally, the cattle are watered every second day. This pattern was quite clear for some of the GPS pastoralists; one day they walk from the camp to the borehole, next day in the opposite direction. The small ruminants are watered every day. Depending on the livelihood strategy and how far away from the borehole the pastoralists live, they fetch water at the borehole in a tube on a cart and bring it back to the camp where the small ruminants are watered. This is to spare the small ruminants the walk to the borehole where there is less pasture. By bringing the water to the camp, the small ruminants can graze where the pasture is most abundant. It is more labour intensive to water the small ruminants at the camp, but it seems to be a worthwhile investment, at least for the Tabaski pastoralists. At the borehole in the village of Tessekre, these patterns are evident. There are always a lot of cattle being watered, and there are many donkey carts with tubes being filled with water and only a small number of small ruminants. At the antennas, however, there are more small ruminants.

During the dry season, some pastoralists stay in the camp, while others are more inclined to move around in the pastoral unit. Also, this depends on the season. When pasture is abundant it is not necessary to move around much. In the hot dry season, it may be necessary to move more. Some prefer to walk longer distances with their animals every day while others prefer to move the camp to an area that has not been utilised. These differences were seen in the GPS data and explained during the participatory herding. One example is the household of Ali, one of the GPS pastoralists and the decision-maker of the household. In the cold dry season of 1999-2000, his second and third wives left the rainy season camp with the small ruminants. They stayed in a temporary camp a few kilometres away from the *rumaano*. Then, in the hot dry season, Ali's 1st wife left the *rumaano* with the cattle and set up a temporary camp between the *rumaano* and the camp of the other wives. Ali found it necessary to split up the herd – and family – because of the number of animals and their different needs. The cattle do not want to eat where the small ruminants are and vice versa.

4.2 Herding

Today, the semi-sedentary lifestyle and the lack of predators mean that the cattle can be left to roam freely (Sutter 1987; Touré 1990). When they are in the pastoral unit, which the cattle know, many pastoralists choose not to herd their cattle; instead they spend the time on other activities. Herding of cattle depends on the preferences of the household. It is mainly a question of generation whether the cattle are herded or not; the elders prefer to herd, while the younger generation finds it unnecessary. Further, it depends on the strategy. Subsistence pastoralists are more inclined to herd and for commercial pastoralists it may be well worth the investment of time if the cattle are to be sold. Some herd part time, i.e. at certain times of the year, while other guide

their cattle in a certain direction in the morning and make sure that they are all watered at the borehole later that day. Herding affects the mobility patterns and resource use of the cattle; therefore, absence of herding is important.

For those who do not herd all year, herding is mainly related to transhumance, because it is necessary to herd while on transhumance. Also, many go on transhumance just before the rainy season in order to meet the rain in the southern regions, where the rain starts. Those staying at home have to herd anyway, because the cattle can smell that it has been raining and therefore start to walk south if they are not herded.

Small ruminants, on the other hand, are still herded all year, because these can get lost, stolen or eaten by jackals. Depending upon the strategy of the household, the small ruminants are herded by the children, young men, or a paid herder. For Tabaski pastoralists and commercial pastoralists, herding is an investment in the 'capital stock' and they are not likely to involve their young children as herders.

4.3 Relations and conflicts

With changing livelihood strategies, conflict over resources can arise between different groups of pastoralists; for example when pastoralists on transhumance pass through a pastoral unit where there is shortage of pasture. Furthermore these issues influence the use of mobility, for instance, social relations with people in a certain area can cause pastoralists go there on transhumance or conflicts can have a restraining effect on mobility. Relations¹⁴ and conflicts occur in two spheres: within the pastoral unit and outside the pastoral unit, i.e. during transhumance.

Concerning the relations and conflicts within the pastoral unit, the answers were very homogeneous. There are no conflicts within the pastoral unit of Tessekre. The pastoralists explain that they all want the same. Concerning cultivation, there are only a small number of fields and these are fenced, which means that conflicts are unlikely to arise. The picture was somewhat different with conflicts and relations outside the pastoral unit. Concerning relations with agriculturalists, the well-known exchange of manure for crop residuals was mentioned. However, conflicts with agriculturalists seemed to be more common; animals trespassing fields caused the highest number of conflicts. Some had relations with other pastoralists, usually relatives, which meant that they accompanied each other during the transhumance. However, it turned out that the number of conflicts revealed in the questionnaire interviews did not fully account for all the problems. During the focus group interview, some of the pastoralists explained that they had partly given up transhumance or changed the direction due to conflicts with agriculturalists.

¹⁴ Here 'relations' are understood as positive interactions or connections, the opposite of conflicts. Usually, relations are actively pursued.

In order for relations between agriculturalists and pastoralists to be beneficial, these have to occur at the right time of the year¹⁵. Evidently, livestock cannot graze on stubble fields in any season. Also, the timing of the manuring can be more or less optimal. The terms of trade between animal products, e.g. milk and grain varies throughout the year. The potential of crop-livestock **interaction** depends upon the degree of crop-livestock **integration** of the pastoralist and the agriculturalist, i.e. if one or both of the parties involved are agro-pastoralists to some extent. This means that subsistence pastoralists, who are most likely to have agricultural activities, are the types less likely to be interested in interactions with agriculturalists.

4.4 Perceptions of mobility

In order to understand the pastoralists' use of mobility, their perception of mobility and their reasons for going on transhumance were analysed and related to their practices.

The pastoralists all gave the same reasons for going on transhumance, namely to search for pasture and water. There were some variations in the answers when it came to pasture, some go because they want to find better quality (pull effect) and others because the quantity is lacking (push effect). This difference is mainly related to the type of livelihood strategy. Tabaski pastoralists are willing to go in order to find better quality, while subsistence pastoralists and especially non-herding pastoralists only go in case of need. For the commercial pastoralist and especially the non-herding pastoralist, the use of a paid herder is common for livestock on transhumance.

The answers could all be interpreted as illustrating the pastoralists' attempt to find a balance despite the variability of the resources. However, there are no indications that the pastoralists have the environment as the point of departure for their considerations on mobility. On the contrary, mobility is discussed from the point of view of livestock needs. I find there is a difference between these two perspectives. The pastoralists of Ferlo are not using mobility because it is ecologically rational. To them, mobility is a means to ensure the survival of the livestock.

The question is: how do the pastoralists perceive the environment? First of all, there is no word in Pulaar that translates into environment, which is a rather abstract concept. Instead my interpreter used the word *ladde*, which in Pulaar means bush or everything outside the camp. The local perception of 'the environment' can be illustrated by the response to two questions concerning herding. The first was: 'Do you think it is better for the cattle not to herd?' This question was understood and the pastoralists did not find it to be a strange question. Although the answers varied, it was not difficult for the pastoralists to answer. For example: 'it is best to herd the cattle so they eat well and breed every year'. The other question was: 'Do you think it is better for the environment not to herd?' It was very difficult for them to comprehend and thus to answer. While

¹⁵ In the literature, it is often pointed out how agriculturalists and pastoralists have interactions and conflicts (e.g. Bayer & Waters-Bayer 1995, McIntire et al 1992).

the pastoralists acknowledged the relationship between herding and animals' performance, it did not seem straightforward for them that their herding practice might affect the environment. For example: 'I have no idea. For me the best thing for the environment is rain' or 'I know rain is good for the environment and bush fire is bad for me'. Consequently, I do not believe that the use of transhumance or mobility within the pastoral unit is related directly to concerns for the environment.

4.5 Mobility and cultural construction of identity

In the literature, the image of the 'freedom loving', independent, and mobile pastoralist is so well established that the importance of mobility for the cultural construction of identity is rarely questioned. My preconceived idea of the ethnic identity of the Fulani included this image of mobility as a key aspect. Further, one of the lessons of the 'new rangeland paradigm' is the ecological rationale of mobility. Subsequently, I did not question the importance of mobility for the cultural construction of identity.

However, among the pastoralists of Tessekre, mobility does not seem to relate to their (ethnic) identity. Nothing in the answers could be interpreted in this way. Further, the practice indicated the same. This can be illustrated by the widespread use of hired herders for going on transhumance. Instead, the identity is strongly linked to the livestock, especially the cattle. While the majority of the pastoralists explained that cattle were necessary for the Fulani identity, nobody expressed mobility as a necessity for their identity.

The pastoralists were asked why they had decided to stay where they stayed at the moment (this being the *rumaano* or a temporary camp). If they did not stay in the *rumaano* this was because the needs of the livestock had forced them to move. They explained that they had to be where the pasture was right for their livestock: 'to look after the livestock is the work of the Fulani'. The women expressed a dislike for transhumance, because this gave them extra work making huts, etc. Also, herding is necessary during transhumance, and because many of the pastoralists have decreased the amount of time they spend on herding, this means that transhumance also increases the workload of men.

There was no difference between the four ideal types in terms of their attitude towards the relationship between mobility and pastoral identity or the Fulani ethnicity. This is not to say that mobility has never had importance, as explained by Eickelman and Piscatori: 'Ethnicity is an enduring social and political force, constructed and reconstructed as circumstances and contexts change' (1996: 100). In contemporary Ferlo, I did not find evidence that mobility affects the cultural construction of (ethnic) identity.

Concerning the Fulani identity, the concept of *pulaaku*¹⁶ has been mentioned as central in Mali and Burkina Faso (Bolwig & Paarup-Laursen forthcoming, Dupire 1970). However, this term did not come up in any of the conversations. With regards to the pastoralists of Ferlo, Touré has pointed out that the Fulani ‘do not so much choose mobility as submit to it’ (1988: 36).

4.6 The shaping of space into place

Concepts such as ‘sense of belonging’ or ‘shaping of space into place’¹⁷, (Taylor 1999; Tuan 1977) can be used for understanding the pastoralists’ use of mobility as well as for their conceptualisation of mobility.

When asked about migration, the pastoralists only said that they have been on transhumance when they have left the pastoral unit altogether. There is a sense of belonging not only to the *rumaano*, but also to the whole pastoral unit. Within this the family can set up the camp anywhere, it is still considered home. In other words, the whole ‘space’ is considered ‘place’. Interesting to note that the pastoralists relate to an administrative unit such as the pastoral unit of Tessekre, which is quite new. However, the shape and size of the pastoral units depend on the distance to the neighbouring boreholes. The area belonging to a pastoral unit is thus the area closest to a certain borehole. Therefore, when the pastoralists relate to their pastoral unit, they simply relate to the closest borehole and move around in its ‘catchment area’.

The GPS experiment revealed an interesting fact. Seven out of the nine GPS pastoralists use pasture outside the pastoral unit while using the borehole of Tessekre. This means that the ‘place’ and the pastoral unit are not entirely overlapping. Further, the nine pastoralists were all considered part of the pastoral community of Tessekre. But the data revealed that two of them had their *rumaano* in other pastoral units and to a large extent used the pasture in these units while benefiting from the borehole in Tessekre.

There may be a number of reasons why the pastoralists prefer to stay within the pastoral unit, and why they consider the whole area of the unit for their place. First of all, within the pastoral unit, the cattle know the area and herding can therefore be omitted. Also, the pastoralists know the landscape and consequently the resource availability. This feeling of intimate knowledge of an area may be one of the mechanisms shaping space into place. Another reason for staying may be that the price of the water is cheaper compared to other boreholes. Even though the administrator of the borehole stated that the price for watering animals was the same for locals (belonging the

¹⁶ *Pulaaku* has been used to denote the Fulani identity, it includes the social and moral code that Fulani consider central to their ethnic identity (please refer to de Bruijn & van Dijk 1995: 199-201 for an overview of the usage of the concept in the literature).

¹⁷ A general discussion of ‘space’ and ‘place’ is beyond the scope of this paper. Suffice it to say that ‘space is more abstract than place’ (Tuan 1977: 6), which means that while space is general, place is particular: ‘space is everywhere, place is somewhere... place is a space with attitude’ (Taylor 1999: 10).

pastoral unit) and strangers (passing through during migration), this may not be entirely correct. Further, the GPS data showed that the pastoralists used the borehole in Tessekre even when this was not the closest watering point. This may indicate the 'sense of belonging' to the borehole of Tessekre or that the price is lower.

Hence, the shaping of space into place affects the use of mobility. It means that leaving the *rumaano* is not considered a 'barrier' as long as the temporary camp is made within the pastoral unit. For the women, however, the workload increases as soon as they leave the *rumaano* and have to make a temporary camp, but they still seem to distinguish between the pastoral unit and 'outside'. This may be due to the fact that fetching water usually is the women's chore. Going to the usual borehole gives them an opportunity to talk with the friends and family and a few days a week there are schooling opportunities for the women in Tessekre. During transhumance, on the other hand, these social networks are interrupted. Finally, the absence of conflicts and presence of relations within the pastoral unit may be a reason why this is considered a place.

Also, I identified how the shaping of space into place related to different scales. This was done by looking at the actual camp, and if there was a difference between the semi-permanent *rumaano* and the temporary camps. In the *rumaano*, the huts are of a permanent character. They can be made of clay/clay bricks, but straw huts are still the most common. Usually the huts are circular with a cone-shaped roof. The roofs consist of a wooden frame covered with straw. A professional artisan is paid to make this wooden frame. Hence, the pastoralists choose to invest money in the construction of the *rumaano*. In the temporary camps, the huts are of a less permanent character, they are dome-shaped made out of material found on location. The women are responsible for making these huts. The first attempt to change space into place is to clear a circular spot where the hut is to be made. The living place must not have grass on it. In the same manner, the area of the *rumaano* is cleared and often fenced.

Finally, the issue of burial ground was addressed to see if this had an influence on the choice of living area and if the shaping of place related to the family history. But there did not seem to be a relationship. As mentioned, Ferlo was only a wet season area for the pastoralists until the construction of the first boreholes in 1950s. Concurrently with the construction of boreholes (and later antennas), people have found new areas to stay. It is common for the pastoralists to change the location of their *rumaano*, even to a new borehole. Consequently, the shaping of place does not seem to relate to a long established relationship to a certain place.

4.7 Sum up of the case study

The case study from Ferlo shows how different livelihood strategies cause different use of mobility. The Tabaski pastoralists, who are the most mobile of the four types, are involved in commercial sheep production. For them mobility is a means to ensure fat sheep at the right time

of the year. If they find other ways of fattening their sheep, e.g. by import of fodder, they are likely to diminish their use of mobility. For none of the pastoralists was mobility related to the cultural construction of (ethnic) identity. They did not attribute any value to mobility *per se*. Especially the women considered mobility a burden. Nevertheless, the shaping of space into place showed that it is not the actual number of kilometres, which define mobility. As long as mobility takes place within the pastoral unit, the place, the perception is positive.

The above mentioned issues can be used for understanding mobility in the wider context of livelihood strategies and thereby in the context of increased commercialisation. In the existing literature, the framework for understanding or discussing pastoral mobility does not fully take into account the view of the pastoralists. Therefore, I decided to make my own approach for studying pastoral mobility. This is discussed in the next section.

5. The ‘mobility complex’

Inspired by the ‘check-list concept’ by Niamir-Fuller and Turner (1999), a list of issues of importance for understanding pastoral mobility is made here. Nine aspects together form the checklist called the ‘mobility complex’. I have chosen to call it the ‘mobility complex’ well knowing this has strong associations to the ‘cattle complex’, a renowned and scolded concept within the study of pastoralism (Herskovits 1926). However, I find ‘complex’ the best way to characterise the composite nature of mobility. Here ‘complex’ should be understood in the meaning ‘multifaceted’ and not as a neurosis or obsession (similarly to Herskovits’ note in his paper from 1926). Nevertheless, if the first association that springs to mind when reading ‘mobility complex’ is a strong preference for mobility, this is intended. I certainly believe this exists. Although the pastoralists of Tessekre did not demonstrate a strong preference for mobility, there is no doubt that a number of researchers have a mobility complex, myself included. However, with this paper I want to question it.

Hence, two out of the nine aspects are taken from the checklist (including four aspects) made by Niamir-Fuller and Turner (1999). The rest are inspired by the case study from Ferlo. In the following, each issue is outlined beginning with a general introduction to the idea providing a few references, and ending with the implications for understanding pastoral mobility (in boxes).

The mobility complex may serve as an analytical tool for studying pastoral mobility. All issues may not be of importance for all studies and there are likely to be issues I have overlooked or which do not manifest themselves in the Ferlo case. Hence, I do not believe that the ‘mobility complex’ is an exhaustive list. It is meant to be extended and refined by others.

5.1 Mobility and the dryland environment

The ‘mobility complex’ builds upon the notion of disequilibrium ecology. I have discussed elsewhere (Adriansen 1999) how pastoral mobility functions as a response to climate variability and how indigenous management has proven superior to a conventional management project in Ferlo. These points are also illustrated in Niamir-Fuller 1999a. While I find it imperative to understand the ecological processes, this is only one element of the ‘mobility complex’ and the ecological way of reasoning cannot be transferred to pastoralists’ perception of mobility. The fact that it is ecologically rational to use mobility in drylands does not explain the pastoralists’ reasons for using mobility. Further, it should be noted that disequilibrium ecology only applies to some of the areas inhabited by pastoralists. Generally, arid and semi-arid areas in Africa, the Middle East, and Australia are governed by disequilibrium. Please refer to Ellis 1995 and Ellis et al. 1993 for a further discussion of this.

The ‘new rangeland paradigm’ represents contemporary understanding of dryland functioning and therefore this should be used for understanding and discussing possible environmental consequences of pastoralist behaviour in these areas. Furthermore, it is imperative to include this understanding when planning development projects in drylands.

5.2 The influence of tenure on mobility

In the book by Niamir-Fuller (1999a), emphasis is on tenure systems and institutions. Besides the issues of conflicts and relations mentioned above, tenure and institutions in Ferlo have been analysed in a number of studies (e.g. Diop et al. 1998; Juul 1999; Touré 1997). It has been shown that in policy making, it is important to keep in mind that all stakeholders should be included (Swift 1995; Thébaud 1995). Further, appropriate tenure regimes and institutions should account for increased commercialisation and should ensure flexibility for the variety of livelihood strategies employed by pastoralists. Although, the issue pertinent, it seems necessary to understand the needs and wishes of pastoralists before appropriate tenure regimes and institutions can be fully discussed. In case of pasture shortage, for instance, pastoralists may be more interested in being able to buy fodder for their livestock than going on transhumance with them.

If we want to accommodate the pastoralists, establishment of efficient marketing may be more important for them than institutions ensuring mobility corridors. However, from the range ecology point-of-view, mobility out of the shortage area may be better than import of fodder to the shortage area. In this case, the interests of the pastoralists and the pasture are conflicting and we need to find out which interests to accommodate before suitable measures can be taken.

Tenure regimes and institutions may be a key to understanding pastoralists’ use of mobility as these factors may have constraining or enabling effects on the movements.

5.3 Types of mobility

The ‘classic’ study of types and patterns of mobility is made by Douglas L. Johnson (1969). Johnson discussed the various types of mobility and made a classification. Johnson’s study is characteristic of many mobility studies in that small-scale migrations are overlooked or just classified as small-scale without proper investigation into the types and implications for livestock management and livelihood of the family. As noted by Cribb, a classification of mobility types or patterns ‘is likely to be more of geographical than anthropological interest’ (Cribb 1984: 11). However, the spatial distribution of grazing pressure is of interest for people involved in range management. Further, by making pastoralists discuss their classification of mobility types, we can gain insight into the decision-making process related to mobility and obtain knowledge of livelihood strategies.

It is often argued that in the process of sedentarisation of pastoralists, mobility is hampered (e.g. Ayantunde et al. 2000; Swallow 1994). However, it is important to distinguish between the mobility of people and livestock. The study from Tessekre shows that different types of animals may have different mobility; for instance, cattle are left to roam freely and small ruminants are herded. Further, mobility may be used differently even for the same type of livestock depending on the livelihood strategy, e.g. Tabaski sheep versus sheep owned by subsistence pastoralists.

Mobility types are interesting both with respect to the spatial distribution of grazing pressure and with respect to understanding pastoralists’ own perception of mobility. Further, mobility types can be used to distinguish between mobility of humans and animals and between different types of livestock, and the different types form an integrated part of livelihood strategies.

5.4 Labour input and mobility

It is common to perceive labour availability as an important component for understanding utilisation of the natural resources and the choice of livelihood strategies (e.g. Bolwig 1999; Raynaut 1997; Toulmin 1992). However, labour availability cannot be understood on its own or as a mere calculation of family resources. In another study from the area (Adriansen 2002), I have shown that considerations concerning labour availability have to be based upon the perception of the pastoralist and his household.

The study from Ferlo shows that herding influences on the mobility patterns and that the use of herding may be a question of labour availability. Other researchers of pastoralists in Ferlo have pointed to the decreased labour input in pastoral activities. Touré (1988) mentions that the establishment of boreholes reduces the time spent on transhumance and on digging wells. Sutter also notes that the decrease in transhumance and absence of herding have changed the labour input and quotes an elder herder ‘all our young people know how to do today is hang around the teapot’

(Sutter 1987: 212). The pastoralists in Tessekre also mentioned this generation difference in attitude towards working.

Based on pastoralists' own perception of labour and labour constraints, this aspect can be used to interpret the use of various types of mobility and the choice of livelihood strategy.

5.5 Perceptions of mobility

In the literature, the most common explanation for the pastoralists' use of mobility is the lack of pasture or water (e.g. Daget & Godron 1995; Niang 1996; Scoones 1995b; Swallow 1994). It is evident that livestock-owning people will make sure that their animals survive. As many pastoralists live in areas with scarce and variable natural resources, mobility has become a means to balance this variability. However, this does not reveal how people perceive the environment or their and the animals' interaction with it. Furthermore, most pastoralists have ties with settled agriculturalists or with towns for exchange of products (Chatty 1986; Eickelman 1989). How does this influence mobility patterns? For Tuareg pursuing caravan trade through the Sahara, mobility has been more than mere searching for pasture and water (Spencer 1998).

In Tessekre, the explicit reason given for going on transhumance was also to search for pasture and sometimes water. However, when it came to the underlying understanding of the relationship between livestock and pasture and the local perception of 'the environment' this was quite complex.

It is important to distinguish between the needs of livestock and the 'needs' of pasture. Some pastoralists may leave an area because they want to spare the resources or they may not use an area until all other resources are exploited. These reasons have to be properly understood and the local knowledge and conceptualisation of 'nature' deconstructed.

5.6 Mobility and the cultural construction of identity

The nomadic facet of pastoralism has been considered very important for the pastoral identity or even as defining this identity (Cole 1975; Dyson-Hudson & Dyson-Hudson 1980; Salzman 1995). Therefore, sedentarisation of pastoralists has often been associated with changes in the (ethnic) identity either intentionally from the official, government side or as a side effect from changing the nomadic aspect of pastoralism (e.g. Eickelman 1989). It may well be our, the western construction, of pastoral identity that has created the direct link between mobility and pastoral identity. Nevertheless, this view of mobility can be found among some pastoralists groups in the recognition of the most mobile pastoralists as the most noble (Chatty 1986). In this case, however, the admiration for very mobile pastoralists may be due to their endurance and not an admiration for mobility per se. Among the Rwala Bedouins, the ideology emphasises equality and autonomy

(Lancaster 1981). If mobility is seen in this light, a high degree of mobility is honourable because it is a display of a high degree of autonomy.

In the case study from Ferlo, there was no indication that mobility was important for the cultural construction of identity. The Fulani identity in Ferlo relies on the importance of cattle, as has been shown by Müller (1993), and this was an important element for understanding the livelihood strategies in Tessekre. Hence, mobility is central *qua* the importance of cattle for the Fulani identity.

Mobility may be an important element of the cultural construction of identity. As this construction is of importance for understanding livelihood strategies, and hence the use of mobility, it should be included in the study.

5.7 The shaping of space into place

Among human geographers, there is an increasing interest in the idea that space is culturally constructed, especially (Unwin 2000). This interest has led to studies of the tension between space and place (e.g. Taylor 1999). Further, some studies look at the relation between the construction of identity and the image of home/place versus outside/space (e.g. Buttimer 1998; McHugh 2000). These issues are of importance for understanding people with shifting homes, e.g. migrants and nomadic pastoralists (e.g. Powell 1998).

Researchers studying Fulani pastoralists have found that *wuro*, the camp, and *ladde*, the bush or non-human space, appear to be central concepts in the shaping of space into place – although they do not use these terms (Bovin 1991; de Bruijn & van Dijk 1995). *Wuro* and *ladde* can be said to constitute culturally constructed categories among the Fulani to distinguish between localities.

There is a potential for including issues of the perceptions of space and place in studies of pastoral mobility, especially on the use of micro-mobility. In combination with the mobility types, the shaping of space into place can be used to understand use of resources.

5.8 The influence of commercialisation on mobility

Most studies of pastoral commercialisation have focused on herd composition, while effects on mobility are hardly mentioned or only considered in very crude terms of mobility versus sedentarisation (e.g. Amanor 1995; Sikana et al. 1993; Zaal 1999). Kerven (1992) has analysed the Fulani's involvement in cattle marketing in an historical perspective. This involved both pre-commercial and commercial exchange of milk and other animal products for cereals. In order for this exchange to take place, pastoralists had to meet agriculturalists. Certain times of the year would offer better terms of trade and therefore be more profitable for either the one or the other

of the groups. Influence of commercialisation or exchange on mobility patterns is therefore far from new.

In Ferlo, the Tabaski sheep are raised in order to be sold at a specific time of the year. Transhumance can cause weight loss of the livestock and therefore the pasture quality and quantity of the pastoral unit has to be considered carefully before deciding on transhumance. Here, increased commercialisation has influenced the cost-benefit of going on transhumance, which means that the most commercial are the most mobile – or at least their herds are.

Commercialisation influences mobility in a number of ways. Access to the market does not automatically cause a decrease in mobility. If the purpose of the herd is sale it may be worthwhile to find good pasture for the livestock in which case mobility can increase.

5.9 Quantitative and spatial assessments of mobility

Few quantitative assessments of pastoral mobility have been made, but many studies mention that pastoralists have become less mobile. Mobility is often perceived from the family-unit point of view. If the family unit becomes (semi-) settled, nomadism is said to be in decline. For instance, Eickelman notes: 'In Libya, 25 per cent of the population was nomadic in 1962 as compared with 3.5 per cent in 1970' (1989: 78). However, this is a rather simplistic statement; it does not say anything about the movement of the herd. The question is how is the degree of mobility measured? Is it the number of kilometres walked within a day? Or is it the distance from a certain point? Is mobility related to man or livestock?

GPS data can provide information on the number of kilometres walked per day, i.e. a quantification of the mobility. Another study from Ferlo shows the potential of using GPS data for studying pastoral mobility (Adriansen & Nielsen 2002). Depending on how the data collection protocol is made, GPS measurements can be used to illustrate the usage of an area and the mobility types as well as to provide quantitative information on the distance covered.

From the range-ecology point-of-view, the spatial distribution of stock is interesting because this can balance the variability in natural resources. From a social science point-of-view, quantification per se may not be interesting, but the information can be used to obtain a thorough understanding of the use of mobility and as an inspiration for approaching the underlying values.

5.10 Sum up of the mobility complex

The nine aspects listed above constitute the mobility complex. They are all interrelated although the emphasis is on pastoralists' perspectives. Here, the nine aspects are discussed in relation to each other.

The mobility complex builds upon the ecological understanding of drylands provided by 'new rangeland paradigm'. This means that from an ecological perspective, pastoral mobility is rational. However, in order to understand pastoralists' use of mobility, a more complex view is necessary. First of all, pastoral mobility should be studied in the broader context of livelihood strategies and not seen as an isolated phenomenon. Issues of importance for the analysis of livelihood strategies relate to values as well as to practice, i.e. the cultural construction of identity, labour input, and mobility types.

Although pastoral mobility not should be studied *per se*, a more comprehensive understanding of mobility is beneficial, both for understanding mobility in the context of livelihood strategies and in relation to dryland ecology. It is important to distinguish between mobility of humans and of animals, and between different types of livestock. In line with this, quantification and the spatial distribution of mobility become interesting.

When interpreting the use of mobility, the pastoralists' perspectives should be included, otherwise we may not understand why they move the way they do. This means the shaping of space into place as well as the local understanding of concepts such as nature and the relations between man, animals and environment become interesting. The interpretation of the use of mobility should also account for the constraints imposed on mobility by tenure regimes as well as the push-pull effects of commercialisation.

6. Conclusion

The 'mobility paradigm', which was launched by Niamir-Fuller and Turner (1999), provided the answer to the question: Is mobility necessary or rational for pastoralists or for arid lands? It was shown that mobility is necessary for arid lands and hence that pastoral mobility is a rational management strategy. But how do the pastoralists themselves perceive mobility and how does the importance of mobility manifest itself for pastoralists? These issues are omitted in the 'mobility paradigm' and in the wider discussion of the 'new rangeland paradigm'. In this literature, it suffices to say that pastoral mobility is rational.

The positive perception of pastoral mobility is a hegemonic discourse within the range management cum pastoralism research community. In this paper, this discourse has been deconstructed in order to provide a more complex approach to the study of pastoral mobility. The approach

takes its point of departure in pastoralists' perceptions and motives for using mobility and combines this with observed practice.

The case study from Ferlo was used as inspiration for developing the 'mobility complex'. The study did not include considerations of the possible environmental consequences of changes in mobility patterns or recommendations for establishment of institutions. Nevertheless, these aspects are important for a comprehensive understanding of pastoral mobility and therefore they are included in the 'mobility complex'.

The mobility complex is considered an analytical tool for studying pastoral mobility. It highlights aspects of importance of analysing pastoralists' use and perception of mobility in the context of livelihood strategies and point to the importance of issues such as rangeland ecology and tenure regimes for understanding future dynamics of pastoral mobility.

References

- Adriansen, H.K. 2002 *A Fulani without cattle is like a woman without jewellery*. Geographica Hafniensia A11, Copenhagen.
- Adriansen, H.K. 1999 Pastoral mobility as a response to climate variability in African drylands. *Danish Journal of Geography*, 99, 1: 1-10.
- Adriansen, H.K. & Nielsen, T.T. 2002 Going where the grass is greener: on the study of pastoral mobility in Ferlo, Senegal. *Human Ecology* 30, 2: 215-226.
- Agnew, C.T. & Chappell, A. 1999 Drought in the Sahel. *GeoJournal* 48: 299-311.
- Alissoutin, R.L. 1997. Pond management in the Podor department, Senegal. IIED Drylands Programme, *Issue Paper No 72*.
- Amanor, K.S. 1995 Dynamics of herd structures and herding strategies in West Africa: a study of market integration and ecological adaptation. *Africa* 65, 3: 351-394.
- Ayantunde, A.A., Williams, T.O., Udo, H.M.J., Fernández-Rivera, S., Hiernaux, P. and van Keulen, H. 2000. Herders' perceptions, practice, and problems of night grazing in the Sahel: case studies from Niger. *Human Ecology* 28, 1: 109-130.
- Ba, C. 1986 *Les Peuls du Senegal*. Etude géographique. Les Nouvelles Editions Africaines, Dakar.
- Barralrall, H. 1982 *Le Ferlo des forages*. ORSTOM, Dakar.
- Barfield, T. 1993 *The Nomadic alternative*. Prentice Hall, New Jersey.
- Barth, F. 1995 Other knowledge and other ways of knowing. *Journal of Anthropological Research* 51: 65-68.
- Batterbury, S. & Warren, A. 2001 The African Sahel 25 years after the great drought: assessing progress and moving towards new agendas and approaches. *Global Environmental Change* 11: 1-8.
- Bayer, W. & Waters-Bayer, A. 1995 Forage alternatives from range and field: pastoral forage management and improvement in the African drylands. In Scoones, I. (ed) *Living with uncertainty: new directions in pastoral development in Africa*, pp.58-78. Intermediate Technology Publications, Exeter.
- Behnke, R.H., Scoones, I. & Kerven, C. (eds) 1993 *Range ecology at disequilibrium: new models of natural variability and pastoral adaptation in African savannas*. Overseas Development Institute, Nottingham.
- Bolwig, S. 1999 *Livelihood practices and land use in the sahel: labour allocation and adaptive capability among the Fulani Rimaybe in northern Burkina Faso*. PhD Dissertation, University of Copenhagen.
- Bolwig, S. & Paarup-Laursen forthcoming Crisis, identity and livelihood in the Sahel: historical change in status and income among Fulani Farmers (*Rimaybe*) and herders (*Fulbe*) in Northern Burkina Faso. In Bovin, M. & Diallo, G. (eds) *Culture and crisis in the Sahel*. The Scandinavian Institute of African Studies, Uppsala.
- Bourdieu, P. 1993 *Sociology in question*. Sage Publications, London.
- Bovin, M. 1991 Spor i sandet. In Dybbroe, S., Møller, P.B., Olesen, A., Vestergaard, E. & Vestergaard, T.E. *Klaus Khan Baba*, pp. 134-153. Aarhus Universitetsforlag, Esbjerg.
- de Bruijn M. & van Dijk, H. 1995 *Arid ways: cultural understandings of insecurity in Fulbe society, central Mali*. Thela Publishers, Amsterdam.
- Buttimer, A. 1998 Geography's contested stories: changing states-of-the-art. *Tijdschrift voor Economische en Sociale Geografie* 89,1: 90-99.
- Chatty, D. 1986 *From camel to truck: the Bedouin in the modern world*. Vantage Press, New York.

- Cole, D.P. 1975 *The nomads of the nomads: the Al Murrah Bedouin of the Empty Quarter*. Aldine Publishing Company, Chicago.
- Coleman, J. 1988 Social capital in the creation of human capital. *American Journal of Sociology* 94: 95-120.
- Cribb, R. 1984 Greener pastures: mobility, migration and the pastoral mode of subsistence. *Production pastorale et société* 14: 11-46.
- Daget, P. & Godron, M. 1995 *Pastoralisme: troupeaux, espaces et sociétés*. Universités Francophones. Hatiers, Canada.
- Davis, J. 1992 The anthropology of suffering. *Journal of Refugee Studies* 5: 149-161.
- Diop, A.T., Niang, I., Ka, A., & Deme, A. 1998 Senegal. In Lane, C.R. (ed) *Custodians of the commons: pastoral land tenure in East and West Africa*, pp. 93-119. Earthscan, Guildford and Kings Lynn.
- Dupire, M. 1970 *Organisation sociale des Peuls*. Plon, Paris.
- Dyson-Hudson, R. & Dyson-Hudson, N. 1980 Nomadic pastoralism. *Annual Review of Anthropology*, 9: 15-61.
- Eickelman, D. F. 1989 *The Middle East: an anthropological approach*. Prentice Hall, USA.
- Eickelman, D.F. & Piscatori, J.P. 1996 *Muslim politics*. Princeton University Press, Princeton.
- Ellis, J. 1995 Climate variability and complex ecosystem dynamics: implications for pastoral development. In Scoones, I. (ed) *Living with uncertainty: new directions in pastoral development in Africa*, pp.37-46. Intermediate Technology Publications, Exeter.
- Ellis, J.E. & Swift, D.M. 1988 Stability of African pastoral ecosystems: alternate paradigms and implications for development. *Journal of Range Management* 41: 450-459.
- Ellis, J.E., Cougenour, M.B. & Swift, D.M. 1993 Climate variability, ecosystem stability, and the implications for range and livestock development. In Behnke, R.H., Scoones, I. & Kerven, C. (eds) *Range ecology at disequilibrium - new models of natural variability and pastoral adaptation in African Savannas*, pp.31-41. Overseas Development Institute, Nottingham.
- Equipe ECOSSEN 1997 *Crises de l'environnement et dynamique des espaces ruraux du nord-ouest Sénégalais*. Rapport technique à 3 ans. Université Cheikh Anta Diop, IFAN, Laboratoire de Géographie, Project ECOSSEN, subventionné par le CRDI, Ottawa, Canada, Université de Sherbrooke, CARTEL.
- Hardin, G. 1968 The tragedy of the commons. *Science* 162: 1243-1248.
- Herskovits, M.J. 1926 The cattle complex in East Africa. *American Anthropologist* 28: 230-272, 361-388, 494-528, 633-644.
- Hulme, M. 2001 Climatic perspectives on Sahelian desiccation: 1973-1998. *Global Environmental Change* 11: 19-29.
- Juul, K. 1999 *Tubes, tenure and turbulence: the effects of drought related migration on tenure systems and resource management in northern Senegal*. PhD dissertation, Institute of Geography and Development Studies, University of Roskilde, Denmark.
- Johnson, D.L. 1969 *The nature of nomadism - a comparative study of pastoral migration in southwestern Asia and northern Africa*. Research Paper No 118, Department of Geography, University of Chicago, Chicago.
- Kerven, C. 1992 *Customary commerce: a historical reassessment of pastoral livestock marketing in Africa*. ODI Agricultural Occasional Paper 15. Overseas Development Institute, Nottingham.
- Lancaster, W. 1981 *The Rwala Bedouin today*. Cambridge University Press, Cambridge.
- McHugh, K.E. 2000 Inside, outside, upside down, backward, forward, round and round: a case for ethnographic studies in migration. *Progress in Human Geography* 24,1: 71-89.

- McIntire, J., Bourzat, D. & Pingali, P. 1992 *Crop-livestock interaction in Sub-Saharan Africa*. World Bank Publications, Washington.
- Mikkelsen, B. 1995 *Methods for development work and research: a guide for practitioners*. Sage Publications, New Delhi.
- Milton, K. 1996 *Environmentalism and cultural theory: exploring the role of anthropology in environmental discourses*. Routledge, St. Ives.
- Milton, K. 1997 Ecologies: anthropology, culture and the environment. *International Social Science Journal* 49: 477-495.
- Müller, J.O. 1993 Nomadenkultur und ökonomische Rationalität: zum Problem ökonomischer and biotechnologischer Modernisierung unter Peul-Nomaden im Senegal. *Afrika Spectrum* 28, 3: 341-357.
- Niamir-Fuller, M. 1998 The resilience of pastoral herding in Sahelian Africa. In Berkes, F., Folke, C. & Colding, J. (eds) *Linking social and ecological systems: management practices and social mechanisms for building resilience*, pp. 250-284. Cambridge University Press, Cambridge.
- Niamir-Fuller, M. (ed) 1999a *Managing mobility in African rangelands: the legitimization of transhumance*. IT Publications, Exeter.
- Niamir-Fuller, M. 1999b Introduction. In Niamir-Fuller, M. (ed) 1999 *Managing mobility in African rangelands: the legitimization of transhumance*, pp.1-17. IT Publications, Exeter.
- Niamir-Fuller, M. & Turner, M.D. 1999 A review of recent literature on pastoralism and transhumance in Africa. In Niamir-Fuller, M. (ed) *Managing mobility in African rangelands: the legitimization of transhumance*, pp.18-46. IT Publications, Exeter.
- Niang, A.M. 1996 *Monitoring the pastoral resources in the Sahelian zone: the case of Senegal*. Paper presented at the International Workshop on Sustainable use of Rangelands and Desertification Control, Jeddah, Saudi Arabia.
- Powell, N. 1998 *Co-management in non-equilibrium systems: cases from Namibian rangelands*. Doctoral Thesis, Swedish University of Agricultural Sciences. Acta Universitatis Agriculturae Sueciae. Agraria 138.
- Putnam, R. 1993 *Making democracy work: civic traditions in modern Italy*. Princeton University Press, Princeton.
- Raynaut, C. 1997 *Societies and nature in the Sahel*. Routledge, London.
- Rhoades, R.E. 1989 Evolution of Agricultural Research and Development since 1950: Toward an Integrated Framework. IIED, *Gatekeeper Series*, No SA12.
- Roe, E., Huntsinger, L. & Labnow, K. 1998 High reliability pastoralism. *Journal of Arid Environments* 39: 39-55.
- Salzman, P.C. 1995 Studying nomads: an autobiographical reflection. *Nomadic Peoples* 36/37: 157-166.
- Sayer, A. 1998 *Realism and social science*. Sage Publications, Wiltshire.
- Scoones, I. 1993 Why are there so many animals? In Behnke, R.H., Scoones, I. & Kerven, C. (eds) *Range ecology at disequilibrium - new models of natural variability and pastoral adaptation in African Savannas*, pp. 62-76. Overseas Development Institute, Nottingham.
- Scoones, I. (ed) 1995a *Living with uncertainty: new directions in pastoral development in Africa*. Intermediate Technology Publications, Exeter.
- Scoones, I. 1995b New Directions in Pastoral Development in Africa, pp.1-36 in Scoones, I. (ed) *Living with uncertainty: new directions in pastoral development in Africa*. Intermediate Technology Publications, Exeter.

- Sikana, P.M., Kerven, C. & Behnke, R.H. 1993 From subsistence to specialised commodity production: commercialisation and pastoral dairying in Africa. ODI, *Pastoral Development Network Paper*, No 34d.
- Spencer, P. 1998 *The pastoral continuum: the marginalisation of tradition in East Africa*. Oxford University Press, Guildford & King's Lynn.
- Stenning, D.J. 1957 Transhumance, migratory drift, migration patterns of pastoral Fulani nomadism. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 87, 1: 57-73.
- Sutter, J.W. 1987 Cattle and inequality: herd size differences and pastoral production among the Fulani of northeastern Senegal. *Africa* 57: 196-218.
- Swallow, B. 1994 The role of mobility within the risk management strategies of pastoralists and agro-pastoralists. IIED, *Gatekeeper Series*, No 47.
- Swift, J. 1995 Dynamic ecological systems and the administration of pastoral development. In Scoones, I. (ed) *Living with uncertainty: new directions in pastoral development in Africa*, pp.153-173. Intermediate Technology Publications, Exeter.
- Swift, J. 2000 Prospects for the Sahelian pastoral economy. In Adriansen, H., Reenberg, A. & Nielsen, I. *The Sahel: energy supply; economic pillars of rural Sahelian communities; need for revised development strategies*, pp. 77-88. Proceedings of the 12th Danish Sahel Workshop, 3-5 January 2000. SEREIN Occasional Paper, No 11.
- Taylor, P.J. 1999 Places, spaces and Macy's: place-space tensions in the political geography of modernities. *Progress in Human Geography* 23,1: 7-26.
- Thébaud, B. 1995 Land tenure, environmental degradation and desertification in Africa: some thoughts based on the Sahelian example. IIED Drylands Programme, *Issue Paper*, No 57.
- Thébaud, B. & Batterbury, S. 2001 Sahel pastoralists: opportunism, struggle, conflict and negotiation. a case study from Niger. *Global Environmental Change* 11: 69-78.
- Toulmin, C. 1992 *Cattle, women and wells: managing household survival in the Sahel*. Clarendon Press, Oxford.
- Touré, O. 1988 The pastoral environment of northern Senegal. *Review of African Political Economy* 42: 32-39.
- Touré, O. 1990 *Where herders don't herd anymore: experience from the Ferlo, northern Senegal*. IIED Drylands Programme, *Issue Paper*, No 22.
- Touré, O. 1997 Espace pastoral et dynamiques foncières au Sénégal. IIED Drylands Programme, *Pastoral Land Tenure Series*, No 9.
- Tuan, Y.E. 1977 *Space and Place*. Arnold, London.
- Unwin, T. 2000 A waste of space? Towards a critique of the social production of space... *Transactions of the Institute of British Geographers*, NS 25: 11-29.
- Warren, A. 1995 Changing Understandings of African Pastoralism and the Nature of Environmental Paradigms. *Transactions of the Institute of British Geographers*, NS 20: 193-203.
- Weicker, M. 1993 *Nomades et sédentaires au Sénégal*. Série Etudes et Recherches no 139-140, Dakar: Enda- Editions.
- Westoby, M., Walker, B. & Noy-Meir, I. 1989 Opportunistic management for rangelands not at equilibrium. *Journal of Range Management* 42: 266-274.
- Winter, I. 2000 *Towards a theorised understanding of family life and social capital*. Australian Institute of Family Studies, Working Paper 21.
- Zaal, F. 1999 *Pastoralism in a global age: livestock marketing and pastoral commercial activities in Kenya and Burkina Faso*. Thela Publishers, Amsterdam.