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Land and water rights in the Sahel

Tenure challenges of improving access to water for agriculture

Edited by
Lorenzo Cotula

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List of acronyms

AMVS	Autorité de Mise en Valeur de la Vallée du Sourou (Burkina Faso)
CBO	Community-based Organisation
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
CNCAS	Caisse Nationale pour le Crédit Agricole au Sénégal (Senegal)
FAO	Food and Agriculture Organization of the UN
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICJ	International Court of Justice
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development
ILO	International Labour Organisation
IWRM	Integrated Water Resources Management
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
OFEDES	Office des Eaux et du Sous-Sol (Niger)
OPIB	Office du Perimètre Irrigué de Baguinéda (Mali)
PRSP	Poverty Reduction Strategy Paper
RAF	Réorganisation Agraire et Foncière (Burkina Faso)
SAED	Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal et des Vallées du Fleuve Sénégal et de la Falémé (Senegal)
UN	United Nations

Contents

1. Introduction

LORENZO COTULA

1.1 Background

In recent years, access to water has featured high in international policy agendas and debates. The UN Millennium Declaration and the World Summit on Sustainable Development pledged to halve the proportion of people without access to safe drinking water by 2015. In 2002, the UN Committee on Economic, Social and Cultural Rights stated that access to water is a basic human right recognised under international law. A series of international water conferences have taken place (e.g. The Hague, 2000; Bonn, 2001; Kyoto, 2003), and a number of donors committed to support water supply programmes in developing countries. Water-related objectives and actions are included in the NEPAD Policy Document, and an African Ministerial Conference on Water was established by African leaders in 2002.

All this, however, has largely focused on water supply for personal and domestic use. At the international level, much less attention has been paid to access to water for agriculture – broadly defined here as including crop production (farming), livestock rearing and other activities to produce food through the use of natural resources. Yet, water is indispensable for agriculture and food production, and irrigation is the single largest consumptive use of fresh water in the world (WCD, 2000). As some authors recently put it, increases in food production "that have fed the world's growing population would not have been possible" without improved access to water – especially in those developing countries where provision of irrigation was one of the elements underpinning the Green Revolution (Rosegrant et al, 2002:1). In this sense, access to water for agriculture is fundamental for the realisation not only of the above-mentioned human right to water, but also of other internationally recognised human rights, particularly the right to food.

Box 1.1 Definition of agriculture

Agriculture is broadly defined as including crop production (farming), livestock rearing and other activities to produce food through the use of natural resources.

Water for agriculture draws on a range of sources – from naturally available water bodies to water supply infrastructure. In sub-Saharan Africa, only a very small percentage of arable land is irrigated. Most farmers produce food under rainfed conditions. In 1995, for instance, 89% of cereal production in sub-Saharan Africa was delivered from rainfed agriculture, compared to 58% in the West Asia and Northern Africa region (InterAcademy Council, 2004). The situation in the Sahel is very much in line with this trend. Here, the past few decades have witnessed considerable efforts to improve the water infrastructure in rural areas. As a result, there has been a multiplication of pastoral water points and of irrigation schemes – from large, state-owned schemes like the Office du Niger in Mali (which dates back to the 1930s) to village-level irrigation schemes. Irrigation has enabled the cultivation of a range of crops – from rice to fruit and vegetables. However, rainfed farming (millet, sorghum, etc) and pastoralism are – and are likely to remain – the dominant forms of agricultural production and the pillars of rural livelihoods in much of the Sahel.

Demographic and other changes are raising new challenges for water access in the Sahel. With rapid population growth, competition over water resources for agricultural uses is increasing. In many places, water points have been at the centre of tensions and even violent clashes between users. Climate change may exacerbate the scarce and erratic nature of rainfall in the region. "A reduction in rainfall projected by some climate models for the Sahel […], if accompanied by high inter-annual variability, could be detrimental to the hydrological balance of the [region] and disrupt various water-dependent socio-economic activities" (InterAcademy Council, 2004:45).

Addressing these challenges and ensuring access to water for agricultural activities is critical for rural livelihoods and agricultural development in the Sahel. Unsurprisingly, this is seen as a priority by key national policy documents – such as the Poverty Reduction Strategy Papers (PRSPs) of Mali (2002), Niger (2002) and Senegal (2002), and Senegal's Agro-Sylvo-Pastoral Policy Act 2004. These and other policy documents call for a range of interventions in the water sector.

On the one hand, securing access to water for agriculture may require improving the water supply infrastructure. A few years ago, the World Commission on Dams warned that "the potential to expand irrigation

into new areas has sharply declined" (WCD, 2000: 146). Similarly, a study recently commissioned by the UN Secretary General to prepare a "strategic plan for harnessing the best science and technology to increase the productivity of agriculture in Africa" found that "the further scope for economically viable and environmentally benign large-scale irrigation development in Africa is limited" (InterAcademy Council, 2004: 214). "Carefully selected" investment in water supply, however, still has a role to play in areas where water infrastructure is very poor (Rosegrant et al, 2002). This investment is likely to include the maintenance, upgrading and expansion of the existing infrastructure, and the creation of new small-scale irrigation and water supply schemes. Last year, the Director-General of the Food and Agriculture Organization called for efforts to double the percentage of irrigated land in sub-Saharan Africa (Diouf, 2004). These trends are reflected in key policy documents adopted by Sahelian governments. For instance, the PRSPs of Mali and Niger respectively identify the development of "hydro-agricultural facilities", and "rehabilitating and creating irrigation perimeters", as priority areas (paras 294 and 5.2.1.1, respectively). Also, water supply projects are being implemented by a range of development agencies (for instance, with regard to pastoral water points in Niger).

On the other hand, there is a growing recognition that addressing water scarcity requires not only adequate water infrastructure, but also efficient and sustainable water management – creating incentives for better use of existing water systems. "Successfully meeting human demands for water in the next century", stated the World Commission on Dams, "will increasingly depend on non-structural solutions and a completely new approach to planning and management" (WCD, 2000:3). To this end, Integrated Water Resources Management (IWRM) principles are being mainstreamed in water policies, laws and programmes. Mali and Burkina Faso, for instance, have recently revised their water legislation better to reflect IWRM principles, while Senegal's Agro-Sylvo-Pastoral Policy Act explicitly refers to IWRM as the basis for the national water policy (article 48).

Experience shows that improving access to water for agriculture is a complex challenge. The success of both water supply and management projects depends on a range of factors – including geophysical, technical, economic, social and legal/institutional factors (Mathieu, 2001). In the past, emphasis tended to be placed on geophysical and technical issues, while social, legal and institutional factors have often been neglected.

Yet, getting rules and institutions right is crucial to promote efficient, equitable and sustainable water use. Without them, the construction and operation of water facilities may engender disputes on the social or environmental impacts of those facilities, and/or on the allocation of use rights over the water supplied by them. This is a key challenge across the Sahel[1]. Legal and institutional factors include establishing clear property rights and management rules for water and water infrastructure. And, very importantly, addressing the linkages between water rights and land tenure.

In the past, development programmes have paid little attention to the land tenure implications of water-related interventions. Decisions on the construction of water infrastructure, on its location and on its management regime were typically based on hydrological and technical factors alone. And, policy and legislation on water and on land have evolved largely isolated one from the other. However, on the ground, land and water rights are closely linked.

For a start, water points and irrigation tend to boost land values, and may therefore exacerbate land competition and foster conflict between land users. And, the creation and maintenance of water points is typically recognised as a form of productive land use ("*mise en valeur*"), upon which protection of land rights is usually conditional across the Sahel. As a result, those who are perceived to "steer" water interventions (e.g. individuals building irrigation facilities or digging wells; communities requesting water infrastructure from government or development projects) would strengthen their control over the land area affected by those interventions.

Creating irrigation schemes may raise land tenure issues because of the land expropriation and of the subsequent reallocation of land-cum-water rights that they usually entail. Farmers' land tenure security is a key challenge in many irrigation schemes across the Sahel. In some cases, access to water and access to land are linked by contractual or other arrangements (e.g. clauses conditioning farmers' access to irrigated land to regular payment of the water charge). Lively land sales and rental markets have flourished in many irrigated areas, despite being prohibited by legislation.

1. And well beyond: in 54 BC, Cicero famously represented the town of Raete in a dispute against neighbouring Interamna – a dispute concerning a system of artificial canals regulating the flow of the River Velinus.

In many pastoral societies, access to rangeland is determined by a blend of common-property and individual rights over the wells located in it. In these contexts, water rights are crucial to manage grazing lands sustainably, and endow pastoral communities with assets that can be negotiated to access distant resources in times of crisis. In some cases, government provision of de facto open-access water points has weakened traditional rangeland management systems, deprived pastoralists of a valuable asset in negotiations with incoming herders and fostered conflict and land degradation. On the other hand, in some pastoral areas, the creation of private water points on common lands is being used as a strategy for elites de facto to privatise common property resources.

Despite their importance, the linkages between water rights and land tenure are still little understood by policy makers, and scarcely taken into account in development programmes. As a result, many well-meaning water projects have ended up undermining land tenure security, fostering land disputes and contributing to resource degradation.

Decentralisation has further complicated the picture and raised the stakes. In Senegal, irrigated lands are managed by local governments, and land/water user groups have been given greater say in resource management. In Mali, local governments have been transferred responsibility for water supply and, on paper, for natural resource management. Anecdotal evidence suggests that communes are requesting donor support to build water infrastructure, without much consideration for the complex land tenure implications of these efforts – thus fostering resource conflict.

Decentralisation also raises issues concerning resource management and revenue sharing. In Niger, the recent establishment of local governments raises issues as to the coordination between these new bodies and pre-existing water management committees. The water fees received by the latter constitute a major economic stake, and are attracting the attention of local governments that are short of cash and under pressure to live up to expectations. Similar coordination and revenue sharing challenges arise within the context of valuable wetlands. In the Inner Niger Delta (Mali), resource access fees are received by "customary" chiefs, who are determined not to lose their prerogatives to local governments.

1.2 Object, scope and methodology

In order to improve access to water while preventing conflict and promoting local sustainable development, efforts to address the agriculture-related water needs must take into account the complex interface between land tenure and water rights. This study aims to contribute to these efforts, by seeking **to clarify the nature of the interface between water rights and land tenure in the Sahel**. It builds on an earlier desk study commissioned by the FAO, which reviewed key issues and trends worldwide (Hodgson, 2004). This study adds value to that review by generating empirical evidence on a selected region of the world – the Sahel.

The study is to support a **longer-term process of policy debate and exchange of experience** on how best to tackle the issues raised by the interface between water and land rights in the Sahel. Such process (the "Sahel Water Governance Learning Group") is to involve a range of actors working to improve access to water – policy makers, development practitioners, user and producer associations, community leaders and other civil society actors – and will discuss practical ways to take account of land tenure issues in water programmes.

The study focuses on two key areas of interface between land and water rights: **irrigation** and **pastoral water points**. It also explores some key issues concerning the linkages between rights over water, land and other natural resources within the context of highly valuable humid lands – **wetlands**. As for geographical scope, the study focuses on the Sahel, particularly **Senegal, Mali, Burkina Faso and Niger**. Relevant evidence and materials from other Sahelian countries are used to provide additional insights. Reference is also made to developments in other sub-Saharan African countries, with a view to placing the analysis on the Sahel in its broader context.

In exploring the linkages between water rights and land tenure, the study takes a **socio-legal approach**[2]. It analyses those linkages both in law and in the practice of development programmes and other interventions. To do so, it combines an analysis of legal texts with a study of the intended or unintended outcomes of legislative interventions on the ground, and of how different actors are using, not using or mis-using those legal processes in practice. And, given the importance of custom-

2. For a theorisation of such an approach, see Hesseling et al, 2005.

ary rules for the management of water and land rights in much of the rural Sahel, the study pays attention to the way in which the water/land rights linkages are affected by the interplay between statutory and customary law. It also examines how development programmes in the water sector may have intended or unintended implications for land and water rights as they are perceived and applied at the local level.

The study draws **on a review of legislation, on a literature review, on unpublished materials from previous IIED research programmes, and on original fieldwork**. The analysis of legal texts enabled us to explore the relationship and the degree of coherence between sectoral laws (e.g. on land, water, pastoralism and decentralisation). The literature review enabled us to mobilise findings from existing research, to explore key issues, and to identify gaps. It revealed the existence of a wealth of materials tackling the tenure issues raised by irrigation and pastoral water points in the Sahel – including a vast literature from the 1980s and early 1990s. Previous unpublished work includes research on land relations in irrigation schemes undertaken for the IIED Future of Family Farming programme (e.g. Keita, 2003) and several studies on wetland management in the Inner Niger Delta, Mali (e.g. Cissé, 2001 and 2002; Cissé and Konaté, 2003). Fieldwork focused on "strategic" issues and/or on recent developments that are not well documented in the literature. In particular, two field studies were undertaken:

- **A study in Senegal**, focusing on the land/water rights interface within the context of decentralised management of **irrigation** schemes. Fieldwork was carried out in six rural communities in the Senegal River Valley, covering both the Delta (Rural Communities of Ross Béthio, Gandon, Ronkh and Mbane) and the Middle Valley (Rural Communities of Bokidiawé and Nabaji Civol)[3].

- **A study in Niger**, focusing on the development of private **pastoral wells** as a strategy to appropriate common lands. Fieldwork took place in the departments of Tanout and Gouré, both in the Zinder Region[4].

3. Oumar Sylla, "Droits d'accès à l'eau et au foncier: la problematique de la gestion décentralisée du domaine irrigué dans la vallée du Fleuve Sénégal", July 2005.
4. Kees and Gill Vogt, "Wells and their spells: A closer look at the knock-on effects of placing wells in pastoral areas in Zinder Region, Niger", June 2005.

In both cases, fieldwork methodology involved: a. **semi-structured interviews** with key informants (e.g., in Niger, government and NGO officials, representatives of pastoral associations, customary chiefs, professional well diggers, officials from the local land tenure commissions, and pastoralists; and in Senegal, farmers, rural councillors, irrigation agents, government and NGO staff, and village chiefs); and b. **group discussions** (e.g., in Niger, focus groups contributed to identify key issues for the fieldwork, and discussed preliminary fieldwork findings).

1.3 Plan of the study

Besides this introduction, this study is structured in four substantive chapters and a conclusion. Chapter 2 defines key concepts and reviews main trends in policy and legislation. This is to lay the ground for the subsequent three chapters, each of which focuses on a specific land/water theme (irrigation, pastoral water points and wetlands). Chapter 3 discusses the land/water rights interface with regard to irrigation, drawing on the literature review, on unpublished materials from other IIED programmes, and on the case study from Senegal. This chapter mainly covers Burkina Faso, Mali and Senegal. Chapter 4 focuses on pastoral water points, drawing on the literature review and on the case study from Niger, as well as on the longstanding work of one of the co-authors. While referring to examples from different Sahelian contexts, the chapter focuses on Niger. Chapter 5 deals with wetlands. It briefly touches on some of the key issues and focuses on one example, drawing on unpublished materials from an earlier IIED programme in the Inner Niger Delta, Mali. Finally, chapter 6 draws conclusions from the analysis of literature review and fieldwork findings.

2. Key concepts and trends in policy and legislation

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2.1 Talking rights

As the study explores the interface between land and water rights, it may be useful to recall what these "rights" are, and how they relate to other types of rights – particularly human rights.

Land and water rights

Land rights are the backbone of a land tenure system – the system of rules, rights, institutions and processes under which land is held, managed, used and transacted. Land rights include ownership and a range of other land holding and use rights (leasehold, usufruct, servitudes, grazing rights, etc), which may coexist over the same plot of land (Hodgson, 2004). Land rights may be held by individuals or groups (e.g. private property) or by the state (ownership, trusteeship, etc). They may be based on national legislation, on customary law or on combinations of both. In much of rural Africa, customary and statutory land tenure systems coexist over the same territory – often resulting in overlapping rights, contradictory rules and competing authorities ("legal pluralism" – see below, section 2.3).

Land tenure security refers to the degree of reasonable confidence not to be arbitrarily deprived of the land rights enjoyed and/or of the economic benefits deriving from them. It includes both 'objective' elements (nature, content, clarity, duration and enforceability of the rights) and 'subjective' elements (landholders' perception of the security of their rights) (Lavigne Delville, 2003; Cotula et al, 2004; Place et al, 1994).

Water rights are legal entitlements for the abstraction and/or use of water resources – whether surface or groundwater (Hodgson, 2004). The exercise of water rights may depend on infrastructure (wells, canals) to abstract and transport water. This is particularly so in dry areas, where water access often requires facilities to take groundwater to the surface.

Water rights include "permits", "licences", "concessions" and other legal instruments through which government authorities enable individuals or groups to abstract water – and, if needed, to build the necessary infrastructure. It is widely accepted that, although these rights are created under administrative law, they constitute property rights (Hodgson, 2004; ODI, 2004). Permit holders may then provide water to users for drinking or irrigation purposes, on the basis of a contract between service provider and users and in consideration for payment. In this sense, water rights may also be construed as contractual rights (ODI, 2004). Finally, like land rights, water rights may be based on bodies of norms other than domestic legislation – namely, customary law. Tenure security in the enjoyment of water rights relates to the degree of reasonable confidence not be arbitrarily deprived of access to water resources.

Land/water rights and human rights

Land and water rights are distinct from, but linked to several human rights – the fundamental rights and freedoms to which all human beings are entitled. Human rights are affirmed in international treaties and declarations, and in national constitutions. Key international instruments include the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR). For each human right, states have a duty to "respect" (i.e. to refrain from undertaking activities that negatively affect the enjoyment of that right), to "protect" (i.e. to prevent individuals and groups from impinging on the rights of others), to "facilitate" (i.e. to implement policies, laws and programmes that promote the realisation of that right), and to "provide" (i.e. to provide support where individuals or groups are unable to fend for themselves)[5]. States must also refrain from discriminating among different groups or individuals in the enjoyment of human rights. Specific non-discrimination obligations apply in relation to particular groups. For instance, the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) prohibits discrimination and requires states to adopt measures to ensure gender equality – with implications for access to both land and water (article 14(2)(g) and (h)).

5. This classification of legal obligations was developed in "General Comments" adopted by UN human rights bodies to provide guidance on the interpretation of human rights treaties (e.g. General Comments 12 and 15 of the UN Committee on Economic, Social and Cultural Rights, on the right of food and the right to water, respectively). It was also followed by the African Commission for Human and Peoples' Rights in the case *SERAC v Nigeria* (2001) AHRLR 60.

Although land rights as such are not recognised as human rights, they are linked to the right to property, which is a human right recognised by the Universal Declaration of Human Rights; by regional human right treaties such as the European Convention on Human Rights (Protocol 1), the American Convention on Human Rights and the African Charter on Human and Peoples' Rights; and by most national constitutions. International law also contains provisions on the land rights of specific groups – such as indigenous peoples (ILO Convention 169). These human right provisions protect land rights acquired under both statutory and customary law. For instance, in the Tanzanian case *Attorney General v Akonaay, Lohar and Another* ([1995] TLR 80), the Tanzanian Court of Appeal held that although customary land rights do not amount to ownership, they are nevertheless "real property" protected by the Constitution, and their expropriation entails therefore payment of compensation.

Similarly, water rights are (distinct from but) linked to the human right to water. This right is based on the ICESCR – particularly articles 11 (right to an adequate standard of living) and 12 (right to the highest attainable standard of health). Its content has recently been clarified by the UN Committee on Economic, Social and Cultural Rights (General Comment No. 15, 2002). According to the Committee, the right to water "entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses" (paragraph 2). The right is to be realised "progressively" and "to the maximum of available resources". State must refrain from arbitrarily interfering with existing water access (e.g. "arbitrarily interfering with customary for traditional arrangements for water allocation" – paragraph 21), and must take a range of measures (from regulation to provision) in order to progressively ensure access to water for all. While the Committee focused on personal and domestic uses, it also noted "the importance of ensuring sustainable access to water resources for agriculture" (paragraph 7).

Finally, both land and water rights are instrumental to food production and, therefore, to the progressive realisation of the right to adequate food – also recognised by the ICESCR. The right to food entails first and foremost the right to undertake activities enabling the production or procurement of food. States have a duty to respect, protect and facilitate these activities. Ensuring access to land, water and other productive assets is a key element of this task.

2.2 Trends in policy and legislative frameworks

The changing roles of state, local government and the private sector

The past few decades have witnessed important evolutions in agriculture-related policy, legal and institutional frameworks across the Sahel – and indeed across sub-Saharan Africa. Structural adjustment, political democratisation and economic liberalisation have resulted in a revision of the role of the state in the agricultural sector. This includes for instance a gradual and partial withdrawal of state and parastatal organisations in the direct provision, maintenance and management of the water infrastructure. Parastatal agencies like the Office du Niger in Mali have substantially reduced their personnel, and shared some maintenance and management responsibilities with committees in which user groups are represented. The withdrawal of the central state has developed in two main directions – decentralisation and privatisation. It has resulted in a multiplicity of actors in the water sector (state/parastatals, local governments, private operators).

On the one hand, decentralisation processes are underway in Senegal, Mali, Burkina Faso and Niger – although at very different stages. In some cases, responsibilities for the management of water infrastructure and/or irrigated lands have been transferred to local governments. In Senegal, for instance, Decree 87-720 of 1987 changed the legal status of many state-operated irrigation schemes from "*zones pionnières*" to "*zones de terroir*". As a result, land management responsibilities over these areas were transferred to local governments. Similarly, in Mali, local governments are to play a key role in the management of water resources – for instance with regard to pastoral water points (Pastoral Charter 2001, articles 38-46).

On the other hand, private operators have played a growing role in the provision of water infrastructure. For instance, in some parts of Senegal, numerous village irrigation schemes have been built by village associations and funded through international remittances. Similarly, private operators are increasingly engaged in the creation of pastoral water points in Niger. Attraction of private capital is also seen as key to maintaining and expanding existing state-operated schemes, and to increasing agricultural productivity. Long-term land leases are being

given to private "investors" for them to build and/or upgrade irrigation facilities (see below, section 3.3). And, in December 2004, the Malian government decreed the sale to private operators of 3000 hectares of land in the Office du Niger irrigation scheme (see below, section 3.3).

Land and water laws: missed encounters…

Overall, land and water policies and laws have evolved largely independently from one another – a trend that is not unique to the Sahel. Many developing countries and transition economies have had sectoral reforms reshaping both land tenure and water rights, with little coordination being established between the two (Hodgson, 2004). More generally, policies and laws in the two sectors are driven by distinct groups of professionals (hydrologists, hydraulic engineers and water lawyers for the water sector; land economists, surveyors and land lawyers for the land sector), and the literatures on land tenure and on water rights are compartmentalised (Hodgson, 2004). While land policy tends to be perceived as a "political" issue, water policy seems to be treated more as a "technical" challenge, drawing on IWRM and other principles.

Yet, historically, water and land rights used to be closely linked. For a long time, the right to use water depended on ownership or use of adjacent lands ("riparian right"; Hodgson, 2004). Roman law, for instance, distinguished between public and private water; access to the former was open to all those who had access to it – i.e. all those who owned land along the water body (Hodgson, 2004). This approach was followed by the civil law tradition (e.g., in the French Civil Code 1804), which derives from Roman law and which has in turn influenced much legislation in the Sahel.

On the other hand, recent water law reforms have abolished or eroded private water ownership and riparian rights, and brought water resources under state ownership or control. In this approach, water rights are then allocated by government authorities through administrative processes – with exemptions for domestic use and/or use below specified water quantities ("*de minimis*" exemptions). This is to enable flexible water use planning, the setting of priorities in the allocation of water rights, and the promotion of efficient and sustainable water use. As a result, water rights are fully dissociated from land rights. This is the approach followed for instance by the legislation of countries as diverse

as Italy (1994), Morocco (1995) and South Africa (1998) (FAO 2002; Burchi, 2000; Hodgson, 2004).

Water legislation in the Sahel has evolved in line with this trend. In Mali, for instance, the Water Code 2002 provides for state ownership of all water resources (with a few limited exceptions) and establishes a permit regime for water abstraction – excluding water use for domestic purposes *and* below specified volumes (articles 18 and 19). Burkina Faso's Water Management Policy Act (*Loi d'Orientation relative à la Gestion de l'Eau*, 2001) and Niger's Water Code (1993, as amended in 1998) contain similar principles. In Niger, for instance, the creation of infrastructure for water abstraction is subject to the "authorisation" of the administrative authorities for facilities above a specified water volume, and to simple "declaration" of the intention to create the water point for infrastructure below that threshold. These water laws also establish a range of national, local and watershed-level bodies to contribute to water use planning, and they integrate, explicitly or implicitly, IWRM principles (see for instance Burkina Faso's Decree 220 of 2003, containing an Action Plan for the implementation of IWRM).

Since the 1990s, land legislation has tended to evolve in a different direction – broadly speaking, away from state control and towards greater recognition of private ownership or use rights. Law reform to accommodate private land ownership has been particularly widespread in Central and Eastern Europe. In sub-Saharan Africa, private ownership has been introduced in several countries. Also, some African land laws have taken steps to grant greater protection of land use rights, including customary rights – even where land remains state-owned or vested with the state in trust for the nation (e.g. Mozambique's Land Act 1997, Tanzania's Village Land Act 1999, Uganda's Land Act 1998; FAO, 2002; Cotula et al, 2004). This is in contrast with water legislation, where explicit recognition of customary rights is rare.

Again, land legislation in the Sahel has broadly followed this trend – though only in part. After independence, most Sahelian governments nationalised or otherwise took control over land. This was to promote agricultural development on the one hand, and to seize control of a valuable asset and a source of political power on the other. Today, most land is still owned or held by the state – e.g. in Senegal (under the Land Act 1964), in Mali (Land Code 2000, as amended in 2002), and in Burkina

Faso (Land and Agrarian Reform Act – RAF – 1996). On state lands, users enjoy use rights so long as they put land to productive use ("*mise en valeur*"). Typically, land management institutions are mandated to monitor productive use, and to allocate land to third parties in case of non-use (e.g. article 19 of Niger's Rural Code).

However, recent years have witnessed an emerging (if patchy) trend towards greater decentralisation of land management responsibilities, stronger protection of private property, and greater recognition of local ("customary") land rights. In Senegal and Mali, for instance, legislation provides for the devolution of land management responsibilities to local governments – though in Mali this is not operational yet. As for private property, this was introduced in Burkina Faso with the 1996 Act, which enables the state to "cede" land to private operators (articles 3-5 and 66 ss). However, these provisions have hardly been applied in practice. A somewhat bolder attempt to promote private property was carried out in Mali with the Land Code 2000. Here, more than half of the provisions of the Code concern private property and other private land rights – though the formal registration of private ownership rights over rural land remains extremely rare. Customary rights are not recognised in Senegal and in Burkina Faso. But the protection of customary rights has been steadily strengthened in Mali from the Land Code 1986 to the Land Code 2000 and its 2002 amendment. Similarly, in Niger, the Rural Code specifically recognises customary rights as a legitimate source of land claims (article 9). On the whole, however, it can be said that the state remains the key player in land relations under the land legislation of most Sahelian countries.

To sum up, in the Sahel like elsewhere, the law has evolved towards a full dissociation between land and water rights. Water and land legislations have evolved often with little coordination and, in some respects, in different directions – towards greater state control over water resources, and (partly) away from state control for land. The case of Senegal clearly illustrates this. While land management responsibilities have been devolved to local governments, water management in irrigated areas remains under the control of central government agencies and parastatals.

… and some areas of overlap

Having said all that, there are also many "junctions" between the legislative frameworks on land tenure and on water rights. First, a piece of legislation may cover both land and water rights issues. In Niger, the Rural Code was designed as a legal framework for all natural resources and socio-economic activities in rural areas. It therefore sets principles on both water and land rights, which are then spelt out in implementing regulations and in the Water Code – though contradictions between the Rural Code and the Water Code exist (see below, chapter 4). Similarly, some laws take an activity – rather than a resource – as their entry point, and address issues concerning rights over the different resources that are instrumental to that activity. This is the case of "pastoral" legislation, which typically covers issues relating to both land and water rights (Guinea's Pastoral Code 1995; Mauritania's Pastoral Code 2000; Mali's Pastoral Charter 2001; Burkina Faso's Pastoral Policy Act 2002).

Secondly, although Sahelian land laws rarely define what qualifies as "*mise en valeur*" (productive land use, a condition for the protection of land use rights), it is widely recognised that the creation and maintenance of water points constitutes "*mise en valeur*" for the purposes of land law. This is explicitly stated in Niger's legislation (e.g. Decree 6 of 1997, article 10, with regard to pastoral resources). Also, land areas supplied with irrigation or pastoral water points tend to have a special regime under land legislation. In Burkina Faso, for instance, while subsistence agriculture in most rural areas is effectively exempted from state regulation (article 52 of the RAF and article 505 of its implementing decree), irrigated land is subject to a special regime and to detailed regulations (article 191 ss of the RAF).

Thirdly, legislative provisions may address issues like expropriation and compensation of land rights for the purposes of creating, improving or maintaining the water infrastructure – a key element of the interface between land tenure and water rights (e.g. article 11 of Burkina Faso's Water Management Policy Act).

2.3 Legal pluralism

In much of West Africa, state policies and laws tend to be little implemented in rural areas. Lack of financial resources and of institutional capacity in government agencies, lack of legal awareness and, often, lack

of perceived legitimacy of official rules and institutions all contribute to limit the outreach of state regulation in rural areas. In Niger, for instance, a decree fixing a Northern limit for cultivation and reserving land North of that line to pastoralism (Decree 5 of 1961) has notoriously had very little implementation and impact on the ground. On the other hand, local ("customary" but continuously evolving) resource tenure systems are commonly applied even where inconsistent with legislation, as they often are more accessible to rural people.[6]

Customary law is a body of rules founding its legitimacy in "tradition", i.e. in its claim to have been applied for time immemorial. The content of customary law is extremely diverse, possibly changing from village to village. The degree of its internal consistency also varies, ranging from (rare) systematised codes to, more often, "loosely ordered...repertoire[s] of norms" (Comaroff and Roberts, 1981, writing on the Tswana of Botswana). This diversity is the result of a range of cultural, ecological, social, economic and political factors. For instance, customary rules governing land tenure and water rights in pastoral areas and in agricultural or agro-pastoral areas tend to differ substantially. Because of this great diversity, generalisations should be avoided. Also, customary rules are not static, but continually evolving as a result of diverse factors like cultural interactions, population pressures, socio-economic change and political processes. In much of the Sahel, customary land tenure and water rights systems have been influenced by Islamic law. "Traditions" are continuously reinvented to back conflicting claims of different social groups.

Very broadly, under many customary land tenure systems in West Africa, land belongs to the group (e.g. the lineage), and land access is usually determined by group membership and social status. Customary tenure systems encompass very different institutional arrangements, ranging from common property (usually for grazing land) to household farming rights on plots allocated by the "customary" chief (mainly for cultivated land). In the latter case, households' rights vary from place to place. They are usually conditional upon the continued use of the plot. And, they are usually inheritable but cannot be sold (especially to outsiders), although certain transactions are generally allowed (gifts, loans, etc.) and some systems do allow land sales. Across the Sahel, customary systems cater

6. On customary land tenure systems in the Sahel, see Lavigne Delville et al, 1998; Chauveau, 1998; Lund, 2000; Mathieu et al, 2000; Thébaud, 2002; Toulmin et al, 2002.

for multiple resource uses (e.g. pastoralism, farming, fishing) and users (farmers, residents and non-resident herders, agro-pastoralists; women and men; migrants and autochthones; etc). Institutional arrangements regulate relations between those who first cleared the land ("autochthones") and newcomers ("migrants"; see below, section 3.2).

In practice, the neat distinction between "customary" and "statutory" land tenure systems is considerably blurred. "Customary" systems have been much changed by a century or more of contact and interference by governments, both colonial and since independence. Equally, statutory systems for land management usually operate with considerable possibilities for negotiation. Resource users gain access to natural resources through a blend of "customary" and "statutory" arrangements.

As a result, a range of customary, statutory and hybrid institutions and regulations having de jure or de facto authority over land and water rights may co-exist in the same territory, a phenomenon referred to as "legal pluralism". A lack of clear hierarchy or other form of co-ordination amongst the different structures creates confusion and fosters tenure insecurity. Parties to land disputes invoke different norms to support competing claims, and choose the institutional channel which they feel is most likely to be favourable to their cause ("forum shopping"). Typically, certain actors prefer one or other system. For example, urban investors prefer to seek formal written backing for their land rights, while rural groups may feel their rights are best represented through the customary sphere. Migrants and women may feel that the formal statutory system provides a better guarantee of their rights over land than would be possible under customary norms.

2.4 Putting rights in context

Land and water rights cannot be considered in isolation from their social, economic, political, cultural and ecological context. The operation of rules and institutions – whether statutory or customary – is affected by power relations within society. Typically, more powerful groups are able to reinterpret and manipulate rules to their advantage, with a view to consolidating or increasing their control over resources. Also, as access to land is crucial for rural livelihoods, control over this resource is itself an important source of political power across the Sahel.

The creation of water points and the allocation of access and management rights over these have profound implications for control over the territory and, more generally, for the nature and direction of rural development. In Northern Senegal, for instance, rural livelihoods were traditionally centred on pastoralism and on seasonal transhumance between the Senegal River Valley ("*waalo*") and the central Ferlo area ("*jeeri*"). In the 1950s, the creation of boreholes led to the progressive abandonment of traditional transhumance patterns and to greater sedentarisation of pastoral groups. In the 1960s, the creation of irrigation schemes in the Senegal River Delta led to a shift from pastoralism to rice cultivation; and to a scramble for valuable irrigated land, with outsiders coming in from other areas of Senegal (Touré, 1997; Thébaud, 1995). In the study field sites in the Senegal River Delta (see above, section 1.2), the development of irrigation schemes has encroached on pastoral lands and blocked access to pastoral water points. Government agencies and development projects have recently sought to delimitate transhumance tracks, so as to ensure access to water points. This shows how, while this study addresses issues concerning irrigation and pastoral water points in two different chapters for sake of clarity, the two are in fact closely linked. Indeed, the creation of irrigation schemes can result in conversion of grazing lands into cultivated plots and in loss of land rights for pastoral groups.

Discussions on the interface between land and water rights in the Sahel also need to be placed in the context of the ongoing debate on agricultural "modernisation". In the Sahel, two models of agricultural development are competing in the policy arena. On the one hand, a commonly held view calls for the promotion of agribusiness as a way to attract private capital and increase agricultural productivity. On the other, family farming and pastoralism remain the backbone of rural livelihoods across the Sahel, and have shown to be dynamic, responsive to change, and an important source of investment in agriculture (Toulmin and Guèye, 2003). Discussions on these two models, for instance, underpinned the debate on Senegal's Agro-Sylvo-Pastoral Policy Act 2004 (Haramata, 2004). As a high-value productive asset, irrigated land is at the centre of this debate. Strategic policy choices on the model of agricultural development are likely to have implications for the allocation of land-cum-water rights on irrigated land. The Malian Decree of December 2004 authorising the sale to private operators of lands in the Office du Niger area is a telling example of this. Also, different actors

(agribusiness, smallholders) may have different needs as to the content of land and water rights and as to ways to secure them. Similar strategic policy choices are being debated in relation to the "modernisation" of livestock rearing activities – for instance in relation to the promotion of modern technology (transfer of embryos, artificial insemination, importation of European livestock species), which is likely to be only relevant for commercial ranches rather than for pastoralism. Policy choices on these fundamental issues would have implications for the development of pastoral water points and for related water/land rights issues.

Finally, the design and implementation of development projects for the provision of water infrastructure are embedded in complex social relations. A growing literature shows how development projects are "arenas" that different groups use to strengthen their claims and to further their interests. In this context, local actors manipulate development projects and external operators to their own ends. Similarly, local stakeholders acting as intermediaries vis-a-vis development projects use their role to strengthen their social position within the community, leaning on a real or supposed capacity to mobilise funds from the outside ("*courtiers du développement*"; see e.g. Lavigne Delville et al, 2000). In many cases, the construction of a water facility has been used as a tool to challenge or consolidate land claims – for instance, to "emancipate" a village that is customarily tributary to another village for its access to land (Lavigne Delville et al, 2000). These aspects are analysed in the next chapters.

3. Land/water rights and irrigation

LORENZO COTULA AND OUMAR SYLLA

3.1 Introduction

In the Sahel, the development of irrigated agriculture has been a priority ever since colonial times. For a long time, emphasis was placed on state-run, large-scale irrigation schemes – such as the Office du Niger in Mali, established by the French in the 1930s; the SAED in Senegal[7], set up in the 1960s; and the AMVS in Burkina Faso[8]. The past few decades have witnessed major changes – for instance, in the extent and nature of government intervention, in the crops cultivated on irrigated land, and in the rise of private irrigation schemes. Irrigation schemes in the Sahel present a great diversity of situations, for instance with regard to size (from large-scale schemes to small and micro dams), legal regime (ownership, management rules, nature and duration of use rights, etc) and farming system (subsistence or commercial production; size of farms/irrigated plots; etc). Crops also vary – though rice is usually the main crop, often coupled with other crops. As a result, land tenure and water rights issues also vary substantially.

As Hodgson (2004) pointed out, irrigation schemes raise issues in relation to both water and land rights. Water rights issues concern two main "levels": the right to abstract water from the natural source to feed the irrigation scheme, a right held by the irrigation agency usually through a "licence" or "permit"; and water delivery rights, held by individual water users – the farmers – on the basis of a contract with the irrigation agency and in return for a water fee (Hodgson, 2004). To further complicate the picture, over the past few years responsibility for the operation and maintenance of state irrigation schemes has been (partly) transferred to water users associations (e.g. in the Senegal River Valley and in the Office du Niger). Key water delivery rights issues include farmers' security of access to water, nature and level of the water fee, accountability mechanisms to ensure timely and effective water delivery, and the responsibilities and functioning of water users associations (Hodgson, 2004).

7. Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal et des Vallées du Fleuve Sénégal et de la Falémé.
8. Autorité de la Mise en Valeur de la Vallée du Sourou.

As to land tenure, irrigation schemes raise three broad groups of issues. Firstly, with regard to the very creation of the scheme – which may entail the expropriation of existing land rights, and the reallocation of land-cum-water rights to new users. Secondly, with regard to the land tenure security enjoyed by farmers on irrigated plots (nature and duration of use rights, etc). Thirdly, with regard to land transactions fostered by the increased land values that irrigation brings about. These issues are closely linked to the water delivery rights issues identified above. For instance, in many schemes non-payment of the water fee entails loss of land use rights – with clear implications for land tenure security.

3.2 Creating irrigation schemes and allocating irrigated plots – land tenure challenges

Across the Sahel, there is hardly any agricultural land that is not claimed by individuals or groups – whether on the basis of customary or statutory law. Therefore, the creation of irrigation schemes on the part of government or development agencies is likely to entail the suppression of existing land rights, and the reallocation of land-cum-water rights to users who may or may not be the original right holders. Legislation typically empowers the government to do this[9]. This raises issues as to the extent to which local land rights are recognised by legislation, and right holders are compensated for loss of their rights. In Senegal and Burkina Faso, customary rights are not legally protected[10]. On the other hand, Mali's Land Code provides for the compensation of suppressed customary rights, and for a procedure similar to the expropriation process applicable to titled property.

In some cases, right holders receive "improved" (i.e. irrigated) plots rather than cash compensation. For instance, our fieldwork in Senegal found that the expropriation procedure is not used for irrigation projects. No formal transfer of land ownership takes place. Instead, the rural council (the local government body responsible for land management) "withdraws"

9. For instance, in Burkina Faso, Law 29 of 1963 (empowering the government to expropriate existing resource rights and reallocate lifelong tenancy rights over the improved resource) and article 11 of the Water Management Policy Act 2001 (requiring compensation for loss of land rights resulting from water-related interventions).
10. However, article 11 of Burkina Faso's Water Management Policy Act 2001 refers to implementing regulations for determining the conditions for the compensation of "direct, material and certain" impairment of customary rights.

Photo: Jorgen Schytte/Still Pictures

Traditional irrigation system, Niger. Farmers watering a field in the Zinder region, used to grow melons and other vegetables.

("*désaffecte*") land from the land users, and allocates it to the irrigation agency (in our case, the SAED) for irrigation development. No cash compensation is paid. However, the original landholders usually manage to obtain irrigated plots after the construction works (study fieldwork).

The allocation of use rights to irrigated plots after the completion of the irrigation scheme is usually made on the basis of criteria determined by legislation or development projects. Such criteria may include: pre-existing land rights; labour or cash contribution for the construction of the irrigation facility; household size; capacity to cultivate the land; local residence; and others. The balance between these criteria depends on the approach underpinning the irrigation project. Where equitable land distribution is an aim, irrigation projects favour the allocation of equal irrigated plots to those who contributed labour to the construction

works, irrespective of previous land ownership (Lavigne Delville et al, 2000; Nepveu de Villemarceau et al, 2005). As irrigation increases the value of the land and many actors claim their share, the application of these criteria may create tensions between competing claimants – between neighbouring villages; between "owners" and tenants, autochtones and migrants, herders and farmers; and along gender lines.

Creating irrigation facilities and allocating water rights raise land tenure issues that vary substantially depending on the size of the irrigation scheme and the legal regime applicable to it. Large-scale, state-owned schemes raise very different land tenure issues to village irrigation schemes. And, projects designed and implemented by outsiders – whether government or development agencies – are more likely to be prone to manipulation by local actors and to produce unintended consequences. The following sections review some of the most common land tenure challenges linked to the creation of irrigation schemes and the allocation of land-cum-water rights. For sake of clarity (if somewhat simplistically), we have organised them in inter- and intra-community issues.

Land relations between communities

Under most Sahelian customary land tenure systems, villages have different land tenure statuses. An important distinction is between the descendants of those who first cleared the land (sometimes referred to as "autochtones") and the descendants of those who moved to the area at a later stage (sometimes referred to as "allochtones" or "migrants" – even after several generations of settlement). Migrants obtain(ed) access to land through an arrangement with the autochtones. Their villages are "tributary" to the autochtone, landholding village[11]. This often results in tensions. On the one hand, after a generation or more of settlement, many migrants are less willing to maintain such relations of dependence with their patrons, and are seeking to renegotiate their land tenure arrangements. On the other hand, with increasing land scarcity, autochtones may seek to claim their land back to cultivate it directly. Autochtones typically rely on customary law principles, which emphasise the rights derived from first clearance of the land. Migrants tend to rely more on the statutory-law principle of "*mise en valeur*", whereby land

11. On the relationship between migrants and autochtones in Francophone West Africa, usually referred to as "*tutorat*", see the extensive work of Chauveau – e.g. Chauveau, 1998.

rights are obtained by putting land into use for a certain period of time (land to the tiller). Irrigation projects offer the opportunity to strengthen first-clearance claims – or to undermine them. For instance, tributary villages may seek to manipulate the irrigation project to gain land tenure "independence" from their patrons, and obtain full rights over the land they use.

Under most customary systems, a tributary village demanding an irrigation scheme in its land area should obtain permission from the land chief of the landholding village. This may grant his approval and impose certain conditions in return – for instance, that the project be extended to the land area cultivated by the landholding village (e.g. as documented for a village in the south of Mali; Lavigne Delville et al, 2000). Failure to consult the land chief would amount to the tributary village asserting its land tenure "independence", and may trigger bitter disputes between the two villages. Because of these dynamics, many irrigation projects in the Sahel have fostered resource conflict (for two examples, see Boxes 3.1 and 3.2 below). In this context, a seemingly innocuous issue like the choice of the name for the irrigation scheme may have far-reaching land tenure implications – and foster land disputes. Indeed, naming the irrigation scheme after one village instead of another would strengthen the land rights of the former in the eyes of the local population (Lavigne Delville et al, 2000; Laurent and Mathieu, 1995; for case studies, see e.g. Schmitz, 1993, on the Senegal River Valley; and Soumare, 1995, on the case of Bouani, in Mali).

These dynamics are further complicated by three factors. First, national legislation may not recognise customary land rights (e.g. in Burkina Faso), thereby undermining the rights of the "first occupants" and encouraging tributary villages to seek emancipation. Secondly, external operators – whether government officials or project staff – may not fully master the long history and extreme complexity of local land relations. This exposes them to manipulation by well-informed locals. Thirdly, administrative boundaries and customary land tenure boundaries may not coincide. A landholding village may have lands in a neighbouring department. And, a tributary village may be the administrative centre ("*chef lieu*") of that neighbouring department. This may encourage the tributary village to use its administrative status to seek land tenure independence from its traditional patrons – for instance, by requesting funds for an irrigation scheme without consulting the customary landholders

(Lavigne Delville et al, 2000; Laurent and Mathieu, 1995; study fieldwork in Senegal).

In Burkina Faso, the picture is further complicated by the fact that, for decades, the government supported the settlement of farmers from the majority ethnic group (Mossi) in areas cleared from River Blindness and/or provided with irrigation schemes – but customarily held by other groups. For instance, in the Sourou Valley scheme, lands were traditionally held by the Marka, but a large number of holders of irrigated plots are Mossi. In many parts of the country, this is a recurrent source of tensions (DANIDA, 2000).

Box 3.1 A dispute between three villages in Burkina Faso

The dispute concerns an irrigation scheme created on lands around the village of Koumana, in the Department of Bondokuy, and largely cultivated by inhabitants of the same village; but customarily held by the village of Kosso, in the Department of Warkoye. Farmers from Koumana – including a group of farmers originating from another village, Syhn – gained access to the land they cultivate through an agreement with Kosso. The irrigation scheme was first created without much conflict in 1970. Years later, a rehabilitation project sparked tensions between the inhabitants of Koumana and Kosso over the allocation of rehabilitated plots. And, the village of Syhn sought to establish land control on the area by requesting that the scheme be named "Syhn-Koumana". After various mediation attempts (including by the Minister for Agriculture), the dam was named "Koumana-Kosso" and the irrigated area "Kosso" - thereby acknowledging the land claims of Kosso.

Source: Lavigne Delville et al, 2000.

Box 3.2 Mediating between two rural communities in Senegal

In Matam Region, Senegal, an irrigation scheme is being created in an area located in the Rural Community of Nabadji but customarily held by villages located in the Rural Community of Ogo. Applicable legislation (Decree 72-1288 of 1972) provides for the allocation of irrigated plots to farmers residing within the rural community only. This sparked tensions, as farmers from Ogo would have been excluded from "their" lands. After lengthy negotiations and the mediation of the SAED, the Rural Community of Nabadji accepted to associate farmers from Ogo in the scheme.

Source: study fieldwork.

Land relations within the community

A community is not a homogeneous entity. Within it, different actors position themselves to make the most of the irrigation project. These actors manipulate external interventions in the village to their advantage. In so doing, they exploit the interplay between statutory and customary rights systems.

Legislation on land tenure, irrigation schemes and rural cooperatives typically emphasises equal access to irrigated plots for all eligible villagers. Access is to be determined, for instance, on the basis of the labour or cash contributions that villagers provide. Legislation on cooperatives provides for democratic decision making in land/water user groups. These egalitarian and democratic principles are often at odds with customary principles, which entrench social hierarchies and gender inequalities (e.g., on the Sourou River Valley scheme in Burkina Faso, Dialla, 2002).

In this sense, publicly funded irrigation projects may entail a redistribution of land rights – not only between communities (see above) but also within the community. This is particularly so where customary land rights are concentrated in the hands of a few. In the Senegal River Valley, state-led distribution of irrigated land gave lower-caste groups growing access to land, which was previously denied to them under customary law (Niasse, 1991, quoted in WCD, 2000). In the Gambia, an IFAD irrigation project brought about the devolution of irrigated plots from customary landholders to all the community members who contributed labour to the project. This outcome was made possible by a "land for labour" agreement concluded between the programme's beneficiaries and customary landholders (Nepveu de Villemarceau et al, 2005).

However, in many irrigation schemes, customary rules on social stratification tend to resurface after the completion of the scheme (e.g., on the Senegal River Valley, Mathieu, 1985; and study fieldwork). Typically, customary landholders use their position in the community (as customary chiefs, elected councillors, etc) to circumvent formal rules and perpetuate their privileged access to land. This tends to skew the distribution of land-cum-water rights (see Box 3.3).

Box 3.3 Decentralised management of irrigated land in Senegal

After years of centralised management of irrigated lands by the SAED, Decree 87-720 of 1987 transferred management responsibilities for irrigated lands to local governments (the "rural communities", governed by a rural council). Since then, democratically elected rural councils allocate irrigated plots to user groups and, increasingly, to individuals. User groups then allocate plots to individual users, usually on the basis of household size. In our field sites, traditionally characterised by a highly hierarchical society, this has led to the coexistence of descendants of nobles and slaves in the same irrigation scheme.

However, while rural councils are democratically elected, social status plays a key role in the election process. In the Rural Community of Bokidiawé, 30 out of 32 councillors are of noble origin. Local landholding elites typically wear several "hats", straddling between statutory and customary institutions. In Bokidiawé, community leader "Old Dème" is – among other things – village chief, rural councillor, president of the land user group, member of the Socialist Party, and himself a rice grower. Local elites use these positions to maintain their control over irrigated land. Our fieldwork has documented several cases of customary landholders managing to retain use rights over their land after the construction of the irrigation scheme; of militants of the majority political party disproportionately benefiting from allocations of irrigated land; and of lower-caste farmers having to enter into sharecropping arrangements (formally prohibited by legislation) in order to gain access to irrigated land. We also found many instances in which local elites had allocated irrigated land to powerful outsiders (politicians, army and government officials, religious leaders, judges), despite legislation restricting access to irrigated land to local residents. In the Rural Community of Mbane, the total area of allocated plots is well above the total land area available to the Community. This suggests that many plots were allocated more than once.

These findings are in line with findings from other studies. In a Rural Community in St Louis Region, Thébaud (1995) found that in 1989 (just two years after the devolution), while the total land area available to the community was some 11,000 ha, the land allocated by the rural council amounted to 13,000 ha. Some 30% of these allocations benefited "outsiders" – particularly urban elites from St Louis, Dakar and Touba.

Source: study fieldwork.

Divisions within the community may also reflect conflicting economic interests. The dispute on the irrigation scheme of Keur Seib Ndoye (Thiès Region, Senegal) illustrates this point (Laurent and Mathieu, 1995). The scheme was built between 1985 and 1990 by a Senegalese NGO. The village includes both customary landholders and tenants. During the construction works, the latter group began to fear that the landholders would increase the rent after the completion of the irrigation facility.

They sought a written commitment from the landholders not to do so. The landholders refused, and the works were halted. In the standoff, both groups established an association to represent their interests. Several mediation attempts followed, led by local notables – including by the regional governor and the local MP. Eventually, a solution came with the establishment of a joint association. This ensured equal representation of landholders and tenants, and was chaired by the village chief. The new association provided a negotiation and discussion forum for regulating relations between the two groups. After that, the construction of the scheme was successfully completed (Laurent and Mathieu, 1995).

Another key intra-community land tenure issue concerns gender. As irrigation increases the value of the land, men may try to take control over plots previously left to women. Many field studies suggest that some public irrigation projects entailed reallocations of land and water rights that disadvantaged women. In Comoé Province (Burkina Faso), for instance, while men control land on the uplands and grow groundnuts and cotton, women have land rights in the *bas-fonds* (lowlands) and cultivate rice. While land chiefs are men, land-cum-water authorities in the *bas-fonds* are often women. In this context, a water infrastructure project ("*Opération Riz*", 1979-1993) was undertaken. In the first phases of implementation, the project relied on male chiefs and on a male-biased interpretation of customary law. After the construction of the infrastructure, improved *bas-fond* plots (and relating water rights) were allocated to (male) household heads, ignoring women's pre-existing rights. In subsequent phases of the project, this gender bias was removed: women participated in the decision-making process and obtained land-cum-water rights (van Koppen, 1998; see also Kevane and Gray, 1999a; Pander, 2000)[12].

In a similar case from Niakoni, Mali, the project staff proposed the allocation of land and water rights to household heads. This was resisted by village women, who cultivated the area before the irrigation project. Eventually, plots were allocated to household heads – usually men; but 75% of these agreed to "delegate" these rights to women in their household (Lavigne Delville et al, 2000).

12. A similar process of erosion of women's rights in the context of irrigation projects is documented for the Gambia in Dey (1981) and Kevane and Gray (1999b).

Women's access to water and land is protected under international human rights law. The CEDAW prohibits discrimination against women. It also requires states to adopt measures "to ensure the full development and advancement of women", and "to modify the social and cultural patterns of conduct of men and women, with a view to achieving the elimination of prejudices and customary and all other practices which are based on the idea of the inferiority or the superiority of either of the sexes or on stereotyped roles for men and women" (articles 3 to 5). In addition, the CEDAW protects the right of "rural women" to adequate living conditions, including in relation to water supply, and entitles them to "equal treatment in land and agrarian reform" (article 14(2)(g) and (h)). These rules of international law are usually reflected in national legislation affirming the principle of gender equality, including both constitutional provisions (e.g. article 5 of the Constitution of Burkina Faso) and land legislation (e.g. article 62 of Burkina Faso's RAF). These norms are notoriously difficult to implement, particularly in rural areas.

In recent years, many irrigation projects have paid greater attention to gender issues, and have promoted women's access to irrigated plots. In the above-mentioned IFAD project in the Gambia, 90% of project beneficiaries were women (Nepveu de Villemarceau et al, 2005). In one of our field sites (Kobilo, in the Rural Community of Bokidiawé, Senegal), the irrigation agency insisted that 40 of the 700 ha of irrigated land be allocated to the village women's association (study fieldwork).

3.3 Farmers' tenure security on irrigated land

Land tenure security is key to improving agricultural productivity and to promoting rural development, as agribusiness and smallholders alike need secure tenure in order to invest in the land (for a review of the evidence on this, see World Bank, 2003). In the Sahelian irrigation schemes, the nature and security of the property rights over land, water and water infrastructure vary substantially, not only from country to country but also from a scheme to the other. Yet, very broadly, a recurrent problem is the farmers' lack of tenure security over the irrigated plots they cultivate (for a definition of land tenure security, see above, section 2.1). In some countries, law reform has sought to tackle this issue – with mixed success.

Conditional use rights

In most publicly funded irrigation schemes, farmers do not own the irrigated plots they cultivate. Rather, they enjoy conditional land use rights. Conditions typically include putting land into productive use ("*mise en valeur*") and payment of the water fee. The former is meant to promote greater agricultural productivity and equitable access to publicly funded irrigation schemes. It should entail that land is allocated to those farmers that are better able to cultivate it, using their own and their family's labour. However, legislation rarely defines what qualifies as "*mise en valeur*". This leaves wide discretion to government bodies responsible for monitoring fulfilment of this requirement, and opens the door to abuse and to manipulation by the more powerful.

The latter condition (payment of the water fee) clearly illustrates the strong link between access to land and to water in irrigation schemes. In case of non-payment, the irrigation agency may deprive farmers of the land they cultivate. This provides an effective sanction to ensure payment of the water fee. But it makes farmers vulnerable to fluctuations in harvests and income, and to losing their land after a bad harvest. As a result, the mechanism may undermine land tenure security.

This situation is common across the Sahel. In Burkina Faso, while the 1996 Land and Agrarian Reform Act (RAF) allows private land ownership in principle, the 1997 Decree implementing it excludes private ownership of irrigated land. Here, use rights ("*titres de jouissance*") are allocated by local commissions under strict conditions listed in a "*cahier des charges*" – including productive land use and payment of water and other fees. A recent study in the Sourou River Valley scheme found that farmers – many of them government-induced settlers rather than "autochtones" with customary land claims – feel that their land rights are precarious (Dialla, 2002). In Mali's Baguinéda irrigation scheme (OPIB[13]), the land is owned by the state, managed by the OPIB and cultivated by farmers on the basis of annual contracts or, after three years of cultivation, of licences with indeterminate duration. In Senegal, since 1987 rural councils allocate and withdraw use rights on irrigated plots. Withdrawal decisions can be taken for instance for lack of productive

13. Office du Périmètre Irrigué de Baguinéda, governed by Law 98-011 of 1998, Decree 94-157 of 1994, and Decree 98-067 of 1998.

land use. In practice, councils often delegate management responsibilities to land/water user groups (see above, Box 3.3).

In recent years, Sahelian legislators have sought to provide greater tenure security to farmers cultivating irrigated plots. The extent and effectiveness of these efforts vary across countries, and even across irrigation schemes within the same country. The next section examines these issues, focusing on a case study.

A telling example: the Office du Niger in Mali

Mali's Office du Niger scheme provides a useful example to explore these issues more in depth. Under the 1996 Decree regulating land tenure on the scheme (Decree 96-188), land ownership is vested with the state, which delegates land management responsibilities to the Office du Niger. The Office allocates land use rights to farmers. The terms and conditions of these use rights have evolved substantially over time. Historically, the Office du Niger could change plot assignments and plots size at will, and could evict farmers on a range of grounds. This led to widespread tenure insecurity on the scheme. Over the years, donor pressure and innovative development projects have led to far-reaching reforms towards greater tenure security (Aw and Diemer, 2005).

Building on these reform efforts, the 1996 Decree provides for a two-tier system:

- Farming contracts. These are for a one-year duration, they are tacitly renewable, they are subject to conditions (*mise en valeur*, payment of the water fee, conservation measures, etc), and they can be withdrawn if those conditions are not respected.
- Farming licences. Farmers can apply for a licence after two years of cultivation under the farming contracts. In therory at least, farming licences provide much greater tenure security: they have indeterminate duration; they are transmissible to heirs; and their withdrawal entails payment of compensation – unless the withdrawal is motivated by violations of the farmer's obligations (which are the same as under farming contracts).

In addition to contracts with individual farmers, a collective performance contract ("*contrat plan*") is negotiated every three years among the Office du Niger, the government and representatives of farmers. The

performance contract states the roles and responsibilities of the various stakeholders. Among these, the contract for the period 2002-2004 reiterates the obligation of farmers to pay the water fee, sanctioned by eviction of non-complying farmers (Aw and Diemer, 2005).

On paper, these reforms have gone a long way towards offering greater tenure security to farmers (Aw and Diemer, 2005). According to a recent study (Aw and Diemer, 2005), these land tenure and other institutional reforms are to be credited for the good economic performance of the Office du Niger over the past decade. Indicators of such performance include a 300% increase in yield between 1982 and 2002, and a 600% increase of the net real income per household between 1989 and 1998 (Aw and Diemer, 2005). The two-tier model adopted by the 1996 Decree (two years of probation, followed by permanent, transmissible use rights) has been replicated elsewhere (e.g. in the Baguinéda scheme – see above). However, a recent study in the Office du Niger found that, by 2000, only 1500 farming licences had been issued (covering less than 10% of the farms), mainly because farmers seemingly did not consider such licences as providing substantially greater tenure security than the farming contracts (Dave, 2004). The vast majority of farmers stick with the farming contracts (Vandersypen, pers. comm.).

As for water rights, a combination of infrastructure rehabilitation and institutional reform has improved water delivery in the Office du Niger. Institutional reforms have given farmers greater control over water distribution, particularly in relation to tertiary canals (which convey water to the irrigated plots). As a result, water shortages are rare. A recent survey of farmers in the Office area found that most farmers were happy with water delivery (Vandersypen et al, forthcoming).

Land evictions for failure to pay the water fee remain a thorny issue and a major bone of contention between farmers and the Office du Niger. Until a couple of years ago, water fee collection rates were extremely high (97.8% in 2000-2001, according to Aw and Diemer, 2005). However, a bad harvest in 2003 jeopardised farmers' ability to pay the water fee. The farmers' union sought a 50% reduction of the fee and an extension of the deadline for its payment. In 2004, the Office du Niger issued eviction orders for some 4000 farmers (i.e. some 20% of the total number of farms) for failure to pay the water fee (Coulibaly and Belières, 2004; various articles from the Malian press). However, under pressure from

farmers' organisations, the government reversed this decision and extended the deadline for payment. After the expiry of the latest extension (June 2005) many farmers still have not paid the fee, in total or in part. As of May 2005, the collection rate of the water fee was around 60%. At the time of writing, a number of farmers have been evicted from their lands. The farmers' union is resisting these evictions through both political mobilisation and legal action (various articles from the Malian press). Talking to informants in Mali, anecdotal evidence suggests that well-placed elites are "closing in" fast on land made available by the evictions.

This dispute dramatically illustrates the strong link between access to land and to water on irrigation schemes. Failure to comply with water-related obligations may entail loss of land rights. As mentioned above, this constitutes an effective way to ensure the payment of the water fee – but it may undermine land tenure security. Eviction follows immediately and irrevocably the first time the water fee is not paid, irrespective of how many years it was paid on time; upon eviction, farmers lose all their rights, and no compensation is paid (Vandersypen, pers. comm.). From a human rights perspective (see above, section 2.1), mechanisms and safety nets must be in place to ensure that evicted households without alternative sources of livelihood have secure access to adequate food. A growing case law from across Africa on evictions – particularly in relation to housing – may provide useful insights on this (see Box 3.4).

Positions on the water fee and its land tenure implications are polarised not only for the financial burden that the fee places on farmers, but also for the lack of effective accountability mechanisms – mechanisms enabling farmers to call the Office to account for the quality of its water service provision (Dave, 2004). The complaint procedure provided by the 1996 Decree (complaint before a committee with representatives of both farmers and management) is essentially toothless. While effective sanctions exist for farmers failing to comply with their obligations, no effective accountability mechanism exists if the Office fails to provide adequate water delivery services.

Box 3.4 Evictions for failure to pay the water fee – Lessons from the case law on the right to housing

The case law on evictions and the right to housing presents very different facts to the ones usually observable in cases of eviction for failure to pay the water fee. It also comes from legal traditions that are extremely different to the ones prevailing in the Sahel. However, some lines of reasoning used by courts may still provide useful insights - particularly on the safety nets that need to be in place even for technically lawful evictions. The standard of "reasonableness" developed by the South Africa Constitutional Court in the Grootboom case illustrates this point.

Ms Grootboom and her community – some 390 adults and 510 children – were homeless illegally occupying a piece of land, where they lived in shacks. The land area was privately owned and earmarked for construction of low-cost housing for the poor – as part of a government housing programme. Therefore, on the basis of a magistrate order, the local municipality forcibly evicted the community. As a result, they were left with no shelter. They then filed a lawsuit to enforce their right to adequate housing, protected by the South African Constitution. The Cape High Court ordered the government to provide them basic shelter (Irene Grootboom and Others v. Oostenberg Municipality, 2000 (3) BCLR 277).

Upon appeal, the Constitutional Court examined whether the measures adopted by the government under its housing programme were "reasonable" for the progressive realisation of the right to adequate housing – as required by the South African Constitution. The Court noted that the programme catered for medium to long-term housing needs. However, it did not consider the short-term housing needs of those "in desperate need". Therefore, it was not "reasonable", and as such unconstitutional. The Court ordered the government to design and implement a comprehensive housing programme capable both of responding to long-term needs and of addressing the immediate needs of the most desperate (Government of the Republic of South Africa and Others v. Irene Grootboom and Others, case CCT 11/00, 4 October 2000, reported in 2000 (11) BCLR 1169 (CC)).

If this type of reasoning is applied to land evictions for failure to pay the water fee (which are admittedly very different in terms of facts, norms and stakes), the implications are clear. Even if farmers are no longer legally entitled to stay on the land, they cannot simply be put on the street if they have no alternative means to fend for themselves.

Half-hearted devolution

Recent reforms have transferred, to varying degrees, management responsibilities for irrigated land to the local level. In theory, giving land/water users greater say in resource management may increase their real or perceived tenure security. The clearest example of decentralised management is Senegal, where Decree 87-720 of 1987 transferred management responsibilities for irrigated land to local governments (see

above, Box 3.3). In other cases, reform efforts have focused on giving greater say to land/water user groups. In the Office du Niger, legislation provides for joint committees responsible for land management ("*comités paritaires de gestion des terres*"). Committee members include representatives of both farmers/water users and Office du Niger management.

However, this devolution of powers has been curtailed by important caveats. In Senegal, the devolution only concerns the allocation of land rights – not water rights issues. Water remains within the "*domaine public*" of the state (Water Code 1981), and is managed by central government agencies. This artificially separates land and water rights management. It also undermines efforts to ensure payment of the water fee, as prescribed by the Water Code. As water authorities have no say in land rights allocation and cannot withdraw allocations to farmers failing to pay the water fee, they have no effective sanctions for non-payment. Our fieldwork found that payment of the water fee is rare, and usually confined to farmers that benefit from state-sponsored credit through the CNCAS[14]. Some governments have created "informal" water fee systems. For instance, at its meeting of 25 April 2005, the rural council of the Rural Community of Mbane set up a local water fee (study fieldwork). Legislation on decentralisation enables the state to transfer parts of its *domaine* to local governments (Law 96-07 of 1996 and Decree 96-1130 of 1996). If this was applied to water infrastructure, local governments would be able formally to levy water fees. This does not seem to have happened yet.

Devolution to water user groups has been even more cautious. In the Office du Niger, while joint committees "examine" requests for irrigated plots and other matters, decisions are taken by the Office du Niger.

Bringing fresh capital in

After the structural adjustment programmes of the 1980s and the ensuing reduction of state funding for irrigation, finding resources for maintaining, upgrading and expanding irrigation schemes has become a key challenge. Governments are increasingly looking to the private sector as a source of investment to fund irrigation infrastructure – including both maintaining and upgrading existing state infrastructure, and

14. *Caisse Nationale pour le Crédit Agricole au Sénégal*. In these cases, payment of the water fee is integrated in the credit reimbursement scheme.

building new irrigation facilities. Granting tenure security to private operators is seen as key to promoting this type of investment. Therefore, some lawmakers have created special tenure regimes to encourage private investment.

Demographic growth has increased pressure on many irrigation schemes. In the Office du Niger, some 50% of the farms cultivate less than 3 ha, with an average of 0.27 ha of irrigated land per person (Dave, 2004). In the period 1978-2002, the number of households with irrigated plots in the Office increased from 5000 to 23,400, i.e. a nearly fivefold increase; the irrigated land area, on the other hand, increased from 36,500 ha to 58,300 ha, i.e. by a factor of 1.5 (Coulibaly and Belières, 2004). Expanding the irrigated land area is seen as a key priority by the farmers' union (Dave, 2004).

This situation is very common in Sahelian irrigated agriculture. In Burkina Faso's Sourou River Valley scheme, irrigated plot sizes vary between 1 and 1.5 ha (Dialla, 2002). In Mali's Baguinéda scheme (OPIB), the average plot size is 0.84 ha. This data conceals major disparities: in 1998, plots size in the OPIB ranged between 0.15 and 9.90 ha (Tall et al, 2002). In the Sélingué scheme (Mali), plot sizes range from 0.25 to 1 ha (Tall et al, 2002).

Government efforts to attract private capital to address these challenges and expand irrigation facilities exemplify the current policy thrust in favour of agribusiness that is increasingly dominant in the Sahel. They must be placed in the broader context of the ongoing policy debate on the comparative advantage of family farming and agribusiness in the Sahel (see above, section 2.4).

A range of land tenure options are being explored to grant tenure security to those investing in irrigation facilities. They usually entail granting longer-term and stronger land rights on state irrigation schemes. In the Office du Niger, a special land tenure regime has been established to provide greater tenure security to private investors. These may be allocated renewable 50-year leases on non-irrigated land. In return, they would pay an annual fee and build irrigation infrastructure. The Office du Niger can terminate the lease before its expiry only for a public purpose, and must pay compensation (Decree 96-188 of 1996).

Similarly, in Burkina Faso, different legal regimes exist for the allocation of irrigated plots (Decree 54 of 1997, articles 191 ss) and for the alloca-

tion of non-irrigated land for the purposes of building and operating irrigation facilities (article 68 of the same decree). In the Sourou River Valley scheme, a special regime has been set up for agribusiness. This includes a minimum plot size of 10 ha (compared to 1-1.5 ha for local farmers) and a 25-year lease, renewable for up to 99 years (Decree 97-598 of 1997; Arrêté 98-032 of 1998; Dialla, 2002).

Private land ownership is also being introduced. In December 2004, the Malian government decided to sell some 3000 ha of land in the Office du Niger to private operators – that may therefore gain full ownership of that land. This new approach is being tested within the context of the National Programme for Rural Infrastructure (PNIR), and is expected to concern large investors (articles from the Malian press). This constitutes a major change of policy. Until now, land ownership in the Office area was squarely vested with the state.

These efforts have focused on attracting large-scale capital. Questions remain as to creating appropriate incentives for investment by local smallholders – who have provided the bulk of agricultural investment in the Sahel. In some cases, smallholders may be granted long-term leases – at least in theory. But it cannot be assumed that land tenure models that work for agribusiness would work equally well for smallholders. And, in most cases, smallholders only have precarious use rights on the land. In Senegal, smallholders that build irrigation infrastructure would own the infrastructure but have precarious use rights on the land – which can be withdrawn by the rural council if this deems the land under-exploited. This may affect the propensity of smallholders to contribute cash and/or labour to build or upgrade irrigation infrastructure.

The special land tenure treatment of those investing in water facilities may also result in greater land concentration. Investing in irrigation facilities requires resources. Therefore, wealthier land users – better able to "develop" the land – are also better positioned to obtain secure land rights from land management institutions.

Land markets – illegal but dynamic

In most cases, land transactions on irrigated plots are prohibited – whether rentals, sales or other. Such prohibition may be embodied in legislation or in the "*cahier des charges*" attached to land use rights allo-

cations. Yet field studies have documented widespread practices of informal land transactions.

In the Office du Niger, land transactions are prohibited by legislation (Arrêté 96-1695 of 1996). Yet land rentals are common. They may involve informal contracts signed in the presence of a witness or simply oral agreements (Belières et al, 2002). Coulibaly and Belières (2004) estimate that, in 2000, rentals covered some 13% of the plots and 7% of the irrigated land area. Land rentals are often linked to inability to pay the water fee – which would entail loss of land use rights (see above). Rather than losing their plot, farmers may informally rent it out (Coulibaly and Belières, 2004).

In Senegal, we found similar practices with regard to reimbursement of rural credit. Rather than losing his/her plot, the debtor informally gives it to a third party, who pays the debt on his/her behalf. The duration of this temporary transfer varies depending on the amount paid (study fieldwork). In Senegal, sharecropping arrangements on irrigated land are also common even if illegal – as documented by our fieldwork and by the literature (e.g. Laurent and Mathieu, 1995).

Informal land sales are also significant. In the OPIB (Mali), Keita (2003) documents several informal land sales, often to urban elites from Bamako. Prices per hectare vary between 150,000 and 600,000 CFA. After the "purchase", the buyer seeks to regularise his/her position by requesting a formal land allocation from the relevant government agency (e.g., requesting a lease from the OPIB management). Informal sales have also been documented in the Office du Niger (Dave, 2004; Dramé, 2004). Here, sales occur frequently enough for land prices to be well established and known to everybody (Vandersypen, pers. comm.). Land sales seem to be tolerated by the Office du Niger – and Office du Niger officials are themselves among the market players (Dave, 2004; Dramé, 2004).

3.4 Conclusion

This chapter has outlined some of the land tenure challenges raised by irrigation – in relation both to the creation of irrigation schemes and to their operation. The allocation and continued enjoyment of land-cum-water rights raise distributive issues – between and within communities, between smallholders and agribusiness, and so on. Failure to take

account of land tenure issues in the creation of irrigation schemes may result in resource grabbing and conflict.

Land/water rights within the context of irrigation also raise rural development issues, particularly via the extent to which rural producers enjoy tenure security and are therefore willing to invest in the land. In many contexts, a range of conditions attached to precarious land/water use rights undermine the tenure security of resource users. These conditions relate both to land use (e.g. "*mise en valeur*") and to water access (e.g. payment of the water fee). Manipulation and abuse in the enforcement of precarious resource rights and in the application of the conditions attached to those rights may discourage agricultural investment – for agribusiness and smallholders alike – and hamper growth.

Experimentation is ongoing on how best to improve land tenure security. In this context, after decades of state ownership, transfers of ownership have been discussed and tested. This may have distributive implications. Vesting land ownership with land/water users may foster land concentration, as valuable resources improved with public money are transferred to private actors, and as poorer farmers may sell their irrigated plots in periods of crisis. And, this experimentation seems to be focusing on attracting large-scale capital rather than on creating incentives for greater investment by local smallholders – who have provided the bulk of agricultural investment in the Sahel.

A key crosscutting challenge emerging from this analysis is the gap between legal frameworks and local practice – whether pre-existing customary land tenure or informal land transactions. This is despite the special efforts that government agencies have made to regulate land relations on irrigation schemes. Devolution of decision-making responsibilities to the local level is key to bridging that gap and granting land/water users greater control over their rights. However, for this to succeed, the transfer of powers must be meaningful, and accompanied by appropriate safeguards against elite capture.

These and other issues are discussed more in detail in the overall conclusion of the study (chapter 6).

4. The implications of water rights for pastoral land tenure: the case of Niger

BRIGITTE THÉBAUD, GILL VOGT AND KEES VOGT

4.1 Introduction

In the pastoral Sahel, water and land rights are closely linked. For reasons that are explained below, access to rangelands is affected by control over water points. This has long been neglected by water infrastructure programmes, which have often not taken resource tenure aspects into account; and by legislators, that have regulated water and land rights through sectoral, often ill-coordinated laws. As a result, many well-meaning water programmes have ended up undermining local resource management arrangements, fostering resource conflicts and contributing to resource degradation. Recently, local elites have begun to build private wells and to appropriate public ones – thereby obtaining exclusive control over water and land. Furthermore, decentralisation processes have brought new challenges, with local government being given responsibility for water management and supply.

This chapter explores these issues, drawing on the extensive work of one of the authors in Eastern Niger, in Northern Burkina and in the Ferlo Region of Senegal (Thébaud, 1990, 1995 and 2002); and on fieldwork undertaken by the other two authors in Zinder Region, Niger, specifically to contribute to this study (see above, section 1.2). While referring to examples from different Sahelian contexts, the chapter focuses on Niger, a country where the issues raised by the interface between land and water rights in relation to pastoralism are particularly acute. From an ecologic point of view, the chapter focuses on the Northern part of the West African Sahel, where average annual rainfalls are frequently below 300 mm and insufficient or too unpredictable to sustain agriculture (millet). In these areas (which we refer to as the pastoral Sahel), pastoral resource use makes it possible to exploit lands that would otherwise be unproductive.

The pastoral Sahel

In the pastoral Sahel, a typical year includes a short rainy season from July to September, and a long dry season from October to June, which is

in turn divided into a cold period (from November to February) and a hot period (from March to June). Rainfalls are erratic and unpredictable. This results in scattered pastoral resources and in continuous variations in the biomass between and within years. Droughts are part of the pastoral life. Several droughts have severely battered Sahelian countries during the 20th century (in 1914, 1931, 1942, 1973, 1984, 1992), except during a period of higher rainfall in the 1950s and 1960s. More recently, countries like Niger have been hit by a new drought which, in combination with locust invasions during the preceding months, resulted in major food and pasture shortages.

Herders respond to this difficult environment with different strategies, particularly mobility – taking herds to areas where resources are more abundant. Secure access to such areas is therefore critical to pastoral livelihoods, particularly during the dry season. Expanding herd size during good years is another mechanism enabling herders to recover from drought and prepare for future ones[15].

For a long time, pastoral communities were seen as economically irrational actors, and accused of destroying the environment through erratic herd movement and ever larger herd sizes. Overgrazing was seen as the main cause of land degradation in the Sahel. These assumptions have been challenged by two decades of research on Sahelian pastoralism, which has shown the rationale of pastoral systems in unpredictable and unstable ecosystems. Pastoral communities are now increasingly recognised by development agencies as efficient resource users. Research has also highlighted the resilience of Sahelian pastures and the influence of climate – rather than stocking rates – on the vegetation, especially grass. And, research along North-South transects in the Sahel confirmed that pastoral land degradation tends to happen when herd mobility is constrained and livestock maintain a high grazing intensity for prolonged periods of time.

The role of water rights in pastoral systems

For Sahelian pastoralists, water is a basic resource that enables them to meet the basic needs of their livestock and families. The terms and condi-

15. The period of high rainfall in the 1950s and 1960s, vaccination campaigns and the reclamation of previously inaccessible rangelands through the creation of dry-season water points enabled herders to expand their herds. This enabled them to recover more rapidly from the 1973 drought, compared to the 1984 one – which occurred after several years of low rainfall.

tions for access to water also determine their ability to access rangelands, and influence their capacity to survive in an unpredictable environment with scattered resources. In many respects, water is the key to the management of pastoral resources. This is due to ecological and biological factors.

Grazing and water resources are strongly influenced by seasonal changes. During the rainy season, natural pastures – usually dominated by annual grasses – are in full growth and their nutritional value is at its highest. Natural depressions are filled up by the rain providing herds with free access to surface water and allowing pastoral households to move freely through the rangelands. As the rains come to an end, ponds dry up and pastures dry out. During the long dry season (eight months), the biomass available becomes a fixed supply of dry grass of low nutritional value, which diminishes as it is consumed by livestock. Therefore, controlling the grazing rhythm is essential. If pastures are fully grazed before the end of the dry season, livestock will suffer and herders will have to leave the area. On the other hand, if pastures are undergrazed[16], the vegetation may suffer from biomass build-up and, after a few years, from loss of productivity (Thébaud et al, 1995). The ideal situation occurs when animals are able to graze until the very end of the dry season, leaving a "clean" surface for new grass to sprout.

When surface waters dry up, pastoralists move to groundwater points, such as wells and boreholes, around which they spend the dry season. In the Sahel, traditional, hand-dug wells and modern, cement-lined pastoral wells are most common. Boreholes are more rare, as they are more expensive and require special skills for managing the equipment. The exception is the Ferlo Region in Northern Senegal, where a network ("*maillage*") of boreholes was built in the 1950s, after the discovery of a deep water table. This allows herders to remain in the area during the dry season. As a result, pastoral systems in this region underwent major changes, and local Fulani herders gradually sedentarised.

During the dry season, use of rangelands is therefore restricted to areas around wells and boreholes, although herd mobility remains essential. Watering the herds during the dry season is time and labour consuming and frequently involves women and children. The distance that livestock

16. A situation that can happen after a drought, when many pastoralists have not yet returned to their home area.

can travel in their search for grazing is limited by their need regularly to return to nearby wells in order to be watered. Such pendular herd movements to and from the well define the grazing area accessible in relation to a particular water point. This area usually has a radius varying between 15 and 25 km, depending on the capacity of each species to cover ground. Small ruminants have a more limited range of action. Temperature is also an important factor. During the cold dry season (November-February), cattle can be watered less often, and herds can cover longer distances.

Photo: Brigitte Thébaud

Traditional well in Eastern Niger (2000)

To sum up, water points are key to managing grazing lands. Livestock need regular access to water for biological reasons. Therefore, herds can move along transhumance tracks and graze on rangelands only as long as they have access to water. As a result, individuals and groups controlling access to water points de facto control access to the surrounding lands. In order for herds to move from one water point to another, rights of access to water must be open to multiple users. If water points were privately owned with exclusive rights, pastoral movements would become difficult and pastoral communities would be condemned to destitution in years of low rainfall. On the other hand, the more water is available and accessible to all, the more livestock can be brought to graze on the surrounding rangelands. And, the more livestock, the

higher the risk that dry-season grazing is depleted before a new rainy season. Therefore, by indirectly restricting livestock access to grazing lands, control over water points has traditionally provided the mechanism to ensure sustainable resource use.

4.2 The mismatch between local practice, development programmes and legal frameworks

Negotiating access to traditional wells: the example of Eastern Niger

Located in the extreme East of Niger, at the border with Chad, Cameroon and Nigeria, the Diffa region is extremely arid. Pastoral land use prevails since agriculture is not a viable option – except in the South, along the Komadougou River. Three main pastoral communities live in Diffa: the Fulani (FulBe and WoDaaBe), the Toubou and the Arabs (Awlâd Suleyman, Shuwa and, more recently, Mohamid who arrived from Chad in the early 1980s). Throughout the Manga plain that covers most of the region, shallow depressions called *cuvettes* are scattered where the water table is closer to the surface. Following a North-West (Termit mountains) to South-East direction (Lake Chad), the fossile valley of the Dillia marks a physical separation between FulBe communities living South and the Toubou and Arabs living North (see map).

Traditional wells in Diffa are of small diameter, and are hand-dug by professional artisans ("*puisatiers traditionnels*"). They are lined with green wood and have a short life-span ranging from 6-12 months to a few years, depending on the texture of the sand. They are usually constructed on the initiative of FulBe or Toubou families living around the "*cuvettes*". Their construction would cost about 100,000 FCFA, depending on the depth. Their depth ranges from 10 to 30 meters and the water yield rarely exceed 1 cubic meter over a 10 hour period. Such constraints have a direct impact on number of animals being watered, around 300 cows per day. Traditional wells are in large number, however, which makes it possible to cover large rangelands while ensuring that stocking rates are well distributed through space.

Under local resource tenure systems, FulBe pastoralists digging traditional wells enjoy priority water rights. They offer access to their well to outsiders, under conditions that are negotiated between rightholders

Map1. The Dillia fossile valley, Diffa Region, Eastern Niger

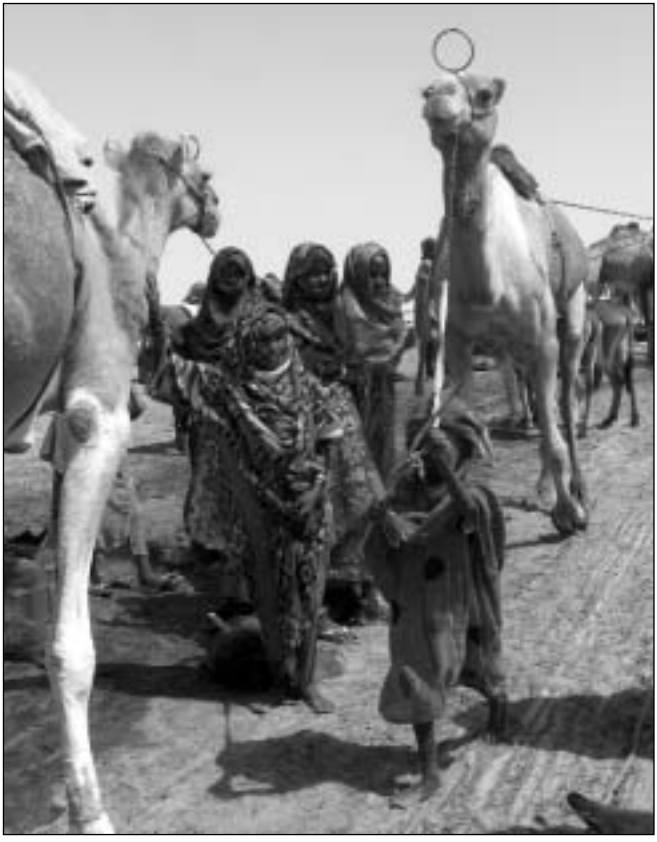

Photo: Brigitte Thébaud

Young girl leading a camel to extract water (Niger, 2005)

and outsiders. Such conditions include length of stay, health of visiting herds and time of the day for watering. Limiting the length of stay of incoming herders is a key tool to limit livestock numbers around the well. It therefore serves as a mechanism to regulate access not only to water, but also to the surrounding rangelands. This is essential to prevent rapid grazing and ensure sustainable land use. Through these negotiations, residents also reassert their priority rights over the well. For close neighbours, the "protocol" is minimal, compared to more distant ones. Payment can take various forms: money to help financing the construction of a new well; tea and sugar; a small ruminant; or, in some cases, the lending of a cow for reproduction purposes. Incoming herders also offer to residents reciprocal access to their wells if/when needed – for instance,

if residents are subsequently affected by a localised drought. Such reciprocal access may be exercised even several years after the first agreement.

Through negotiations and reciprocity, traditional wells also play a key role in the development of social capital and of a strong social fabric among pastoral communities. This is key to ensuring access to resources in an unpredictable environment. It partly explains the number of local agreements ("*conventions locales*") between resource users that are regularly concluded and which contribute to prevent resource conflict. Controlled access to water points also provides communities with possibilities to have each a territorial home area, while maintaining access to other wells.

Over the past 50 years, however, these traditional resource access systems have been undermined by the introduction of new forms of water access. The creation of "modern" water infrastructure, which rapidly became open access, is a significant example.

Access to modern wells (open access): the need for a historical perspective

Until the end of the Second World War, investment in pastoral water points remained limited to local situations and military requirements. The concept of "*hydraulique pastorale*" (pastoral water infrastructure) was first introduced at the beginning of the 1950s. The construction of wells was then based on planning and technical considerations. Pastoral wells and boreholes were built to enable access to grazing areas that were difficult to use during the dry season because of a lack of water points. Improving water availability for herds was also viewed as a necessary measure to sustain parallel efforts made in animal health and vaccination campaigns: "What good would it do to save a cow from rinderpest and let it die of thirst, afterwards?" (Merlin, 1951). The aim was to preserve national herd stocks and increase animal production and productivity, during a climatic period (the 1950s and 1960s) that allowed high stocking rates. Modern wells and boreholes were also viewed as a way to facilitate the watering of animals, especially around boreholes equipped with pumping stations. Here, water quality would be higher and time for watering shorter, thus enabling grazing over longer periods of time.

Debates on the creation of pastoral water points were mostly technical, addressing issues such as the balance between water output, stocking rates

and carrying capacity; and choices between different types of infrastructure, depending on the water resources available and the costs involved. It was agreed that the location of wells should follow, as much as possible, a geometric approach, in order to form networks ("*maillages*") of wells and boreholes with regular distances, allowing optimal pasture use.

Risks of overgrazing were mainly considered in the case of boreholes, where high water output made it possible for large numbers of livestock to be watered every day[17]. To avoid such risk, legislation was passed in several countries, particularly Senegal and Niger. This legislation gave government agencies responsibility for preventing grazing on the areas surrounding boreholes during the rainy season; and for controlling stocking rates during the dry season – within a maximum of 5,000 cattle and according to the "carrying capacity" determined for each year. Such laws proved difficult to enforce, for it would have implied a constant presence of the administration in remote areas and the establishment of a complex system of surveillance over livestock and resources. In rare cases, boreholes with high stocking rates were closed by the administration, resulting in riots. Apart from these isolated episodes, however, that legislation was not applied. As a result, wells and boreholes became de facto open to all (open-access).

After Independence, pastoral water programmes became more and more popular. Construction of water points in pastoral areas provided donors with an easy justification ("delivering water to people and livestock"), and the private sector with potential benefits. During the 1970s and until the end of the 1980s, large water programmes were launched in many pastoral areas.

A perfect coverage of pastoral areas, with a carefully designed network of boreholes, was never attained, except in Northern Senegal. Instead, wells were built based on administrative boundaries and local influences. Until the end of the 1990s, Sahelian states were in charge of the construction and maintenance of pastoral water points. In Niger, for example, a parastatal organisation called the OFEDES (*Office des Eaux et du Sous-Sol*) would build the wells and maintain them on a yearly basis. This would include cleaning up the infrastructure (silt) and repairing masonry. Around the boreholes, caretakers placed by the OFEDES would organise

17. A borehole can provide water to 10,000 cattle, whereas a cemented well providing 5 m^3 per hour over a 10-hour period per day will water less than 2,000.

water access for herders ("*tour d'abreuvement*"). The legal status of wells was not considered a major issue. Since water had to be available to all as a basic development goal, state ownership of water infrastructure and open access to water resources was the logical way to proceed.

The introduction of de facto open-access water infrastructure in pastoral areas had a strong impact on the management of pastoral resources. For herders, it soon became apparent that access to cement-lined wells and boreholes was open to all. This undermined the traditional resource management systems described above. Rangelands where local pastoralists would have priority use rights (through control of traditional wells) became accessible to all, as incoming herders would water their livestock at state-provided water points. Public water points attracted ever larger numbers of herds to the area. As borehole technology enabled greater numbers of livestock to be watered, surrounding rangelands were rapidly depleted. Securing access to water became associated with the use of force, rather than with negotiation and reciprocity (see section below). In Eastern Niger, the construction of public wells resulted in a decrease in the number of traditional wells located within the radius of influence of the public wells and, as a result, in a concentration of livestock around fewer numbers of water points – thus fostering resource degradation.

Photo: Brigitte Thébaud

Concentration of camel herds at a public well (Niger, 1984)

To sum up, government provision of de facto open-access water points, and failure to take account of the land tenure implications of water rights (with pastoral wells serving as the "key" to surrounding pastures) has weakened traditional rangeland management systems, deprived pastoralists of a valuable asset in negotiations with incoming herders and fostered conflict and land degradation.

The establishment in most countries of community-based management systems around pastoral wells and boreholes, which started in the 1980s and the 1990s, did not provide a suitable solution to the problem. In Niger, for example, management committees (*Comités de gestion*) have shown limited effectiveness, as their powers have been limited to financial and maintenance aspects. In many instances, modern wells and boreholes became the focal point for intercommunal conflicts, and in some cases triggered armed conflicts, as the example below from the Diffa Region (Niger) shows.

Water and conflict: the example of the Diffa region, in Eastern Niger

During colonialism, the French administration favoured the installation of Fulani groups in the pastoral territories in the North of the Diffa region, until then mostly controlled by Toubou groups[18]. Toubou herders were then perceived as an anarchic and aggressive society without traditional chiefs, which made it difficult to find "entry points" and to conclude long-term agreements. The Fulani (FulBe and WoDaaBe) were viewed as more peaceful populations. Gradually, the Toubou were forced to migrate to the North of the Dillia valley, opening a vast corridor for Fulani migrants. Through the 1930s and 1940s, the FulBe constructed a network of traditional wells in the pastoral area South of the Dillia.

Because of good rainfall conditions prevailing during the 1950s and the 1960s, Toubou herders in the North were able to cope with changing conditions and maintained cattle herding. They dug traditional wells, and managed them according to tradition – whereby herders digging wells would enjoy priority use rights to water and to the surrounding pastures. On both sides of the Dillia, but particularly South of the valley, government authorities built an extensive system of public cemented wells. The location of these wells was determined without much consultation with

18. This section is based on Thébaud and Batterbury, 2001; and on Thébaud, 2002b.

local groups. And, under legislation and according to local practice and perceptions, such wells were owned by the state and accessible to all. No account was taken of the land tenure implications of building new, open-access water points. As water points in the area were now accessible to all, so were the surrounding pastures. This undermined the priority use rights that FulBe herders enjoyed over the network of traditional wells that they built over time South of the Dillia. Thus, with the introduction of public wells, two parallel systems developed in the area, with priority use rights to traditional wells on the one hand, and open access to cemented wells on the other; and the presence of cemented wells undermined local tenure systems over traditional wells. In this context, public wells became the object of tensions between herders.

At the beginning of the 1980s, a series of rainfall deficits forced large numbers of Fulani herders to migrate South, to Northern Nigeria. In 1984, groups of Toubou and Arabs living north of the Dillia crossed the valley and took control over a number of public wells within FulBe terri-

Photo: Brigitte Thébaud

Watering camels at a modern well (Niger, 2005)

tory. Civil and military authorities showed little concern, faced with a drought which had already resulted in vast movements of populations in the area. And, from a resource tenure perspective, public wells were open to all – providing the Toubou with an entry point to access and reclaim the land. Efforts by FulBe herders to remain in the area were defeated through violent clashes. By the end of the 1980s, large areas had become inaccessible to the FulBe and WoDaaBe, forcing them to migrate further South.

In the 1990s, the fall of Hissene Habre in Chad resulted in the introduction of guns among FulBe communities, who formed militias and fought the Toubou and Arab newcomers. After years of violent clashes, the FulBe reclaimed most of the territory and of the wells located in it. At the beginning of the year 2000, peace agreements were signed. The armed conflict had lasted for more than 15 years and had contributed to endemic pastoral poverty in the area, as well as to a number of deaths (estimated at several hundreds).

The legislative framework: the example of the Water Code in Niger

The link between access to water and pastoral land tenure has been misunderstood not only in water supply programmes, but also in legislative frameworks. The relationship between the Rural Code and the Water Code in Niger illustrates this. Here, a series of laws and decrees known as the Water Code ("*Code de l'Eau*") governs water resources. The Rural Code governs all resources and socio-economic activities in rural areas, including rangelands and water points.

The Rural Code states that herders have a right to use rangelands in common. Herders can obtain recognition of priority rights on their home areas ("*terroir d'attache*"[19]). This includes both land and water rights. Outsiders may gain access to water and grazing resources on the basis of negotiations with the right holders. Through this innovative legal concept, the Rural Code seeks to build on the traditional resource management systems described above. These provisions imply that the creation of modern wells must be associated with priority rights on

19. According to the Rural Code, a "terroir d'attache" is defined as the land area (usually including a water point) where a group of pastoral households spend most of the year, and to which they return after transhumance or migration during drought.

water and grazing resources, and that open-access wells are possible only in no-man's-land situations or on transhumance routes.

On the other hand, the principles underlying the Water Code are:

- Access to public water points for livestock is open to all, including outsiders such as transhumant herders.
- Construction of water points with an output equal or exceeding 40 m^3 per day (such as modern wells and boreholes) must be authorized by the regional administration and follow a set of rules, including the production of technical data; water facilities below that water volume are subject to a "declaration" regime.
- Public water points have to be managed by Management Committees ("*Comités de Gestion*"), which must be formally established by the administration. A Management Committee must have at least a President, a Secretary-General, a Treasurer and one person responsible for the hygiene of and around the well. The total number of Committee members should not be greater than nine persons.
- Management Committees are responsible for the general maintenance of the wells and the collection of users fees.

Such principles have created a number of problems. The Water Code does not establish a functional link between access to water and access to grazing, as if these resources were independent from each other. The role of Management Committees is limited to the surveillance of the water infrastructure, excluding the use of grazing resources or control over the number of livestock using the well. Their capacity to control access to water and grazing resources is limited. When problems arise, the regional administration is the one to intervene and, if necessary, to close access to the well. The Code gives almost no recognition to the controlled access systems developed by pastoral communities, and traditional wells are not even mentioned. The texts do not take into account the specific circumstances characterising pastoral life. For instance, mobile communities are not always in a position to maintain their members around the well throughout the year, and the election of additional treasurers and committee members would often be necessary. But the law allows only a total of nine members.

4.3 The challenges ahead

The privatisation of water points

Lack of recognition of local systems for access control has also resulted in the private appropriation of water points and surrounding lands. Our fieldwork in the Zinder Region of Niger has shown the complexity of these processes of appropriation, and shed some light on a range of strategies that are used to establish exclusive resource rights. Paradoxically, in undermining customary systems through de facto open-access water points, the state has created the conditions for the privatisation of resources, the very outcome it meant to prevent.

In Niger, private wells entailing exclusive use rights are mushrooming, mostly in relation to wells located on private land. This situation is traditionally unknown in pastoral areas, where customary systems and legislation provide for priority but not exclusive rights. However, the creation of private water points in enabled by legislation, which provides for an authorisation and a declaration regime – depending on the size of the well.

In other cases, private individuals have manoeuvred to take over control of public wells. Our fieldwork found more examples of public wells "managed" by private individuals than public wells managed by communities. In these cases, although the modern well is legally owned by the state, managed by a local committee and open to all, in practice it is controlled by powerful individuals or groups who have "captured" the management committee or simply appropriated the well itself.

Those appropriating water points have secured exclusive access not only to the water infrastructure but also to the pasture resources around it. This is because, by restricting access to water, those controlling the wells make it impossible for outsiders and their herds to stay in the area.

Actors engaged in these activities usually belong to local or national elites. They include wealthy herders, customary chiefs, MPs, traders and civil servants. Rarely, foreign operators are also involved. Some examples are reported in the boxes below to illustrate the phenomenon.

Box 4.1 Private wells as a means to take control of pastoral resources

In the North of the Zinder Region, Mr B. is a very rich herder owning thousands of livestock. Mr B. funded the construction of a borehole. Through this he secured de facto exclusive access to the surrounding rangelands for himself and his salaried herders. He did so by restricting access to water for people and livestock – making it impossible for outsiders to stay in the area.

Mr B. also obtained a certificate of land ownership for an area of 15km^2 around his borehole, even though the land is common property under customary law. The certificate was issued by the local Land Tenure Commission. Unfortunately for Mr B., he lost his certificate. He hopes to get a duplicate from the Land Tenure Commission. However, the Commission is proving reluctant to provide a duplicate and re-legitimise an act that was illegal and invalid in the first place. Negotiations are currently underway.

Source: study fieldwork.

Box 4.2 Taking control of public wells

Example 1. Tanout Department
In Tanout Department (Niger), three public wells were built in locations designated by the customary chief. After completion, these public wells were de facto taken over by the chief's son. He sent guardians to the wells to collect money from all users. Water fees vary depending on socio-ethnic belonging, with favouritism being displayed for certain tribes. The wells are managed as a private commercial enterprise. The money is not used for the upkeep of the wells but rather for the upkeep of the chief's son. This has been going on for years.

Example 2. Diffa Department
In the Gouré Department, an OFEDES type well was appropriated by an Arab who fixed a pump to the well in order to water his 1,000-plus herd. Once pasture becomes insufficient, he leaves the area with his herd. However, before leaving, he locks up the well to prevent others from using it in his absence.

Example 3. Diffa Department
In 1999, a rich Fulani herder, Mr I. (thought to own over a thousand livestock), approached the Water Department in Diffa to get a 'public' well dug in his area. Apparently, money changed hands. But the Water Department took its time to build the well, and Mr I. threatened to denounce those who had received 'gifts' from him. This threat triggered the process through which the Water Department ensured that Mr I.'s well was funded through a development project implemented in the region. One of the conditions for the building of the well included listing all the applicants / beneficiaries. Once the required number of 'beneficiaries' had been signed-up, the well was dug and 'transferred' to the beneficiaries. However, in reality the beneficiaries/-applicants turned out to be Mr. I's family and neighbours, who were already taking water from elsewhere. Currently, the sole user/beneficiary is Mr I. himself, who waters his animals freely from morning to night. The fact that Mr I. is reportedly armed and violent discourages others from daring to approach the well let alone use it. Mr I. is so convinced that it is his own well that he even employed professional artisans to increase the depth of the well by two metres in order to increase its output.

Source: study fieldwork.

The quality of the water infrastructure

The quality of the water infrastructure in pastoral areas is becoming a real concern. In Niger, the state (OFEDES) monopoly over well construction ended in the 1980s, and the private sector became a key player. As similar technical standards to those applied by the OFEDES were followed by private operators, these 'second generation' wells were (and still are) referred to as "OFEDES type": an implicit quality assurance. Unfortunately, the gap between theory and practice has grown progressively wider over time, due to an apparent incapacity of the state (and of development projects) to assure high quality of technical supervision and respect for technical standards.

The quality of water infrastructure built by the private sector has dropped drastically, along with its cost. Some newly built wells in Niger do not last more than 5 years, while the depreciation of a "good" well is normally 30 years. Cement-lined wells are now classified in two categories, the "real" OFEDES wells and the "fake" ones (see table below).

A "real" OFEDES well	A "fake" OFEDES well
Qualified and certified entrepreneurs with a proven track record are used.	Any entrepreneur is used.
Anchor points are inserted in the soil every 10 metres to stabilise the well, thereby limiting movement of well linings.	Anchor points are inserted only at the top because that is where they can be seen. As a result, any movement of well linings is felt along the whole column.
A double filtration system at the bottom is used in sandy soils.	A single column is used even in sandy soils.
Very frequent supervision.	Infrequent or no supervision.
Plenty of clean water is used to mix and cure the cement.	Dirty water from sources nearby is sparingly used.
The proportion of cement and iron bars in the material is checked so that the reinforced cement is of good quality.	Little or no checks result in cement that quickly crumbles.
Well linings are bolted together so that lateral slippage is minimised.	Well linings are placed on top of each other but not bolted together - lateral slippage easily takes place.
The well usually lasts for more than 20 years.	The well usually falls into disrepair within 5 years.

Poor quality of infrastructure has direct implications for herders. For financial and economic reasons, decisions to build water points must take a 25-30-year perspective, in order to ensure that maintenance and depreciation costs are sustainable for users. It also has implications for the interface between land and water rights. Well-spread networks of reliable wells are needed to enable access to rangelands. Without functioning wells, livestock would not be able to reach distant pastures.

The challenges of decentralisation

Over the past decade, decentralisation processes in Mali, Burkina Faso and Niger have led to the establishment of local governments (communes) endowed with responsibilities in the water sector. In Niger, for example, responsibilities transferred to local governments include sectors such as education, health and water. Such transfers of responsibilities are to be accompanied by a parallel transfer of the financial resources required to meet those responsibilities. Legislation on decentralisation provides that, in the water sector, communes are responsible for the construction of wells and for their management. However, inconsistencies exist with provisions of the Water Code, which was adopted before the establishment of the communes.

Since the 1990s, following structural adjustment programmes and the redefinition of the role of the State, most Sahelian governments have gradually withdrawn from regular maintenance of water points. This now has to be paid for by users themselves. While construction of wells still relies heavily on the national budget and on donors, new financing mechanisms are being explored for maintenance. On the one hand, calculations on the level of user fees for cemented wells and boreholes are being made, so as to cover part of the depreciation costs over a 30-year period. On the other hand, it is expected that communes will generate revenue and invest it in water infrastructure, especially those in a position to levy taxes on livestock markets. And, anecdotal evidence suggests that the substantial sums raised by water management committees through water fees are attracting the attention of the newly established communes. Short of cash and under pressure to live up to expectations, some communes are reported to be manoeuvring to obtain a share of those fees.

Providing water to pastoralists within the new context of decentralisation raises a set of important questions:

- To what extent will the rural communes be willing and able to take over management of water points located within their territory?
- What will be their relationship with the existing management committees?
- How will this affect the resource rights of pastoral communities?
- How will pastoralists be involved in decision making in communes where they are not registered, but where they move temporarily to gain access to pastoral resources?
- What financial and other conditions will communes apply to water access, particularly vis-à-vis transhumant pastoralists, and what will be the implications for inter-communal mobility?

4.4 Conclusion

In many Sahelian countries, no specific approach has been designed for providing pastoral water infrastructures. In Niger, for instance, the most common tool used for appraising the feasibility of new wells in pastoral areas follows the same approach as that used with farming communities – despite the important contextual differences. Until a few years ago, it was only the technical aspects of well emplacement that preoccupied institutions working on water development. These aspects included population data (higher density meaning more wells per surface unit), hydro-geology (with wells being dug where rock formations look promising to bear water wells), and the existence of other public wells in the area[20]. Land tenure issues, social aspects relating to the location of wells, the needs of the population benefiting from the wells and issues relating to institutions for the management of the wells were of secondary importance, if considered at all.

As a result, wells are often badly placed, without prior dialogue with local communities. Sometimes, communities do not want new public wells. These wells may destabilise a situation in which traditional wells are already providing sufficient water for local needs. High-capacity public wells in pastoral areas attract other pastoralists, eroding the priority land and water use rights customarily enjoyed by the residents. Public wells may also bring about rangeland degradation, as many more livestock can graze in the surrounding area for longer periods; and resource conflict.

20. The existence of traditional wells and modern private wells was hardly ever taken into account when building public wells.

The situation is exacerbated by the fact that success of water projects is measured in immediate quantifiable results, rather than by the quality of the intervention over time. Therefore, although management committees are created, this tends to be done at great speed and in a standardised way, without allowing time for real dialogue. The result is committees with little legitimacy, which find it difficult to enforce rules. Management committees quickly degenerate into non-transparent management systems, resulting in elite capture and even private appropriation of common resources.

Technicians alone are insufficiently equipped to address the complexities of social organisation and dialogue with mobile pastoral communities. Social investment is required to create appropriate management structures relevant to the needs of local governments. This work to establish appropriate decision-making systems takes time, is a complex process and does not necessarily yield the outcome expected at the beginning of the project.

Efforts are also needed to create an enabling legislative framework. Given the close link between water and land access, legislation on water (in Niger, the Water Code) and other relevant legislation (in Niger, the Rural Code and legislation on decentralisation) need to be coherent, not contradictory. For local committees to be effective they must be backed by legislation that gives them enough leverage to enable them to elaborate and enforce resource management rules. And, the legal status of different types of water points – traditional and modern wells, public and private water points – must be clear in the law and in its application.

These and other issues will be further analysed in the overall conclusion of the study (chapter 6).

5. Wetlands

LORENZO COTULA AND CED HESSE

5.1 Overview

This chapter does not seek to provide a comprehensive review of the issues raised by wetlands. Rather, it identifies some of the key land/water rights issues linked to wetlands; and it presents one case study to illustrate some of those issues. That case study draws both on a literature review and on unpublished materials generated by a previous IIED programme ("Pastoral Land Tenure and Decentralisation in Mali", funded by NORAD; Cissé, 2001 and 2002, and Cissé and Konaté, 2003).

According to the Ramsar Convention on Wetlands of International Importance, wetlands are "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt" (article 1.1). Abundance of water (due to seasonal inundations, permanent cover or other) is the dominant ecological feature. This has repercussions for the vegetation in the land area – and for livelihood opportunities.

In dry areas like the Sahel, wetlands are of strategic importance. They typically constitute the basis for the livelihoods of multiple resource users. In seasonally flooded plains, fishers and farmers may use the same area of land/water in different seasons. Herders may come to the area during the dry season, in search for green pastures for their herds. The complexity of competing livelihoods strategies and overlapping use rights matches the complexity of the ecosystem.

There is a great deal of overlap between issues concerning wetlands and the issues tackled in the previous two chapters. Many Sahelian irrigation schemes and pastoral water points are built on wet lowlands ("*bas-fonds*"). As a result, many of the issues examined in relation to irrigation and pastoral water points would also be relevant here – and we will not repeat them.

On the other hand, the issues touched upon in this chapter present significant differences. First, while the chapters on irrigation and pastoral water points were mainly concerned with the land tenure impli-

cations of human interventions to improve the water infrastructure, this chapter primarily deals with a type of natural habitat – wetlands. However, the resource rights issues tackled here do have repercussions for interventions to promote better management of that habitat.

Secondly, in wetland ecosystems, relations of interdependence exist between rights over different natural resources – not only water and land, but also fisheries, grazing and other resources. In our case study from the Inner Niger Delta (Mali), for instance, probably the most prized resource is a grass that provides highly valued dry season pasture ("*Echinochla stagnina*", commonly called "*burgu*"). To capture this complexity, this chapter broadens the scope of the analysis from a land/water rights focus to the linkages between rights over all the natural resources existing in a given territory.

Photo: Brigitte Thébaud

Harvesting rice and fishing on the Niger River (Gao, Mali, 2005)

Finally, because of their strategic importance, wetlands raise issues not only at the local and national level, but also on regional and international arenas. The next sections outline some of these key challenges.

Reconciling competing resource uses

In wetlands, different forms of resource use (e.g. farming, fishing and grazing) may take place on the same area, either simultaneously or sequentially (e.g. based on seasonal floods). Competition for resource access among different uses may give rise to tensions. Fertile, seasonally flooded land can be used for farming (e.g. as rice fields) or for pastoralism (as "*bourgoutières*"). In many places, grazing lands have been converted to rice fields, often with the tacit or otherwise backing of the government administration. Similarly, tensions may occur between fishing and farming communities (see Box 5.1). Tensions for access to, or control over wetlands may escalate in violent clashes – and even in international disputes (see Box 5.2).

The close interdependence of resources and resource uses in wetlands creates challenges for government policies and programmes, which are typically sectoral in scope. Legislation typically regulates water, land, fisheries and pastoral resources; and different institutions may be responsible for each of these sectors; but the interaction among these resources and/or activities remains largely unaddressed.

At the local level, experimentation is ongoing to develop institutional mechanisms for reconciling competing resource uses. Local stakeholder agreements ("*conventions locales*") are increasingly used in the Sahel – whether in wetlands or not. Broadly speaking, these are contractual arrangements negotiated and agreed by all the users of an area of land, with a view to regulating resource access and use. Development agencies facilitate the process through which the different users are identified, brought around the negotiating table on an equitable basis, and supported in the design and implementation of the agreement. The agreement may then be formally endorsed by local governments (thus becoming local bye-laws) or by government authorities (the "*préfet*").

Box 5.1 A dispute between farmers and fishers in Lake Korientzé, Mali

Located North of the Inner Niger Delta, Lake Korientzé supports the livelihoods of multiple users. Farmers cultivate the lake banks, and herders take their livestock to graze on the bourgoutières. Subsistence fishing is also practised by local groups. And, in January, non-resident *bozo* fishers come to the lake. Their resource access depends on agreements with the water chief ("*maître des eaux*"), for access to the lake; and with *bambara* farmers, for the establishment of fishers' temporary settlements. Incoming fishers pay a fee to the water chief, a member of the local fishing community.

In 1999, a dispute broke out between incoming fishers and one of the *bambara* farming villages. The dispute seemingly concerned a fishing technique (the "*fourrière*"). This is alleged to be harmful to the environment, and local farmers want to prohibit it. Behind this dispute, however, is the attempt of the *bambara* village to assert claims on the lake and obtain a share of the fee. This constitutes a remarkable amount of cash relative to the local economy. Until 1999, the water chief paid a share of the fee to the *bambara* villages. This practice ended as a new water chief came to power in that year. In recent years, border disputes among *bambara* villages have also erupted. This is because competing villages try to gain control over land - that they can then allocate to incoming fishers in return for payment of a fee. Since 2002, an NGO has worked in this area to promote shared management of natural resources.

Source: Lavigne Delville and Hochet (2005).

Establishing effective management and equitable revenue sharing arrangements

Given the strategic importance of wetlands, controlling access to these areas may generate substantial wealth – and, with the monetarisation of the economy, impressive amounts of cash. This exacerbates competition among different institutions for control over these resources. Central and local government authorities legally empowered to manage wetland resources must come to terms with "customary" institutions that claim legitimacy from "tradition" but that are increasingly driven by private profit. Customary chiefs typically make the most of the revenue flows associated with wetland resources. In the Nigerian shore of Lake Chad, for instance, resource access is de facto regulated by local chiefs (the "*lawan*") that apply "customary" law. Nigeria's Land Use Act 1978, which vests land ownership with state governors and devolves land management to local governments, is not applied. In return for access to farmland, pastures or fisheries, the *lawan* receive substantial revenues. While these should be channelled to local governments, this does not happen in practice (Sarch, 2000). Similar patterns are observed in the

Box 5.2 When resource rights tensions escalate in a sovereignty dispute: the case of Lété Island

In July 2005, the International Court of Justice (ICJ) decided on a frontier dispute between Benin and Niger. The dispute concerned sovereignty over islands in the River Niger and its tributary River Mekrou. The largest of these is the fertile Lété Island (some 40 sq km). At independence, violent clashes took place on the Island. Incidents also took place in 1993 and 1998. In 2001, the two countries signed a Special Agreement to bring the matter before the ICJ.

At the root of the dispute lie tensions between competing resource users, particularly herders and farmers. Historically, Lété Island was cultivated by Dendi farmers from a village in today Benin; Fulani herders periodically came from Niger and elsewhere. During colonisation, increasing numbers of Fulani from Niger settled on the island. And, the fertile lands of the island constitute a strategic resource ("*zone de repli*") for Nigerién herders during the dry season. Since independence, recurring disputes have been sparked by land rights contestations and crop damage caused by herd passage.

The ICJ determined the boundary between the two countries along the Rivers Niger and Mekrou. The Court applied international law. As such, it made no reference to local resource tenure issues. Rather, it applied the principle of the intangibility of the boundaries inherited from colonialism - including former colonial administrative delimitations that became international frontiers after independence (both countries were French colonies). Having ascertained that the colonial administration responsible for Lété Island was the one based in Niger, the Court found that the island belongs to Niger.

Source: ICJ, *Case Concerning the Frontier Dispute (Benin/Niger)*, Judgement, 12 July 2005; and other case documents (memorials and counter-memorials of the parties).

Inner Niger Delta of Mali with regard to the *jowro* (see below, section 5.2). This raises issues as to the democratic nature of resource-use decision making; and as to the distribution of revenues generated by resource use.

Promoting conservation and sustainable use

As valuable and fragile ecosystems, wetlands require special efforts for conservation and sustainable use. In a nutshell, the 1971 Ramsar Convention on Wetlands of International Importance provides for: (i) the *conservation* of wetlands included in the "List of Wetlands of International Importance" – each state having to designate at least one such wetland in its territory; and (ii) the *sustainable use* ("wise use", in the words of the Convention) of all wetlands within the territory of state parties. Senegal,

Mali, Burkina Faso and Niger are all parties to the Convention. Listed wetlands in their territory include Lake Chad (Niger), the W National Park (Niger, Burkina Faso) and the Inner Niger Delta (Mali).

On the ground, projects to promote conservation and sustainable use may have resource rights implications. In the eyes of local resource users, individuals and groups involved in the project would strengthen their claims over the resources – through mechanisms similar to those already examined with regard to irrigation and pastoral water points (see e.g. section 3.2; see also above, Box 5.1). This has been documented, for instance, in a case study on a conservation project in the Gourma area of the River Niger (Mali). This project concerned the signing of an agreement between the government administration, a Norwegian NGO and groups of local herders, aimed at restricting access to degraded pasture lands ("*bourgoutières*") to enable their regeneration (Laurent and Mathieu, 1995). Signing this type of agreement with some local resource users rather than others would de facto strengthen the resource claims of the users party to the agreement. It is therefore essential to identify all the resource users – a task made more difficult by the multiplicity of users and by the seasonal mobility of some of them (e.g. non-resident herders and fishers).

5.2 The *jowro*: custodian of the commons or common profiteer?

The *jowro* are highly contentious figures. To some they are the legitimate, customary managers of pastureland in the Inner Niger Delta, Mali; a function that was formalised by the *Dina* of Sekou Amadou in the 19th century (Cissé & Konaté, 2003; Kassibo, 2001; Legrosse, 1999; Moorehead, 1998). To others they are no more than common profiteers selling rights of access to critical dry season pastures (in particular the much prized dry season *burgu* grass, *Echinochloa stagnina*), or even the land itself over which customarily they have no ownership rights.

The controversy is essentially a power struggle over the control of the *burgu* pastures and the enormous profits to be had in regulating their access to resident and non-resident cattle herds. The economic and political stakes are huge and have increased over time. Whereas in the past conditions of access were regulated more by social relations and the need to build reciprocal networks of exchange, in recent years the

system has become increasingly driven by personal financial gain. The impressive amounts of money that the *jowro* earn from selling grazing rights to visiting herders represent a major economic stake.

The emergence of democratically elected local government authorities following Mali's decentralisation reforms ushers another actor onto the scene. This further complicates the situation. Under the laws of decentralisation, rural councils have the authority to manage the natural resources within their jurisdiction, including, in the case of the Inner Niger Delta, the highly prized burgu grasslands. They are also authorised to keep such revenues as are generated from the good use and management of these and other natural resources. Reconciling the *jowro*'s historical claims with those of local government is critical for the sustainable and equitable management of the Inner Niger Delta and the future success of the decentralisation process in this highly populated area of Mali.

From conquest to regulation

The Inner Niger Delta is an area of national and international strategic importance. It is the largest inland wetland in West Africa, supporting exceptionally diverse, rich and complex ecosystems. The annual floods bring up to 25,000 to 30,000 Km^2 of "extra" land into production (Moorehead, 1998). In addition to considerable wildlife resources,[21] the delta contains rich agricultural land and the highly nutritious dry season pasture commonly known as *burgu* (*Echinochloa stagnina*). Over half a million people reside within the delta making their living as pastoralists, fishers and farmers, raising 40% of the national cattle herd and accounting for 90% of the national fishing catch (Cissé & Konaté, 2003).

Historically, FulBe pastoralists have dominated the land use patterns and tenure rules governing rights of access to resources in the delta. Arriving in successive waves from the 13th century onwards, they gradually spread throughout the delta carving out areas over which they controlled access to pastures. Initially, resource access was regulated by the clan head (*ardo*), who governed the seasonal movement of livestock in response to the pattern of flooding. During the flood period, rights to exploit the area belonged to the fishers and farmers; but once the waters

21. The Inner Niger Delta hosts more than 350 species of migratory birds, 138 species of fish as well as numerous reptiles, amphibians and mammals including hippopotamus and the manatee (www.ramsar.orgwwd/4/wwd2004_rpt_mali1.htm).

receded, the *ardo* controlled the timing and pattern of the clan's grazing regime as well as the conditions of access for outsiders' herds (Moorehead, 1998). Over time, a more complex pasture management system developed, with the *ardo* delegating responsibility for the management of village pasture land (*harrima*) to the *dioum-ouro, or jowro* (Cissé & Konaté, 2003; Moorehead, 1998; Gallais, 1967 quoted in Moorehead, 1998).[22]

In the 19th century, the theocratic state of Sekou Amadou (the *Dina*), in defeating the *ardo,* sedentarising the delta's population and dividing the pastoral resources of the delta into 37 territories (*leyde*) reinforced the position of the *jowro* as the "master of pastures" within their *leyde* (Cissé & Konaté, 2003; Moorehead, 1998). The *Dina* organised the pastoral system according to a strict set of rules, regulating the movement of livestock in and out of the delta. This consolidated power among the sedentary communities represented by the *jowro*, within a socio-economic order that favoured the pastoral economy over that of fishing and farming (Moorehead, 1998). It was nonetheless an effective system for allocating and controlling access to the delta's rich resources for both resident and outside populations.

Institutional confusion

French colonial policy, particularly with respect to land, undermined the customary system for regulating resource access, and laid the foundations for the resource degradation and conflict that now characterise the area. Specific measures included legislation decreeing that all "vacant" land (i.e. long-term fallow or land used on a seasonal basis) enter the state's private estate,[23] as well as directives specifying the dates at which livestock were to enter and leave the dry season pastures. The former de facto created a dual tenure system that allowed certain groups to gain access to productive resources to which they had no access under customary systems. The latter weakened the ability of the *jowro* to regulate the number and timing of livestock entering their *leyde*, particularly vis-a-vis outsiders (Kassibo, 2001; Moorehead, 1998). The land tenure and development policies of a succession of post-independence governments have exacerbated this situation. The proliferation of state institutions involved in one way or another in allocating access to resources, often without

22. The diom-ouro, literally head of the village, was also responsible for the farming communities.
23. Land tenure decree of 24 July 1906.

reference to each other, has created a situation of "open-access", and further weakened the powers of the *jowro*. The cumulative effect of these measures has been the gradual opening up the delta's resources to outsiders, without the assurance that their numbers and mode of production are effectively regulated either by the state or by customary authorities (Moorehead, 1998).

FulBe society and the social framework within which the *jowro* operate has also been weakened by the droughts of the 1970s and 80s, and by the increasingly monetisation of the delta economy. In the past, the *jowro* were accountable to the *suudu baaba*[24], who chose the *jowro* on the basis of their livestock husbandry skills and personal integrity. The *suudu baaba* also played a key role in monitoring the activities of the *jowro*, so as to ensure they contributed to the good management of the Delta's resources (Cissé & Konaté, 2003; Kassibo, 2001). Over time, however, the authority of the *suudu baaba* as a regulatory force has declined. The post of *jowro* is increasingly becoming a private or family affair without reference to the broader community. Leading families competing for the position of *jowro* "buy" the support of clan members and state institutions to back their succession claims. The privatisation and sale of the *burgu* pasture lands by the *jowro* is increasingly common place.

Decentralisation: will it solve or worsen the problem?

Decentralisation in Mali offers real opportunities for the residents of the delta to have a say in natural resource management. Local government authorities (rural municipalities) have been vested with the responsibility for managing natural resources within their jurisdiction, including, in the case of the Inner Niger Delta, pasturelands such as the highly prized *burgu* grasslands. According to the law, they are expected to consult local communities under their jurisdiction, and to ensure participatory and equitable planning and decision-making processes. NGOs and donor development projects are also expected to work with these elected local government bodies with respect to the funding and implementation of local development projects. In theory, the broad institutional framework

24. *Suudu-baba*, literally "fathers' house" in *fulfulde*. In the Inner Niger Delta, this term refers to two distinct but interrelated groupings. On the one hand, it refers to a group of herders claiming descent from the same ancestor (a clan), from which a *jowro* is elected. On the other, it refers to the broader community comprised of all resident ethnic groups living in the area (fishers, farmers, etc.).

is in place to redress the situation and bring the resources of the delta back under local control. In practice many challenges remain.

Foremost among these is resolving the relationship between the *jowro* and other customary institutions on the one hand, and the newly established local governments (*communes*) on the other, particularly with respect to control over the high-value *burgu* grasslands and the huge financial resources they generate. Although decentralisation laws confer to local governments responsibility for the management of the natural resources within their territory, these provisions are not in force due to lack of the necessary implementation regulation and decrees. The *jowro*, in their drive to maintain their control over the taxes they levy from granting access to key resources, strongly position themselves as the legitimate managers of the delta's pasture lands, a position tacitly supported by various local authorities who benefit from the status quo. The legality, and increasingly the legitimacy of the *jowro*'s claims are, however, contested by the newly elected local government bodies, who see the taxes levied by the *jowro* as rightfully belonging to them to fund their local development plans. The situation, however, is not as clear-cut as it might appear for many *jowro* have successfully played the politics of the multiparty system and have been democratically elected as mayors and/or municipal councillors thereby confusing the boundaries between their contested customary prerogatives and their clearly defined legal powers. The fact that the territorial boundaries of the recently established rural municipalities do not follow those of the *leyde* (the customary territorial units of the *Dina*) further complicates the situation. Interestingly, most rural councils have not yet sought to clarify their territorial boundaries for fear of the tenure conflicts this may engender (Cissé & Konaté, 2003).

The land law and other sectoral natural resource management legislation are at odds with the physical and social characteristics of the resources they regulate. Sectoral policies and legislation do not sufficiently recognise the unique tenure characteristics of the delta. These are based on a system of multiple resource use rights, which change from one season to the other in order to accommodate changes in the physical environment. The Pastoral Charter 2001 potentially addresses some of these issues. In regulating an activity (pastoralism) and its relations with other forms of land use (e.g. farming), it tackles access to different natural resources (grazing, water) rather than focusing on a single resource. It vests natural resource management with local governments,

and requires these to perform this function in collaboration with user groups and civil society. These "*cadres de concertation*" may provide a forum to bring together different resource interests, including those of the *jowro*. However, at the time of writing, the Charter still lacks the implementing regulations defining the modalities of its practical application. As such, it is of limited operational effect. In addition, while the Charter regulates access to community *bourgoutières*, it does not address claims concerning private *bourgoutières*. This leaves room for manoeuvre to the *jowros* that have claimed individual ownership over some *bourgoutières* (Thébaud, pers. comm.).

The good management of resources in the Inner Niger Delta is unlikely to be resolved either by the state excluding the *jowro*, or by formally reinstating them to the exclusion of the rural councils and other actors. The historical role of the *jowro* cannot be ignored, but has to be redefined in a consensual and informed manner by all parties involved. Facilitating this process is no easy matter given the levels of poverty and lack of awareness about the policy environment among local people, the high political and economic stakes, and the lack of a common vision among stakeholders on their potential roles for resource management within the context decentralisation.

6. Conclusion

LORENZO COTULA

6.1 Overview

This study has explored the linkages between land tenure and water rights in the Sahel. In so doing, it has focused on two key areas of interface between land and water rights (irrigation and pastoral water points), and touched upon a third one (wetlands). The study followed a socio-legal approach. It combined the analysis of legal texts with a review of field studies from a range of social science disciplines, and with original fieldwork. Fieldwork focused on irrigation schemes in the Senegal River Valley, Senegal, and on pastoral water points in Zinder Region, Niger.

In dryland areas like the Sahel, land and water are scarce and valuable resources. Whether in irrigation schemes, around pastoral water points or in wetlands, this study has found intense competition between different resource uses and interests – between herding and farming, agribusiness and smallholders, "autochtones" and "migrants", and along gender lines.

The interface between land and water rights is at the heart of this competition. Digging private pastoral wells or appropriating public ones is being used as a strategy to grab common resources and secure exclusive land/water use rights (see above, section 4.3). De facto open-access pastoral water points have attracted increasing numbers of herders, undermining the priority land/water use rights of local communities (section 4.2). "Migrants" are seeking to strengthen their land claims by manipulating irrigation infrastructure projects (see above, section 3.2). Smallholders are losing access to irrigated plots for failure to pay the water fee (see above, section 3.3). Governments are increasingly looking to agribusiness for promoting productive use of irrigated land and for expanding the water infrastructure (section 3.3). The development of irrigation schemes is depriving herders of access to pastures and water points (section 2.4). And, wetlands constitute an arena for tensions between competing users, and for resource/revenue grabbing by customary chiefs (chapter 5).

This situation raises not only distributive issues, fostering marginalisation and social exclusion; but also concerns for the tenure security enjoyed by resource users – which is key to promoting agricultural investment (World Bank, 2003). These issues create important challenges for development policies and programmes. The next sections briefly review some of those challenges.

6.2 Bridging the gap between land and water policies and programmes

Programmes to develop the water infrastructure may improve access to water for agriculture. However, in the past, failure to take account of property rights issues in water development projects – whether in relation to irrigation or to pastoral water points – ended up undermining land tenure security, fostering land disputes and contributing to resource degradation. Local elites have harnessed their access to resources, contacts and information to manipulate external interventions to their advantage. Resource users – "autochtone" and "migrant" groups, farmers and herders – have used water development projects to strengthen their land claims.

This calls for taking land tenure issues seriously in the design and implementation of water infrastructure programmes. It requires a solid understanding of complex systems of local resource tenure. Key water development decisions must be taken in light not only of geophysical and technical factors, but also of land tenure issues. This includes decisions on whether to build the water infrastructure, on its location, its nature, its management regime and even its name (see e.g. section 3.2). Full consultation of local resource users – both resident and non-resident – is necessary to ensure that local land tenure issues are properly taken into account in programme design and implementation. Clarity must be established on who has right over what after the end of the project intervention – including management and use rights on land, water and the water infrastructure. Where pre-existing land rights are lost or eroded as a result of a water programme, compensation must be granted. Such compensation may be in cash or in kind (i.e. in the form of access to plots "improved" by the water programme). Solutions must be both consistent with legislation and acceptable to local users (see section 6.3).

At the policy level, there is a need for promoting better coordination between land and water policy and legislation. In the Sahel like elsewhere, the law has evolved towards a full dissociation between land and water rights. With exceptions (e.g. Niger's Rural Code), legislation is typically sectoral in scope, and different laws regulate resources such as land and water. Water and land laws have evolved often with little coordination and, in some respects, in different directions. Recent legislation on decentralisation may contain provisions at odds with sectoral natural resource laws. Government institutions also tend to be sectoral. This makes it more difficult to address issues raised by the interface between rights over different resources – namely, between land and water rights. The chapters on irrigation and pastoral water points have identified a series of problematic areas in that interface. And, the chapter on wetlands illustrated the strong linkages that de facto exist between access to resources as diverse as land, water, grazing and fisheries.

In practice, some "division of labour" between different legal texts and institutions is inevitable. In Niger, while the Rural Code aims to regulate all socio-economic activities in rural areas, water is governed by the Water Code. The challenge is to establish coherence and effective coordination between different laws and institutions. This requires, first and foremost, eliminating contradictions within and between pieces of legislation - such as the contradictions between Niger's Rural Code and Water Code highlighted above (section 4.2). Where natural resource legislation predates decentralisation, it needs to be revised in light of the devolution of powers that decentralisation laws entail. And, coherence must be established between land and water laws. Where appropriate, for instance, water legislation needs to address the land tenure issues raised by its provisions. An example is the provision of Burkina Faso's Water Management Policy Act 2001 on compensation for impairment of land rights as a result of water-related interventions (article 11).

6.3. Addressing tensions between national legal frameworks and local practice

A crosscutting issue emerging from this study is the gap between what is in the statute books and what happens in practice. Legislation regulates management of, and access to land, water and water infrastructure (irrigation facilities, pastoral water points). However, the implementation of this legislation is riddled with difficulties. This is despite the special efforts

that Sahelian governments have made to regulate resource access and management in publicly funded irrigation schemes and pastoral water infrastructures. This lack of implementation is largely due to lack of capacity of state institutions fully to implement legislation. It also reflects a deeper issue – the existence of a gap between the law and the needs of local resource users.

In pastoral areas, local resource management systems, centred around priority rights on "traditional" wells, have been undermined by decades of lack of proper legal recognition. And, in irrigated lands, while legislation typically prohibits land rentals and sales, these are common practice in many irrigation schemes. Land rentals constitute an important element in the livelihood strategies of many farmers – enabling them to pay off debt and water fees in periods of distress, without losing access to their plots in the longer term. Bridging law and practice may entail legalising this type of rental arrangements for smallholders, while establishing safeguards against abuse.

In this context, the relationship between local land tenure systems and state legislation is a particularly thorny issue. Programmes to develop irrigation infrastructure may entail expropriation of land rights and reallocation of land-cum-water rights after the completion of construction works. In this context, protecting pre-existing local land rights, and paying compensation for their expropriation, are key to avoiding resource conflict and social exclusion. Yet where local land rights are mainly based on customary law, this raises issues as to the extent to which land rights acquired through means other than those prescribed by law are legally protected. Quite often, the perception of local resource users is that those rights ought to be protected in some form; but in several countries they are not (e.g. in Senegal and Burkina Faso).

A challenge in protecting local land rights is their fluidity and ambiguity. In many areas, who has right over what is hotly disputed. Customary systems have evolved profoundly as a result of economic, social, political and cultural change – and in many places they have been greatly eroded. This is particularly so in areas with substantial migration and resettlement – a situation often associated with irrigation. After generations of settlement, "migrants" are challenging the customary-law principle whereby they would always be tributary to the first occupants. A tension exists here between, on the one hand, avoiding the anachronism of reaf-

firming the land tenure prominence of "first occupants" who may have not used the land area for decades; and risking fostering resource conflict by simply by-passing them, on the other.

The case study on the *jowro* of the Inner Niger Delta (section 5.2) shows another angle of the interface between the statutory and the customary. While legislation gives responsibility for natural resource management to elected local governments, customary chiefs (the *jowro*) de facto continue to manage the most valuable resources, and to receive the associated revenues. Traditional accountability mechanisms have been weakened as a result of economic, social and cultural change – for instance, the erosion of the extended family. As a result, many *jowro* treat those revenues as their personal income rather than as resources for the benefit of the community as a whole. Similarly, customary chiefs are manipulating both custom and the law to appropriate public pastoral wells for private gain (see box 4.2). Therefore, a key challenge for policy and law makers is developing tools to protect local ("customary") land rights, which are the main mechanism through which groups gain access to natural resources, without further entrenching discriminatory and unaccountable customary institutions.

6.4 Establishing effective governance of land and water resources

Effective land/water governance must address issues as diverse as regulating the creation of water infrastructure (e.g. through permits for digging wells) and its land tenure implications; determining the nature, content and duration of the property rights over land, water and the water infrastructure; establishing systems for recording those rights; creating institutions and processes for resource management; and providing fora for the settlement of disputes.

Providing adequate tenure security for resource users is key. This requires addressing the factors currently undermining tenure security, which we identified in the previous chapters. These include poorly defined concepts like "*mise en valeur*" and, in the case of irrigation, other strict conditions attached to land use rights. Among these, payment of the water fee is a sensible condition to ensure high collection rates – provided that farmers are granted flexibility mechanisms for periods of crisis. Institutionalising the rescheduling of payments in times of crisis,

and allowing smallholders to rent out land may contribute to such flexibility (see section 6.3).

Protection must be granted to investment in water infrastructure provided by farmers. In Senegal, farmers enjoy the same type of land use rights, irrespective of whether irrigation facilities were provided by government agencies or built by the farmers themselves. New land tenure models experimented to promote investment in water infrastructure (such as long-term leases in Mali's Office du Niger and in Burkina Faso's AMVS) grant stronger and longer-term rights to those building irrigation facilities.

However, these efforts target agribusiness rather than smallholders. This reflects a general policy thrust favouring agribusiness over smallholders – a trend emerging in most Sahelian countries. Yet the latter constitute the backbone of the Sahelian agriculture, whether irrigated or rainfed. This calls for examining a range of land tenure options to give smallholders greater tenure security and promote their investment – from more secure use rights to full ownership. In doing so, it must be borne in mind that the land tenure needs of smallholders may differ substantially from those of agribusiness.

This policy tension between agribusiness and smallholders shows that addressing the governance challenges of the land/water rights interface is more than a technical issue – it requires strategic policy choices, such as choices on the very model of agricultural "modernisation".

Dispute settlement is another key area. The chapters on irrigation, pastoral water points and wetlands show how resource disputes are mushrooming in many parts of the Sahel (by way of example, see boxes 3.1, 3.2, 5.1 and 5.2). This reflects the intense competition for control over land/water resources. Hardly any of the disputes we examined was settled by courts. Rather, customary chiefs, administrative authorities (the "*préfet*"), NGOs and politicians (local councillors, MPs, ministers) have undertaken alternative dispute resolution, with varying degrees of success. This reflects the socio-cultural preferences of local resource users. But it also reflects the geographic, economic, linguistic and other inaccessibility of judicial institutions, and a lack of trust in their work. The lack of predefined, clear and trusted dispute settlement processes leads to "forum shopping" (see section 2.3), and to ever-resurfacing disputes.

Finally, as to resource management, a tension exists between centralised management and decentralisation. On paper, decentralisation enables better to respond to different local needs and practice; to promote public participation in decision making; to increase the effectiveness of efforts to monitor compliance and enforce regulations; and to increase the perceived tenure security of local resource users. However, this requires the devolution of real decision-making powers, and adequate resources for local governments to work effectively. And, temptations to idealise the "local" should be resisted. Power imbalances and elite capture are as problematic at the local level as they are at the national. Resource grabbing within the context of decentralised management of irrigated land in Senegal illustrates this point (see Box 3.3). Therefore, there is a need to design and test effective checks and balances that enable good local governance and prevent elite capture.

Where ongoing decentralisation processes entail the devolution of responsibilities for the management of land and water, efforts are needed to address the relationship between the newly established local governments and a range of local institutions that already manage land and water resources – whether de jure or de facto. This includes customary chiefs (e.g. the *jowro* in the Inner Niger Delta; section 5.2) and local communities managing public water points (see section 4.3). Competition for control over resource access fees, in relation to both water and other valuable resources (e.g. the "*burgu*" in the Inner Niger Delta), makes addressing this challenge even more difficult.

6.5 Tackling the land/water rights interface through a human rights lens

Land and water rights are instrumental to the realisation of fundamental human rights like the right to food and the right to water (see section 2.1). Addressing the problematic areas of the land/water rights interface contributes to the progressive realisation of those human rights, which is required by international human rights treaties. Taking a human rights perspective entails bridging the gap between field-level work on land and water rights and international processes to promote enjoyment of human rights.

On the one hand, this requires taking a rights-based approach in policies and programmes aimed at improving access to water for agriculture. A

human rights approach is based on the understanding that the realisation of human rights like the right to food and the right to water is not only function of the availability of key livelihood assets – for instance, of water points and irrigation facilities. It is also function of institutions and processes that address power imbalances and ensure access to those assets for the poorest and most vulnerable groups. This has implications both for the content of policies and programmes and for their formulation process.

As for content, a rights-based approach provides benchmarks for evaluating policies and programmes – such as non-discrimination and "non-retrogression". Non-discrimination prohibits arbitrary differentiations of treatment (see above, sections 2.1 and, on gender equality, 3.2). Non-retrogression entails a presumption that states cannot take "steps back" – measures that would reduce existing enjoyment of protected rights (see section 2.1). Therefore, action resulting in loss of access to land/water for some would need to be properly justified in order for it to be lawful. In other words, a human rights approach would not provide normative guidance on the merits of strategic policy choices – such as on whether to favour access to land and water resources for agribusiness or for smallholders. But it requires that certain basic principles must be respected – such as non-discrimination; and that, whatever the policy choice, measures must be taken to ensure that those who lose out have access to reliable, alternative sources of support.

As for process, a rights-based approach requires establishing effective mechanisms for accountability and redress. Freedom of expression, assembly and association are the foundations of a vibrant civil society. Access to justice – courts, human rights institutions, alternative dispute resolution – is key to enforce rights and obtain redress for violations. The recent mobilisation of farmers' organisations in the Office du Niger against evictions for failure to pay the water fee (see section 3.3) would have been more difficult without those democratic guarantees.

On the other hand, field experience with tackling land/water rights issues has invaluable lessons to feed into international human rights processes. Debates on the right to water have focused on access to water for personal and domestic use. They have largely neglected the importance of access to water for agriculture. The implementation of the right to water in agriculture raises very different issues to those raised by water access for personal and domestic use. In agriculture, the imple-

mentation of the right to water must take into account the resource tenure needs of local production systems. In Niger, programmes to ensure free access to water for all had negative impacts on local pastoral land/water tenure systems. In many cases, this fostered resource conflict and degradation (see above, section 4.2). There is a need to mainstream these specificities in international debates on the human right to water. In addition, there is a need to more clearly spell out the implications of applying a rights-based approach to improving water access for agriculture. UN documents like General Comment No. 15 on the right to water embody important statements of principles but tend to remain at a fairly abstract level. Lessons from the implementation of national policies and field programmes can help translate those principles into more operational guidelines.

6.6 To sum up

Land and water rights are closely interdependent – it is not possible to use one resource without the other. Creating and running irrigation schemes raises important land tenure issues. In such schemes, access to water and access to land are closely linked. In pastoral systems, control over water points enables regulation of access to surrounding grazing land. Past experience shows that failure to take account of this interdependence can undermine land tenure security, foster land disputes and contribute to resource degradation.

Legal frameworks must adequately address the interdependence between land and water rights. This requires:

- Improving the coherence and coordination between natural resource laws (e.g. on water, land and pastoralism) and between these laws and other relevant legislation (e.g. on decentralisation);
- Ensuring that the legal framework adequately builds on and responds to local resource tenure systems – such as pastoral resource systems based on priority rights over "traditional" wells and surrounding grazing lands;
- Regulating the land tenure implications of creating water infrastructure, including recognition of pre-existing local land rights, compensation for loss or erosion of these rights, and conditions for access to "improved" (e.g. irrigated) plots;
- Establishing clear, effective and accessible mechanisms for the settlement of disputes arising from the interdependence between land and

water rights (such as those reported in boxes 3.1, 3.2, 5.1 and 5.2); and
- Removing restrictions that create rigidities in the operation of the land/water rights interface – such as prohibitions of land rentals, which are often used by farmers in years of bad harvest in order to avoid eviction for failure to pay the water fee (see above, sections 3.3 and 6.3).

Water programmes must take into account the land tenure issues raised by their interventions. This requires:
- Preliminary research to understand complex and history-loaded systems of resource tenure;
- Mainstreaming land tenure aspects in decisions concerning the provision of water infrastructure – including decisions on whether to build the water infrastructure, on its location, its nature, its management regime and even its name;
- Full consultation of local resource users in the design and implementation of water programmes, promoting dialogue and negotiation among all affected stakeholders ("autochtone" landholders and "migrants"; herders and farmers; men and women; resident and non-resident groups; etc);
- Compensation in cash or in kind (e.g. through access to "improved" plots) for loss or erosion of land rights as a result of water programmes; and
- Clarity on who has right over what after the programme intervention.

Land/water users must be given greater control over the sources of their livelihoods. This requires:
- Developing and testing new tenure options that grant land/water users greater tenure security – not only for the benefit of agribusiness, but also for smallholders, which have provided the bulk of agricultural investment in the Sahel;
- Granting greater security of land/water rights to smallholders that invest in the water infrastructure – which would entail introducing differentiation in the tenure regimes applicable to smallholders (e.g. between those using publicly funded water infrastructure and those building their own water facilities on state-owned land);
- Reducing the conditions and restrictions attached to use rights (e.g., removing restrictions on land rentals), and introducing flexibility mechanisms that facilitate meeting the remaining conditions (e.g. enabling rescheduling of water fee payments in years of bad harvest);

- Decentralisation can be an effective means to grant local users greater control, provided that real powers are devolved and adequate safeguards are established.

Bibliography

Aw, D., & Diemer, G., 2005, *Making a Large Irrigation Scheme Work: A Case Study from Mali,* Washington D.C., The World Bank.

Bâ, A. H., & Daget, J, 1975, *L'Empire Peul du Macina*, Editions de "Ecole de Hautes Etudes en Sciences Sociales".

Banzhaf, M., Drabo, B. & Grell, H., 2000, *From Conflict to Consensus: Towards Joint Management of Natural Resources by Pastoralists in the Zone of Kishi Beiga, Burkina Faso*, London, IIED/SOS Sahel International.

Barral, H., 1982, *Le Ferlo des Forages, Gestion Ancienne et Actuelle de l'Espace Pastoral*, ORSTOM, Dakar.

Barraud, V., Bérété, S. & Intartaglia, D., 2000, "Des Instances Paritaires pour Gérer des Ressources Communes?", *Les Éditions du Groupe Initiatives Vétérinaires Sans Frontiéres No. 8.*

Belières, J.-F., Bosc, P.- M., Faure, G., Fournier, S., & Losch, B., 2002, *What Future for West Africa's Family Farms in a World Economy?* London, IIED.

Bernus, E., 1974, "Possibilités et limites de la politique d'hydraulique pastorale dans le Sahel", *Cahiers ORSTOM*, Vol XI, No 2 : 119-126.

Bourgeot, A. (ed.), 1999, *Horizons Nomades en Afrique Sahélienne*, Paris, Karthala.

Boutillier, J.-L. & Schmitz, J., 1987, "Gestion Traditionnelle des Terres (Système de Décrue/Système Pluvial) et Transition Vers l'Irrigation: Le Cas de la Vallée du Sénégal", *Cah. Sci. Hum. 23(3-5) 1987: 533-554*.

Boutillier, J.–L., 1989, "Irrigation et Problematique Foncière dans la Vallée de Sénégal" *Cah. Sci. Hum (4) 1989: 469- 488.*

Boutrais, J., 1990, "Derrière les clôtures…: Essai d'Historie Comparée de Ranchs Africains", *Cah. Sci. Hum. 26 (1-2) 1990:73-95.*

Burchi, S. 2000, "Current Developments in Water Legislation", 11 *Water Law* 3.

Chauveau, J.-P., 1998, "La Logique des Systèmes Coutumiers", in Lavigne Delville, P. (ed.) with Chauveau, J.-P., Gasteloli, J., Kasser, M. and Le Roy, E., 1998, *Quelles Politiques Foncières pour l'Afrique Rurale? Réconcilier Pratiques, Légitimité et Légalité,* Paris, Karthala, pp. 66-75.

Cissé, S., 1999, "Décentralisation et Développement dans le Delta Intérieur du Niger (Mopti, République du Mali)" in Bourgeot, A., (ed.), *Horizons Nomades en Afrique Sahélienne,* Paris, Karthala.

Cissé, S., 2001, *Le Jowro: Une Institution de Gestion de Ressources Naturelles Renouvelables Histoire, Statut et Role Actuel*, Bamako, Grad/IIED.

Cissé, S., 2002, *Séminaire/ Aelier sur les Jowro Face aux Defies de la Décentralisation et de la Charte Pastorale – Pour une Gestion Optimale des Ressources Naturelles,* Bamako, Grad/ IIED.

Cissé, I. & Keita, M. S., 2003, "Etude d'Impacts Socio-Economique et Environmental des Plaines Aménagées pour Riziculture au Mali", *GcoZa Rapport No. 25*, Noway, GCoZA.

Cissé, S. & Konaté, A. B., 2003, *Diagnostic du Tandem Jowro/ Communes Rurales pour une Gestion Durable des Ressources Naturelles du Delte Interieur du Niger, Bamako,* Grad/IIED.

Comaroff, J., & Roberts, S., 1981, *Rules and Processes – The Cultural Logic of Dispute in an African Context*, Chicago, University of Chicago Press.

Commisariat General au Developpement (Republique du Niger), 1972, *Les Problemes d'Abreuvement et Le Fonctionnement des Stations de Pompage.*

Coulibaly, Y. M., & Bélières, J.-F., 2004, *La Longue et Difficile "Appropriation" par les Exploitations Agricoles Familiales du Grand Périmètre Irrigué de l'Office du Niger au Mali: Libéralisation Économique, Différenciation entre Exploitations et Compétition pour l'Accès au Foncier et à l'Eau*, Draft.

Cotula, L., 2002, *Gender and Law: Women's Rights in Agriculture*, Rome, FAO, Legislative Study 76.

Cotula, L., 2005, "Making Law Work for the Poor", London, IIED, Sustainable Development Opinion Paper.

Cotula, L., 2005, "Can Research Help Bridge the Gap between Local Rules and National Legal Frameworks? The Case of Local Conventions for Natural Resource Management in the Sahel", in A. Reenberg and H.S. Marcussen (Eds), *Bridging Research and Policy*, Copenhagen, University of Copenhagen, pp. 125-132.

Cotula, L., and Toulmin, C., (Eds), 2004, *Till to Tiller: International Migration, Remittances and Land Rights in West Africa*, London, IIED, Issue Paper No. 132.

Cotula, L., Toulmin, C., & Hesse, C., 2004, *Land Tenure and Administration in Africa: Lessons of Experience and Emerging Issues,* London, IIED.

Cotula, L., Ochieng Odhiambo, M., Orwa, N. and Muhanji, A., (eds), 2005, *Securing the Commons in an Era of Privatisation: Policy and Legislative Challenges*, Summary conclusions of the second international workshop of the Co-Govern network, Nakuru, Kenya, 25-28 October 2004, London, IIED, Securing the Commons No. 10.

DANIDA, 2002, "Problématiques sociologiques concernent le gestion des resources en eau du Burkina Faso".

Dave, B., 2004, *Le Projet Paysan du Sexagon*, Universite Libre de Bruxelles, memoir de DES.
Dey, J., 1981, Gambian Women: Unequal Partners in Rice Development Projects?, Journal of Development Studies, 17 (3) pp.109-122.
Dialla, B. É., 2002, "La Sécuritié Foncière sur les Périmètres Irriguès du Burkina Faso: le Cas de Vallée du Sourou", *Afrique et Développement,* Vol. XXVII, Nos 1&2, 2002, pp.62-83.
Diouf, J., 2004, "La Sviluppo Agricolo, Una Carta che l'Africa Puó Giocare", *Le Monde Diplomatique*, Italian Edition, December 2004.
Diop, A. T., Sy, O., Ickowicz, A. & Toure, I., N.D., "Politique d'Hydraulique et Gestion de l'Espace et dans la Région Sylvopastorale du Sénégal".
Diop, M., 2001, "Patrimonial Changes or "Imperfect" Individualisation of Land Rights in the Timbi-Madina Plain in Fouta Djallion, Guinea", *Land Reform 2001/2002.*
Drame Diallo, S., 2004, *Evolution des Droits d'Acces à la Terre et les Transactions Foncieres dans la Zone de l'Office du Niger: Cas de Konyan N'golobala dans la Zone de Niono et de Kerouane dans la Zone de Molodo*, Bamako, Universite Mande Bukari.
FAO, 2002, *Law and Sustainable Development Since Rio: Legal Trends in Agriculture and Natural Resource Management*, Rome, FAO, Legislative Study No. 73.
Fay, C., 1999, "Pastoralisme, Démocratie et Décentralisation au Maasina (Mali)" in Bourgeot, A. (ed.), *Horizons Nomades en Afrique Sahélienne,* Paris, Karthala.
Faye, M., N.D., "La gestion Communitaire des Ressources Pastorales au Ferlo Sénégalais: L'Expérience du Projet d'Appui à l'Élevage" .
Fediore, I., 1985, "Les Formes de Participation Paysanne à la Mise en Valeur des Amenagements Hydro-Agricoles dans la Vallée du Fleuve Sénegal" in Conac, G., Savonnet-Guyot, C. & Conac, F. (eds.), *Les Politiques de l'Eau en Afrique: Développement Agricole et Participation Paysanne*, Paris, Economica.
Gadelle, F., N.D., "Participation du Sectuer Privé au Developpment de l'Irrigation en Afrique", *Aridoc.*
Habou, A., Marty, A., Youssouf, I., & Any, I., 1990, *Les Regimes Foncier Pastoraux - Etude et Propositions (Rapport de Mission au Niger, Janvier et Février 1990),* Paris, IRAM.
Hammell, 2001, *Terroirs d'Attache des Pastuers au Niger,* London, IIED.
Haramata, 2004, "What does the Future Hold for Senegalese Farmers?" London, IIED, Haramata 47, pp.16-19.

Hesse, C. & Trench P., 2000*, Qui Gère les Ressources Communes?: Pour Une Gestion Inclusive et Durable,* London, SOS Sahel International/ IIED.

Hesseling, G., Djiré, M., and Oomen, B.M., 2005, *Le droit en Afrique – Expériences locales et droit étatique au Mali*, Paris, Karthala.

Hodgson, S., 2004, *Land and Water – The Rights Interface,* Rome, FAO, Legistlative Study.

IIMI, 1997 "Les Conditions d'une Gestion Paysanne des Aménagements Hydro-Agricoles en Afrique de l'Ouest", Synthèse du Séminaire International de Niamey 22-28 Septembre 1996*.*

Inter-Academy Council, 2004, *Realising the Promise and Potential of their Agriculture: Science and Technology Strategies for Improving Agricultural Productivity and Food Security in Africa*, Amsterdam, IAC.

Joseph, A., Abouba, S. & Royer, J. C., 2003, "Gestion des Ressources en Eau et Développment Pastoral au Niger".

Kaag, M., 2001, *Usage Foncier et Dynamique Sociale au Sénégal Rural: L'Histoire d'un Bas-Fond et ses Défricheurs*, Amsterdam, Rozenberg Publishers.

Kassibo, B., 2001, *Programme de Recherche sur les Décentralisations Environnementales*, Bamako, Centre Univeritaire Mandé Bukari.

Keita, A., 2003, *Le phénomène des citadins-paysans au Mali – Etude de cas dans la commune de Baguineda-Camp*, London, IIED, Unpublished.

Keita, I., 2004, "Politique de la Gestion de la Terre pour la Protection de l'Eau", *Ministerial Conference on Harnessing Science and Technology to Increase Agricultural Productivity in Africa: West African Perspectives*, Ouagadougou.

Keita, N., N.D., *Decentralisation et Responsabilité dans les modes de Gestion des Ressources Naturelles et des Redevances y Afferentes. Les Bourgoutieres Yallarbe de Youwarou*, Bamako, Centre Universitaire Mande Bukari.

Kevane, M., & Gray, L., 1999a, *A Woman's Field is Made at Night: Gendered Land Rights in and Norms in Burkina Faso,* Santa Clara University, Department of Economics, Santa Clara (CAM) mimeo. Available online at www.scu.edu/~mkvane/.

Kevane, M., & Gray, L., 1999b, Diminished Access, Diverted Exclusion: Women and Land Tenure in Sub-Saharan Africa, *African Studies Review*, 42 (2), pp. 15-39.

Lane, C., and Moorehead, R., 1994, *New Directions in Rangeland and Resource Tenure and Policy*, in Scoones, I. (ed), *Living with Uncertainty: New Directions in Pastoral Development in Africa*, Intermediate Technology Publications, London.

Laurent, P.J. & Mathieu, P. (eds), 1995, *Actions Locales, Enjeux Fonciers, et Gestion de l'Environement au Sahel*, Cahier du Cidep, No. 27.

Lavigne Delville, P., 1991, *La Rizière et la Valise: Irrigation, Migration et Stratégies Paysannes dans la Vallée du Fleuve Sénégal*, Paris, Syros Alternatives.

Lavigne Delville, P., 1991, "Irrigation, Émigration et Sécurité Alimentaire sur le Fleuve Sénégal", *Cah. Sci. Hum. 27 (1-2) 1991: 105-116.*

Lavigne Delville, P., 2003, "Options de Sécurisation Foncière en Milieu Rural", Concept Paper presented at the Praia+9 Forum, organised by CILSS and held in Bamako on 17-21 November 2003.

Lavigne Delville, P. (ed.) with Chauveau, J.-P., Gasteloli, J., Kasser, M. and Le Roy, E., 1998, *Quelles Politiques Foncières pour l'Afrique Rurale? Réconcilier Pratiques, Légitimaté et Légalité,* Paris, Karthala.

Lavigne Delville, P., Boujou, J., & Le Roy, E., 2000, *Pendre en Compte les Enjeux Foncieres dans une Demarche d'Aménagement*, Paris, Éditions du Gret.

Lavigne Delville, P., and Hochet, P., 2005, "Construire une Gestion Négociée et Durable des Resources Naturelles Renouvelables en Afrique de l'Ouest" Paris, Gret, Claims Programme.

Legoupil, J.C., Seck, S.M., Lidon, B. and Wade, M., 2004, "Profesionnaliser la Gestion Paysanne des Aménagements Hydo-Agricoles pour l'Amélioration des Performances del'Agriculture Irrigée".

Le Roy, É., 1999, "A la Recherche d'Un Paradigme Perdu: Le Foncier Pastoral dans les Sociétés Sahéliennes" in Bourgeot, A. (ed.) *Horizons Nomades en Afrique Sahélienne,* Paris, Karthala.

Lund, C., 2000, *African Land Tenure: Questioning Basic Assumptions,* London, IIED.

Ly, I., 2004, *Essai de Presentaion des Tendances d'Evolution du Droit Pastoral en Afrique de l'Ouest*, Rome, FAO, Etude Juridique en Ligne No. 35.

Maiga, A., N.D., "Analyse de la Problematique du Foncier Pastoral et de sa legislation dans les Zones Sahélienne et Soudanienne du Mali", *CIHEAM.*

Maiga, I. D., & Toure, A. H., 2001, *Etude de Cas du Conflict de Succession de Laousside Koubi, Commune de Konna*, Bamako, Grad/IIED.

Marty, A., 1972, *Les problèmes d'abreuvement et le fonctionnement des stations de pompage vus par les éleveurs de l'Arrondissement de Tchin Tabaraden, Enquête realisee par l'Animation Nomade 1971-72*, Présidence de la République du Niger, Secrétariat d'Etat à la Présidence, Commissariat Général au Développement, Service de la Promotion Humaine.

Marty, A., 2000, "Les Approaches de la Gestion des Pâturages et les Projets de Développement: Quelles Perspectives?", Atelier Régional Portant sur la Zone Sahélienne Ouest Aficaine, Niamey, Niger, 2 au 6 Octobre.

Mathieu, P., 1985, "Agriculture Irriguée, Reforme Foncière, Participation Paysanne: Le Cas de la Zone du Lac de Guiers dans la Vallée du Fleuve Sénégal" in Conac, G., Savonnet-Guyot, C. & Conac, F. (eds.), *Les Politiques de l'Eau en Afrique: Développement Agricole et Participation Paysanne*, Paris, Economica.

Mathieu, P., Lavigne Delville, Ph., Ouedraogo, H., Paré, L. & Zongo, M., 2000, *Sécuriser les Transactions Foncières au Burkina Faso*, Rapport de Synthèse de l'Étude sur l'Évolution des Transactions Foncières, GRET/ Ministère de l'Agriculture/Ambassade de France au Burkina Faso.

Maton, G., 1985, "La Politique Francaise de l'Eau en Afrique" in Conac, Gérard, Savonnet-Guyot, C. & Conac, F. (eds.), *Les Politiques de l'Eau en Afrique: Développement Agricole et Participation Paysanne*, Paris, Economica.

Merlin, P., 1951, L'hydraulique pastorale en AOF, Rapport présenté à la Conférence des Chefs de Service de l'Elevage de l'AOF, Bamako (Soudan français), 22-27 janvier.

Ministère des Mines, de l'Energie et de l'Eau (Republic du Mali), 2004, "Definition de Processus d' Élaboration du Plan d'Action de Gestion Intégrée des Ressources en Eau du Mali", Mali.

Ministère du Developpement Rural et de l'Eau (République du Mali) & Office du Niger, 1999, *Étude du Schéma Directeur d'Aménagement pour la Zone de l'Office du Niger.*

Ministère du Developpment Rural (Republique du Mali) & Office du Niger, 2000, *Schema Directeur de Developpement pour la Zone de l'Office du Niger.*

Moorehead, R., 1998, "Mali", in Lane, C. (ed), *Custodians of the Commons*, London, Earthscan, pp. 46-70.

Morovich, B., 1999, *Almy Bahaim: Etude sur la Gestion Partaire des Points d'Eau",* Paris, Ecole des Hautes Etudes en Sciences Sociales.

Moutari, M. M. E., 1999, "La Problématiqe du Foncier dans la Zone Pastorale de Zinder (Niger)" in Bourgeot, A. (ed.), *Horizons Nomades en Afrique Sahélienne,* Paris, Karthala.

Nepveu de Villemarceau, A., Fye, J.S., and Cleveringa, R., 2005, "Rice Land for Labour Agreements Benefiting Women – The Lowlands Agricultural Development Programme (LADEP), Gambia", Rome, IFAD.

Niang, M.,1985, "Politique de l'Eau et Participation des Populations Rurales au Sénégal", in Conac, G., Savonnet-Guyot, C., & Conac, F.

(eds.), *Les Politiques de l'Eau en Afrique: Développement Agricole et Participation Paysanne*, Paris, Economica.

Niasse, M., 1991, "Les Périmetres Irrigués Villageois Vieillissent Mal: Les paysans se Désengagent-ils en Même Temps que SAED?", in Crousse, M., Seck, S.M. & Mathieu, P. (eds.), *La Vallée du Fleuve Sénégal, Evaluations et Perspectives d'une décennie d'améagements (1980-1990),* Paris, Karthala.

Niasse, M., 1997, *Réforme Foncière et Equité. La Loi sur le Domaine National à l'Epreuve dans les Perimeters de la Vallé du Fleuve Sénégal,* Proceedings of the Regional Conference on "Décentralisation et Réformes Foncières au Sahel", Djamena, Chad, CILSS/ PADLOS, 28 July- 1 August.

ODI, 2004, *Right to Water: Legal Forms, Political Channels,* London, ODI Briefing Paper.

Ouédraogo, H. M. G. (ed.), 2000, *La Réorganisation Agraire et Foncière et l'Aménagement Agro-Sylvo-Pastoral de le Nouhao*, Ougagadougou, Imprimerie Arts Graphiques.

Ouédraogo, H. M. G., Edja, H., Koné, M., & Thiéba, D., 2004, "Etude Comparative de le Mise en Oeuvre des Plans Fonciers en Afrique de l'Ouest: Bénin, Burkina Faso, Côte d'Ivoire", Ouagadougou, LandNet West Africa.

Pander, H., 2000, *Gender and Land Tenure – Women's Access to Land and Inheritance Rights: The Cases of Burkina Faso and Lesotho,* Paper written for the FAO and GTZ, 30 March.

Peters, P. E., 2004, "Inequality and Social Conflict Over Land in Africa" *Journal of Agrarian Change,* Vol.4, No. 3, July 2004, pp. 269-314.

Ramazzotti, M. (ed.), 1996, *Readings in African Customary Water Law*, Rome, FAO, Legislative Study No. 58.

Receveur, P., 1960, *Hydraulique pastorale. Bases d'une politique de l'eau en zone sahélienne,* Niamey.

Rosegrant, M. W., Cai, X. & Cline, S.A., 2002, *World Water and Food to 2025: Dealing With Scarcity,* Washington D.C. IFPRI.

Sabit, I., 2005, *Contribution des Eleveurs de Tahoua Nord au Processus d'Elaboration des Textes Complementaires au Code Rural sur l'Elevage et le Pastoralisme au Niger: Rapport Technique Récapitulatif du Déroulement des Activités,* APEL-ZP/ UEP, Republique du Niger.

Salman, S. M.A., 2002, "The Abuja Ministerial Decleration on Water: A Milestone or Just Another Statement?", *Water International,* Vol. 27, Number 3, September 2002.

Santoir, C., 1993, "D'une Rive l'Autre: Les Peul Mauritaniens Réfugiés au Sénégal (departments de Dagana et de Podor)", *Cah. Sci. Hum. 29 (1) 1993: 195-229.*

Sarch, M.-T., 2000, "Fishing and Farming at Lake Chad: Institutions for Access to Natural Resources", available online at www.up..ac.za/academic/liberts/polsci/awiru.

Sarniguet, J., 1984, *Hydraulique pastorale et aménagement des zones arides*, Etudes pour de développement, Société d'Etudes pour le Développement Economique et Social, no 4, pp 71-83.

Scoones, I., 1999, *Nouvelles Orientations du Développment Pastoral en Afrique. Vivre dans un Environnement Incertain,* Wageningen-Paris, CTA-Karthala.

Schmiz, J., 1993, "Anthropologie des Conflicts Foncier et Hydropolitique du Fleuve Sénégal (1975- 1991), *Cah. Sci. Hum.29 (4) 1993: 591- 623.*

Tall, E.H.O., Traoré, M., Gnoumou, Y. & Bloch, P., 2002, *Étude sur la Problématique Foncière dans les Périmèteres Irrigués au Mali*, Madison, University of Wisconsin, Land Tenure Center.

Thébaud, B., 1988, *Elevage et développement au Niger, quel avenir pour les éleveurs sahéliens?*, Bureau International du Travail, Genève.

Thébaud, B., 1990, "Politiques d'Hydraulique Pastorale et Gestion de l'Espace au Sahel", *Cah. Sci. Hum. 26 (1-2) 1990:13-31.*

Thébaud, B., 1992, *Puits et espaces pastoraux : Diffa, Niger, 1992*, in *Le Développement Agricole au Sahel*, Tome III Terrains et Innovations, Document Systèmes Agraires no 17 , CIRAD, Montpellier, France, pp. 238-279.

Thébaud, B., 1995, *Land Tenure, Environmental Degredation and Desertification in Africa: Some Thoughts based on the Sahelian Example*, London, IIED.

Thébaud, B., 1999, *Gestion de l'espace et Crise Pastorale au Sahel; Étude Comparative du Niger Oriental et du Yagha Burkinabé*, Paris, EHESS.

Thébaud, B., 2001, *Droit de Communage ("Commons") et pastoralisme au Sahel*: *quel avenir pour les éleveurs sahéliens*, in Benjaminsen, T.A., and Lund, C. (eds), *Politics, Property and Production in the West African Sahel*, Nordiska Afrikainstitutet, Uppsala, Sweden, pp 163-181.

Thébaud B., and Batterbury S., 2001, "Sahel Pastoralists, Opportunism, Struggle, Conflict and Negotiation : A Case Study from Eastern Niger", *Global Environmental Change* 11: 69-78.

Thébaud, B., 2002, *Foncier Pastoral et Gestion de l'Espace au Sahel. Peuls du Niger Oriental et du Yagha Burkinabé,* Paris, Karthala.

Thébaud, B., 2002b, *The management of pastoral resources in the West Arican Sahel: negotiating water and pastures in eastern Niger and northern Burkina Faso*, in Juul, K., and Lund, C. (eds), *Negotiating Property in Africa*, Heinemann.

Thébaud, B., Grell, H. & Miehe, S., 1995, *Vers une Reconnaissance de l'Efficacité Pastorale Traditionnelle: Les Leçons d'une Expérience de Pâturage Contrôlé dans le Nord du Sénégal,* London, IIED.

Toulmin, C., Lavigne Delville, P., & Traoré, S. (eds.), 2002, *The Dynamics of Resource Tenure in West Africa,* London, IIED/ GRET.

Toulmin, C., & Guèye, B., 2003, *Transformations in West African Agriculture and the role of Family Farms,* London, IIED.

Touré, O., 1997, "Espace Pastoral et Dynamiques Fonciéres au Sénégal", PRASET, Atelier Regional sur le Foncier au Sénégal, 16-21 June.

Touré, O., 2004, *Impact des Lois Pastorales sur la Gestion Equitable et Durable des Ressources Naturelles en Guinée,* London, IIED.

Turner, M. D., 1999, "The Role of Social Networks, Indefinite Boundaries and Political Barganing in Maintaining the Ecological and Economic Resilience of the Transhumance Systems of Sudano-Sahelian West Africa", in Niamir-Fuller, M. (ed.)*, Managing Mobility in African Rangelands: The Legitimization of Transhumance,* 1999, Rome, FAO.

Vandersypen, K. Bengaly, K., Keita, A., Sidibe, S., Raes, D., JaminJ-Y., forthcoming, "Irrigation performance at tertiary level in the rice schemes of the Office du Niger (Mali): Adequate water delivery through over-supply", *Agricultural Water Management*.

Vandersypen, K., Keïta, A., Kaloga, K., Coulibaly, Y., Raes, D., Jamin, J-Y., forthcoming(2), "Sustainability of farmers' organization of water management in the Office du Niger irrigation scheme in Mali", *Irrigation and Drainage*.

Van Koppen, B., 1998, *Gendered Water and Land Rights in Construction: Rice Valley Improvement in Burkina Faso,* Paper presented at the 8th biennial conference of the International Association for the Study of Common Property (IASCP), Bloomington Indiana (USA), 31 May- 4 June.

Vedeld, T., 1994, *The State and Rangeland Management: Creation and Erosion of Pastoral Institutions in Mali,* London, IIED.

WCD, 2000, *Dams and Development: A New Framework for Decision-Making,* London, Earthscan Publications.

Weigal, J.-Y., 1985, "Irrigation et Participation Paysanne dans la region de Bakel (Vallée du Senegal) (1)" in Conac, G., Savonnet-Guyot, C. & Conac, F. (eds.), *Les Politiques de l'Eau en Afrique: Développement Agricole et Participation Paysanne*, Paris, Economica.

Witsenburg, K., & Roba, A. W., 2002, "The Use and Management of Water Sources in Kenya's Drylands: Is There a Link Between Scarcity and Violent Conflicts?", Paper presented at the workshop, *Conflicts Over Land and Water Management in Africa, Copenhagen, 28-29, November 2002.*

World Bank, 2003, *Land Policies for Growth and Poverty Reduction*, Washington DC, The World Bank.

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