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The Property Rights Challenges of Improving Access to Water for Agriculture: Lessons from the Sahel¹

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Abstract In the Sahel, efforts have been made to improve access to water for agriculture through the creation of irrigation schemes and pastoral water points. In the past, decisions on the construction and operation of these water facilities were typically based on hydrological and technical factors alone, while issues concerning who has right over what before and after the water development project have often been neglected. However, if these issues are not properly addressed, water development projects can foster disputes, undermine the security of resource rights, and contribute to resource degradation. Drawing on the analysis of relevant legislation, on a literature review and on original fieldwork, this paper tackles the property rights issues raised by the creation and operation of irrigation schemes and pastoral water points, focusing on four Sahelian countries: Senegal, Mali, Burkina Faso and Niger.

Key words: Sub-Saharan Africa, Sahel, Water, Agriculture, Land rights, Water rights, Legal frameworks, Property rights, Pastoralism, Farming, Wells, Irrigation

Introduction

Overview

Across dry-land Africa, improving 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 — is fundamental for rural development and poverty reduction. In the Sahel (West Africa), rain-fed farming and pastoralism are the main livelihood sources. Over the past few decades, however, efforts have been made to improve access to water for agriculture through the creation of pastoral water points and irrigation schemes — from large, state-owned schemes

such as, for example, the Office du Niger in Mali (which dates back to the 1930s) to village-level irrigation schemes. In the past, decisions on the construction and operation of water infrastructure were typically based on hydrological and technical factors alone, while issues concerning who has right over what before and after the water development project (referred to here as property rights issues) have often been neglected.

Water development projects raise important property rights issues. Projects may, for instance, entail the suppression of pre-existing land rights and the reallocation of irrigated plots to users who may or may not be the original right holders; or the provision of open-access water points, which may erode pre-existing priority use rights over water and surrounding lands. If these issues are not adequately addressed, the construction and operation of water facilities can engender disputes on the social or environmental impacts of these facilities, and/or on the allocation of use rights over the water supplied by them. It can also undermine the security of resource rights, thereby possibly discouraging agricultural investment and raising important distributive issues, and contribute to resource degradation.

This paper analyses the property rights issues raised by the creation and operation of irrigation schemes and pastoral water points, focusing on four Sahelian countries: Senegal, Mali, Burkina Faso and Niger. The article is based on the findings of a research project coordinated by the author in 2004–2005 (Cotula, 2006). The project entailed the analysis of relevant legislation (Cotula, 2005), a literature review, and original fieldwork in Senegal (Sylla, 2005) and in Niger (Vogt and Vogt, 2005). It also entailed the ‘capitalization’ of the direct experience of those involved in the project (for example, Thébaud *et al.*, 2006). The research took a socio-legal approach, combining analysis of legal texts with a study of how different actors use them in practice; how property rights over land and water are shaped by the interplay between customary rules and state legislation; and how water development projects may have implications for land and water rights as they are perceived and applied at the local level, irrespective of their legal value.

The next subsection clarifies the concept of property rights, as used in this article. The following section explores the property rights issues raised by the creation of irrigation schemes, focusing on small-scale schemes, and by the operation of existing schemes, focusing on large-scale schemes. The next section then discusses similar issues in relation to pastoral water points, drawing on evidence from Niger, and covering both public and private water points. The conclusion summarizes key findings and highlights lessons for policy and practice.

The concept of ‘property rights’

Property rights describe “legal relations among people with regard to control of valued resources” (Singer, 1996, p.71). While the term

'property rights' is associated by some with a specific school of thought and political vision, the term is used here free of ideological connotations — namely, as a broad concept that encompasses not only rights of ownership but also a much wider range of entitlements (e.g. various types of use right) over diverse valued resources such as land, water and water infrastructure, held by private actors (individuals or groups) and/or by the state, and based not only on state legislation but also on local ('customary' but continuously reinterpreted and adapted) tenure systems.

Sahelian states have legislated extensively on property rights over scarce and valuable resources such as irrigated land. In Burkina Faso, for instance, while subsistence agriculture in most rural areas is effectively exempted from state regulation (Article 52 of the Land and Agrarian Reform Act 1996, and Article 505 of its implementing decree), irrigated land is subject to a special regime and to detailed regulations (Articles 191–198 of the decree). However, in much of the Sahel, 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.

On the other hand, 'customary' tenure systems are often applied even where they are inconsistent with legislation, because they tend to be more accessible to rural people. Such systems claim to draw their legitimacy from 'tradition', as shaped both by practices over time and by systems of belief, specifically on what practices respond to legal obligations: '*opinio iuris*' (Caponera, 1992). However, customary systems have been profoundly changed by decades of colonial and post-independence government interventions, and are continually adapted and reinterpreted as a result of diverse factors such as cultural interactions, population pressures, socio-economic change and political processes (Cotula, 2007).

While in some countries customary resource rights enjoy (limited) protection under state legislation (e.g. Mali), in others they do not (e.g. Senegal). In practice, however, in much of the rural Sahel, property rights in respect of both land and water are based on complex combinations of both state legislation and customary rules.

Creating and operating irrigation schemes: property rights challenges

Creating small-scale irrigation schemes

Property rights issues are of crucial importance in the creation of irrigation schemes. This usually involves the suppression of local land rights in order to build the water infrastructure, and the reallocation of rights over both land and water to users who may or may not be the original right holders. The allocation of rights over irrigated plots 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 to the construction of the irrigation facility, household size, capacity to cultivate the land and local residence. As irrigation increases, the value of the land increases and many actors claim their share. The allocation of rights based on these criteria may create tensions between competing claimants — between neighbouring villages; between ‘owners’ and tenants, autochthons and migrants, herders and farmers; and along gender lines. Power relations within society shape the outcomes of such competition. For sake of clarity (if somewhat simplistically), the following addresses inter-village and intra-village issues separately.

Property rights issues in relations between villages

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 ‘autochthons’) and the descendants of those who moved to the area at a later stage (sometimes referred to as ‘allochthons’ or ‘migrants’ — even after several generations of settlement). Migrants obtain(ed) access to land through an arrangement with the autochthons. Their villages are ‘tributary’ to the autochthonous, landholding village (on this relationship, usually referred to as ‘*tutorat*’; see Chauveau, 1998). This arrangement usually has no legal value, and is often characterized by tensions, particularly as generations go by and demographic growth increases pressure on the land.

In this context, irrigation projects offer the opportunity to strengthen first-clearance claims — or to undermine them. Tributary villages may seek to manipulate the irrigation project to gain land tenure ‘independence’ from their patrons, and to 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. The latter 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 (for a case from Mali, see 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. While these arrangements have no legal value, they are very real in the eyes of the local population.

These customary-tenure dynamics are further complicated by their interface with state law. First, national legislation may not recognize customary land rights (e.g. in Burkina Faso), thereby undermining the rights of the ‘first occupants’ and encouraging tributary villages to seek emancipation. Secondly, statutory 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 its

administrative centre (*'chef lieu'*). This may encourage the tributary village to use its administrative status under statutory law to renegotiate customary rules and seek land tenure independence from its traditional patrons — for instance, by requesting funds for an irrigation scheme without consulting the customary landholders (documented by fieldwork undertaken for this study; Sylla, 2005; see also Laurent and Mathieu, 1995; Lavigne Delville *et al.*, 2000). Failure to take account of these issues in decisions concerning irrigation schemes may foster conflict between the autochthonous and allochthonous villages. This is particularly the case given that external operators — government officials or project staff — may not fully master the long history and extreme complexity of local land relations, which exposes them to manipulation by well-informed locals.

Fieldwork undertaken for this study (Sylla, 2005) documented several such examples. In Matam Region (Senegal), for instance, 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 only within the rural community. This sparked tensions, as farmers from Ogo would have been excluded from 'their' lands. After lengthy negotiations, the Rural Community of Nabadji accepted to associate farmers from Ogo in the scheme (Sylla, 2005).

In this context, a seemingly innocuous issue such as the choice of the name for the irrigation scheme may have far-reaching land tenure implications — and may 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. In Burkina Faso, for instance, a dispute erupted around the rehabilitation of an irrigation scheme located on lands around the village of Koumana, in the Department of Bondokuy, largely cultivated by inhabitants of the same village but customarily held by the village of Kosso, in the Department of Warkoye (Lavigne Delville *et al.*, 2000). The 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. Following the launch of the rehabilitation project, tensions erupted between the inhabitants of Koumana and Kosso over the allocation of rehabilitated plots. The village of Syhn sought to assert 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 (example from Lavigne Delville *et al.*, 2000; see also Laurent and Mathieu, 1995).

Property rights issues in relations within villages

It is well known that villages are not homogeneous entities, but tend to be differentiated on the basis of wealth, status, gender, age, professional

groupings and other factors. When a water project is introduced, different actors position themselves to make the most of the project. Legislation on land tenure, irrigation schemes and rural cooperatives typically emphasize equal access to irrigated plots for all eligible villagers. But these egalitarian principles are often at odds with customary principles, which entrench social hierarchies and gender inequalities, including in the distribution of land rights (e.g. on the Sourou River Valley scheme in Burkina Faso; see Dialla, 2002). In these contexts, publicly funded irrigation projects promoting egalitarian access to irrigated plots may entail not only improved access to water, but also a redistribution of land rights. In the Gambia, for instance, an irrigation project brought about the devolution of irrigated plots from customary landholders to all those 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 cases, customary rules on social stratification tend to resurface after the completion of the project — as documented by the fieldwork undertaken for this study in the Senegal River Valley (Sylla, 2005). Here, after years of centralized management of irrigated lands by a para-statal organization, 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 the field sites covered by the study, traditionally characterized 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 (Senegal), for instance, 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 Cissé' 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. The fieldwork undertaken for this study 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. It also found cases where local elites had allocated irrigated land to powerful outsiders (politicians, army and government officials, religious leaders, judges), despite legislation restricting irrigated plots to local residents (Sylla, 2005).

Another key intra-village issue concerns gender. As irrigation increases the value of the land, men may try to take control over plots previously left to women. 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 rules. After the construction of the infrastructure, irrigated plots were allocated to (usually male) household heads, ignoring women's pre-existing rights. In subsequent phases of the project, this gender bias was removed and women participated in the decision-making process and obtained land-cum-water rights (example from van Koppen, 1998). Similar processes of erosion of women's rights in the context of irrigation projects have been documented for the Gambia by Dey (1981) (see also Cotula, 2002). In recent years, irrigation projects have paid greater attention to gender issues, and have promoted women's access to irrigated plots. In a more recent project in the Gambia, for instance, 90% of project beneficiaries were women (Nepveu de Villemarceau *et al.*, 2005).

Running large-scale irrigation schemes

Large-scale irrigation systems such as the Office du Niger in Mali, and the *Autorité de Mise en Valeur de la Vallée du Sourou* (AMVS) scheme in Burkina Faso, present different issues compared with small-scale schemes. For instance, the interplay between statutory and customary tenure, which so powerfully shapes access to small-scale irrigation schemes, is much less prominent in large-scale schemes. Here, customary systems have more effectively been replaced by state legislation, and undermined by decades of settlement by incoming '*colons*'. Another difference is that, in the Sahel, emphasis is on managing and possibly expanding existing large-scale irrigation schemes, rather than on creating new ones altogether. However, addressing property rights issues remains central — particularly with regard to tenure security over irrigated plots, which is key to investing in land and to maintaining, upgrading and expanding the water infrastructure.

In many Sahelian large-scale irrigation schemes, demographic growth has led to increased competition for access to irrigated plots, and to often very small plot sizes — for instance, between one hectare and one and a half hectares in Burkina Faso's AMVS scheme (Dialla, 2002), and between one-quarter hectare and one hectare in Mali's Sélingué scheme (Tall *et al.*, 2002). This calls for investment in the irrigation infrastructure — including both maintaining and upgrading the existing infrastructure, and

expanding it. However, after the structural adjustment programmes of the 1980s, and the ensuing reduction of state funding for irrigation, governments have increasingly looked to private investment to fund irrigation infrastructure.

On the other hand, tenure insecurity over irrigated plots remains widespread, particularly for smallholders — thereby possibly affecting the propensity of private operators (whether large or small scale) to invest. In most large-scale irrigation schemes, farmers do not own the irrigated plots they cultivate. Rather, land ownership is usually vested with the state, the infrastructure is managed by a para-statal organization and farmers enjoy conditional land use rights (e.g. under Decree 96–188 of 1996 for Mali's Office du Niger). Conditions typically include putting land into productive use (*'mise en valeur'*) and payment of the water fee (for instance, under articles 191–198 of Burkina Faso's Decree 97–054 of 1997).

Productive use requirements are meant to promote greater agricultural productivity and equitable access to publicly funded irrigation schemes. However, lack of clarity in their legal definition and application leaves wide discretion to government bodies responsible for monitoring fulfilment of this requirement, opens the door to abuse and manipulation, and thereby undermines tenure security. The water-fee requirement entails that the irrigation agency may deprive farmers of the land they cultivate in case of non-payment. 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. Eviction usually follows the first year 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. As a result, the water-fee requirement may undermine land tenure security, and may negatively affect the livelihoods of poorer and more vulnerable farmers.

In recent years, far-reaching reforms towards greater tenure security have been adopted for several irrigation schemes. This is illustrated, for example, by the Office du Niger in Mali. Historically, the management of the Office could change plot assignments and plot size at will, and could evict farmers on a range of grounds that led to widespread tenure insecurity on the scheme. Following recent reforms, farmers gain access to irrigated land either through farming contracts that have a one-year duration, are tacitly renewable or are subject to conditions (e.g. *mise en valeur*, payment of the water fee, conservation measures) but can be withdrawn if these conditions are not respected, or they gain access through farming licences that provide greater tenure security and that are of indeterminate duration, are transmissible to heirs and whose withdrawal entails payment of compensation. Smallholders can apply for a licence after two years of cultivation under the farming contracts.

On paper, the property rights reform in the Office du Niger has gone a long way towards offering greater tenure security to farmers. According to a recent study (Aw and Diemer, 2005), this 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 1981 and 2002, and a 600% increase of the net real income per household between 1989 and 1998 (Aw and Diemer, 2005, p. 66). 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 (Dave, 2004, p. 19). In practice, the vast majority of smallholders stick with the farming contracts, which limits the impact of the reform.

Moreover, the reform has not addressed some of the sources of tenure insecurity identified above — namely, the productive-use and water-fee requirements. This is illustrated by the recent land evictions for failure to pay the water fee in 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, p. 76). However, a bad harvest in 2003 jeopardized farmers' ability to pay the water fee. 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 Bélières, 2004). But, under pressure from farmers' organizations, the government reversed this decision and extended the deadline for payment. After the expiry of the latest extension (June 2005), many farmers still had 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 had been evicted from their lands and the farmers' union was resisting these evictions through both political mobilization and legal action.

Another source of tenure insecurity in several Sahelian large-scale irrigation schemes relates to the fact that many farmers gain access to land through rental agreements — which are, however, prohibited by legislation and therefore lack legal value. In the Office du Niger, for instance, while land rentals are prohibited by legislation (Arrêté 96-1695 of 1996), they are very common in practice. Coulibaly and Bélières (2004, p. 13) estimated 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 as described above. Rather than losing their land, farmers may informally rent it out (Coulibaly and Bélières, 2004). Our fieldwork in Senegal documented similar practices with regard to reimbursement of rural credit. Rather than losing their land, debtors informally give it to a third party, who pays the debt on their behalf. The duration of this temporary transfer varies depending on the debt amount (Sylla, 2005).

On the whole, in the Office du Niger and in other Sahelian large-scale irrigation schemes, many smallholders — who have provided the bulk of agricultural investment in the Sahel — still have only precarious use rights on the land, which may affect their propensity to contribute cash and/or labour to upgrade irrigation infrastructure. More serious efforts to improve tenure security and promote investment seem to have focused

on large-scale capital. In the Office du Niger, agribusiness 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). Private land ownership for agribusiness is also being discussed. Similarly, in Burkina Faso's AMVS scheme, a special regime has been set up for agribusiness. This includes a minimum plot size of 10 hectares (compared with one hectare to one and a half hectares for local farmers) and a 25-year lease, renewable for up to 99 years (Decree 97-598 of 1997, and Arrêté 98-032 of 1998).

Property rights issues and pastoral water points²

While the previous discussion tackled the property rights issues raised by the creation and operation of irrigation schemes, the following looks at pastoral water points, drawing on the work of Brigitte Thébaud, Gill Vogt and Kees Vogt (Vogt and Vogt, 2005; Thébaud *et al.*, 2006) in Niger. The creation of pastoral water points raises important property rights issues — although quite different ones to those examined in the previous sections.

In the pastoral Sahel (those areas where average annual rainfalls are insufficient or too unpredictable to sustain agriculture), herd mobility is made necessary by scattered pastoral resources and continuous variations in the biomass between and within years. Flexible institutional arrangements ensuring secure access to distant water and dry-season grazing resources are therefore crucial. Sahelian pastoralists have developed systems of property rights based not on exclusive access to well-defined land areas, but on priority use rights and on negotiated and reciprocal access to 'strategic' resources such as water and dry-season pastures (Thébaud *et al.*, 2006).

Owing to ecological factors, control over water points is the pillar of pastoral systems of property rights over both water and grazing land. Because livestock need regular access to water, herds are restricted in their movements, and the biomass (trees, grasses, shrubs) accessible to them is limited within a certain radius. 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. But 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 (Thébaud *et al.*, 2006).

For example, in the Diffa Region of Eastern Niger, Fulani pastoralists digging traditional wells enjoy priority water use rights. They offer access to their well to outsiders under conditions that are negotiated between rights-holders and outsiders. Such conditions include length of stay and time of day for watering animals. 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, which is essential to ensure sustainable land use. Through these negotiations, residents also reassert their priority rights over the well (Thébaud, 2002).

Over the past 50 years, however, these customary systems have been undermined by the introduction of new forms of water access. This includes the creation of public water points, in which access is regulated by legislation but has largely become open to all, and the emergence of private water points, held on the basis of exclusive (rather than priority) rights — issues that are explored in the following two sections.

Public water points and the erosion of customary tenure systems³

In Niger, efforts to improve the pastoral water infrastructure first started in the 1950s. Cement-lined wells and boreholes were built to enable access to grazing areas that were difficult to access during the dry season due to lack of water points. The location of wells followed, as far 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. To avoid such risk, resource management legislation was passed in several countries, particularly in Senegal and Niger. This legislation gave government agencies responsibility for preventing grazing around the boreholes during the rainy season, and for controlling stocking rates during the dry season. Such laws proved difficult to enforce, however, since 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. Apart from isolated episodes, the legislation was not applied. As a result, wells and boreholes became *de facto* open to all (Thébaud, 2002; Thébaud *et al.*, 2006).

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-scale water programmes were launched in many pastoral areas (Thébaud, 2002).

The introduction of an open-access water infrastructure in pastoral areas undermined the local systems of resource rights described above. For herders, it soon became apparent that access to wells and boreholes

was open to all. Rangelands where local pastoralists would have priority use rights (through control over traditional wells) became accessible to all, as incoming herders would water their livestock at public water points. These attracted ever larger numbers of herds to the area. As borehole technology enabled greater numbers of livestock to be watered, surrounding rangelands became degraded. Securing access to water became associated with the use of force, rather than with negotiation and reciprocity (Thébaud *et al.*, 2006).

Paradoxically, open-access water infrastructure, meant to be accessible to all, ended up fostering exclusion, as those with more resources were able to take control of water points — and, given the linkages between water and land rights in pastoral systems, control the surrounding pastoral lands. In Eastern Niger, for example, 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 increasing the risk of resource degradation (Thébaud, 2002).

Statutory regimes established by legislation reinforced these processes, as local systems of property rights were rarely given legal backing. The Rural Code 1993 constitutes a departure from this approach and 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'*; Decree 97–006 of 1997, adopted under the Rural Code). Outsiders may gain access to water and grazing resources on the basis of negotiations with the right holders. However, the Water Code seems to contradict these provisions, as it states that access to water for livestock is open to all, including both locals and outsiders such as transhumant herders. The Water Code gives almost no recognition to the controlled access systems developed by pastoral groups, and traditional wells are not even mentioned. These tensions between the Rural Code and the Water Code have fostered confusion, and further undermined local systems of property rights (Thébaud *et al.*, 2006).

The establishment of community-based management systems around pastoral wells and boreholes, which started in the 1980s and continued through the 1990s, did not provide a suitable solution to the problem. In Niger, for example, management committees have shown limited effectiveness, as their powers have been limited to financial and maintenance aspects and do not extend to property rights issues (Thébaud, 2002).

A relevant example⁴: water points and conflict in the Diffa region, Eastern Niger

An example from Eastern Niger illustrates these issues. 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. Toubou herders were at the time perceived as an anarchic and aggressive social group, while the Fulani were viewed as more peaceful. Through the 1930s and 1940s, the Fulani constructed a network of traditional wells in the pastoral area South of the Dillia Valley (Thébaud and Batterbury, 2001; Thébaud *et al.*, 2006).

Because of good rainfall conditions prevailing during the 1950s and the 1960s, Toubou herders were able to sustain their livelihood North of the valley. 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 cement-lined wells. The location of these wells was determined without much consultation with local groups. Under legislation, as (mis-)interpreted and applied at the local level, such wells were owned by the state and were accessible to all. No account was taken of the property rights 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 Fulani 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 hand. The presence of *de facto* open-access wells undermined local systems of property rights over traditional wells. In this context, public wells became the object of tensions between herders (Thébaud and Batterbury, 2001; Thébaud *et al.*, 2006).

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 of a number of public wells within Fulani territory. Civil and military authorities showed little concern, even though faced with a drought that had already resulted in vast movements of populations in the area. From a property rights perspective, public wells were open to all — providing the Toubou with an entry point to access and reclaim the land. Efforts by Fulani herders to remain in the area were defeated through violent clashes. By the end of the 1980s, large areas had become inaccessible to the Fulani, forcing them to migrate further South (Thébaud and Batterbury, 2001; Thébaud *et al.*, 2006).

In the 1990s, the fall of Hissene Habre in Chad resulted in the Fulani obtaining guns, who formed militias and fought the Toubou and Arabs. After years of violent clashes, the Fulani reclaimed most of the territory, and of the wells located therein. At the beginning of 2000, peace agreements were signed, by which time the conflict had lasted for more than 15 years and had contributed to endemic pastoral poverty in the area, as well as to hundreds of deaths (Thébaud and Batterbury, 2001; Thébaud *et al.*, 2006).

*The privatization of water points*⁵

While the erosion of customary systems of property rights through the creation of public water points is a longstanding problem that has now begun to be recognized, a more recent development concerns the private appropriation of grazing lands through the creation of private water points. In Niger, for instance, 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 the Rural Code provide for priority but not exclusive rights. However, the creation of private water points is enabled by the Water Code, which provides for an authorization and a declaration regime — depending on the size of the well. Besides wealthy herders, actors engaged in these activities include customary chiefs, Members of Parliament, traders and civil servants, and — although rarely — foreign operators (Vogt and Vogt, 2005).

Fieldwork undertaken for this study documented several examples of this (Vogt and Vogt, 2005). In the North of the Zinder Region in Niger, for instance, a rich herder owning thousands of livestock funded the construction of a borehole through which he secured *de facto* exclusive access to the surrounding rangelands, since he restricted access to water for people and livestock — making it impossible for outsiders to stay in the area. He also obtained from the local Land Commission a certificate of land ownership for an area of 15 km² around his borehole, even though the land is common property under customary rules.

In other cases, private individuals have manoeuvred to take control of public water points where, although the water point is legally owned by the state, managed by a local committee and open to all, it is in practice controlled by powerful individuals or groups who have ‘captured’ the management committee or simply appropriated the well itself. In so doing, they have effectively secured exclusive access both to the water point and to the pasture resources around it, since, by restricting access to water, those controlling the wells make it impossible for outsiders and their herds to stay in the area (Vogt and Vogt, 2005).

In Diffa, for instance, a rich Fulani herder applied to the Diffa Water Department for the creation of a public water point in his area and, apparently, money changed hands. However, the Water Department took its time to build the well, and the herder threatened to denounce those who had received ‘gifts’ from him. Following this threat, the Water Department ensured that the water point obtained funding through a development project implemented in the region. Once the well was dug, it was transferred to the ‘beneficiaries’ — who at present only include the applicant herder who prevents others from accessing the water point. The fact that this herder is reportedly armed and violent discourages others from challenging him (Thébaud *et al.*, 2006).

Conclusion

In the Sahel, improving access to water for agriculture is fundamental for rural development and poverty reduction. 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 — has ended up undermining resource tenure security, fostering resource conflict and contributing to resource degradation. It has also raised important distributive issues, as competing resource users (e.g. ‘autochthonous’ and ‘migrant’ groups, farmers and herders, men and women) have sought to use water development projects to strengthen their rights over land and other valuable resources. This points to the importance of according serious attention to property rights issues in policies and projects aimed to improve access to water for agriculture, and for tackling the challenges that they raise. While these challenges vary substantially — for instance, from farming to pastoral contexts — some common threads can be identified.

First, a major gap exists between the statute books and local practice — whether customary systems of property rights or informal (and even illegal) land rentals. This is despite the special efforts that Sahelian governments have undertaken to regulate property relations in irrigation schemes and around pastoral water points. This situation is largely due to the lack of capacity of state institutions to fully implement legislation. It also reflects a deeper issue, namely the existence of a gap between the law and the needs raised by local contexts and stakeholders.

Local systems of property rights reflect the strong association between land and water rights, which is shaped by the local ecology; for example, under customary pastoral systems where control over water points is key to regulating access to grazing lands. On the other hand, legislative frameworks on land and water have evolved towards a full dissociation between land and water rights. In some respects, legislative frameworks have evolved in different directions towards greater state control over water resources, with state ownership of water resources being the pillar of Mali’s Water Code 2002, Burkina Faso’s Water Management Policy Act 2001 and Niger’s Water Code 1993 (as amended in 1998); and, to a certain extent, away from state control over land, with the longstanding principle of land nationalization being increasingly qualified by the introduction of private land ownership (for example, under Burkina Faso’s Land and Agrarian Reform Act 1996 and Mali’s Land Code 2000) and by greater protection of customary rights (for example, under Mali’s Land Code and Niger’s Rural Code 1993). In some cases, this situation, coupled with limited coordination between legislative processes in the land and water sectors, has resulted in tensions and even contradictions between different laws, with negative repercussions for the security of property rights — as illustrated by the case of the Rural Code and the Water Code in Niger. This highlights the need for better coordination and coherence between

sectoral laws, but also for national legislation to better respond to local needs and build on local practice.

Second, whether in relation to irrigation schemes or pastoral water points, the findings of this research highlight the need to more effectively mainstream property rights issues in the design and implementation of water development projects — ranging from decisions on whether to build the water infrastructure to those on its location, its nature, its management regime and even its name. This requires a solid understanding of complex and history-loaded local systems of property rights, and full consultation of local resource users to ensure that such systems are adequately taken into account. It also requires establishing clarity on who has rights over what following completion of the project intervention — including rights over land, water and the water infrastructure. Where land rights are lost or have been eroded as a result of the water project, it requires providing for compensation, whether in cash or in kind (e.g. in the form of access to plots ‘improved’ by the water project). The approaches for implementing these interventions need to be both consistent with legislation as well as acceptable to local users.

Third, tackling property rights is not a purely technical matter, but raises important issues of power and distribution of benefits. Access to water is a function not only of the availability of water points and irrigation schemes, but also of who has what right over such water facilities. This is exemplified by the findings of this study relating to gendered property rights and the impact of creating small-scale irrigation schemes; to the competition for irrigated land between agribusiness and smallholders, particularly in large-scale irrigation schemes; and to the competition for access to water points between different pastoral groups. This raises the need to pay greater attention to equity in water policies and programmes, and to strengthen institutions and processes for mediating competing property right claims and for addressing power imbalances.

It also raises the need to more clearly articulate the relationship between local property rights and human rights, particularly the right to water — the human right enshrined in international law (Articles 11 and 12 of the 1966 International Covenant on Economic, Social and Cultural Rights) and clarified by the UN Committee on Economic, Social and Cultural Rights (General Comment 15 of 2002). This human right entitles everyone to “sufficient, safe, acceptable, physically accessible and affordable water” (para. 2 of General Comment 15), and is to be realized “progressively” and “to the maximum of available resources” (Article 2 of the International Covenant on Economic, Social and Cultural Rights). Field experience with water policies and projects can contribute to further clarifying the content and implications of the right to water. International debates on this right have focused on water access for personal and domestic use, but have neglected access to water for agriculture. There is a need to fill this gap, and to spell out the implications of the right to water

in agriculture. Among other things, this requires coming to terms with the property rights issues linked to the creation and operation of water facilities.

For example, experience with programmes to ensure free access to water for all in Niger reveals how these can have negative impacts on local systems of property rights, ultimately undermining access to water and grazing land for poorer pastoral groups and fostering resource conflict and degradation. On the other hand, some important implications of the right to water in agriculture can already be spelt out — both in terms of the content of water policies and projects (e.g. non-discrimination and ‘non-retrogression’, the principle whereby action reducing water access for some would need to be properly justified and accompanied by safety net measures) and of their formulation process (e.g. access to accountability and redress mechanisms). Translating these content and process-related implications into practice can help tackle the power imbalances that underpin the often inequitable outcomes of competing property right claims.

Notes

- 1 This is an adapted version of a background paper prepared for the United Nations Development Programme *Human Development Report 2006*. It is based on the findings of the first phase of a project of action research, capacity-building and policy engagement, which was funded by the United Nations Food and Agriculture Organization and the Swedish International Development Cooperation Agency, led by the International Institute for Environment and Development, and coordinated by the author. The research involved several contributors, including Ced Hesse, Oumar Sylla, Brigitte Thébaud, Gill Vogt and Kees Vogt.
- 2 This section is based on Thébaud *et al.* (2006) — a work that in turn draws on the extensive work of the lead author in Eastern Niger, in Northern Burkina and in the Ferlo Region of Senegal (for example, Thébaud, 2002) — and on fieldwork undertaken for this study in the Zinder Region, Niger (Vogt and Vogt, 2005).
- 3 This section is based on Thébaud (2002) and Thébaud *et al.* (2006).
- 4 This section is based on Thébaud and Batterbury (2001) and on Thébaud *et al.* (2006).
- 5 This section is based on fieldwork undertaken for this study, the key findings of which are summarized in Vogt and Vogt (2005).

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