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Water Rights, Poverty and Inequality: The Case of Dryland Africa

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This background paper explores key issues concerning access to water for agriculture, with a view to feeding findings in the process to elaborate the UNDP Human Development Report 2006. Funding for this paper was generously provided by the United Nations Development Programme.

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1. Introduction

1. Object, scope and methodology

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). Access to water for agriculture is fundamental for rural development and poverty reduction across dryland Africa.

Box 1.1. Key concepts

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

Water rights are legal entitlements for the abstraction and/or use of water resources - whether surface or groundwater (Hodgson, 2004). They 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. 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. Water rights may be based on bodies of norms other than domestic legislation - namely, customary law.

Tenure security in the enjoyment of (land and) water rights relates to the degree of reasonable confidence not be arbitrarily deprived of access to water 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 irrigated¹. Most farmers produce food under rainfed conditions.

¹ 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).

This background paper explores key issues concerning access to water for agriculture, with a view to feeding findings in the process to elaborate the UNDP Human Development Report 2006. It focuses on the linkages between access to water for agriculture on the one hand, and poverty reduction and social exclusion on the other. Consistently with the Terms of Reference, the background paper covers four broad thematic areas:

- The linkages between water, poverty and inequality in the Sahel region, providing a broad overview of the key challenges;
- The critical interaction of land rights and water rights in shaping entitlements to water;
- Political processes through which poor households and communities are marginalized with regard to access to water;
- Tensions between customary and statutory land tenure.

The paper explores these interlinked thematic areas in relation to two issues concerning access to water for agriculture: irrigation and pastoral water points. Consistently with the Terms of Reference, it does so using country level case studies on both irrigation and pastoral water points.

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.

The paper is based on an earlier and more extensive study coordinated by the author of this paper and funded by FAO and Sida². That study drew on a review of legislation, on a literature review and on original fieldwork. Fieldwork involved two studies:

- A study in Senegal, focusing on irrigation schemes³;
- A study in Niger, focusing on pastoral water points⁴.

1.2. Cross-cutting issues: an overview

The next few sections briefly review the main cross-cutting issues underlying this study (see above, section 1.1), which will be examined more in detail in the chapters concerning irrigation and pastoral water points (chapters 2 and 3, respectively).

Access to water and poverty reduction: key challenges

In much of the Sahel, agriculture - including farming and livestock rearing - constitutes the main form of livelihood for the great majority of the rural population. Secure access to water for agriculture is therefore key to promoting agricultural development, reducing poverty and improving rural livelihoods. On the other hand, as competition for water increases, poorer

² Lorenzo Cotula (ed), forthcoming, 'Land and Water Rights in the Sahel – Tenure Challenges of Improving Access to Water for Agriculture', London, IIED, Issue Paper.

³ Oumar Sylla, "Droits d'accès à l'eau et au foncier: la problématique de la gestion décentralisée du domaine irrigué dans la vallée du Fleuve Sénégal", IIED, 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", IIED, June 2005.

groups may lose out - generating negative implications for their livelihoods and fostering social exclusion.

In dryland areas like the Sahel, water is a scarce and valuable resource. With rapid population growth, competition over water resources for agricultural use is increasing. In many places, water points have been at the centre of tensions and even violent clashes between users. Access to irrigated land is one of the main stakes in ongoing policy debates on agricultural "modernisation" in the Sahel - with governments increasingly looking to agribusiness, rather than family farming, as the main basis for rural development. In Mali, recent government decisions to transfer some 3000 hectares of land in the Office du Niger irrigation scheme to private operators, while setting aside some 300 hectares for family farmers, illustrates this point. Competition may also increase as a result of climatic and other factors. 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 and Southern Africa, if accompanied by high inter-annual variability, could be detrimental to the hydrological balance of the continent and disrupt various water-dependent socio-economic activities" (InterAcademy Council, 2004:45).

Addressing these challenges and ensuring access to water for agricultural activities 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. This 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. 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. To this end, Integrated Water Resources Management (IWRM) principles are being mainstreamed in water policies, laws and programmes. And, access to water is not only function of the availability of water infrastructure - such as water points and irrigation facilities. It is also function of institutions and processes that ensure access to those assets for the poorest and most vulnerable groups. Therefore, there is a need to address issues of equity and social exclusion.

The interaction between land and water rights

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. Many countries have had sectoral reforms reshaping both land tenure and water rights, with little coordination being established between the two (Hodgson, 2004). In the Sahel like elsewhere, the law has evolved towards a full dissociation between land and water rights. In some respects,

water and land legislations have evolved in different directions - towards greater state control over water resources, and (partly) away from state control for land⁵.

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 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.

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.

Tensions between customary and statutory resource tenure

In much of West Africa, state policies and laws tend to be little implemented in rural areas. 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

⁵ For a more detailed review of this, see Cotula, forthcoming.

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.

customary law is extremely diverse, possibly changing from village to village. This diversity is the result of a range of cultural, ecological, social, economic and political factors. 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 practice, the neat distinction between "customary" and "statutory" land tenure systems is considerably blurred, and resource users typically 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 water rights may co-exist in the same territory, a phenomenon referred to as "legal pluralism".

Power relations and processes underlying marginalisation in access to water

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 the rules to their advantage, with a view to consolidating or increasing their control over resources.

The creation of water points and the allocation of access and management rights over these have profound implications for control over the territory. 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 Senegal River Delta, 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 background paper 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. It also shows how improved access to water for agriculture for some - e.g. farmers cultivating irrigated plots - may result in reduced access to strategic water resources for others - e.g. herders critically depending on access to dry-season water points.

Discussions on access to water for agriculture 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. Where efforts to improve tenure security focus on agribusiness, as has been the case in several Sahelian countries, smallholders are likely to lose out. This shows how, far from being a purely technical matter, access to water for agriculture is loaded with distributive (and ultimately political) 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 the 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). Power relations drawing on social status, wealth and access to contacts and information can shape the nature and outcomes of public interventions to improve access to water - and ultimately foster processes of marginalisation in access to key livelihood assets such as land and water.

2. Irrigation: Lessons from Burkina Faso, Mali and Senegal

2.1. 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. 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.

In dryland areas like the Sahel, irrigated lands are a scarce and precious resource. Access to irrigation raises all the cross-cutting issues identified above (section 1.2). Secure and improved access to irrigation is an important component of poverty reduction efforts. Access to irrigation also raises issues of equality and social exclusion - particularly with regard to ongoing policy debates on agribusiness and family farming. Irrigation schemes raise issues concerning the interface between rights to land and to water - both in the creation of new schemes and in the management of existing ones. Indeed, 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. Managing existing schemes also raises land tenure issues as to the security of land rights and the equity of land access. Finally, given the limits in the application of much natural resource legislation in the rural areas of many Sahelian countries, and the continued use of "customary" resource tenure systems, the interplay between statutory and customary systems is at the heart of competition for access to water in much of the Sahel.

2.2. Competition, disputes and social exclusion in small- and medium-scale irrigation schemes

As mentioned above, the creation of irrigation schemes may involve the suppression of local land rights, and the re-allocation of rights over both land and water. 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. 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. Entrenched power relations within society shape the

outcomes of such competition. And, if appropriate conditions are not in place, more vulnerable groups may lose out.

First, the creation of irrigation schemes may exacerbate competition between communities. This unintended effect is the result of the interplay between customary and statutory rules; of the close links between land and water rights - which entail that allocation of water rights within the context of irrigation has implications for access to land and vice versa; and of the efforts of more powerful and better connected individuals and groups to gain control over valuable resources.

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 village⁷. While customary law emphasises the rights of the first occupants, statutory law typically embodies the principle of "mise en valeur", whereby the law protects the resource rights of those productively cultivating the land - whether "autochtones" or "migrants". This interplay between the customary and the statutory often results in tensions for resource access. In this context, 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 an example, see Box 2.1 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

⁷ 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.

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, 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 the administrative centre ("*chef lieu*") of that neighbouring department. This may encourage the tributary village to use its administrative status under statutory law to renegotiate customary law and 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; Sylla, 2005).

These inter-community tensions illustrate some of the points made in section 1.2 above. While policies and laws on water and on land are largely compartmentalised, land and water rights are interwoven on the ground - and creating facilities for improving water access may have important land tenure implication. In this process, better connected and more powerful groups seek to manipulate the interface - and the contradictions - between statutory and customary law to their advantage.

Box 2.1. 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. This case shows how failure to take account of the possible contradictions between customary tenure and administrative boundaries may spark disputes between communities.

Source: Sylla, 2005.

Tensions may also arise within the community. It is well known that communities are not homogeneous entities. Within them, 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. While these statutory law provisions aim to promote equity in access to land and water, the egalitarian and democratic principles that underpin them 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 not only improved access to water; but also a redistribution of land rights - both between

communities (see above) and within the community. This is particularly so where customary land rights are concentrated in the hands of a few. 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 Sylla, 2005). 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, and to foster inequality and social exclusion (see box below).

Box 2.2. 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. Sylla (2005) 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. He 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.

Source: Sylla, 2005.

Another key intra-community equity 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 and marginalized 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)⁸.

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 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 (Sylla 2005).

To sum up, autochtone-migrant patronage relations, wealth, caste and gender are some of the lines along which small- and medium-scale irrigation projects may be manipulated to the benefit of the more powerful - and may end up undermining the land and water rights of more vulnerable groups.

2.3. Access to irrigated land in large-scale irrigation schemes

Overview

Large-scale irrigation systems such as the Office du Niger in Mali and the AMVS in Burkina Faso are at the centre of the debate on agricultural “modernisation” in the Sahel - and at the very heart of the competition for access to irrigated land. Larger-scale schemes present somewhat different issues compared to small-scale schemes. On the one hand, 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. In such schemes, customary systems have more effectively been replaced by government regulations, and undermined by decades of settlement by incoming “colons”. On the other hand, the interface between land and water rights remains central - as illustrated by the recent land evictions for failure to pay the water fee in the Office du Niger (on which see below).

Several large-scale irrigation schemes are facing two main challenges. On the one hand, demographic growth has led to increased competition for access to irrigated plots and to often very small plot sizes (see box 2.3). This calls for investment in the irrigation infrastructure - including both maintaining and upgrading the existing infrastructure, and building new irrigation facilities. However, after the structural adjustment programmes of the 1980s and the ensuing reduction of state funding for irrigation, governments have increasingly looked to the private sector as a source of investment to fund irrigation infrastructure. This is in line with the policy thrust in favour of agribusiness that is increasingly dominant in the Sahel. In this context, the promotion of agribusiness is seen as a strategy to attract private capital,

⁸ 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).

improve efficiency in the use of a scarce and strategic resource (irrigated land) and increase agricultural productivity.

Box 2.3. Increased pressure on irrigated land

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).

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 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. However, lack of clarity on its application 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. As for payment of the water fee, 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 - and illustrates the close links between water and land rights in irrigation schemes. 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, and may negatively affect poorer and more vulnerable groups (for an example from the Office du Niger, see below).

A range of land tenure options are being explored to improve tenure security, and particularly to grant tenure security to those investing in irrigation facilities. They usually entail granting longer-term and stronger land rights on state irrigation schemes (e.g. in the Office du Niger, Mali, and in the Sourou River Valley scheme, Burkina Faso). Private land ownership is also being introduced - for instance, in the Office du Niger (see below). But these efforts to improve tenure security and promote investment seem to have focused on attracting large-scale capital. Questions remain as to how to create 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. This may affect the propensity of smallholders to contribute cash and/or labour to build or upgrade irrigation infrastructure.

A possible side effect of granting special land tenure treatment to those investing in water facilities is its potential to foster land concentration - and thus to affect the livelihoods of poorer groups. 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. This may end up undermining access to key livelihood assets for poorer and more vulnerable groups.

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. Overall, donor pressure and innovative development projects have led to far-reaching reforms towards greater tenure security (Aw and Diemer, 2005). Farmers now gain access to irrigated land either through farming contracts that have a one-year duration, are tacitly renewable, are subject to conditions (*mise en valeur*, payment of the water fee, conservation measures, etc), and can be withdrawn if those conditions are not respected; or through farming licences providing greater tenure security (they have indeterminate duration; they are transmissible to heirs; and their withdrawal entails payment of compensation). Smallholders can apply for a licence after two years of cultivation under the farming contracts.

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 smallholders stick with the farming contracts (Vandersypen, pers. comm.).

A range of measures have also been adopted specifically to grant greater tenure security to private operators investing in the water infrastructure - particularly agribusiness. 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). Private land ownership for agribusiness 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 programme is expected to concern large investors rather than smallholders. With the same decision, the government set aside 281 ha for smallholders - i.e. less than 10% of the land area set aside for agribusiness (articles from the Malian press). This move exemplifies the current policy thrust in favour of agribusiness.

On paper, land tenure reform in the Office du Niger has gone a long way towards offering greater tenure security to farmers (Aw and Diemer, 2005). According to a recent study (Aw and Diemer, 2005), 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). However, distributive issues - namely the shifting balance between agribusiness and smallholding in the Office - also deserve a closer look. The recent land evictions for failure to pay the water fee illustrate this point.

Land evictions 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).

Such evictions can profoundly affect the livelihoods of poorer groups. 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.). And, talking to informants in Mali, anecdotal evidence suggests that well-placed elites are "closing in" fast on land made available by the evictions. Evictions for failure to pay the water fee - per se a useful institutional arrangement linking land and water rights as a way to help secure high water fee collection rates - risk turning into a mechanism that jeopardises the livelihoods of more vulnerable farmers and that favours a shift in land access towards the better off. In addition, mechanisms and safety nets must be established to ensure that evicted households without alternative sources of livelihood have secure access to adequate food.

Positions on the water fee and its land access 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.

However, it has been noted that 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).

Finally, equity issues are also raised by the operation of informal land markets in the Office. While land transactions on irrigated plots - whether rentals, sales or other - are prohibited (Arrêté 96-1695 of 1996), field studies have documented widespread practices of informal land transactions on the ground. This includes both land rentals and sales - which have different equity and livelihood impacts.

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). Coulibaly and Belières (2004) estimate that, in 2000, rentals covered some 13% of the plots and 7% of the irrigated land area. Prohibitions of land rentals seem to have been little implemented on the ground; and if they were implemented, they may negatively affect more vulnerable farmers.

Informal land sales have also been documented (Dave, 2004; Dramé, 2004). Land sales seem to be tolerated by the Office du Niger - and Office du Niger officials and other local elites are themselves among the market players (Dave, 2004; Dramé, 2004). Land sales markets operate very differently to land rentals, as poorer farmers may be forced into distress sales in times of crisis.

3. Pastoral water points: the case of Niger⁹

3.1. Introduction

In the pastoral Sahel, the creation of “modern” water points has long been pursued as a strategy to improve access to water and to reduce poverty. However, in many cases, failure to take account of the close links between land and water rights, and lack of recognition of local “customary” tenure systems by statutory regimes have ended up undermining local resource management arrangements; fostering resource conflict; and feeding processes through which wealthier and better connected groups appropriated common resources to the detriment of poorer groups. This chapter explores these issues, focussing on Niger.

In the pastoral Sahel, 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 adaptive resource management systems based on negotiated and reciprocal access to ‘strategic’ resources such as water and dry-season pastures.

In these systems, water points are key to managing grazing lands. 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. 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. These principles underpin “customary” systems for resource management. These are based on priority rather than exclusive rights, and on flexible arrangements based on negotiation and on reciprocal access to water points and pastures controlled by local and incoming herders (for an example, see box 3.1).

⁹ This is a shortened version of Thébaud et al, forthcoming, which in turn draws on the extensive work of Brigitte Thébaud in Eastern Niger, in Northern Burkina and in the Ferlo Region of Senegal (Thébaud, 1990, 1995 and 2002); and on a recent field study undertaken in Zinder Region, Niger (Vogt and Vogt, 2005). This research is to appear in Cotula (ed), forthcoming.

Box 3.1 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. Traditional wells in Diffa are of small diameter, and are hand-dug by professional artisans ("*puisatiers traditionnels*"). 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 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 overgrazing and ensure sustainable land use. Through these negotiations, residents also reassert their priority rights over the well.

Over the past 50 years, however, these traditional resource access 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.

3.2 Public wells and the erosion of customary tenure systems

In Niger, efforts to improve the pastoral water infrastructure first started at the beginning of the 1950s. Pastoral wells and boreholes were built to enable access to grazing areas that were difficult to access during the dry season because of a 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 day¹⁰. To avoid such risk, resource management legislation was passed in several countries, particularly Senegal and Niger. However, apart from isolated episodes, 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.

¹⁰ A borehole can provide water to 10,000 cattle, whereas a cemented well providing 5 m³ per hour over a 10-hour period will water less than 2,000.

The introduction of 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 became degraded. Securing access to water became associated with the use of force, rather than with negotiation and reciprocity (see box 3.2). Paradoxically, open-access water infrastructure, meant to be accessible to all, ended up fostering exclusion and reinforcing poverty, as those with more power (based e.g. on resources and connections) were able to take control over water points - and, given the linkages between water and land rights in pastoral systems, over pastoral lands. 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.

Statutory regimes established by legislation reinforced these processes, as local resource tenure systems were rarely given legal backing. The rural code 1993 constitutes a departure from this approach. It 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*"). 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. 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 communities, and traditional wells are not even mentioned. This undermines traditional pastoral resource management systems, and enables local elites to grab common resources - thereby fostering social exclusion.

To sum up, 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.

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.

Box 3.2 Water points and conflict in the Diffa region, 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. 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 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 territory. 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).

Source: Thébaud and Batterbury, 2001; Thébaud, 2002b.

3.3. The privatisation of water points as a strategy to grab common lands

Lack of recognition of local systems for access control has also resulted in the private appropriation of water points and surrounding lands. 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 legislation provide for priority but not exclusive rights. However, the creation of private water points is 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. 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. In so doing, they have effectively secured exclusive access to the well and 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 3.3. 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 15km² 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: Vogt and Vogt (2005)

Box 3.4. 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: Securing exclusive access even when absent

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 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 2 metres in order to increase its output.

Source: Vogt and Vogt (2005); Thèbaud et al, (2005).

4. Conclusion

4.1. To sum up

In dryland areas like the Sahel, water is a scarce and valuable resource. Whether in irrigation schemes or around pastoral water points, this paper has found intense competition between different resource uses and interests - between herding and farming, agribusiness and smallholders, “autochtones” and “migrants”, and along gender lines. Water rights, and their interface with rights over other resources such as land, are at the heart of this competition. And, manipulating the interface and contradictions between water rights and land tenure, and between statutory and customary tenure is a key strategy deployed in such competition. For instance, 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. De facto open-access pastoral water points have attracted increasing numbers of herders, undermining the priority land/water use rights of local communities, and thus reinforcing poverty and inequality. “Migrants” are seeking to strengthen their land claims by manipulating irrigation infrastructure projects. Women lose access to their plots following the construction of irrigation facilities that increase land values. Smallholders are losing access to irrigated plots for failure to pay the water fee and governments are increasingly looking to agribusiness for promoting productive use of irrigated land and for expanding the water infrastructure. The development of irrigation schemes is depriving herders of access to pastures and water points. In this competition, it is the more powerful that tend to prevail, while more vulnerable groups are further marginalized. This is even more dramatically so where competition degenerates into conflict and violent clashes.

In irrigation schemes, 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. In many irrigation schemes, 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).

Experimentation is ongoing on how best to improve land tenure security in irrigation schemes. 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 has so far focused 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. This risks undermining the livelihoods of smallholders in the Sahel, and fostering exclusion and marginalisation of

poorer groups. Protection must be granted to investment in water infrastructure provided by farmers. 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.

Many pastoral water programmes have largely neglected the social and tenure issues raised by the creation of water points. 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 local herders - and dispossessing them of their most important assets. Failure to recognise traditional pastoral resource management systems in legislation undermines these systems, and enables local elites to grab common resources - thereby fostering social exclusion. Public wells may also bring about rangeland degradation, as many more livestock can graze in the surrounding area for longer periods and resource conflict. Paradoxically, open-access water infrastructure, meant to be accessible to all, ended up fostering exclusion and reinforcing poverty, as those with more power (based e.g. on resources and connections) were able to take control over water points - and, given the linkages between water and land rights in pastoral systems, over pastoral lands (Thébaud et al, forthcoming).

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 (Thébaud et al, forthcoming).

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 and around pastoral water points. 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.

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, 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. Therefore, there is a need to design and test effective checks and balances that enable good local governance and prevent elite capture.

4.2. Key recommendations

Making legal frameworks responsive to local contexts and needs

This requires:

- 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;
- 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);
- 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, which are now usually dealt with by an uncoordinated number of different institutions (administrative authorities, politicians, NGOs and others), usually with limited effectiveness in solving disputes in an equitable, legally backed and socially legitimate way.

Mainstreaming property rights issues in water programmes

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; this includes designing specifically tailored methodologies for the creation of water points in a pastoral context, compared to those used for water facilities for “sedentary” farming communities;
- 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) and paying special attention to the needs of more vulnerable groups;
- 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.

Granting water users greater control over the sources of their livelihoods

This requires:

- Developing and testing new tenure options that grant 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 tenure security 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 clarifying vague conditions like 'mise en valeur'), 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 against elite capture are established.

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