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“In the Name of Development”: indigenous resources management in irrigation schemes

*“Au nom du développement” : gestion autochtone des ressources face aux projets
d'aménagement hydro-agricoles*

Charlotte Torretti

Introduction

- 1 Large-scale irrigation started in Uganda in the 1970s. However, long periods of political crisis and violence following independence led such schemes to be left aside mainly until early 2000s. In post-conflict northern Uganda, the irrigation schemes of the Olweny Swamps (Lango region) and at the foot of the Agoro Hills (Acholi region) reflect strong strategic issues: developing marginalised areas, capturing votes in reluctant regions, promoting irrigation as a stepping stone towards wealth creation and adapting climate change, etc. (Gay & Torretti, 2015). Coupled with technocratic and top-down implementation disconnected from the ground, they aim at creating new territories that focus on rice production. In the light of 18 months of ethnographic fieldwork based upon an inductive methodology, a major question evolved: In a context distinct from the 1970s, how do irrigation development projects transform indigenous resource management?

Figure 1. Location of irrigation schemes in Uganda.

- 2 In this paper, development projects are represented by two irrigation schemes of about 600 ha. They were put in place by the Ugandan government for use by indigenous people, since large-scale irrigation schemes were a significant policy among African states in the 1970s¹. At the time, they were at the heart of the “Green Revolution” that held a major position among the new “development” policies. This paradigm emerged after World War II, dividing the world into “developed” and “developing countries”. It was then focusing upon economic growth resulting from the use of fossil-fuel-based technology allowing industrialisation of the society – including the agricultural sector – a process defined as “modernisation” (Rist, 2014).
- 3 In many “developing countries” most of the population live in rural areas. Farming systems are largely subsistence oriented, since cash crops can be food crops as well with the harvest being partly sold². Consequently, exploiting natural resources for agricultural production is often the main source of income for households if not the sole one. Thus, implementing agricultural development projects in rural areas transforms the balance within one farming system between two models whose boundaries can be porous: subsistence agriculture, described by most of the interviewed actors as “backward” or “traditional”, and the agri-business model which is perceived as “modern practices” by most of the actors encountered³. This therefore leads to an underlying change, as the agri-business model comes along with new and non-indigenous resource management practices. In this paper, resources are understood as a changing social construction involving power relationships, skills and knowledge linked to its exploitation whose disruption can potentially leads to mechanisms of exclusion and/or inequalities. The case of self-governing irrigation institutions, as the two studied schemes in this paper were designed to be, links water

and land closely, since managing water over distance often bounds irrigators together, requiring then strong level of collective action (Ostrom, 1990).

- 4 In order to understand changes induced by irrigation schemes on indigenous resource management, the theoretical framework developed by Tobias Haller (2010) is mobilised⁴. He explores new institutionalism linking the work of Elinor Ostrom (1990) and Jean Ensminger (1992), but also including theories of legal pluralism and inputs of the political ecology. Thus, common pool resources are approached in a wider context by taking into account the background of former colonised countries. The importance of pre-colonial institutions and their legacies is then highlighted. The role of post-colonial states is considered as central, claiming control over resources but lacking means to implement policies. This leads to the paradox of the presence-absence of the state, and to the transformation of common pool resources into *de facto* open access resources when indigenous institutions are eroded at the same time (Haller, 2010).
- 5 By using this theoretical framework, we aim at differentiating the changes induced by institutional disruptions on a long-term perspective from the ones produced by irrigation schemes themselves. Moreover, using the comparison between these two particular schemes should contribute to giving perspective on how historical political events and institutional disruptions impact the appropriation of such agricultural development projects. Indeed, both regions where the schemes were implemented are said to share similar backgrounds in terms of history, environment, culture, agriculture, economy. However, the Acholi region experienced the war against the Lord's Resistance Army (LRA) and camp life for about two decades while the Lango region was left mostly unscathed until the last five years of the conflict. Thus, this approach should then allow us to situate the trajectories of the Olweny Swamps and the Agoro Hills irrigation schemes in light of the new irrigation development policy, meant to fight climate change and secure food production.

Agriculture and common pool resources in the midst of institutional change

- 6 Lango is a region of plateaus and permanently and seasonally flooded lowlands – often called swamps which contribute to the Kyoga lake system. The upland vegetation is deciduous woodland and well-drained savannah. Further north, the Acholi region is characterized by rolling and lightly wooded savannah with varying soils, from a fertile alluvial type in the main river basins to a sandy clay loam type in the upland savannah. In both regions, rainfall patterns can vary from 700 to 1,500 millimetres per year on average⁵.

Figure 2. Rainfall and temperature average.

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- 7 Indeed, since East African countries are under the influence of the El Niño system, rainfall variability within a year and from one year to another is high. In wetlands or lowlands, risks linked to droughts and floods are high and unpredictable. Several strategies in pre- and early colonial periods were identified as coping mechanisms to these climate conditions, such as shifting slash-and-burn agriculture, collective labour and grain crops annually grown to benefit from the most reliable rainfall time window. Despite the importance of grain culture, cattle-keeping had formed people's identity and cattle are considered to be a great social wealth in most areas under Nilotic influence. Its contribution to the local economy was likely more important in Lango where the environment was more favourable for livestock. In both regions, the economy was self-sufficient and non-cumulative. However, the commercial economy was not unknown as barter trading existed (Tosh, 1978).

On the eve of British Rule

- 8 When the British first arrived in northern Uganda, the Acholi and Langi people were perceived as distinct "tribes" and as such, were administrated as homogeneous cultural units. The reasons being, compared to southern Uganda, northern regions seemed to share similar agricultural practices in an environment less favourable in terms of rainfall. Moreover, unlike southern Uganda, cultural groups were highly mobile, population density was low, and socio-political orders were characterised by the absence of centralised institutions. Societies were patrilineal and polygamous. However, the similarities ended there.

- 9 From the 15th to the 18th century, Luo migrations were intense. Though the borders of the current Lango region were more or less stabilised around the 19th century, the emerging collective identity was not based on "any internal consistency, but on historical experience which set them apart from their neighbour" (Tosh 1978: 33). Within the region, diversity was high. Lango was rising as an acephalous and egalitarian society with executive powers distributed between several leader positions and based on a high level of splitting and fragmentation of clans⁶ into sections. Wetland networks in Lango played a significant role as they were strategic and sought-after for grazing. Further north, with the influence from the Bunyoro-Kitara kingdom, harsh droughts and famines, Acholi eventually began to emerge as a polycephalous society at the end of the 18th century divided into about seventy chiefdoms of various sizes (Atkinson, 2010). Though they shared authority to a certain extent, *rwodi* were indigenous leaders placed above the rest of their people as they received tributes in kind or labour, and had a great role in maintaining social cohesion. The valley of the Agoro Hills is thus the territory of one of the oldest *rwotdoms* in Acholi, the Pobar *rwotdom*.

A century of deepening disruptions

- 10 Following an "Indirect Rule" ideology, colonisation in northern Uganda aimed in early 20th century at settling migrating groups and putting an end to inter-village cattle raids⁷. The colonial administration used agents from the southern influential Buganda kingdom, attempting for two decades to replicate its functionality in the north. The resistance encountered led the British to replace the Ganda agents with appointed indigenous leaders who were perceived as more cooperative, such as some *rwodi* in Acholi or war leaders in Lango. As a result, pre-colonial institutions became distorted and were reorganised through forced homogenisation. In many cases, appointed chiefs gained control over people before whom they had no prior claim, hence favouring the emergence of authoritarian hierarchies (Tosh, 1978).
- 11 Cotton was introduced in early 20th century to northern Uganda as a lucrative export crop while the domestic market for cattle also emerged to satisfy the growing southern demand. However, the colonial administration led to a patronage system arising from appointing chiefs. They benefited most from the wealth created by cotton growing, hence leading to social inequalities. The commodification of agriculture was more significant in Lango than in Acholi then. Indeed its central location, more favourable environment and significant livestock activity led to the development of mores infrastructures and a network of trading centres. Diversifying, intensifying and commodifying agriculture, trends initiated by colonial politics, were then emphasised in post-independence period and once again more intensively in Lango than in Acholi.

Figure 3. Comparison of pre-colonial characteristics and colonial legacies in Lango and Acholi.

	LANGO	ACHOLI
<i>On the eve of colonialism</i>		
Indigenous institutions	Acephalous & egalitarian	Polycephalous (<i>rwotdoms</i> composed of an aristocratic lineage and one or more commoner lineages)
Farming system	Grain crop & livestock	Grain crop & livestock
Land tenure system	Communal	Communal
<i>Colonial legacy</i>		
Distortion of indigenous institutions	High	Low
Impact of colonial policies	Intensification/diversification/commodification of farming system ; social differentiation/land as a source of income through cash economy development	Low level of farming system intensification/diversification and of resource commodification
Land tenure system	Premise of a shift from clan to household level regarding cultivated land	Communal

TORRETTI, 2018

- 12 By the 1960s, with a density of population much higher in Lango than in Acholi, time left to fallow land was shorter in Lango. Crop diversification coupled with significant cotton production and adoption of ox-ploughing led to the Langi farming system's intensification. Meanwhile shifting agriculture was still dominant in Acholi (Luciyamoi, 1970). Alongside deeper integration of new state rules over indigenous authority, a shift in land control slowly occurred from clan to household level in Lango starting in the 1970s, while communal land tenure still remains widely spread in present day Acholi. The Langi economy, integrated more into commodified exchanges, therefore suffered more from the economic collapse alongside cooperative system during Idi Amin dictatorship in the 1970s. Whereas southern Uganda started recovering in the 1980s, the north was still facing insecurity and violence that rose at the end of the bush war.

Figure 4. Population density (inhab./km²) in Olweny Swamps and Agoro sub-county.

UGANDA BUREAU OF STATISTICS

Reaching breaking points?

- 13 Eventually in 1986 when Yoweri Museveni took over power after five years of bush war, northern Uganda was engulfed in massive cattle raids perpetrated either by Museveni's army, Karimojong warriors – a marginalised group of the north-east region – or by the collusion of both (Lamwaka, 2016). The Lango, Acholi and Teso regions were then depleted of about 90% of their livestock between 1986 and 1987 (Gay & Torretti, 2015). Cattle-keeping being historically more significant than in Acholi, the Langi and Iteso economies suffered heavily from this loss, leaving land as the only source of potential income. With the fall of the cooperative system that came along with the structural adjustment program in the 1990s, the cotton sector collapsed. Subsistence crop farming became the core strategy before the cash crop economy. Land conflict within communities arose particularly in Lango and Teso, as this resource became pressured by a growing demography – 70 inhab./km² in Lango – while many trees used for land demarcation disappeared with the emerging charcoal business. This dynamic resulted into deepening the commodification process into which land was embedded. It also highlighted the weakening of the authority of the clans. Their ability to solve disputes was indeed highly challenged by unprecedented level of conflict and competition with state authority agents. Besides, the numerous Langi wetlands lost their function as grazing areas, and competition for cultivable wetland appeared, fuelling conflicts over access and use.

Figure 5. Historical timeline of the major political events.

Torretti, 2018

- 14 Whilst this agrarian shift occurred in Lango, alongside new relationships towards land characterised by deepened individualisation and commodification, the Acholi region was undergoing a growing civil war. Opposing the Lord's Resistance Army to Museveni's government troops, it arose out of feeling of exclusion from the relative development that was occurring in the south and of Museveni's army misbehave. Some perceived LRA rebels as freedom fighters when they criticized concentration of executive power in Museveni's hand or the structural adjustment plans implemented in the 1990s (Finnström, 2008). However, the extreme violence of the LRA weakened its popularity. Eventually, the government came to use a scorched earth policy by displacing the Acholi population and later, the Langi as well into camps, a situation that lasted from up to two decades in Acholi to few years in Lango. In total, about two millions of people were displaced during this war (Finnström, 2008), the catastrophic living conditions within camps leading to a peak of about a thousand deaths per week (Mwenda, 2010). The urban population rose significantly⁸. Displacement not only severely weakened indigenous authorities but also led to heavy social as well as cultural damages, and distorted people's links to land. Indeed knowledge of its history and management were lost with the death of many elders. In Lango, where the regional economy was still recovering from the bush war and the cattle raids, all activities went down once again when the war reached the region in the early 2000s. The process of returning home that started in about 2006 was slow, and created a second significant wage of land conflicts between and within families and communities.

From Lango to Acholi, a significant regional differentiation

- 15 Land in Lango followed a general trend initiated by colonial policies and accentuated by the cattle loss during the bush war, commodification of agriculture and thus of livelihoods, labour and land since the 1990s. The Acholi region however remains pretty isolated and self-subsistent, though in the Agoro subcounty, rice and vegetable growing eventually developed during the 1990s (Lamwaka, 2016). However, this diversification remained limited during the war while Lango was being integrated to regional, national, transnational markets. This results from the slow transformation into a cash-crop economy – a trend much more significant in Lango mainly due to cotton production and commodification of livestock and, since the 2000s, of oilseed crops and even forestry. However, though the population census shows that the demography tripled in Lango between 1980 and 2014, land pressure in Agoro subcounty (30 inhab./km² in 2014: UBOS 2016b) remains low compared to the one in the Olweny areas (170 inhab./km² in 2014 on average: UBOS 2016a). Therefore, in Agoro subcounty clan settlement sites barely changed, remaining under indigenous management. In the

Olweny Swamps, the surrounding dryland has been at the core of intense dynamics such as buying/selling and leasing, since then with clan authority becoming more symbolic and less actively involved in land transactions.

- 16 Eventually, indigenous land conflict resolution through consultation of elders was highly weakened, especially after the war and camp life. Meanwhile establishing the new state system called the "Local Councils" in the 1990s directly challenged the legitimacy and authority of clans. Nowadays, Acholi indigenous institutions seem to have efficiently recovered from the war and displacement experience (Hopwood & Atkinson, 2013). However in Lango, a plurality of form of authority now co-exists to manage and solve land conflicts: Local Councils, clan chiefs, elders as well as the judiciary system. In conclusion, for the last century, regional differentiations grew significant between Lango and Acholi. Less impacted by colonial politics and less integrated into the emerging cash crop economy, differentiation in terms of agricultural practices, relationship to land and indigenous institutions appeared. In this context, two irrigation schemes were implemented by the government, in the valley at the foot of the Agoro Hills, in Acholi, and in two wetlands – Itek and Okile – part of the Olweny Swamps.

The Olweny Swamps Rice Irrigation Project

- 17 Langi swampy lowlands previously communally held and used now seem to fit Hällér's description of disputed wetlands. Institutional change, cattle raids and a growing demography led to increased pressure on its resources. Legal pluralism rose as the government put in place an unprecedented environmental legal framework since 1995, whilst indigenous practices evolved in the post-war context. Transforming Itek and Okile swamps into irrigated areas therefore initiated coping mechanisms reflecting the new patterns the region is going through.
- 18 Gutter-shaped lowlands within a slightly rolling plateau, the transformed swamps of Itek, 400ha, and Okile, 210 ha are both a few hundred meters wide and about 10 km in length. Located about 20 km from Lira town, they are at the core of a 170 km² watershed fed by rainwater and water flow. The micro-topography is rugged with a slope coefficient about 0.4%, which does not always favour the water flow to the Kwania lake – main outlet located 20 km to the south. During dry season from October to March, some areas are subject to groundwater upsurge which maintains a certain rate of humidity in the soil – a phenomenon that is more significant in the southern parts of the swamps. The 1997 design of those gravity fed irrigation systems was composed by an upstream non-retentive main buffer dam, from where water was supposed to flow in three canals: a central main drain meant to evacuate the water downstream and two collector canals, bordering each side of the transformed swamps and meant to bring water to the plots through water gates. Lateral dams alongside the swamps were supposed to enhance water input and prevent flooding. The purpose was to retain water during dry season, as well as evacuate the surplus during the peak of the rainy season. Two to three crop cycles per year were then expected to be reached. However most of the lateral canals were not built. Besides the water gates and few pipelines, none of the infrastructures were made of permanent material⁹.

Figure 6. The Olweny Swamps Rice Irrigation Project.

From irrigation to rain-fed agriculture

- 19 The scheme was meant to be self-governed. Individuals were expected to dig small water canals from the water gates to the plots, as well as participating in the cleaning of the main canals, and abiding to water turns. Those collective actions were part of the soft component of the project. Besides, a cooperative society was established by the government in order to supervise water management (infrastructure maintenance through digging and cleaning, water allocation through water turns) as well as post-harvest operations (collective harvest, storage and commercialisation). Those tasks were expected to be performed thanks to the new territorial division of the swamps into zones, blocks and plots, each of those levels being supposedly led by an elected leader. Initially, the project was not welcomed due to strong distrust in the new southern government. The allocation of the newly individualised plots organised by the government's technical team illustrated this local resistance: while about 3,000 plots were designed, only about 1,850 were allocated, most of the time a couple of plots per grower (Ongica, 2001). Nonetheless, the project quickly fell apart as the LRA war spread in Lango and people were being displaced. The Itek and Okile irrigation systems – the infrastructures as well as the plots – went back to being bush land. But war is not the only explanation for the failure to adopt the designed irrigation system and the promoted rice growing. Local rain patterns vary widely. Combined with non-retentive dams, inadequate water collectors and drains, the infrastructures were unable to contain seasonal flooding that occurred more often after the war for some years. The neglect of the infrastructures, alongside people's unwillingness to adopt collective actions, did not allow collective irrigation to emerge nor the new territorial organisation to take root. This led to users favouring individual strategies over

collective action in order to cultivate within the wetland, mainly during the rainy season, hence coping with a difficult water control.

- 20 No crops are cultivated during the dry season as water in the scheme is provided by rains. During the rainy season, rice is not the only crop encountered but also vegetables and maize, which are less demanding in terms of labour and financial investment. However, some cultivators developed strategies to adopt rain-fed rice growing, coping with the micro-localised excess of water caused by one irregular micro-relief, the absence of canals evacuating water or near water spillways to the main drain. Variation of rainfall and the potentially significant impact of neighbours' strategies on a plot make it difficult for rice growers to predict how the plot will react to water input. Consequently, rice growers empirically adapt the crop calendar to their own plot. As a result, across the wetlands, rice is sowed at different periods, though a certain degree of mimicry is encountered at a very localised scale. Besides demonstrating limited knowledge dissemination – due to physical distance between growers, as transport mostly consists in footing while phone network is mostly absent –, it also shows that strategies perceived as successful are reproduced. This adaptation was permitted by the appropriation of rice growing with a water control focusing mainly on individually evacuating the surplus. Eventually, rice growing developed out of empirical individual's initiatives in the Itek/Okile areas, unlike the project design which was aiming at implementing intensive irrigation practices and collective scheme and water management.
- 21 As a result, spatial and social differentiation developed, a pattern firstly initiated in Lango with cotton production and therefore not new. The first can be seen through the unequal, irregular division of rice landscapes across the scheme. The second is illustrated by the cultivators themselves. Indeed they represent a minority in their villages, capable of facing the scheme's significant constraints: competition for labour with the upland crop calendar, investment in clearing, ploughing and harvesting, risk of heavy loss in case of flooding or drought. These growers turned out to have large families able to provide labour and/or own an ox-plough, and/or secure a small income besides agricultural production. An increasing number of cultivators are also urban elites from Lira town looking to make profit with the lucrative wetland rice growing. They rent or have been allocated land within the schemes since the beginning of the project. Most of those are members of the Lira Rice Promoters Association, created in 2004 at a time when rural population were in camps. Benefiting from the circumstances and using their bargaining power, they started to cultivate rice in some of the most favourable and accessible plots. Though being outsiders, their access to land is now locally recognised, therefore initiating the transformation of those former grazing areas into *de facto* open access resources.

Rise of a unique land-based legal pluralism

- 22 Indeed, initially the individualised plots were supposed to be distributed among the surrounding villages to ensure that local population would be the beneficiaries of the scheme. Eventually, the low participation caused by the strong distrust towards the government resulted in the land being allocated in larger plots, but also mainly to people holding a particular position: indigenous, administrative or cooperative authorities. However, in the 2000s, indigenous people spontaneously cleared most of

the protected areas – wetland areas untouched for biodiversity conservation purpose which were found all over the schemes. This proves that the scheme quickly rose interest, but also that the land allocation which occurred within few hands could no longer be contested. Consequently, land distribution is unequal within the schemes as no plot reallocation was initiated. Moreover, as people were returning home from camps, this new land distribution pattern was locally recognised, including *de facto* outsiders. In this context, a unique legal pluralism rose, mixing some of the project guidelines (recognition of the prior individualised plot allocations, project leaders involved in land conflict resolution) within the indigenous locally-based structures of the former communal land. Indeed, within the schemes, the recognition of right to use when land is under cultivation is admitted – a characteristic of the indigenous land tenure system encountered in Lango up to the 1980s (Gay & Torretti, 2015). In case of conflict, the right to cultivate a plot can be lost, for instance of a grower leaves it to someone else to cultivate for several seasons. Consequently, leasing became common though it was not meant to occur in the schemes. It is cautiously practised by favouring for example siblings, in order to preserve the right to use the land.

- 23 The pressure to secure rights over land has two main consequences. On one hand, it puts pressure on growers to maintain some cropping in order to preserve their claim over a plot. On the other hand and tightly linked to the locally-based environment conditions, it also means that a land market emerged within a wetland, directly linked to the presence of the project. Areas within the schemes most suitable for cultivation are more expensive to lease, creating land differentiation through its commodification. The generalisation of leasing also became a way to balance the unequal land distribution. Indeed, in many interviews the financial cost of cultivating in a swamp was the first obstacle mentioned. Leasing then constitutes a means to occasionally cultivate profitable land that most people cannot afford to cultivate every rainy season. Moreover, wetlands are managed in a similar way to dry lands, which also go through a high dynamic of leasing – including to outsiders. Acknowledging indigenous characteristics goes even further by recognising the patrilineal rules of succession of the plots, aside from the project guidelines. However, if the rules regarding land access and use are clearly linked to indigenous land tenure systems, conflict resolution process comes from the scheme's soft component guidelines. Indeed, the land involved in the project was formerly communally used. Conflict over the right to cultivate likely did not exist then but came with the project implementation. Mechanisms to cope with conflicts appeared. Based on indigenous rules to manage the individualised wetland, but serving a purpose introduced by the project, the conflict resolution process is mainly operated by non-indigenous institutions. Indeed, new actors are involved in the scheme's land dispute management such as the Local Council represented by a village leader called the LC1, or people entrusted with leadership (plot leader, block leader, zonal committee member) in a more or less democratic way during the establishment of the new territorial division. However, the involvement of each type of authority – indigenous, project or state related – varies at a very local level across the swamps. It forms a complex between: the influence of the clans, in interaction with the influence of the state system which are found at a village level, and the attractiveness of the plots for cultivation – which depends on the physical and biological micro-conditions – leading to more willingness to adopt the project's territorial division.

- 24 However, one main difference with the surrounding dry lands management lies in the lack of a clear legal framework regarding transformed wetlands, which is reflected at the local level by the emergence of this unique complex land tenure system. Consequently, established rules over the Itek and Okile swamps focus on land access and use – a dynamic process negotiated within communities at village level – rather than on land ownership. Eventually embedding indigenous land tenure characteristics into the project land tenure system put land management at the core of the transformation of Itek and Okile swamps as new territories. By prioritising securing land access/use over water for irrigation access/use, this particular and local legal pluralism directly reflects the main consequence of the Langi agrarian shift: land is perceived as the last resource while cultivating and/or irrigating within a wetland, costly and risky, deepens a pattern of social differentiation through commodification and cash crop economy.

The Agoro Hills Self-Help Irrigation Scheme

- 25 The valley of the Agoro Hills has a long history of irrigation since pre-colonial times (Watson, 1952). The Okura river flow and its tributaries allowed migrating groups to settle as indigenous irrigation systems emerged. In this part of Acholi where droughts occurred frequently and rainfall patterns are lower and less reliable, irrigated crops became an essential security belt for the valley inhabitants. Thus, several irrigation systems were encountered alongside 10 km from the tributaries up the hills toward the plain slopes, before the Okura river turns into a swamp. Land under irrigation is called *joro*, meaning a “soil near a river” or an “inside land”, as opposed to the *woko* – the “outside land”. The several *joro* are characterised by alluvial and fertile soils put under cultivation every dry season¹⁰. Land fragmentation is high, as plots are largely under households control, divided and benefiting patrilineal transmission. On the contrary, the *woko* land is used for shifting and extensive practices as usually encountered in the region, and as such held by lineages which allocate rights to cultivate for their households.

Figure 7. The Agoro valley.

- 26 A *joro* is managed by a group of users collectively opening and maintaining a network of canals. The latter diverts river flow by one non-retentive and hand-made dam with grass, mud and since more recently sand bags. From there primary and secondary canals derived, also collectively opened. The depth and design of those canals can vary from one year to another as well as within one rainy season in order to adapt to the rainfall variability and social dynamics. Indeed, groups are not bound by kinship – their importance is significant though – but above all by the location of their plots. Irrigators across the several *joro* abide by similar rules that put water access and allocation at their core. They exclude water access to outsiders, as well as to people that did not provide labour in constructing the dam and opening canals. Distinct fines are established for those who would not access water according to the rules or did not participate in collective work. The largest *joro* of the valley is encountered downstream in the plain. It was subject to an attempt at “modernisation” in the 1960-70s by the government that quickly fell-through due to political instability. According to testimonies, it was likely about half the size of the current gravity fed irrigation scheme – 675 ha –, then shared by nearly all clans across the plain located in the Pobar and Rudi parishes.

Figure 8. The Agoro Self-Help Irrigation Scheme.

- 27 Before this attempt, the valley was barely impacted by the changes that the Lango region was going through. Very isolated and under harsh climate, neither tobacco nor cotton has ever been significant, while cattle-keeping did not contribute to the local economy nearly as much as in some other parts of Acholi. Population density remained low – about 30 inhab./km² (UBOS, 2016a) – though higher than in the rest of the region. In this context, the attempt of the 1960-70s was likely too disruptive to take root, as it was aiming at transforming the largest *joro* in the plain into a 570 ha rice territory through land re-allocation and a new water distribution system. However, the cash crop economy then became significant due to the adoption of the lucrative vegetable growing, which could fit the indigenous *joro* management systems. Thus the *joro* social organisation remained unchanged until the LRA war. During this time, as rice became one of the main crops cultivated by people living in camps including the one in the Agoro valley, a second attempt was made by the government to transform the large *joro* in the plain. Following the same design as in the 1960-70s, it was then eventually materialised by the Agoro Self-Help Irrigation Scheme's rehabilitation in 2013. Since then, indigenous irrigation systems – the upstream *joro* – co-exist with the downstream *joro* now locally called “the scheme”.

From *joro* to “the scheme”

- 28 The scheme was implemented following the 1960-70s design over nearly 600ha in two parishes, Pobar and Rudi. According to local oral history, Bar and Rudi were brothers that settled at a different time in the plain, reproducing indigenous irrigation practiced by several smaller groups located upstream. While the Podi clan became the ruling aristocratic clan of the valley – which took the name of the Pobar chiefdom for a while – the Rudi parish increased its population after the early 20th century when colonial

policy led to the settlement of outsiders¹¹. The main result is that land within the scheme is highly more fragmented between the clans living in the current Rudi parish than between the Pobar clans, as the first ones gifted land to the settling outsiders. Most of the *joro* at the western side of the Okura river is thus held by clans from Rudi parish while the central and eastern side is largely held by the Pobar clans¹².

- 29 However, the construction work realised in 2013 heavily disrupted social relationships and agricultural practices within the *joro*. Since then, a cemented dam diverts the Okura stream to a storage basin upstream of the scheme. From the basin, several underground pipes distribute water towards a couple of cemented canals. The construction work is inadequate, as some of the cemented canals are too deep, besides a sometimes hilly micro-topography preventing cultivators from bringing water in their fields. Part of the designed infrastructure was also not completed as a result of local resistance during the construction process. The main consequence is that the distribution of water shifted from the river flow to two main canals, depriving most of the western side of the scheme – and to a lesser extent some of the north-eastern side – from water. Therefore, while nearly all Rudi clans are now deprived of water for irrigation, mainly two clans from Pobar – including the aristocratic clan of Podi – enjoy control over water. As their land is the most favourable for rice farming with a relatively flat micro-topography, they also attracted international donors actions that reinforced their capacity to irrigate at the detriment of the rest of the *joro*. As rice became a lucrative crop, leasing emerged with land that can be irrigated becoming about four times more expensive to lease than land in areas now deprived of water access.
- 30 In conclusion, the new irrigation system through cemented dam and water canals introduced an irrigation technology that, compared to the indigenous practices, does not possess the flexibility to adapt to its micro-environment. Using water from cemented canals is uneasy unless one has full control of its distribution, which depends of one plots' location. With the new design, the indigenous organisation was also disrupted. Competition for water access and control arose alongside the new infrastructures and water distribution design.

The rise of a water-based legal pluralism

- 31 Indeed, though land management practices remained, the disruption of water distribution led to the birth of a water-based legal pluralism reflecting the main issue at stake for cultivating in a harsh and unreliable climate: access to water. New groups appeared out of the disruption of indigenous water governance, carrying out the same goal: accessing water, thanks to the indigenous or newly implemented irrigation system, or by a hybrid system embedding both technologies.
- 32 With the construction work also came the creation of a cooperative society in order to manage water. However, staff is recruited across the region based on education criteria to impose new practices which can hardly be embedded into indigenous resource management system such as distinct crop calendars defined for each block, or water turns based on the inadequate new water infrastructures. The cooperative quickly lacked the legitimacy to do so. In another attempt to impose its authority, a Water User Association (WUA) was then created in 2015 to carry out water management, supposedly under the cooperative authority. This is the result of the influence of the

Japanese cooperation agency, which funded field visits in another scheme in western Uganda where a WUA was implemented by the same agency. Quickly the WUA in Agoro became significant, focusing on irrigation of the central and eastern side of the scheme where rice is mostly produced. The aristocratic clan leader of Pobar chiefdom became the WUA's chairman, one of his son the association's secretary and one out of three cooperative water scheme attendant, while most of the members are from Pobar parish. Legitimacy is then not only building on locally grounded leadership, but also by being able to mix it with the legitimacy that comes along with being an institution emerging from external institutions. The organisation of the WUA mimics the indigenous irrigation to some extent: labour must be individually provided in order to benefit from water access, and failure to do so leads to fines. In less than one year, the WUA counted about sixty irrigators. The significant level of participation can be explained by the locally grounded leadership and by mutual interest of its members – running the scheme in order to root the new design that allows unprecedented rice production. Eventually, water distribution through the scheme's canals network reflects the interest of the WUA, favouring those in eastern areas at the detriment of most of the western side. In conclusion, the scheme did generate a formal organisation through the WUA out of the disruption of the *goro*. However it also deepens inequalities in terms of water distribution, and raises tensions with the clans that are now excluded from water for irrigation.

- 33 Therefore coping mechanisms emerged out of the new arrangement within the scheme. Mainly led by users from the western side and alongside the Okura stream, they focused on gathering together as new groups around indigenous hand-made dams or adapting indigenous practices to the new water distribution arrangement across the *goro*. Consequently, four small indigenous irrigation systems were thus encountered during the fieldwork in 2016, based on an organisation similar to the upstream *goro*. Most of those irrigators are not members of the WUA, rather they create new institutions in their struggle to maintain some land under irrigation through the new water configuration. Eventually, a last coping strategy emerged: looking for new land to irrigate. The latter led to the rise of the most important land dispute across the valley, as two clans now claim the swampy area downstream the scheme. The significant risk of flooding and the difficulties of cultivating in a virgin wetland led this area to be unclaimed until then. However, due to the attractiveness of rice growing and the exclusion from water for irrigation or from land that can be irrigated, disputes over the wetland led to tensions and violence. With no resolution reached at the sub-county level, and the election of a new sub-county chief (LC3) due to previous one mismanaging this particular land dispute, the case was reported and fell under the authority of the High Court of Gulu, the main town in Acholi region, and is still ongoing.

Conclusions

- 34 Implementing the Olweny and the Agoro irrigation schemes induced changes that were unexpected for the government but often encountered in the case of large-scale irrigation in Sub-saharan Africa: reinforcement of legal pluralism, competition between actors with bargaining power to access the transformed resources, or adoption of new practices outside of projects' guidelines. The failure to introduced agricultural

practices perceived as "modern" but designed at a top level in disconnection with pre-existing indigenous systems, is also not new. In this regard, it seems that though the national context as dominant paradigms of the "development" sector changed significantly since the 1970, there is still little differences in terms of design and impacts of those projects with the ones conducted back in the 1970s in Uganda and more widely in Sub-Saharan Africa.

- 35 Moreover, this paper contribute to highlight the importance of understanding dynamics on a long-term perspective and at a local/regional scale in order to accurately assess impacts of the projects, an argument widely developed in comparative agriculture (Cochet, 2015) among other fields. In Lango, the irrigation scheme is in line with the general dynamics on a regional scale: wetlands management disruption alongside intensification, individualisation and commodification of farming systems and land management. Implementing the irrigation scheme however turns the Itek and Okile swamps from common pool into *de facto* open resource, as the common resource system disappeared. Legal pluralism became more complex as land management is now largely influenced by external land tenure characteristics and the paradox of presence-absence of a risen state. Reflecting a new land-based legal pluralism focusing on individualised rights, no collective action emerged. In Acholi, the scheme is built on a strong pre-existing territory, which identity was formerly shaped by indigenous irrigation. Adopting cash crops such as vegetables and rice came with the government's attempt to "modernise" irrigation, but it did not initially disrupt resource management in the *joro* nor the indigenous land management compared to the Olweny case. However, the construction work heavily transformed water distribution across the valley, which represents a heavy destruction of indigenous institutions, as water is a key resource in this valley where climate is harsh. Consequently, the attractiveness of the land where irrigation is doable considerably rose as a significant area of the transformed *joro* is now deprived of water access. Competition rose with tensions over water control, leading to the emergence of a water-based legal pluralism. However, the deep-rootedness of indigenous resource management prevents the *joro* from turning into a *de facto* open resource. Collective action, though now divided into distinct new groups that compete with each other, remains. In conclusion, the rise of unique legal pluralism in the scheme's territory reflects locally grounded stakes specific to each case: land in Itek and Okile swamps – where the cash crop economy is deeply rooted and demography high – and water in the valley of the Agoro Hills – at the core of irrigation practices which led to the development of a chiefdom in one of the harshest parts of the Acholi region.
- 36 Eventually, indigenous institutions turned out to be more resilient in the Agoro valley while eroded in the Itek and Okile swamps. This output was unexpected, as post-conflict studies usually point out destruction of social capital in wartime. In this light, the Agoro case seems atypical as indigenous institutions recovered efficiently from two decades of displacement in camps. The Itek/Okile case, where this situation lasted no more than a few years, proves that long-term rooted disruptions weakened the ability of indigenous management to prevent resources from turning into *de facto* open resources, seeing that the disruptions brought by the project in itself were significant. This understanding would likely not have been achieved without looking at the past as far back as the pre-colonial era. In conclusion, this paper shows that as long as donors and/or government agencies will give little consideration to such analysis, it seems

uncertain that the current shift back to large-scale irrigation rising over the last few years will lead to any different outputs than the irrigation schemes from the 1970s period.

BIBLIOGRAPHY

- ATKINSON R.R. (2010), *The Roots of Ethnicity: Origins of the Acholi of Uganda Before 1800*. 2nd Edition, Kampala, Fountain Publishers, 382 p.
- COCHET H. (2015), *Comparative Agriculture*, Springer Netherlands, Quae, 154 p.
- COWARD E.W. (1980), "Irrigation Development: Institutional and Organizational Issues", in COWARD E.W. (ed.), *Irrigation and Agricultural Development in Asia: Perspectives from the Social Sciences*, Ithaca and London, Cornell University Press, pp. 15-27.
- ENSMINGER J. (1992), *Making a Market. The Institutional Transformation of an African Society*, Cambridge, Cambridge University Press, 230 p.
- FAGGI P. (1990), "Les développements de l'irrigation dans la diagonale aride entre logique productive et logique stratégique", *Revue de Géographie de Lyon*, 65, 1, pp. 21-26.
- FINNSTRÖM S. (2008), *Living with Bad Surroundings: War, History and Everyday Moments in Northern Uganda*, Durham, London, Duke University Press, 286 p.
- GAY L., TORRETTI C. (2015), "Territorialisation des marais d'Olweny en Ouganda : luttes de pouvoir, politiques agricoles et environnementales", *L'Espace Géographique*, 45, Belin, pp. 147-159.
- HÄLLER T. (2010), *Disputing the Floodplains: Institutional Change and the Politics of Resource Management in African Wetlands*, Leiden, Brill, 452 p.
- HOPWOOD J., ATKINSON R.R. (2013), *Land Conflict Monitoring and Mapping Tool for the Acholi Sub-region: Final Report*, Kampala, Human Rights Focus & United Nations Peacebuilding Program, 95 p.
- LAMWAKA C. (2016), *The Raging Storm: A Reporter's Inside Account of the Northern Uganda War 1986-2005*, Kampala, Fountain Publishers, 463 p.
- LUCIYAMOI L.L. (1970), *Relation Between Traditional Farming and Social Structure in Acholi*, Kampala, University of Makerere, Faculty of Agriculture, BSc Dissertation, 95 p.
- MOSSE D. (1997), "The Symbolic Making of a Common Property Resource: History, Ecology and Locality in a Tank-irrigated Landscape in South India", *Development and Change*, 28, pp. 467-504.
- MWENDA A. (2010), "Uganda's Politics of Foreign Aid and Violent Conflict: the Political Uses of the LRA Rebellion", in ALLEN T., VLASSENROOT K. (eds.), *The Lord's Resistance Army: Myth and Reality*, London, New York, Zed Books, pp. 45-58.
- OSTROM E. (1990), *Governing the Commons: the Evolution of Institutions for Collective Action*, Cambridge, Cambridge University Press, 280 p.
- OSTROM E. (1992), *Crafting Institutions for Self-Governing Irrigation Systems*, San Francisco, ICS Press, 111 p.

- PESTRE D. (éd.) (2014), "Néolibéralisme et gouvernement. Retour sur une catégorie et ses usages", in PESTRE D. (dir.), *Le gouvernement des technosciences. Gouverner le progrès et ses dégâts depuis 1945*, Paris, La Découverte, pp. 261-284.
- RIST G. (2014), *The History of Development: From Western Origins to Global Faith. Fourth Edition*, London, Zed Books, 320 p.
- TOSH J. (1978), *Clan Leaders and Colonial Chiefs in Lango: The Political History of an East African Stateless Society c. 1800-1939*, Oxford, Clarendon Press, 293 p.
- TORRETTI C. (forthcoming), *The Political Agronomy of the Ugandan Public Irrigation Policy*, Mambo, IFRA Working Paper.
- UBOS (2016a), *The National Population and Housing Census 2014. Main Report*, Kampala, Government Printer, 94 p.
- UBOS (2016b), *The National Population and Housing Census 2014. Subcounty Report. Northern Region*, Kampala, Government Printer, 328 p.
- UPHOFF N., MEINZEIN-DICK R. & ST-JULIEN N. (1985), *Getting the Process Right: Farmer Organization and Participation in Irrigation Water Management*, Ithaca, Cornell University, Consortium for International Development USAID Contract, 155 p.
- VINCENT L. (1995), *Hill Irrigation. Water and Development in Mountain Agriculture*, London, Intermediate Technology Publications, 232 p.
- WATSON J. M. (1952), "The Agoro Systems of Irrigation", *The Uganda Journal*, 16, 2, pp. 159-163.

NOTES

1. Various geographers (among them, Marina Bertoncin, Andrea Pase, Paolo Mozzi, Jacques Bethemont, Tanga Pierre Zoungana) studied such schemes through the concept of hydraulic territorialization elaborated by Pierpaoli Faggi. The latter focuses on analysing how the state materialises through irrigation technology in order to build on legitimation (Faggi, 1990). In northern Uganda, the political dimension of the Agoro and Olweny schemes appeared to be a strong factor influencing conceptualisation and implementation of such projects (Gay & Torretti, 2015; Torretti, forthcoming).
2. In Uganda, the agricultural sector contributed to about 25% of the Gross Domestic Product in 2015 (Source: World Bank, 2015), while about 70 to 80% of the population lives in rural areas (UBOS 2016a).
3. This dynamic has been accentuated since the late 1990s by the paradigm of liberalization promoted by international institutions which involves the agricultural sector as well: by including rural producers into a global market, economic growth is expected to be stimulated for their benefit (Rist, 2014; Pestre, 2014). The agri-business model developed since then is broadly understood as conducting agriculture based on commercial principles (among them, market oriented and value chain approaches for instance) with less consideration given to the cultivated land environment (crop rotation and/or association, crop calendar and/or adaptability to one climate, etc.), the latter were supposedly monitored by the use of the said Green Revolution package (improved seeds and chemical inputs among other practices). See Cochet, 2015 for a more general understanding of comparative agriculture and the evolutionary theory of agrarian systems.
4. Research on irrigation systems mainly developed since the 1980s when repeated failures of large-scale development projects highlighted the necessity of a better understanding of farming

systems and indigenous irrigation. See Coward, 1980; Uphoff *et al.*, 1985; Ostrom, 1990, 1992; Vincen, 1995 ; Mosse, 1997 among others.

5. Source: National Environment Management Authority, 2009.

6. In Lango and Acholi, a clan is understood as an exogamous group following patrilineal descent.

7. Inter-village raids broke out when the massive rinderpest which occurred in late 19th century in East Africa decimated about 90% of livestock, leading to high competition for cattle (Tosh 1978).

8. Between 1980 and 2014, population of Lira town (Lango) increased from 9,000 to 100,000 inhabitants, while in Kitgum and Gulu towns (Acholi) it increased from 5,000 and 15,000 inhabitants to 75,000 and 150,000 (UBOS 2016b).

9. This decision was made due to the newly established National Environment Statute (1995) which, in order to preserve wetlands and their biodiversity, prohibits any construction leading to disruption of the hydrological cycle. The new design that came with the rehabilitation in 2014 bypasses the law with upgraded retentive dams and cemented water canals.

10. During the wet season those *joro* are left due to frequent floods of the streams.

11. Thus, out of the four clans located in Rudi involved in the scheme, only two claim kinship with the clans living in Pobar parish.

12. Consequently, the current administrative boundaries within the Agoro sub-county do not follow the historical ones as the Okura river is not the demarcation between Rudi and Pobar parishes. Furthermore, the administrative boundary now borders the western limit of the irrigation scheme, and includes the head water infrastructures such as the dam and night storage within the parish of Pobar. It is likely that this is the result of power balance benefiting the aristocratic ruling clan of the Pobar chiefdom. Indeed, in an area where land falls under customary land tenure, administrative territories reflect historical ones until high demography leads to new administrative units creation. This new demarcation would likely significantly help to support any claim potentially formulated by Pobar's clans over the irrigation scheme in case of major land conflict.

ABSTRACTS

Large-scale irrigation started in Uganda in the 1970s. In post-conflict northern Uganda, irrigation schemes in the Olweny Swamps, Lango region and in the Agoro Hills, Acholi region reflect strong strategic issues. Coupled with technocratic and top-down implementation, they aim at creating new territories focusing on rice production. This paper uses the institutional change approach developed by Tobias Häller to analyse changes induced by those irrigation schemes on indigenous resources management in a wide historical context. In both cases, sustainability of resources management seems to have been weakened by various degrees. This is as a result of not only the project itself but also from the disruption of indigenous institutions, initiated since colonialism and reflected by distinct postwar coping dynamics. Indeed it turned out that disruption impacts vary according to local context, even in regions often said to share high degrees of historical, cultural, and environmental homogeneity by international donors as well as government agencies.

L'irrigation à grande échelle a débuté en Ouganda dans les années 1970. Dans le nord ougandais, en situation post-conflit, les projets d'aménagement des marais d'Olweny en région Lango et des monts Agoro en région Acholi reflètent de forts enjeux stratégiques. Associés à une mise œuvre

technocratique et par le haut, ces projets visent la création de nouveaux territoires centrés sur la production rizicole. Cet article utilise l'approche par le changement institutionnel développé par Tobias Häller afin d'analyser les changements induits par ces projets sur la gestion autochtone des ressources naturelles dans un contexte historique large. Dans les deux cas, la durabilité de la gestion des ressources a été affaiblie à différents degrés. Ceci est le résultat non seulement de l'implantation des projets en eux-mêmes, mais aussi dû à la déstructuration des institutions autochtones, initiée depuis le colonialisme et illustrée par différentes dynamiques d'adaptation post-conflit. En effet il apparaît que l'impact de tels changements varie en fonction du contexte local de ces régions souvent décrites comme partageant une histoire, une culture et un environnement fortement homogènes selon les donateurs internationaux comme les agences gouvernementales.

INDEX

Keywords: Uganda, development, rice, irrigation scheme, indigenous resources management, post-conflict

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