

**THE LAND AS A CASUALTY:
SOIL, CATTLE, AND THE FUTURE IN SOUTH KIVU, DRC**

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INTRODUCTION

Since 1996, the Congolese wars have brought millions of farmers to the brink of disaster and demanded unbelievable feats of survival. The eastern Democratic Republic of the Congo remains a broken land struggling to regain its future, while the mechanisms of its destitution persist, little studied. This work, based on field research in two Bashi areas of the South Kivu highlands, seeks to understand communities in crisis from the soil up, and their hopes - and actions - for a new start. With a review of the region's recent history, we will investigate how exploitative pre- and post-independence land policies pushed traditional farming into a position of increased vulnerability and diminished sustainability, where cattle and their manure became an essential component to make possible the intensive cultivation of small plots without fallows. This left households open to a complete breakdown of sustainable practices during the wars, when armed groups and disease decimated cattle, and existing social forms of access withered. From the perspective of farmers, who employ a broad view of soil fertility, among the casualties of war were not only people and cattle but the land itself, which suffered enduring scars. Believing that traditional farming offers little but memories of productivity, farmers of South Kivu are engaged in a desperate search for a new, modern basis for livelihoods. This is displayed in both a rush to educate children so they may leave the crippled land behind, and in a creative search for mutually sustaining solutions which social networks can implement in lieu of outside support. This latter initiative is experiencing a striking proliferation and carries true hopes of rising above the individualistic survival ethos of wartime.

METHODOLOGY

The primary basis of this study is field research conducted in South Kivu in April and May of 2008, in the two *groupements* of Luhihi in Kabare and Burhale in Walungu (see Figure 1), as well as among absentee ranchers and staff of small regional NGOs in the provincial

capital of Bukavu. The study was conducted in partnership with the Consortium for Improving Agriculture-based Livelihoods in Central Africa (CIALCA), a project that brings together international (IITA, TSBF-CIAT, Bioversity) and national research partners and NGOs in the DRC, Rwanda, and Burundi. Interpretation and input were provided by two students from Université Catholique de Bukavu, Judith Nyakabasa and Martin Tutu Ramazani, training in socioeconomics and agronomy respectively. Ms. Nyakabasa is a native of Burhale, but from a household located outside the villages where research was conducted.

My research drew on several sources. I conducted extended semi-structured interviews with households randomly sampled from a 2006 census created by CIALCA in collaboration with village heads; these samples totalled 25 households in each *groupement*, divided between 5 villages in each representative of population share. 19 in Luhihi and 23 in Burhale were successfully interviewed to the exclusion of some who had moved out of the village or could not be located. Starting with these informants, I continued with a network sample of former and current cattle owners, farmers active in associations, traditional authorities, and households judged by other informants to have been particularly impacted by conflict. Most of these interviews were conducted on site in farmers' compounds or fields, and involved roughly equal numbers of men and women.

Supporting the information derived from these interviews are the results of CIALCA's baseline survey conducted across the region in 2006. This extensive survey of 1800 farming households in the DRC, Rwanda, and Burundi included 103 households in Luhihi and 100 in Burhale. As this survey offers a much more robust source of quantitative data than my own smaller samples, I employ my own analysis of these baseline results throughout. None among my informants had been involved in this survey, nor in recent data collection by any other organisation.

Table 1: Household characteristics in CIALCA baseline sample

	Luhihi	Burhale
Sex of respondent		
Male	52	67
Female	48	33
Household type		
Male headed, one wife	75	74
Male headed, more than one wife	10	10
Female headed, widowed	14	15
Other	2	1
Occupation of respondent		
Farming	91	93
Other	7	7
Occupation of spouse		
No spouse	16	21
Farming	74	65
Other	11	14

N=103 N=100

CIALCA 2006 baseline survey

SOUTH KIVU AND BUSHI

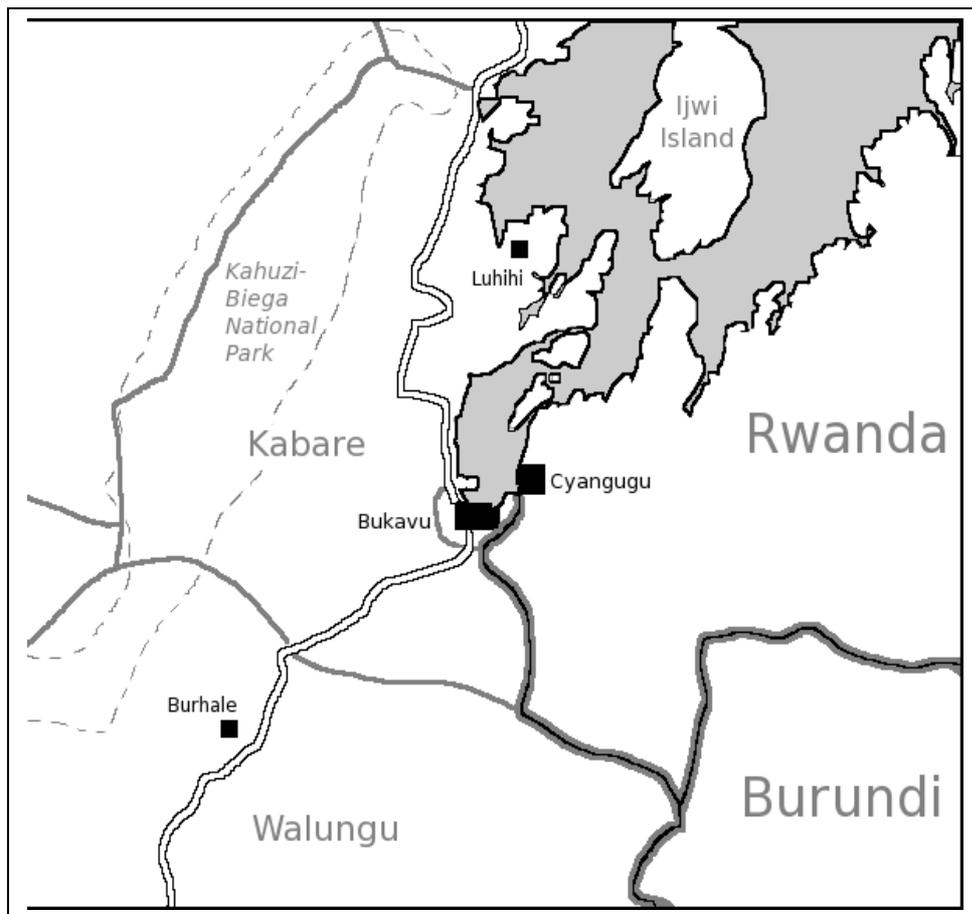
Lying on the remote inland edge of Africa's third largest country, South Kivu is itself one of the smallest of the DRC's provinces, roughly matching the combined size of the tiny bordering states of Rwanda and Burundi. The province's land, spanning the highlands and lowlands between the Congo Basin and the Great Lakes Kivu and Tanganyika, ranges from young and relatively fertile volcanic soils, to the impoverished red clayey Ferralsols and Nitisols familiar from rainforests around the world, to dry pastoral plains. Population density, on the other hand, is very high in most areas - among the highest in the DRC. The agricultural and pastoral pressures on South Kivu's quite variable land resources are in many cases extreme.

A diverse province even by the standards of the central African highlands, South Kivu is home to a great number of languages and tribal groups. The *territoires* of Kabare and Walungu, the focus of this study, are administrative regions formed after independence out of the colonial Kabare, which itself resulted from the melding of the four major kingdoms of the Shi (Schoepf and Schoepf 1988:124). We can thus say very broadly and imprecisely that modern Kabare and Walungu *territoires* - along with the provincial capital of Bukavu - represent the traditional Bushi, lands of the Shi tribes. The people of

this group are known as Bashi, and their language is Mashi. Aside from their language, Bashi identify strongly with certain types of food production: as summed up by one informant, “being Bashi means cows, bananas, and hoe farming.”

Below the *territoire* level, the next administrative unit is the *groupement*, small collections of villages surrounding a central community in which the *Chef de Groupement* resides. The current research took place in the *groupements* of Luhihi in Kabare and Burhale in Walungu, encompassing six villages in each. These were chosen from among the eight sites in which CIALCA had already collected baseline data, and were selected for their widely divergent geographies and histories.

Figure 1: Location of the study sites in Kabare and Walungu *Territoires*



Luhihi *Groupement* lies on a secluded stretch of the shore of Lake Kivu north of Bukavu at around 1,500 metres elevation, cut off from the main Bukavu-Goma road by a volcanic ridge. One must enter and exit the villages via a long track circling far to the north. Certain villages are even more isolated, established on a series of peninsulas in the lake. One peninsula, site of the village of Mwirunga, is partially taken up by a coffee plantation belonging to a Rwandan who lives in Europe. The soil here is a younger volcanic soil than in most parts of South Kivu, and is considered especially fertile. The major crops are beans, cassava, soybeans, and bananas. Despite the natural productivity of the soil, however, land use is intensive and fallowing is rare. In baseline data, the average field size was only a third of a hectare and 68% of households farmed on less than a hectare in total (Table 2). Under these conditions it is hardly surprising that respondents reported their fields had been in continuous cultivation for an average of eighteen years.

Burhale *Groupement* sits at a similarly high elevation (almost 1,700 metres) to the south of Bukavu, but unlike Luhihi its villages lie on a low ridge alongside a main road, making access easy. Parts of this ridge are also plantation farmed; Pharmakina, a Bukavu-based quinine producer with German and French owners, grows cinchona here, and other areas are given over to a Catholic parish concession. Locals complain that these two together take up more land than is available to all other farmers. The soil comprises relatively old Nitisols which when stripped of forest cover rapidly lose fertility. Degradation of the land is visible everywhere in erosion washes and nutrient deficient crops. Unfortunately, here household land holdings are even smaller than in Luhihi, with an average field size of under .3 hectares and less than a quarter of households claiming a full hectare or more (Table 2; the mean household total reported similar for both *groupements*, however, pointing at a less equal distribution in Burhale). The most important crops are cassava, sweet potatoes, and beans, with almost no soybeans to be found. In contrast to the deep banana groves of Luhihi, here banana trees exist only in small stands around compounds.

Figure 2: Map of Luhihi Groupement

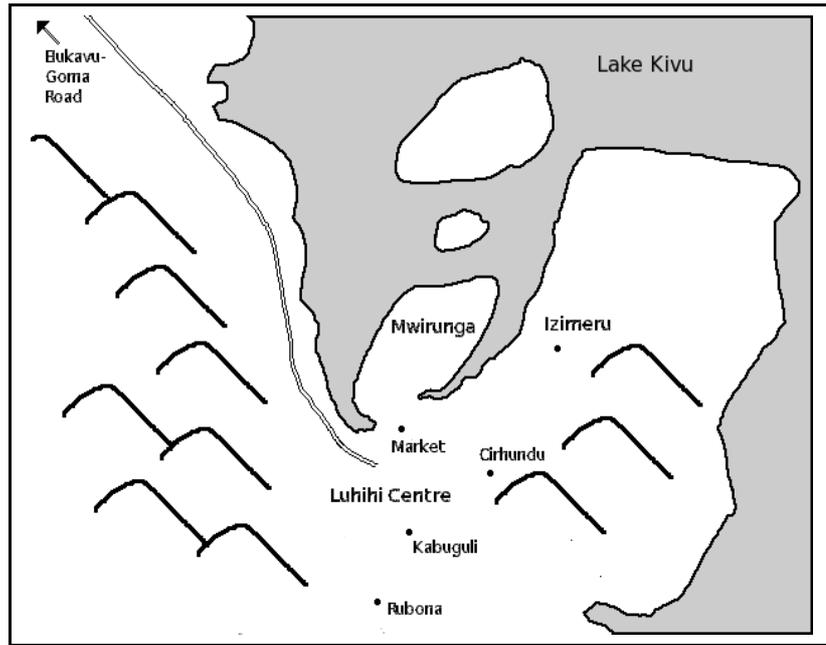


Figure 3: Map of Burhale Groupement

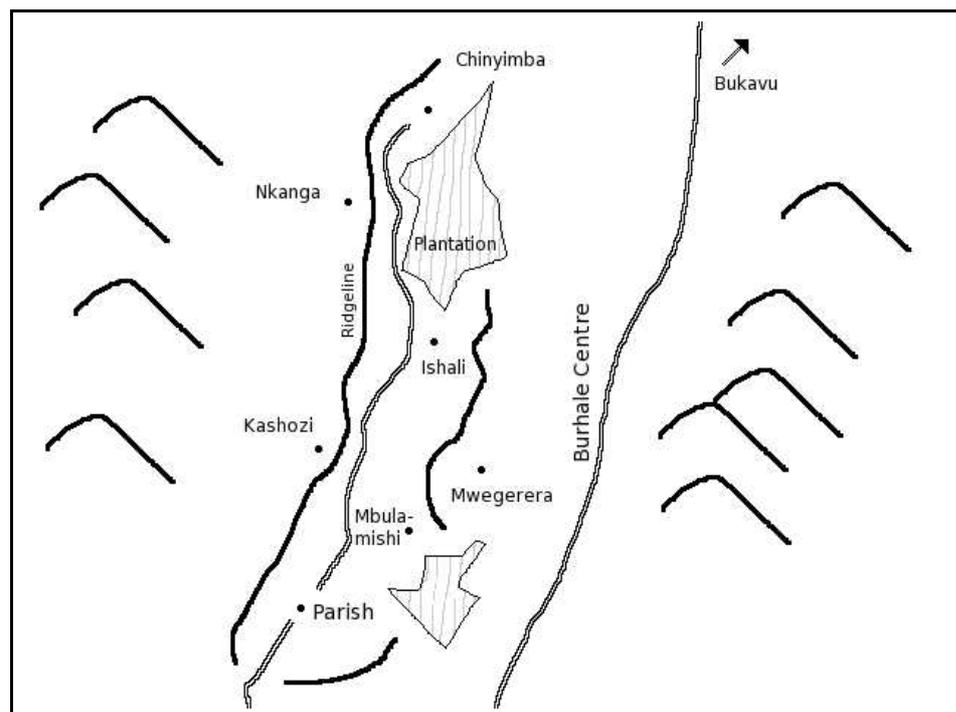


Table 2: Household land holdings

	Luhihi	Burhale
Mean household total land holdings (ha)	0.82	0.86
σ	1.01	1.78
Skew	2.36	3.87
Percentage of households with >1 ha total	32	22
Number of fields per household	1.56	2.94
σ	1.57	2.23
Skew	1.12	0.56
	<i>N=103</i>	<i>N=100</i>
Mean size of field (ha)	0.35	0.29
Mean years of reported continuous cultivation	18.4	19.35
	<i>N=239</i>	<i>N=294</i>

CIALCA 2006 baseline survey

WAR IN SOUTH KIVU

The eastern Democratic Republic of the Congo has been in a state of almost continual instability and periodic violence since 1996. The first Congolese war of 1996-97 soon spawned the second, which began in 1998 and became the largest and deadliest conflict since the Second World War (Turner 2007). From a series of five wide-ranging epidemiological studies, the International Rescue Committee has

estimated that 5.4 million excess deaths resulted between the start of the second Congolese war in 1998 and 2007. The national crude mortality rate remains 57 percent higher than the sub-Saharan average; the researchers estimate that 2.1 million of these deaths have occurred since the formal end of hostilities in 2002 (Coghlan et al. 2007).

The fact that conflict did not end with the Lusaka peace agreement in 2002 is made clear in the *groupement* of Burhale. Both the 1996 and 1998 wars sprang to life in areas very near to these villages (Turner 2007). Residents also speak, however, of a “third war” in 2003 which was the most destructive by far. In April of that year, the Rwandan army and the rebel Congolese Rally for Democracy (RDC) arrived seeking out members of the Bashi militia Mudundu 40, a former ally. They wrought devastation on Burhale, burning and firing upon huts, pillaging the school, hospital, and parish church, and allegedly ordering all males over the age of five put to death (Agence France Presse 15 April 2003). It was in this year that the villages' deepest and freshest wounds were inflicted. In CIALCA's baseline survey of 100 households, 4 experienced deaths, 2 suffered injuries, 20 were displaced, 18 abandoned their fields, and 27 lost goods to the ubiquitous looting (Table 3). Many families fled to other villages or into the bush, leaving their compounds to be used as camps and larders by the soldiers.

Table 3: Households impacted by the conflict

	Luhihi	Burhale
No effects	92	44
Lost member(s) of the household	-	4
Injuries or handicaps in the household	-	2
Lost goods	4	27
Displaced by forces	3	20
Abandoned fields	1	18
Other consequences	2	-
	N=103	N=100

CIALCA 2006 baseline survey

Luhihi rested in the eye of the storm while Burhale suffered in its teeth. Almost no households reported any losses or displacement. Its sheltered location protected it from most direct military conflict,

leaving it to deal with refugees from far and wide, an influx of small arms and criminality, the dissolution of local markets, and the decade-long absence of the Congolese state. As extension services, health care, infrastructure maintenance, and other government programs vanished countrywide (Nest et al. 2006:33), even relatively peaceful villages such as Lulindi were left to fend for themselves while the war raged elsewhere.

According to Vlassenroot et al. (2006:57), the decapitation of the Congolese state left room for new parallel governance structures based on monopolistic military and economic strength. Sometimes building on the co-option of existing informal markets and smuggling, these actors included militias, ethnic organisations, and even foreign governments. Many households had to re-negotiate access and entitlements with these structures, which in much of the country meant disinvestment in agriculture to the advantage of mining activities, routes that promised quicker and less risky returns (Collier 2000). While economic data shows varied trends in different sectors and some areas actually saw increased investment after the unseating of President Mobutu, the only clear outcome was a decline in the formal agricultural sector, source of some 50% of the nation's GNP (Nest et al. 2006:34). Many important food-producing regions became food importers. This flight of labour to mining was especially pronounced in the Kivus and Province Orientale, and was accompanied by a diversion of food to mining enclaves that persists today (Nest et al. 2006:104).

Meanwhile, market entitlements suffered amid checkpoints, armed intimidation of marketers, and the fracturing of the region into a shifting patchwork of autonomously controlled areas (Nest et al. 2006:104). Farmers were often kept from their fields, either because of fear, displacement, or the enforced curfews some combatants used to prevent villagers collaborating with their enemies (Human Rights Watch 2000).

The IMF predicted in 2004 that it will take the DRC 45 years to reach the levels of development last seen in 1990 – not a stellar year by any stretch, but the last year when minerals from Katanga provided large contributions to national coffers (Akitoby and Cinyabuguma

2004:201). Depending on who one asks, the post-war healing process is either a slow and tortuous one, or has not in fact begun at all.

Steadman et al. (2002:55) listed the most common factors subverting peace-building efforts of the past and present: state collapse, multiple belligerents, more than 50,000 armed combatants, hostile neighbouring states or regional networks, and disposable natural resources. All of these increase opportunities and incentives for peace-spoiling, and all exist copiously in the eastern DRC.

EXTRICATING THE CONFLICT

It is attractive to look at this study as a comparison of two *groupements*, one impacted by conflict and one shielded from it, with the purpose of measuring the war's toll. Such a conceptualisation implies that Luhiri is a glimpse back at Burhale before the war, or Burhale as it might now be in an alternate, peaceful world. I shall avoid this "natural experiment" approach for a number of flaws.

As Pottier (1999:173) points out, "development narratives and discourses thrive on explanations marked by attractive simplicity." This is seldom more true than in post-conflict recovery, where the conflict itself is the favoured culprit for any given ill. It's easy to see South Kivu as a land torn apart by years of horrific war, and this it most certainly is, but the basic vulnerabilities which led to much of the suffering and household destitution during and since the wars have deeper roots, extending to before the collapse of Mobutu's Zaire and even to the colonial decades. In fact, many of the factors constraining the recovery of livelihoods in the region were well recognised long before the 1990s, though these have been joined by a new structural failure of mixed farming which has rendered the situation even less sustainable.

TRADITIONAL BASHI FARMING AND LAND ACCESS

Miracle (1967) collects reports by a number of Belgian agronomists and veterinarians on Bashi agriculture in the late 1950s. At this time the region, still bearing its natural cover of high grass, already supported a population ranging from a minimum of 15 persons per square kilometre to over 25 in many areas (Van de Walle 1960). The principal crops in order of acreage were bananas, cassava, beans, sweet potato and sorghum (Hecq and Lefebvre 1959). Cattle and small livestock were kept throughout, often in large herds. These cattle were responsible for one of the defining characteristics of the region's mixed farming, a greatly reduced dependence on fallowing in main fields near the homestead. When main fields were fallowed, it was for a much shorter period than in classic long-fallow systems, and farmers would often simply plant sweet potatoes or bananas as alternative means of resting the land. In addition to the manure that made semi-permanent cultivation possible, cattle also provided milk, and together with goats and chickens were the main currency of social exchanges (Schoepf and Schoepf 1988:108). As in many other regions, livestock were the single most important determinant and symbol of wealth (Vlassenroot et al. 2006:35).

The farming system was, however, more properly characterised as an infield-outfield system: while farming some homestead plots more or less permanently with manure, farmers also planted more distant, unfertilised fields on a shifting basis when required (Miracle 1967:143). These were often on bottom lands and steep slopes otherwise given over to pasture or woodlots; farmers historically preferred to settle on the fertile upper contours of the hills. These outfields allowed for greater diversification of crops under varied conditions, an important mechanism of resilience built into the system (Van Acker 2000).

The flexibility of infield-outfield farming was mirrored in traditional forms of land tenure. From the 19th century Kivu was politically centralised in small states with stratified, almost feudal social structures. The *Mwami* (King; plural *Bami*) ultimately owned

both land and livestock; access was handed down through the hierarchy and regulated by kinship and clientship. Farmers paid rents in labour, production, or both. A long term, patrilineally inheritable contract known as *kalinzi* safeguarded rights to farm and live on land. It also served to tie tenants socially and politically to the *Bami* and their subordinate chiefs, defining the farmer as a part of the chiefdom (Schoepf and Schoepf 1988:107).

For short term cultivation of the sort practised in outfields, landlords granted a contract called *bwasa* lasting for only a year or a season. While *kalinzi* offered a source of secure land for establishing permanent farming, *bwasa* provided extra land for shifting agriculture, often on slopes or marshland. *Bwasa* contracts also gave - and in some cases continue to give - women independent tenure over their own land. Only their access to male labour for clearing the land limited their ability to farm (Fairhead 1990).

THE RISE OF PLANTATIONS IN KABARE

The colonial and post-colonial history of South Kivu is a story of shrinking access to land for farming households. During the half century of the Belgian Congo, the Bushi region developed into the heart of the so-called Savanne food economy zone, producing food for the city of Bukavu (Vlassenroot et al. 2006:35). It also, however, soon became a centre for plantation crops such as cinchona for quinine, chrysanthemums for pyrethrin insecticides, tea, and coffee. Agricultural speculation began in Kivu in the 1920s, and by the start of the 1930s almost 20,000 hectares of prime land had been allocated for plantations, largely in European hands. The majority of this land was in the *territoires* of Kabare and neighbouring Ngweshe, along the roads to Bukavu (Bashizi 1978, quoted in Schoepf and Schoepf 1988:108). In 1952, the administrator of Ngweshe warned that the region had become "saturated" with industrial crops (Bosmans 1981, quoted in same). At the same time, Kabare's population had boomed from 15-25 persons per square kilometre in the 1950s to 232 persons in 1981

(Zaire 1981).

This “saturation” may have been part of the plantation owners’ plans. Fairhead (1990) maintains that under normal Kivutien circumstances, commercial production using wage labour was rarely profitable. Viable large scale agriculture relied wholly on the availability of cheap labour. Across Kivu, many large landowners extended their holdings into traditional village lands, intensifying competition for the remaining suitable fields and driving more landless farmers into the arms of the plantation. In this way they used their control over the land to reshape the local labour market.

Both Fairhead and Schoepf and Schoepf (1987) documented this dynamic post-independence in the 1980s. Amid the profound economic crisis of the Mobutuist state, there was nevertheless a renewed scramble for large tracts of plantation land. In 1985, plantations occupied a reported 65% of the best land in Kabare (Schoepf and Schoepf 1988:112). Fairhead names the new actors as “self-financing projects of church organisations, the urban entrepreneurial elite, the *Bami*, and national (often Kinshasa) politicians.” In uncertain times, they aimed to store and accumulate wealth in land and often in cattle; ranching achieved a new popularity.

Cattle ranching and plantation farming alike continued to depend on, and create, cheap labour. Van Acker (2000) highlights the under-use of plantation land: of 10,273 hectares included in a survey of Kabare plantations in 1984, only 7,813 hectares were used for commercial cropping. The remaining – generally unproductive – land was, on the one hand, simply acquired as a tactic to monopolise access and foster cheap labour, and on the other hand, given to labourers to farm as payment. This constituted a new adaptation of the customary *bwasa* tenure system: rather than offering tribute to the chieftain for short term use rights, farmers traded their labour to the plantation. “The new social actors,” Van Acker writes, “maintained the customary separation of use rights and benefit rights, and as a consequence failed to create the conditions for an effective factor market for labour.” Coming as it did at the expense of the most fertile agricultural land, this new system proved a poor alternative for many farmers.

THE SYSTÈME D OF LAND

The dynamics of co-option and exploitation wrought on a large scale by plantation farming in South Kivu existed throughout the Zairean state at many levels. The slogan behind such strategies was iconically Congolese. In 1960, during the brief dawn of independence, a short-lived secessionist empire arose in mineral rich South Kasai. Its emperor Albert Kalonji, harried by refugees from neighbouring provinces, announced his social policy: "*Vous êtes chez vous, débrouillez-vous.*" This is your home, so fend for yourselves (Wrong 2001). Through the next half century of turmoil, "*Débrouillez-vous!*" took on the weight of law - or common sense. *Système D*, the economics of survival, became the *de facto* organising principle of the nation.

In South Kivu, growing ever more isolated in Mobutu's Zaire, *débrouillez-vous* "became understood as an injunction to get by without the state... an arena of escape from the predatory dialectics of Mobutu's regime" (Jackson 2002). While it represented freedom for some, *Système D* was hardly a wholly beneficial replacement for state infrastructure or for customary land access systems. The *kalinzi* system allowed for redistribution of rents through the system and the production of social capital, public goods the new "system" could not provide (Van Acker 2000).

Kalinzi more or less came to an end in 1973 with the introduction of a modern land law which made the full value of rents available to its owners, ushering in the true *débrouillement* of land. Owners gained their position by capitalising on networks of political power unrelated to the social capital of the customary system, excluding many would-be landholders. Amid the mass procurement, the reciprocal and stabilising elements of *kalinzi* fell by the wayside and the traditional framework folded. To capitalise land, chiefs had to eschew the hereditary and patriarchal trappings of *kalinzi*. In many cases this simply meant declaring the land vacant, an action well within their power. Having brought the land back into their legal possession, the chiefs could

either sell it or turn it over to *bwasa* contracts. *Bwasa* allowed for greater control over the land and the extraction of a rent more commensurate with its productive value; thus this short-term contract was the only customary arrangement to survive the 1973 shift (Van Acker 2000).

As notions of land became individualised, it passed down the hierarchy in ever smaller bundles until single people and households held the titles (Fairhead 1990). New land pressures strained the system of male inheritance, leaving many without land. Van Acker paints this state as more than simple landlessness, as land was the traditional route to social integration. This new landless class had few options: cultivating *bwasa* land, or selling their labour to plantations, illegal mining, or smuggling operations.

At the household level, changes in land use manifested themselves in shifting priorities. *Système D* dictated that farmers capitalise in order to access services; to this end, they began reserving the best and most secure – i.e., privately owned – homestead land for cash crops, often perennials, the most popular being beer bananas. Food crops drifted to the more distant fields, often *bwasa* plots. This new take on the infield-outfield farm offered none of the multivarietal food cropping diversity of the old. Resilience and food security suffered.

An analogous loss of diversity took place in the markets, as observed in Bwisha, North Kivu, by Pottier and Fairhead in 1988. Up to the 1960s and 1970s, women traders carried food to areas experiencing hunger to take advantage of price differentials. These exchanges occurred across elevations and ecological regions and served to keep supplies available in the event of poor harvests. In 1988, bulk carriers supplying distant urban populations became the major destinations for traders. It was the schedules of these lorries, not hunger, that dictated trade (Pottier and Fairhead 1991). One can easily imagine a similar breakdown of local food networks in the “Savanne food economy zone” supplying the city of Bukavu.

Data from a 1981-1982 survey of four villages of Mulungu, Kabare – on the main road near Luhihi – show the cumulative effects of

land pressures (Schoepf 1982). Schoepf posits that the shrinking of total land holdings seemed to proceed apace with a reduction in the number of plots per household, diminishing access to ecological diversity. Still, he observes, households were making every attempt to obtain dispersed plots. Comparing Schoepf's results with more current data from Luhihi and Burhale, total land holdings appear similar; it is this factor of multiple fields, so important to food security, that seems to have suffered in the interim.

Table 4: Land holdings, 1982-2008

	Mulungu 1982	Luhihi 2006	Burhale 2006	Luhihi 2008	Burhale 2008
Average household size	5.2	7.49	7.01		
Average total land holding	0.83	0.82	0.86		
Average number of fields	3.6	1.56	2.94		
% with > 1ha	33	32	22		
% practising <i>bwasa</i> *	13			16	26

(Schoepf 1982)

(Cialca 2006)

(Author's data)

* The baseline questionnaire did not account for *bwasa* practices.

In the 1982 Mulungu study, 16% of males were regular wage labourers, more than half in agriculture. Another 36% reported seeking paid work. Fewer than 1% of females were regularly employed off-farm, but many worked seasonally picking tea in the plantations. On the farms, respondents reported declining crop yields despite the use of manure and compost. Fallowing had virtually disappeared from the system. Schoepf estimated that even utilising intensive cultivation, nearly 90% of farmer households simply did not have enough land to support a family of five. In 1981, a physician working in the region noted that despite highly successful health and nutrition programs, the signs of clinical malnourishment showed a steady increase over the preceding two years. In Walungu and Kabare, he deemed virtually the entire population to be insufficiently nourished (Vuysteke 1981, quoted in Schoepf and Schoepf 1988:109).

The changes wrought by land policies before the wars placed many farmers in states of extreme vulnerability, exploited by employers, tied to distant markets, and clinging to shrinking plots of

second-rate land as they struggled to live up to the ideal of “fending for themselves.” The reimagining of land not only left households susceptible to the fallout of war, it also deepened the multifarious resentments that gave the conflict much of its ferocity, and made control over land a key dynamic of the war itself (Vlassenroot et al. 2006:61). As fighting forces and militias exercised political control by forcibly occupying villages and fields, driving rural populations to flight and destroying the bases of their productivity, *Système D's* self-serving tactics of alienating farmers from their land became weapons of war.

CATTLE AND CONFLICT

In times of protracted conflict, the most valuable of assets can become dangerous possessions. Investments which ordinarily serve to mitigate risk can attract attention from military forces and looters. During wars and in uncertain post-war years, the positive attributes of good fortune associated with expensive, portable assets are turned on their heads (see Brück 2005 on disinvestment in cattle in post-conflict Mozambique, where numbers declined from 1.3 million to 0.25 million in ten years; and Bundervoet 2007 on Burundi, where even wealthy households who could afford the risks of keeping cattle turned away from the activity in conflict regions).

In South Kivu one of the largest and most valuable physical assets to which farmers aspire, second only to land itself, is the cow. Cattle were once the definitive measure of prosperity and livelihood security. From 1996 on, however, soldiers, guerillas, and armed thieves preyed on cattle and other livestock populations across the eastern Congo. The full scale of the loss has not been fully documented. In the Burhale baseline survey, 8% of all households reported the plunder of their cattle in the conflict, a percentage nearly 1/3 the size of the current cattle owning group. Even greater numbers of households lost goats: 34%, a larger percentage than those now owning them. In

Luhihi, with most of its cattle consolidated in sheltered pasture, no households reported losses of cows to war and only a handful claimed the pillage of goats (Table 5).

Table 5: Livestock ownership and looting

	Luhihi (%)	Burhale (%)
Households currently owning any cows	11	29
Households currently owning any goats	36	32
Households who reported cows looted during the war	-	8
Households who reported goats looted during the war	4	34
	<i>N=103</i>	<i>N=100</i>

CIALCA 2006 baseline survey

In both *groupements*, however, many more informants spoke of livestock lost to disease during a time when extension services disappeared and medicine, if available at all, rose to impossible prices. These conditions largely persist in the region, and deaths continue. When a household keeps multiple cows and cannot access immunisations or treatment, sickness in one cow can easily lead to the loss of the whole herd, removing the household from cattle-raising altogether. One such young farmer of Luhihi lost all four of his cows between December 2007 and May 2008, the month of the interview. He equated the symptoms with malaria - a widespread disease in the human population of this area - and blamed the deaths on the unavailability of veterinary drugs. Cattle owners invariably blamed the deprivations of the war for widespread disease mortality since 1996. This is congruent with the International Rescue Committee's estimations of human excess mortality in the wars, which attributed less than 10% of excess deaths to violence, with most of the remainder resulting from infectious diseases in light of the destruction of health and sanitation infrastructure (Coghlan et al. 2007). Like the epidemiologists, farmers recognise disease as part and parcel of war.

When soldiers did seize cows in Burhale, the encounters were in a context of flight. Families who successfully fled with their cattle and continued to evade run-ins with armed forces were the ones who retained their livestock.

If the soldiers came in the day, the boy watching the cows on the pasture would run away and leave them out there, where they might be collected later. But if it was at night they would be at home.

Most families in Burhale fled the village at some point, especially in 1996 and in 2003, sometimes for a matter of months. With sufficient warning, they were able to take their cattle with them or simply hide the cows in the bush. Owners who employed cowherds found the latter tactic particularly useful.

In 2003 soldiers stayed at this house. We left to stay with family but when we returned the soldiers were still here and forced us to feed and cook for them. The soldiers ate all the production from our fields that year. But our cowherd took our cows to the mountain.

Those with family in other villages could lead their cows out of the area altogether.

We lost 6 goats during the war in 2003, but we took the cows far away to Chishumba so they were safe.

In these cases, successfully hidden cattle could prove more secure an asset than crops or smaller animals that had to be carried.

We left our compound and the soldiers took our rabbits and guinea pigs. We kept our cow in the bush so it was safe. We went to another village, and then a third, for a few days or a week at a time. Once some refugees came and stayed here, and then when the situation changed we went home with them. Other times we stayed out in the fields. This was in 2004.

The landscape of war was unpredictable, and risks remained high. Soldiers just as often encountered cows outside of villages.

We had two cows taken by soldiers in 2000 when the FARDC [Congolese armed forces] were fighting the Mai-Mai [anti-Rwandan militias]. The FARDC soldiers took the cows on the pasture and ate them. We were away for two weeks, returned, and then left for another two... When we went to the pasture to

get our cows, only two of them were there.

Other cattle owners were taken by surprise and had to leave their cows behind, but this was an act of last resort.

In 1996 a cow was taken from the compound by soldiers. We fled the farm when they came and left the cow behind. The fighting was already very near the village.

Without time to drive animals out of the village, households had no other means of protecting their cattle from advancing forces. It was all they could do to escape with their lives.

Soldiers took four cows from the compound at night in 2004. We were at home, but there were so many soldiers that we had to run.

The accounts of pillage involve an impressive array of combatants and years, reflecting Burhale's position at a crossroads of protracted conflict. The toll on cattle added up as army followed guerilla force year upon year. Economic fallout proved another foe for cattle owners. The RDC and Rwandan forces burned down many compounds in 2003; two interviewees had to sell their cows after this, needing funds to rebuild and having no place to keep the animals. Another farmer had to sell two cows to pay for the upkeep of another two. One informant had to sell his cow to pay off soldiers so they would leave his compound. Another simply sold his last cow to neutralise the risk after his other seven were taken. The local market price reportedly fell from \$250-\$300 per head to \$50 during the worst of the conflict years, so only the desperate sold cows for any reason. Disinvestment, on the whole, was not much better than outright loss.

The fallout also reached Luhihi, even in the absence of fighting forces. Successive waves of refugees from Bukavu and elsewhere temporarily increased land pressures at the expense of grazing - a trend beginning with Rwandan refugees from across the lake in 1994 - and disease took its toll. Notwithstanding the *groupement's* relative calm, fears of an impending military occupation were strong and

remain strong, making cattle an unattractive investment for the risk-averse. Worst of all, small arms flooded the area, bringing a plague of armed theft.

I own three cows now. Before the war I owned 40. Most were taken by thieves, and the rest got sick. I kept them on pasture in the mountains near Luhihi Centre [a more central location than the currently favoured pastures]. Many thieves came during the war because they all got arms.

The situation has only worsened, if anything, amid the present post-war lawlessness.

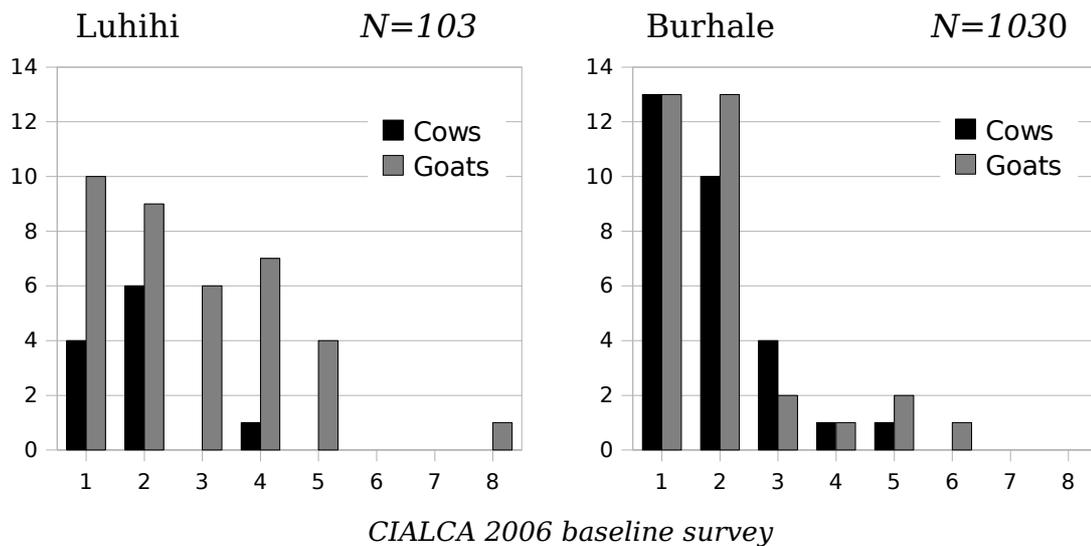
There weren't problems here during the war, but now there are many armed thieves. If you sell two cows, they may come to your house looking for the money.

Some residents fought back, forming a committee against thievery through their cattlemen's association:

Thieves were a big problem. They came at night with arms. These were not soldiers, but people of Luhihi. Now the association asks the chiefs to identify thieves, and we burn their houses and send them to prison in Bukavu. We have found nine thieves and sent four to prison. One died in prison.... If the prison releases them, they have no home to return to here.

By the time of the baseline survey, just over 10% of surveyed households in Luhihi were cattle owners - more than 18% below Burhale's figure - though these owners averaged a nearly identical 1.8 cattle apiece in both *groupements*. Whether this represents a greater impact of the wartime environment on the number of households able or willing to keep cattle in Luhihi, or a difference in the importance of cattle in the two villages, is unclear. We shall explore these possibilities in the following sections.

Figure 4: Number of livestock-owning households (y-axis) by number of cows and goats (x-axis)



A COW ON EVERY FARM

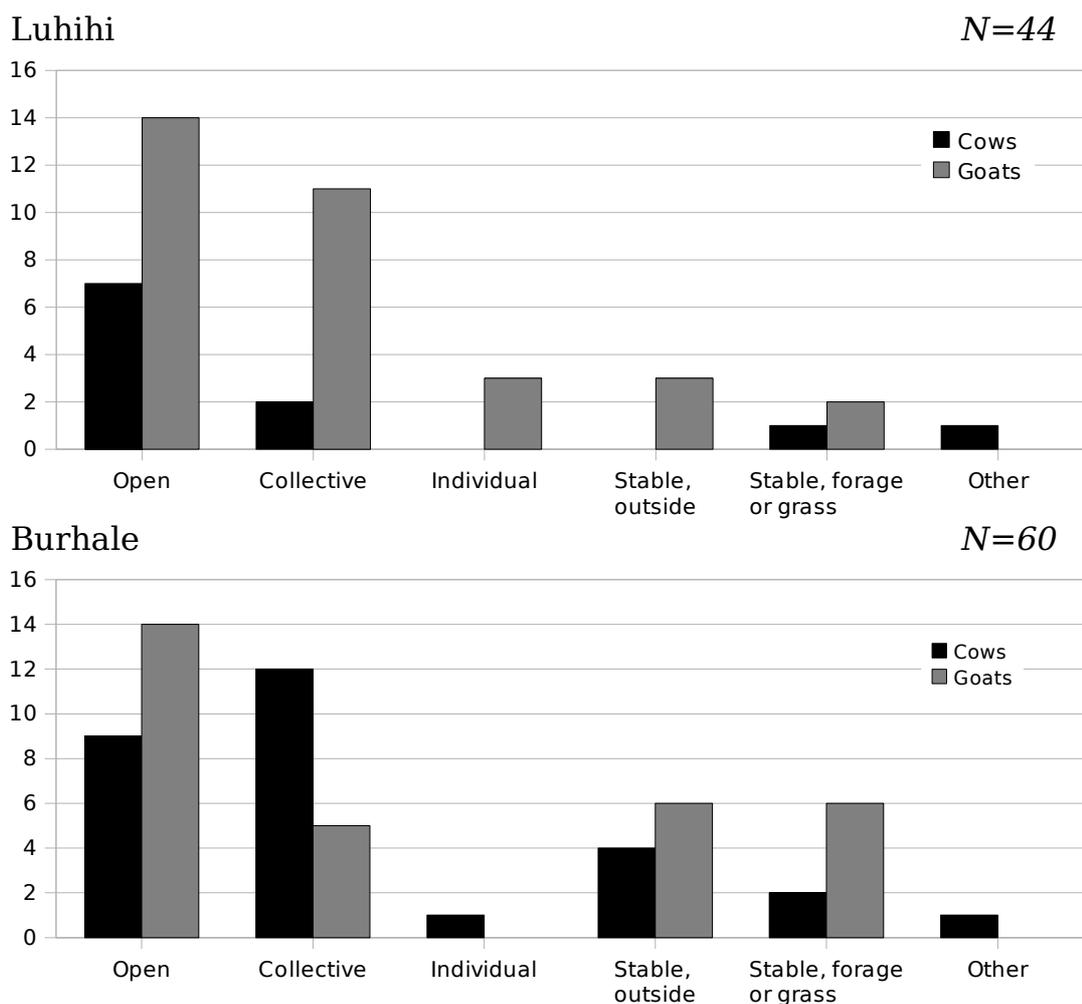
The Bashi are defined by “cattle, bananas, and hoes.” The ideal of a prosperous community involves at least “a cow on every farm,” providing manure, milk, and the potential for bride wealth or land purchase. The history of mixed farming in the region is long, and present constraints on available land make it one of the only suitable systems for permanently cultivating tiny land holdings. While the availability of land had already reached a crisis state long before the wars, cattle manure kept many farms producing. Since 1996, conflict, disease, and poverty have destroyed this lifeline for many.

The traditional pattern of keeping cattle was established by the 1950s (Miracle 1967:177). During the rainy season, the herd stayed in the compound at night, producing manure, and a member of the family would lead them to the pasture each day. In the dry season lasting from June to September, pastures declined and cattle had to be kept away from fields; herders drove them into the mountains, often to elevated higher-rainfall areas a great distance away. Two older informants in Burhale and Luhihi recalled participating in this transhumance in the

past, but none had done so since the wars. Cows now stay in the same area year-round, placing a heavy burden on dry season pastures. Only a few owners with family members in other regions are able to send some of their cows away to distant greener pastures, where the relations keep them for the long term and use their products.

Many households in Burhale, and some in Luhihi, do still keep their cattle in the compound and send them to pasture during the day. This is sometimes the work of young boys, who take the cows out in the early morning before school and collect them in the evening. Others can afford to employ one or more full time cowherds from outside the household - again these are often adolescent boys or younger. Stable raising and zero grazing have only recently been introduced in Burhale by some of the local associations.

Figure 5: Livestock by grazing method



CATTLE IN MARRIAGE

Bashi custom dictates the use of cattle for two significant exchanges: bride wealth and buying land. Some land deals continue to be made with cattle - often a single cow for a plot of land, dependant on the size and quality. Less commonly, goats sometimes supplement the payment, but only the very poorest plots can be had for goats alone. Cash payments are accepted as well, but most farmers do not accumulate such quantities of cash. Cattle are considered the surest route to new land.

The symbolic weight of cows as bride wealth is much greater. At minimum, the groom's parents can give a single cow or even a calf to the bride's family; now this is often supplemented with four to six goats. Some wealthy cattlemen in Bukavu reported giving or receiving up to five cows, including one man who married off three daughters in 1994 and 1995 and acquired thirteen cows in all. In the villages, however, giving more than the single requisite cow has been almost unheard of since the wars. Another recounted tradition, whereby the bride's family would gift the second calf born to the cow to the couple themselves, appears to have gone out of fashion.

A new, and still controversial, practice of giving the cash value of a cow as bride wealth is said to have begun in Bukavu among urban families who had no pasture to keep cattle. Since the wars, it has increasingly caught on in the villages as well.

Giving cash as bride wealth started in the war. Many people who lost cattle think they are dangerous and don't want them, so they just want cash.

This is a point of some debate, and is ultimately more a matter of personal preference than tradition. Those who considered it proper to give cows were, for the most part, already eager cattle owners. They stressed the prudence of having more cows and more manure.

I wouldn't accept money because I would use up all the money

quickly and then I wouldn't have another cow.

Others couldn't or didn't want to acquire cows, while some saw greater opportunities in the flexibility of cash.

If someone offered cash for my daughter's marriage I would take an amount equal to a cow. I would buy a calf for less and keep it for my son so he could marry as well. But I would keep it at home to breed first because my son is still young. By the time he is ready to marry I would have several cows and could give him one.

Livestock prices have recovered in South Kivu in recent years, and cows are now generally valued at around \$250 in the village and \$300 in Bukavu. This is the amount usually employed as a "cow" when bride wealth is offered in cash. In this situation all parties still speak of the gift as a cow. Farmers who believe they can buy a cow or calf for less are more likely to accept money.

Even when an actual cow is used, it is often just an intermediary. The groom's family may buy it specially for the occasion, and the bride's family may sell it, use it to buy land, or use it in turn to marry a son, passing it on to another household. It's common for poorer households to marry daughters and sons in pairs: young men have to wait for their sister to marry so they will have a cow to use themselves. Many cows are bought, sold, and passed along without being fully integrated into mixed farming systems. This is a seeming departure from the traditional role of bride wealth in reproducing cattle-owning households, and negates former practices such as gifting the second calf to the couple. Bride wealth has become a more dynamic exchange and now meets a greater variety of needs.

At the same time, "informal" marriages with no or delayed bride wealth continue to be common, as they have been for many years. In North Kivu before the wars, Pottier and Fairhead (1991) noted that poverty and the decline in parental help made it normal for husbands to go without fully paying bride wealth for at least a few years. As a result, women in such marriages could achieve more leverage in the household during the period of independence. In Kinshasa, De Boeck found urban youth following a similar route against the wishes of their

parents: “they would simply move in together, have a baby, and present it to their families as a *fait accompli*, short-circuiting the gift cycle.” (De Boeck 2004:171) Poor informants in Burhale and Luhahi recounted similar arrangements, most often with the full cooperation of the couple's families.

I have thirteen children. One son is married. I haven't given any bride wealth yet but I think I will eventually offer a cow. Maybe a member of my family will help me out with one. One of my daughters is also married but we didn't get anything from that one either.

While some parents took the eventual responsibility upon themselves, others simply left it up to the son, letting one generation's obligation become the next generation's debt. One couple of Burhale lived together for fifteen years and raised three children before the husband managed to seal the marriage. This is not to say, however, that investment in the future of one's children is being forgotten: education is increasingly filling this role.

We sold our cow to send our son to university... If he wants to get married, he can find a cow for himself, and support his parents while he's at it.

ACCUMULATION OF CATTLE

Not everyone in South Kivu struggles to gain access to cattle. Members of economic elites do accumulate large herds. Most of the largest cattle owners live in Bukavu and use cattle as an investment for income from other business activities. They keep their cows on dedicated ranches or communal pastures far from the city. They seldom sell cows unless forced to, and usually leave milk and manure to those they employ as cowherds. Though some have done well in the post-war years, their large herds rarely came through the conflict untouched, and many lost everything.

One such man comes from a family of Burhale, where he owns a cassava plantation on the mountain and extensive pasture in the plains nearby. He lives in Bukavu where he trades in the valuable mineral coltan, runs a shop and restaurant selling imported food products from Dubai, and supplies materials to MONUC and UNHCR. During the wars, he kept almost fifty cattle on his family pasture and used the manure on his plantation. Most of the herd were looted in 1999. For this he blames the Interhamwe - Hutu militias in exile from Rwanda. The 17 cattle which survived the raids he moved far to the north, to new pasture rented from INERA (the National Institute for Agronomic Research) for \$50 a month on the road near Luhihi. He feels this location is much more secure, and he's since increased the numbers here to 67 head. There have been no incidents here, but the lack of veterinary supplies remains a concern.

Another former cattleman runs a shop on the edge of Bukavu selling materials to the booming construction industry. He owns a large farm of 300 hectares in Kalehe Territoire, north of Kabare, on which he kept 350 modern purebred cattle before the war. He bought the land and cows from a local chieftain in 1985 when he made his fortune selling Belgian medicine. His homeland is Walungu, but there was no good land available there. He employed 20 men and cultivated oil palms on part of the farm, but didn't use manure because the cattle didn't stay in one place and the soil was rich anyway. In 1996 and 1998, all of his cattle were looted: first by Mobutu's soldiers, then the Rwandans, and finally by the Mai-Mai. Now he's beginning to clear the bush again and buying sheep and goats. He's decided to produce wool and sell animals. He has abandoned cows for now because he's unsure about security, his funds are low, and the pasture has degraded. He wants to keep cattle again in the future but too many civilians in the area are carrying arms and it's not safe.

A third Bukavu businessman, another trader in mineral wealth, lost 64 cows near Uvira in 1996; he moved the remaining 22 to an area farther from the border but they too were robbed in 1998. He believes thieves took them across the border to Burundi and Rwanda. He was keeping the cows on the open pastures of the Rusizi Plain. He didn't

see them as a commercial investment, but only kept them for sentimental reasons: he is a Muvira, a tribe strongly associated with pastoralism. He's now bought 50ha of a former colonial ranch on the border of Kahuzi-Biega National Park for \$12,000, and he's looking for money to buy cattle. Other farmers are raising cattle in the area and he can see it is safe and favourable.

Cattle owners of all sizes are willing to go to great lengths for secure pasture. In Luhihi where armed theft is rife, patterns of herding have adapted to use the local geography to minimize risk. Where cows were once kept in the compound and grazed on nearby hills, cattle have now been consolidated on pastures surrounding the village of Izimeru. This area lies on a peninsula to the south of the *groupement*, surrounded by hills on all sides with the only entrance through the centre of the surrounding settled areas. The pastures are open access and most cattle stay here at all times.

In Izimeru, thieves don't take cows from the pasture. Nobody took any during the war either. Because it's hidden by the lake and mountains they don't know they're here, and if they do, there's no way to get in or out without passing through all of the villages.

This informant estimated that some 50-100 owners keep cattle on these pastures. More cattle owners are said to live in this village than elsewhere, which may in itself explain the low numbers reported in the CIALCA baseline survey: Izimeru was not included in the sample. Households in other villages do, however, keep their cows here as well, particularly if they own two or three. On top of safety, the remote location keeps cows out of the way of crowded agricultural land, for which some farmers are willing to forfeit their share of manure.

We used cow manure in the past but now we keeps cows at Izimeru, not at home. People don't like the cows at home because they get into the fields. Now the cowherds use the manure in Izimeru.

Herding has become a small industry in the village. Owners can bring cowherds from outside, but then they have to pay extra for their

accommodation. Boys of Izimeru are more popular for the job.

THE BREAKDOWN OF ACCESS

For young men in the past, the job of cowherd represented one important route to cattle ownership. The arrangement was once similar to that described by Depelchin in the 1970s between the Furiiru and Banyamulenge of Uvira. The Furiiru invested in cattle and used them for bride wealth, but hired Banyamulenge to look after them. The herder did not earn a salary; he received full use of the cows' milk, and in the long run custom required the owner to give him the third or fourth calf born to each cow. In this way the herder could build up his own herd (Depelchin 1974, quoted in Turner 2007:85). The Bashi followed an equivalent tradition, minus the ethnic divisions. A young man could hope to earn one of the calves born to his charges - usually the second, third, or fourth - and use it to marry or to start off his own herd. Assuming he had the social capital to land such an arrangement, even the poorest young man could aspire to own cattle.

Currently, the situation seems to have shifted for many; in both Burhale and Luhihi, the common rate of payment has settled at one goat per year. Some employers allow boys the option of collecting a calf after four or five years instead, but given their immediate needs and general state of poverty, they usually ask for the goat. Other forms of compensation, such as cash or corrugated iron sheets, are much less common but beginning to appear. While these are all valuable assets for poor young men, the rising relative cost of earning cattle has all but closed this traditional route of access to the world of cattlemen and the social mobility it provided.

Distinct from this vertical transmission of cattle wealth existed another custom of sharing cattle among equals, known as *bugabe* in Mashi or *gabirana* in Swahili. This would take the form of anything from an outright gift of a cow from one cattleman to another, to a preferential trade for a small number of goats, to a loan that would later be repaid with the original cow's calf. These varieties of informal

arrangements pay tribute to a long tradition of reciprocal and clientist access to cattle, originally granted by the ruling *Bami*. According to a 1912 description of animal husbandry among the Bashi, the use of cattle was far more widespread than their ownership, paralleling the state of land tenure (Carlier 1912, quoted in Miracle 1967:176). The *Mwami* owned the cattle, as he did the land, and lent them to selected subjects, many of whom hired herders in turn under the terms described above. Another colonial veterinarian, writing in about 1952, described this system of clientship as well as the exchange of cattle for goats, or granting of the use of cattle on interest paid in goats, among equals (Van Gheluwe 1952, quoted in same).

Interviews in the present reveal that *bugabe*, too, has all but disappeared during the years of war. The trading of cows for goats was based on social capital which has not held up against the scarcity of cattle and their growing price differential against small livestock. These are said to have been arrangements "between friends" and exist now, if at all, between social equals with a great many cows.

Now there is no way to acquire cows without money. Before the war, if you had a friend you could trade a goat for a cow, and later return the calf... Now there are not enough cows around for people to do this.

For a few who lost their own animals to conflict but retained the goodwill of their peers, *bugabe* still provided a limited rescue, but such cases were rare.

I lost my two cows during the war. My friend gave me this cow because I know how to look after them. I gave him a goat to thank him, but it was not an exchange.

With cows as sought after as they are now, most people are generally considered "not sympathetic enough" to gift something of such value in uncertain times.

I got my cows by trading goats, of which I had many. Friends would trade one adult cow for 3-4 goats and some beer. The system exists today but the people with cows don't want to give

them away and will ask for many goats. This is because everyone is hungry now and people have little sympathy.

Since the outbreak of war, the social avenues to cattle access have severely diminished. Friendly *bugabe* has fallen by the wayside. Herding is given over to those seeking short-term gains, and even marriage is growing distant from cattle exchange, relegating it to a symbolic act or leaving it as a future potentiality. Land, the only resource matching cattle in value, can hardly be spared. Virtually the only option left is to purchase cattle directly on the open market, a difficult prospect for households producing at or near a subsistence level. Multithreaded networks of access have given way to the singular challenge of accumulating financial capital.

ALTERNATIVES TO CATTLE

To some extent, goats have taken the place of cattle in every arena but marriage, and even here many families now offer a few goats alongside a single requisite cow to round out the bride wealth. Where cattle are scarce, goats have achieved a status of secondary but significant prestige. If the decline of cattle raising is to continue, goats might come to replace cows in many of their social roles, at least for farmers of lower economic status. For the even poorer, pigs, rabbits, and guinea pigs are standard currency; like goats, their value for most households is in storing, investing, and multiplying small amounts of wealth. Nest et al. pose that farmers made a particular shift to guinea pigs during the wars because they are easily carried when fleeing (Nest et al. 2006:104). These are also the three animals which most development initiatives and local cooperatives grant or loan to their beneficiaries.

Small livestock have been a part of Kivutien livelihoods for generations and most certainly play a vital economic role in many households, particularly the poorest. As the sole remnants of a traditional mixed farming system, however, they fall short in providing inputs for farming. The enthusiasm for owning goats as an asset does

not extend to their manure production; goat manure is not considered a valuable resource. Most goat owners add the manure to their household compost, along with the droppings of rabbits and guinea pigs, but don't think of it as a major contribution and continue to suffer from poor soil fertility. Whatever the shortfalls in the soil may be – evidently losses of phosphorus and magnesium, according to CIALCA's initial analysis (Dr. Piet van Asten, personal communication) – goat manure in the available quantities does not appear to make up for them. Even informants who previously owned and lost large numbers of goats did not cite the loss as a reason for declining productivity.

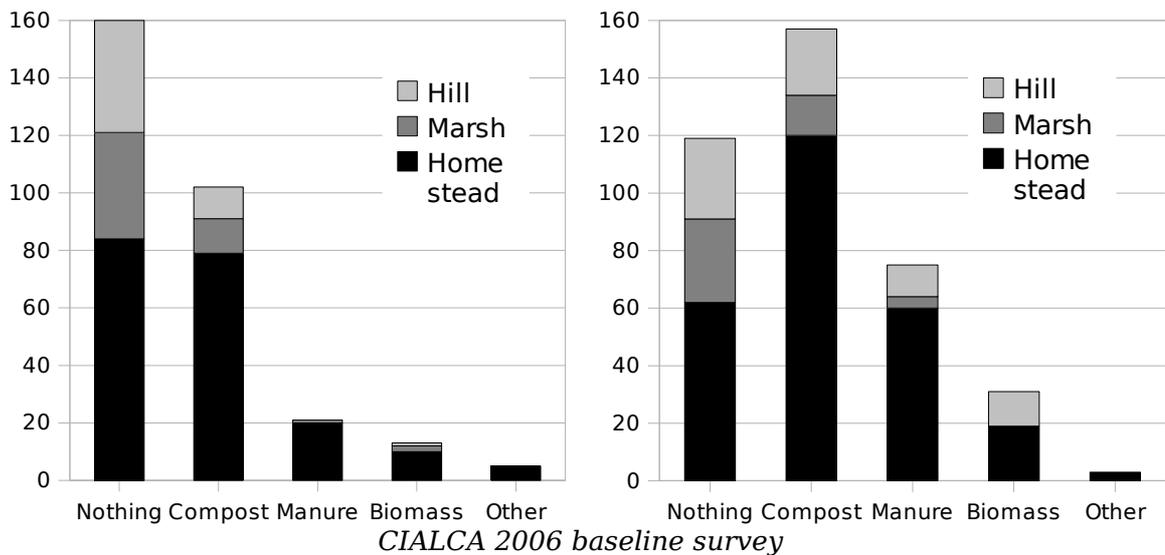
This is what makes cattle more than just a measure or symbol of wealth: they are seen to directly generate productive potential. They are the engines of prosperity in mixed farming as well as its visible embodiment. While the contribution of nutrients from one or a few cows may not be enormous, given the poverty of the soil and few alternatives, bovine manure is becoming of the most valuable resources in rural Kivu short of gold and coltan. Without cattle, the only available inputs for replenishing nutrients are small livestock manure, household refuse, ashes from kitchen fires, and agricultural compost – all of which farmers employ in every available scrap, but to little reported effect. In Luhiji the most popular alternative fertiliser is the leftover mash from the brewing of banana beer, but even this exists in small quantities and is “something to use when there's no manure.”

Table 6: Primary organic matter applied (% of fields)

Field Type	Luhihi				Burhale			
	All	Homestead	Marsh	Hill	All	Homestead	Marsh	Hill
Nothing	56	42	71	82	32	25	61	38
Compost	32	40	23	16	40	44	30	31
Manure	6	10	2	-	19	22	9	15
Biomass	4	5	4	1	8	7	-	16
Other	2	3	-	-	1	1	-	-
<i>N</i> =	318	198	52	68	392	271	47	74

*Note that manure, especially from small livestock, is often added to compost and thus underreported.
CIALCA 2006 baseline survey*

Figure 6: Fields by primary organic matter applied
Luhihi *N*=318 Burhale *N*=392



SOIL AND POTENTIAL

The modern Kivutien concept of soil is of something with precious little inherent merit; crops are grown on inputs alone. As one farmer of the younger generation explained when asked about the quality of a plot of land, “soil isn't good – we make it good.” This is not to say variability in land goes unnoticed, but the breakdown of sustainable farming systems has progressed to the point where even once-fertile land, such as that found around much of Luhihi, is exhausted beyond the point of natural productivity. Land is most often typified as a) incapable of producing certain crops well under any conditions, usually due to advanced erosion; b) capable of good production of certain crops with cow manure; or c) capable of some production even without manure. More important than location is skill in land management and the resources to carry it out.

The land on the ridge [at Mwegerera in Burhale] is good for beans if you have cow manure. The bottom land is good even without cows. The better soil washes down there.

Poor fertility impacts more than just yields; a plot's productive potential constrains the crops that a farmer finds fit to grow on it, reducing cropping diversity for farmers with little access to fields. Most farmers stock their best fields primarily with beans, the staple protein with which they wish to take no chances. On particularly good land these are often intercropped with maize or sorghum, otherwise with cassava or under bananas. Poor fields are given over to sweet potatoes; some consider a year or two under sweet potatoes to be a replacement for a fallow. This is similar to the way Fermont et al (2008) recorded cassava being used as an “imitation fallow” in Uganda and Kenya, where the crop's share of land is expanding drastically. More often, however, Bashi farmers just described sweet potato as the crop that will grow where nothing else will.

Only in the village of Kashozi, known in Burhale as some of the worst eroded land around, had any informants given up on beans altogether. Many households here owned cows in the past and relied on

manure to farm the slopes. Kashozi was near to the battlefield of April 2003, and most of these cows were taken. In their absence farming is barely possible; farmers can only grow sweet potatoes and cassava with regularity, and often have to buy beans from others.

THE VALUE OF MANURE

Cattle manure being in limited supply, farmers use it first and foremost to bolster yields on their better fields and any cash crops they may be growing. In the classic infield-outfield style, outfields tend to be remote and less fertile, often only planted with a monocrop of cassava or sweet potatoes. Whereas these were once shifting long-fallow plots, however, necessity now forces them under cultivation every season, leading to extremely poor production. Fields held under *bwasa* contracts, in particular, are seldom fertilised in any way.

We put manure on our own fields but not on the *bwasa* field. It's far away, and the man could take it back at any time so we don't want to put our manure there.

This is not just a matter of tenure security; *bwasa* tenants have to walk a fine line with their production to avoid drawing the attention of the landlord. The safe strategy is just to plant a patch of cassava and leave it be.

I use compost and used manure [before he lost his goats], but if the land produces too well the plantation supervisor might move me to less productive land so they can grow coffee here. Because of this I want to move off the plantation but there's no other land available.

Cattle manure was never traditionally sold or traded, and it's still an almost universal convention to use one's own. Two informants - one an old widow - collected some manure off the roads, but this is a limited practice. Informants laughed outright at the idea of selling manure. It is simply too valuable a resource; even households with many cattle

usually have a proportionally large amount of land on which to use manure.

Between Luhihi and Burhale I heard of only one household who sold manure. This couple owned four cows in Mwegerera, a central village of Burhale home to many associations and progressive farmers. Each year, they produced three or four piles of composted manure for their own fields and sold two or three at \$10 a pile. They sold the manure to other farmers of Mwegerera and once sold a pile to the priests at the Catholic parish. They knew of only one other man who carried on this business, in the same village, but he had recently lost his cows. This couple did not have an excellent production in their own crops and probably would have produced better if they had used all that their cows provided, but it was a calculated sacrifice. This was their only possible source of cash to pay school fees.

EDUCATION AND MODERNITY

The family who sold their manure had done so for almost twenty years - as long as they had been paying for their children to go to school. President Mobutu's government nationalised previously Church-run primary and secondary education across Zaire in 1974, providing free schooling albeit at a generally low and underfunded standard (Federal Research Division 1993). By the beginning of the 1990s the government schools, like many remnants of the state, became defunct and parents had to turn to the new fee-supported ventures that quickly rose up in their place. Since then, according to the director of Luhihi's primary school,

People know the importance of schooling. In Luhihi, a family with ten children will send at least six to school... The government paid for schooling until 1990-91, then stopped. People value education more now that they have to pay for it.

Survey results do show very high school participation, much higher than education levels in the generation of respondents themselves

(Tables 7&8). Female youth lag well behind the extraordinary rates of male participation, but are still particularly high in Burhale, home to a large girls' secondary school. The average household with children in school paid \$22.50 a year including uniforms and school supplies, a figure roughly the same in both *groupements*. The figure is skewed, however, towards the top quartile, as 73% of households paid less than this while seven households paid over \$100. The interquartile mean measured only \$12.

Table 7: Formal education of respondents

	Luhihi (%)	Burhale (%)
None	47	33
Adult literacy program	9	4
Primary school	24	36
Secondary school years 1-4	15	17
<i>Cycle long</i> (years 5-6)	3	9

N=103 N=100

CIALCA 2006 baseline survey

Table 8: School participation

	Luhihi	Burhale
% males 6-17 attending school	102*	93
% females 6-17 attending school	67	86
% all households paying school fees	55	67
Mean % of yearly expenditures going to school fees in households with school-going children	39	44
σ	24	22
Mean % of expenditures going to health care	14	12
σ	20	18

N=103 N=100

*Calculated as household members 6-17 / members attending school; though 6 is the usual age of first attendance, some are clearly outside this age range.

CIALCA 2006 baseline survey

Table 9: Off-farm income

	Luhihi	Burhale
% households reporting any off-farm income	41	58
Mean yearly off-farm income for households reporting any	\$101	\$118
<i>Interquartile mean</i>	\$41	\$55
<i>Skew</i>	1.79	5.84

N=103 N=100

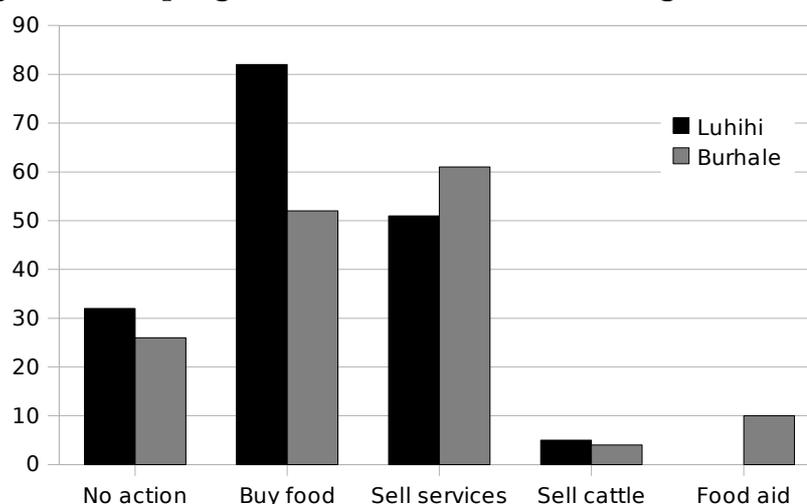
CIALCA 2006 baseline survey

Independent of larger national infrastructure, the schools ran sporadically during the war years, but run they did. Families did what they could to keep up; while fewer than 4% of respondents in the baseline survey said they would sell a cow to buy food in times of crisis (see Figure 7), 3 out of my own sample of 42 had sold a cow recently to pay school fees. A number of others outside the sample had done so or said they would do so, though these were mostly large cattle owners with more than a handful of cows, and some were paying to send children to university. Others would use whatever assets they had at hand, often banana beer or goats, or work in others' fields.

Our only income is from selling bananas, but our production is small. All of our children are in school and we use this money to pay their fees. We can accept poverty in order to pay school fees.

Informants who had lost cattle and failed to replace them often said that they didn't expect to own cows again, because now they had to pay school fees instead of saving up for animals. Cattle and education may seem like two very different investments, but to farmers the decisions are conceptually related, parallel, and too often mutually exclusive.

Figure 7: Coping in case of food crisis (weighted scores)



CIALCA 2006 baseline survey

While many parents explained schooling as an assurance that their children could take care of them in their old age, others gave it a deeper meaning.

I can't explain why I send my children to school. I must do it. My husband and I pay the fees by doing hired farm work. If my children go to school and learn to speak English, they can talk to people like you directly. It makes me angry that someone else has to speak for me.

On a societal as well as a household level, schools are imbued with the capacity to transform.

There will continue to be war because the government paid for school when I studied and now they don't. When people are less educated they can't elect good leaders.

Education is a compulsion, a responsibility, and a means of entry into other, more modern worlds.

I send all of my children to school because I didn't study and I want my children to have a good education. It is good for people to study because then maybe they can go to Europe or America.

Rather than investing in cattle and thus on-farm productivity, households are investing in education, which represents an attempt to participate in a modernity that exists outside the context of war. Investing in school fees, while risky, is subject to a different set of risks from those acting on fields and cattle; looked at this way the mania for schooling is an extreme manifestation of the risk diversification strategies favoured in post-war periods (see Brück 2003). In this case, it's not just a search for a new household activity, but for a new way of life.

For Kivutiens the wars contrived a total break with the past. The new status quo is either one of chaos without end, or a new age of development born with the elections of 2007, depending on an informant's personal perspective and dedication to optimism. Either way, this is a new era and calls for new livelihood strategies. With the

traditional route to security, prosperity, and status – keeping cattle – much less accessible, the new route is participation in modern activities. The most popular by far is education, which is open to all who can afford school fees, if not necessarily to equal benefit. Mining for gold, trading, or seeking work in Bukavu or Goma are other potential ways out of subsistence farming, but these require greater access to social and economic networks, and no path carries any assurances.

In the face of such dedication to the reimagining of the next generation, it seems almost incidental to ask how school fees really pay off. In their study of the University of Kinshasa, Munikengi and Sangol found that such institutions have survived amid economic crisis because they provided a means to capitalise on the social recognition associated with being an intellectual – a title akin to European nobility. By the 1990s salaried employment was far from a sure thing even for holders of medicine and law degrees, but degrees still constitute a form of social capital (Munikengi and Sangol 2004:82). In fact, the end of free education undoubtedly rendered it all the more valuable.

Two sons of Luhihi did, in fact, achieve advanced degrees and now teach as professors at Université Catholique de Bukavu. This presence of superstar intellectuals may contribute to that *groupement's* enthusiasm for education, but in reality most families simply don't have the resources to carry their children even as far as secondary school. The undertaking remains an idealistic one. For the aforementioned couple of Burhale who sold part of their precious manure and sacrificed soil fertility for twenty years to educate their children, the ultimate result was an eldest son with a teaching qualification who teaches in the local primary school. Even he doesn't yet provide the family with any income; he's been teaching unpaid for several years, waiting for someone from the government to come by and offer salaried positions.

THE TIRED LAND

If my children finish their schooling before I die they can help me. This is why schooling is important: if children complete school, they can't become just farmers.

To understand the lengths farmers go to in the name of education, we must consider that for many, agriculture is a livelihood almost given up for dead. The most frequent descriptions of the soil are “old” and “tired,” references to both its nutrient content and to the way of life it once supported. The tiredness of the land is not a simple biophysical state: erosion, loss of fertility, and disease are all symptomatic of a general decay of potential. Cassava mosaic virus, for instance, has permeated the region and is visible in many plots; farmers know the disease by name and blame it for generally poor yields in multiple crops, classifying it alongside other ills of the soil.

Productivity in the fields was good but the soil has become bad. We put goat manure on it and everything but it still doesn't produce. When mosaic came in 2005, it deposited something in the soil which made it poor.

A few farmers decide not to replant cassava in diseased plots, but most lack the flexibility to do this, especially where cassava is monocropped on *bwasa* or other poor land. Having no other means to combat the virus and limited access to resistant cassava varieties, farmers continue to maximise yield potential as best they can through soil management.

This year there are no diseases but in the past the cassava had mosaic. We put manure on it and it grew well.

Also thought to be acting on productivity through the medium of soil, surprisingly, is the conflict:

Before and during the wars we had good production but now it's become bad because the arms had an impact on the soil. A mortar fell near our fields and this ruined the soil. To fix the problem, I could use manure, but we don't have a cow or very

many goats.

Here, war and livestock are set against one another in the domain of soil. Informants didn't have a clear idea of the process through which these impacts acted, but accustomed as they were to being targeted by military forces, they had suspicions.

Before the war productivity was good, but I think the soldiers did something to the soil when they passed.

Along with people, animals, and property, the land itself became a literal casualty of war.

During the war the arms damaged the soil, making it less productive. The war also brought diseases into the fields. We can't do anything about diseases.

Disease, too, can be a manifestation of the conflict.

Our field's production became bad after the war when the crops got diseases. The diseases came from the war - they began to appear just after it.

Researchers recognise that farmers often perceive soil fertility in broad terms, as a complex process culminating in the growth of their crops. The management practices within their control, and environmental conditions outside their control, constantly generate or deteriorate soil fertility, and are at least as important as the persistent properties of the soil itself. In any given season, a soil's true fertility is a function of its past and present management, and judged as such. Desbiez et al. (2004) propose the term "field fitness" as a better representation than soil fertility, with its specific biophysical and mineralogical factors. Farmers assess fields "using a range of indicators which they can actually see or feel, including crop yields, soil depth, drainage, moisture, manure requirements, water source, slope, and weed abundance."

Trutmann et al. found similar perceptions in the central African highlands regarding bean diseases. Farmers rarely mentioned diseases

in questionnaires, but in participatory research they related fungal disease symptoms to the effects of rain and soil depletion, and signs of bean mosaic to varietal traits. Conceptually, disease management strategies were based on prevention by managing the conditions that promote good plant health, a parallel to ideas of health in humans (Trutmann et al. 1996; incidentally, diagnostic trials indicated that these farmers' disease losses remained around a steady 50% of actual yield, while plots under modern management were often totally destroyed: Trutmann and Graf 1993). Now, with a new awareness of cassava mosaic in Luhihi and Burhale, we see the inverse phenomenon emerge: poor soil is blamed on the virus.

Given the emphasis of “fertility” on management and outcomes, on providing the conditions for growth, farmers are not actually mistaking pathogens for nutrient deficiency or erosion for the scars of conflict. In this holistic perspective, the entanglement of war, disease, and cattle into the domain of soil makes sense. To say “the soil is tired” describes the totality of a profound post-war exhaustion: social, economic, and environmental.

COLLECTIVE SOLUTIONS

Even among those farmers of Luhihi and Burhale who have long since given up on the solutions of the past, this has not led to complete pessimism; brighter horizons still lie ahead. In fact, in the continuing absence of a strong, capable state or international attention, local mobilisation for collective development has reached new heights of ingenuity. This is in marked contrast to the centralised, government-led development proceeding across the border in Rwanda, but despite its home-grown flavour, it provides some part of the participation in modern solutions that farmers desire.

Vlassenroot et al. recount the flowering of associations during the war, small groups with determination but without financial means or capacity. These united into platforms in order to attract funding from the international community. In many cases this funding reduced their

activities to the execution of donors' programmes, most aimed at urgent humanitarian assistance. Local development organisations took a back seat to emergency aid, and the Regional and National Councils of Development NGOs (CRONGD/CNONGD) set up to coordinate their activities rarely functioned during the war (Vlassenroot et al. 2006:39). The efforts at development, however, never really ceased; they carried on, as usual, under the banner of *débrouillez-vous*.

In participatory sessions conducted by CIALCA in 2006, villagers in Luhihi listed 35 local associations in the *groupement*, a roster including farmer organisations, churches, and schools, all of which take an active role in development. They also named 9 outside development organisations - to which CIALCA has now added itself - all of which work through local groups. The session in Burhale only produced names of 11 local associations and 3 outside organisations, but this seems to reflect a lack of thoroughness; my own interviews turned up mentions of several beyond those listed. One of the most important is the Comité Anti-Bwaki, a committee of organisations formed by missionaries and local elites in 1965 to fight hunger and malnutrition in the eastern Congo (Schoepf and Schoepf 1988:109; *bwaki* is a local term for kwashiorkor). Some farmers belong to a number of these associations.

I am a member of Comité Anti Bwaki and Feso Libu, an association for water and electrification in Burhale. I'm also the president of Bhuyangani Muzinzi, an association of agro-pastoralists in Muzinzi [a village of Burhale] teaching farmers how to keep cows and grow crops. Sometimes we give milk to needy children and children in the hospital. Before the war we had over 100 members; now, only 40, because many lost their cows so they are no longer members.

Many of these organisations have thus far been carrying out a primarily educational agenda to disseminate modern farming techniques; these programs require the least funding, yet fulfil the need to act towards modernisation.

I'm a member of AMOKA and AEDEN. Both teach how to grow crops in rows and how to keep animals at home [under zero

grazing]. I've begun growing vegetables and I keep my goats at home now.

A recent and successful initiative of local associations has been the teaching of better methods for composting and applying manure. These methods have been taken up by particularly progressive farmers, who make great effort to compost their manure in bins for a year and digging it into the soil before planting, or else applying it around seedlings. The desire to maximise the effects of limited manure supplies is strong, and farmers who follow these practices claim good results.

Much of the most organised association-building takes place in cattle owning circles. The Luhihi cattlemen's association mentioned earlier, which formed to combat and punish thieves in the *groupement*, also orchestrates a number of other activities. Currently standing at 20 members, the association buys milk from its members and sells it to a nearby hospital for the patients. The association also aims to build a veterinary pharmacy: they have land in the village but lack money to construct a building, so for now they use this empty plot as a place to administer medicine to cows when supplies are available.

Table 10: Percentage of households involved in collective activities

	Luhihi	Burhale
Farmer/livestock groups	45	45
Church groups	50	31
Self-help groups	12	5
Women's groups	6	5
Collective farm work	50	41
Maintaining roads, markets, or public places	26	31
Collective marketing	2	7
Other collective activities	2	12
	<i>N=103</i>	<i>N=100</i>

CIALCA 2006 baseline survey

CIALCA IN BURHALE

CIALCA itself counts several partners among the associations of these *groupements*. CIALCA scientists joined local associations, chiefs, and

more than one hundred farmers at the Burhale parish hall for a field day in May 2008. The presentations were given in French: first on CIALCA's aims, then from a regional partner on the benefits of NPK (nitrogen, phosphorus, and potassium) fertiliser, and last from a nutritionist on the uses of soybeans. Though soybeans are rarely grown with any success in this region, this last talk provoked much discussion in the audience. The introduction of new crops and varieties, particularly mosaic-resistant types and germplasm adapted to succeed under very poor soil conditions, is the role which most farmers expect CIALCA to fill. Together with new techniques to restore soil, this is what farmers desire to access when participating in CIALCA's partner associations.

Afterwards, the association heads and a handful of farmers walked to a demonstration plot of beans and cassava under three regimes: "free planted" with manure, row planted with the cassava on a 1m² grid, and the same with both manure and NPK fertiliser. The fertiliser was Rwandan, brought in across the border specially by CIALCA; no supplies exist in the Kivus. The local group responsible for establishing demonstration plots was APACOV, the Association for the Improvement of Living Conditions, a relatively large local association with activities extending to agriculture, pastoralism, collective aquaculture, and female literacy. 20 of their members around the central village of Mwegerera agreed to establish these demonstration fields using improved seeds and NPK fertiliser provided by CIALCA. APACOV also arranged labour to construct erosion control ridges in these plots.

Of the two participants in this scheme interviewed, both were clearly enthusiastic about and proud of their part in it, though they were unable to judge the performance of the trial crops because of poor rains. The male participant had begun using the erosion controls in a second field, while the female participant said she could only do so if APACOV provided the labour again. They referred to NPK fertiliser as "*muzungu* (white person's) manure" (as also recorded in Burkina Faso: Niemeijer and Mazzucato 2003:417), and had not encountered it before. When asked if they would use it again, they both confessed that

they probably wouldn't have the money, but if they did then maybe CIALCA could sell them some or tell them where they had bought it.

As explained by a scientist present at the field day, the purpose of the exercise was to show farmers the benefits of good technology so they would aspire to use it. CIALCA do not plan to distribute fertilisers, but in the meantime “at least farmers can use manure... then if people all want NPK, traders will make it available. The important thing is to make them desire it.” While not providing the most practical of tools or guidance, in other words, the scientists were participating in the dreams of modern agriculture by spreading these dreams. Faced with the scale of problems, collective desire has come to represent its own form of collective action.

GROUPS

Pingali et al. (2005) write that “it is becoming clear that vulnerability, or the space of vulnerability, is the dynamic social production of resilience, or the capacity to manage, adapt to, cope with, or recover from risks to livelihoods.” In the DRC, the production of resilience is something of a national cottage industry. Its modern social production can take the form of associations or committees, but it is just as often created by “groups”: ad hoc alliances of friends and neighbours who pool their resources in small ways to overcome impossible constraints on individual action. Giovanni et al. (2004:114) found these “groups” strengthening in Kinshasa, perhaps in response to failures by NGOs and associations. Expats in the development world, they point out, call them Local Development Initiatives (LDIs), but here they have no name.

Many of the collective activities taking place in Luhihi and Burhale have the appearance of such groups – including some of the so-called associations, which consist of little more than a good idea, an acronym, and a hand-carved rubber stamp. In the Burhale village of Nkanga, five years previous the site of a battlefield, owners of cattle have set aside land to grow fodder together. In Luhihi, many farmers

pooled their money to buy a boat which runs a service to Bukavu on Lake Kivu, providing transport and a shared income. All over Burhale after the destruction of 2003, neighbours came together to rebuild the burned compounds of the poorest among them. These types of group praxis can help individual households rebuild their security, but beyond this they also contribute to the reconstitution of social capital and the bonds of a renewed order. The capacity to self-organisation, forged during the decline of Mobutism and the decade of war, is now the single most important resource in the region for building resilient livelihoods.

CONCLUSION

This study examined farming livelihoods in two Bashi villages of South Kivu as impacted by one of the most appalling armed conflicts the modern world has witnessed. The Congolese wars were, however, only the final strike in an assault on traditional forms of access and resilience begun in the colonial plantation era and furthered during the land grabs of Mobutu's Zaire. Farmers balanced the resulting loss of sufficient fertile land in small but vital ways through the use of mixed farming and its synergies, but here the conflict struck the killing blow. With cattle ravaged by robbery and disease and longstanding avenues of access diminished, only a few households who have retained their cattle against all odds now have the resources to farm sustainably. Other cattle are consolidated in fewer hands and kept on isolated pastures where their former connection to soil fertility is severed. Many farmers, with their land and farming systems exhausted by the conflict, no longer see a possibility for a traditional agro-pastoral livelihood and are employing all available assets to educate their children in hopes of a better future off the land. At the same time, however, this desire to participate in post-war realms of modern activity is also manifest in the attempts of countless local associations, organisations, and collective initiatives to create new solutions for a world beyond war. These social structures are well equipped for

disseminating successful practices and technologies, and are one of the few forces that can directly build the capacity to use them. Outside research agencies cannot hope to impose these strategies, but will have a role in proposing suitable and sustainable tools for local consideration: tools that utilise available resources, support the restoration of critically degraded soils, and recognise extreme constraints on post-war activity. These constraints are formidable but stand opposed to a determination that has proven itself unconquerable. The right devices in the hands of indigenous networks give weight to the reimagining of livelihoods on the very edge of possibility.

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