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# The Making of an Environment

## Ecological History of the Kapsiki/Higi of North Cameroon and North-Eastern Nigeria

*Walter E.A. van Beek and Sonja Avontuur*

### Introduction

Since the writings of Boserup (1981) and McNetting (1993), smallholder agriculture has returned to research and planning agendas as something other than a cul-de-sac of development. The triangular nexus of land, demography and technology offers scope for various forms of intensification, land tenure and labour management, that is, for variation in agricultural practices beyond the simplistic and deterministic Neo-Malthusian metaphors. Land is no longer 'a resource of fixed quantity and quality that conditions both production and population size' (McNetting 1993: 278). With population growth as a relatively independent variable, the responses of farmers to these internal pressures and the transformation of markets, as well as the withdrawal of states, are products of cultural creativity in balancing possibilities, options and needs at the grassroots level.

This adaptive response to population growth brings about intensification and investment in land through irrigation, terracing, diversification, multicropping, manuring and other use of domestic animals (see also Zuiderwijk 1998). Variety is the name of the game, and multi- and intercropping, soil enrichment, mulching, agroforestry are all used in various mixes.

The aim of the following is to demonstrate two points in particular. The first is the flexibility of a population's response to its changing environment. The second is more fundamental. The debate of Boserup and McNetting with the neo-Malthusians implies a fundamental discussion between 'equilibrium' and 'exploitation' in ecological analysis. In the first paradigm, the relationship between population and habitat is dominated by negative feedback mechanisms such as population control, conservation measures – either directly or as a part of a less conscious cultural baggage – indigenous knowledge systems and investment in the productive environment. Netting's study is the best example of this.

The second, the neo-Malthusian paradigm, which is often invoked in conservation circles where worries about a loss of biodiversity abound, uses a positive feedback mechanism, such as the following:

population growth → agricultural intensification → habitat modification → increased production → further population growth plus loss of biodiversity etc. (Scoones 1999).

The first scenario is an optimistic one, according to which humans are wise enough (or experienced enough; or else 'culture' has grown wise) to reset the beacons when the tide goes out. In this scenario, a more sophisticated investment in the habitat, more specific knowledge and additional outlets for labour make for sustainability in a changing ecology. The second is the doomsday scenario, the old Malthusian legacy that is so hard to erase: population growth will exceed resource growth, and our old planet Earth is suffering from a plague of humans.

Our point is that both viewpoints are grounded in a series of dichotomies that have become questionable, namely those between nature and culture, man and habitat, and system and chaos. Recent work in ecology, the so-called 'new ecology' (Scoones 1999), tries to transcend these dichotomies. Croll and Parkin (1992) spoke about 'cultural understandings of the environment' as a dynamic factor, and Ingold (1992, 2000) tried to develop a new terminology with his 'affordances', his aim being to 'shift the focus of an ecological anthropology away from an equilibrial, eco-system-society-based research agenda towards individual responses to hazards' (Scoones 1999: 484). From the biological point of view, a similar shift occurred: 'We can no longer assume the existence of a static and benign climax community in nature that contrasts with dynamic, but destructive, human change' (Scoones 1999: 491). What have resulted from this are the notions of 'ecological engineering' and – on a longer time-frame – 'environmental histories', notions that are central to the cultural construction of the environment and the spatial-temporal construction of culture.

What follows here is therefore an attempt to create an environmental history of a particular environment-*cum*-culture, in order to show the mutual constitution of culture and environment. A group with a definite territory, an adaptive technology and intense local knowledge in an environment that seems stubborn and inhospitable, namely the Mandara mountains of North Cameroon, has been chosen to illustrate this. In recent years a considerable amount of research has been carried out here (van Andel 1998, Zuiderwijk 1998, Avontuur 1997, Boulet 1975, Boutrais 1984, Mueller-Kossack 1996, Seignobos 1982, Barreteau & Tourneux 1988, Sterner 1997). Most of the stages, starting from a moderate population density through increasing population pressure to full intensification can be seen in this area, with a subsequent shift to extensive agriculture when the population is moved to more open resources. The group in question is the Kapsiki-Higi<sup>1</sup> conglomerate, which straddles the border between Cameroon and Nigeria, on the central-western part of the Mandara mountains.

1 The Kapsiki have been studied by Walter van Beek in 1971, 1972–3, 1978, 1984, 1989, 1994, 1999 and 2003, financed by WOTRO (Netherlands Foundation for Tropical Research), Utrecht University, the Africa Studies Center and various other funds, with a total field stay of over two years, and by Sonja Avontuur in 1996 for six months, financed by the VSB foundation, Netherlands.

## The Habitat

The Kapsiki habitat in Cameroon centres on a plateau at an altitude of 1000 metres, bordered by mountain ridges up to 1300 metres. The plateau itself, some forty by fifty kilometres square, is dotted with smaller and larger volcanic outcrops, which give the scenery a peculiar 'moonlike' atmosphere. On the western side, in Nigeria, where the group are called Higi, they live and cultivate on the mountain ridges as well as in the plains, expanding towards their Marghi neighbours. As we shall see agricultural practices vary with the type of field, but on the whole Kapsiki agriculture is quite characteristic of the area. Rain-fed Kapsiki agriculture produces sorghum, millet and maize as staples, intercropped with peanuts, Bambara nuts, beans and tiger nuts. Smaller crops include sweet potatoes, black potatoes, yam, couch, sorrel, tobacco, garlic, peppers and occasionally manioc. Fruit trees, pepper bushes and some sugarcane in wet places supplement their diet. The Kapsiki-Higi number about 200,000, the greater part in Nigeria. The population density is between 30 and 50 per square kilometre. Cattle and other livestock, goats and sheep, form an important feature of their agriculture. The cultivation of land and raising of cattle are both important to the value system of the Kapsiki, as well as to their symbolism.

As an old volcanic area, the Mandara plateau and hillsides are relatively fertile and can be cultivated on a permanent basis with few inputs and simple crop rotation. Water holes can be found all over the plateau and slopes, and although the slopes are not very easy to clear, weeds can be controlled relatively easy. Rains are more dependable in the mountains, which also retain water better. The mountain slopes demand some investment of labour, as they have to be terraced in order to be really profitable. The mountains are therefore well suited to labour-intensive horticulture by a small-scale population using simple technology and mixed husbandry.

The mountains have been inhabited for a very long time. Neolithic remains are quite numerous,<sup>1</sup> though the archaeology of the area is still being developed (David and Sterner 1987; MacEachern 1990). Neolithic axes are everywhere, serving often as ritual implements in the religions of the present day.<sup>2</sup> Until the late Neolithic, people seem mainly to have settled the plains, only a very sparse population entering the mountains. Rains were more plentiful, game more abundant, and in particular war and slavery were threats for the distant future. With the coming of the iron age at roughly AD 500 and diminishing moisture, the hills became more attractive, both as a safer area against external and possibly internal enemies, and for the iron ore which was found in the mountain gullies. The

1. Martin 1970: 1, David and Sterner 1987; van Beek 1978: 6

2. This impression of long-term settlement is reinforced by evidence from palynography, food grains (David 1998) and iron and brass technologies (David and Robertson 1996) In his overview, MacEachern (1990) stresses the paucity of Neolithic sites (in contrast with artefacts)

mountains became both a refuge and a centre for iron production. Gradually the gravity of population shifted towards the mountains, where population density must have climbed slowly on the basis of a Neolithic form of exploitation from about 2000 BC, an iron technology from about 500 AD; brass seems to have arrived much later in the area, well into the second millennium of our era. The new technology facilitated an increased exploitation of the area, and sheep and goat husbandry became more important.

One sign of the length of occupation is the extensive terracing that is found everywhere in the mountains, especially in the north. Some groups, like the Mafa, no longer have any memory of making them and consider the major rock works to be the works of giant, stemming from the beginning of time (Martin 1970; van Santen 1993).

A major factor has been war. For a long time the Mandara mountains were a refuge from slave-raiding. Well before the onset of the Fulani *jihad* of the eighteenth century (Njeuma 1976), the Kapsiki must have populated the steep hillsides and the top of the granite outcrops that dot the plateau (van Beek 1987). Their villages were built, the compounds closely together, on the granite outcrops on what is now the Cameroonian side, and on top of the hills or on the steep hillsides in what is now Nigeria. Defence against mounted slave-raiders, whether Mandara, Baghuirmi, Kanuri, Bornu or Fulani, was of prime importance. Cultivation was feasible in the close vicinity of the mountain strongholds, either under close supervision from the village or in the relative safety of the inaccessible hillsides. Water was a problem, especially on the outcrops, but wells were found at the foot of most mountains.

Thus the Kapsiki lived in isolated villages on the hilltops. Not only were the hillsides a defence against foreign marauders, but the Kapsiki/Higi also fought each other at more or less regular intervals, as well as engaging in fighting within the village itself. Villages fought out their own wars between them (van Beek 1987; Otterbein 1968) and often captured slaves, who were usually ransomed by their kinsmen; a poor lineage, however, had to let its kinsman or -woman be sold beyond Kapsiki territory, into the hostile Muslim empires of Mandara, Bornu or later Yola. In the many fights within the villages poison was not allowed, nor could slaves be caught, since if there were casualties a blood-price had to be paid by the killer.<sup>1</sup> People therefore fought with clubs and sticks within the ward, and with knives and swords within the village, but in order to wound, not to kill. During most of Kapsiki history, the external threat, which did not have the sporting overtones of the internal fighting, was the more serious one. Muslim cavalries were on the whole a superior and better organised enemy (Barth 1985/7/8). Thus,

<sup>1</sup> This never led to reciprocal feuding, however, through a specific mechanism in paying the blood price. Among the Kapsiki, the mother's brother of the deceased received the blood price, not his patrilineal kinsmen, which for the latter reduced the incentive for revenge killings, for which they would have to pay another blood price.

definitions of territory depended largely on the political situation. For our ecological history of the last century, therefore, we use political history divided into five relevant periods: before 1880, 1880–1920, 1920–1950, 1950–1980, and 1980 to the present.

### Slaves and Spoils

During the first period, before 1880, slave-raiding, internal slave-hunting and external warfare must have been endemic, at least from the days of the Sokoto emirate, in the early nineteenth century (Denham and Clapperton 1826; van Beek 1988). Often these raids appear to have been large-scale Muslim expeditions that entered the mountains with a large force of cavalry. In many cases, the spirited defence of the mountain people was noted by outsiders. Just above the village of Kamale, an old earth ridge, reinforced with the ever-present stones, shuts off a narrow and steep gully, being at the same time a defence against slave-raiders and a limit to the cultivated fields. One sultan of Bornu died during a slave raid into the Mandara mountains, in 1863. Still, local losses must have outnumbered 'victories', even if the latter are better remembered.

In the period prior to 1880, the Kapsiki cultivated the slopes of the steeper hillsides and the sides of the outcrops where their villages were situated. The amount of intensification is hard to establish. The slopes of the main historical site of Mogode, *Rhungweḍu*, show a considerable network of ridges and terraces, all dating from before 1880, somewhat like the Mafa area (Zuiderwijk 1998), but on a smaller scale. Agriculture for the Kapsiki must already have been associated with daring, bravery and courage: the bravest had their fields at the greatest distance from the safe haven of the hill-top village.

The general discourse on this period is couched in terms of a primordial family, invoking the image of a very small community on the ancestral mountain, during the times when the whole village could be housed on the three hectares of the mountain top. In the founding myth, the ancestral village was composed of one extended family with some incoming guests (van Beek 1978: 415), and the yearly sacrifice on this mountain recalls those days. In fact, the settlement at the top of the outcrop must be older. In the village of Mogode no sherds<sup>1</sup> younger than 350 years BP have been found on the old mountain top, meaning that the *Rhungweḍu* mountain had already been vacated before the start of the eighteenth century. Probably most villages like Mogodé had already descended from their ancestral abodes for over a century, and it is safe to assume that prior to 1880 the threat of slave-raiding was much less severe than it would be later. The population had grown, people expanded over the gentle slopes that ring the plateau, and cultivation some distance away from the settlements became possible. In many cases,

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1. Most sherds on *Rhungweḍu* date back centuries, with a mean of 350 years BP.

claims to bush fields had been made in the years preceding the arrival of colonisation.

The earliest colonial period, 1880–1920, witnessed an increase in slave-raiding. The British colonial presence in Nigeria was already making its mark, as were the Germans in Kamerun. For the mountain dwellers these white people were far away, but the Fulani were not. Their dominance increased under the colonial presence. These were the days of slave-raiding Fulani dominated by Haman Yaji, a Fulbe chief of Maiduguri, who instituted a reign of terror in the mountains (Kirk-Greene 1958; Vaughan & Kirk-Greene 1995). From several bases, one of them close to Mogodé on the Kapsiki plateau, he carried out a virtually unending series of slave raids. This intensification of slave-raiding during the early colonial period has been noted for many parts of the Mandara mountains, as well as for other reclusive populations and slaving grounds (Fardon 1988). In a way, the colonisers, with their new armaments, upset the precarious balance of power in the mountains. Horses seem to have become more common (Smaldone 1977), and on the whole, after their initial ‘pacification’, the colonisers put their military might at the disposal of the indigenous rulers, or those who were seen as such, namely the sedentarised Fulbe. The markets for slaves, such as Mora, functioned undiminished. Even when the grand emirates were subdued by the incoming Europeans, the hunger for slaves was unabated (van Beek 1988). And of course firearms, though not absolutely superior to mounted cavalry, were an asset for a slave-raider. The impression is that, through the use of firearms, the raids became smaller but more frequent. Large cavalry forces no longer went deep into the mountains, and instead the Fulbe scoured the area through small-scale raiding. Three reasons can be found for this change. First, the centres of power were closer to the Mandara than they had been earlier: Yola, Kanuri and Baghuirmi no longer sent out their warriors on large-scale slaving expeditions, and Maiduguri, Mubi and Mora, all on the mountain perimeter, became the raiders’ homes (cf. Vincent 1991). Guns may have been the second reason: raiders with guns enjoyed military superiority and did not need large numbers. Finally, the European presence precluded large-scale operations (Barkindo 1989).

The Kapsiki must have cultivated as close to their compounds as possible, as informants explicitly state. Agriculture in this period seems to be characterised by intercropping, manuring plots near the walls of the compound or within it, and the first intensive use of maize. Labour organisation was probably marked by increased individualisation of production. In the first part of the period, people still went off to the fields in groups in order to defend themselves; later this collective response to slave-raiding seems to have crumbled, and people started to leave the out-fields fallow and concentrate on the in-fields. As hit-and-run raids became more usual, stalking people very early in the morning and escaping with just a few slaves, collective responses to the problem were hard to organise (van Beek 1992b).

These decades marked the highest intensity of cultivation on the terraced slopes near the villages themselves. This first 'historical period', during which the coloniser gradually took control, was therefore quite atypical, one of a contraction of acreage instead of its expansion.

### Peace in the Land

The following period, 1920–1950, is the first period of colonial rule. World War I had interrupted the colonising project, especially on the Cameroon side, where the Germans were defeated and their colony divided between the British and the French. The mountain peoples, like the Kapsiki, suffered in the struggle between the European nations, as for a number of reasons they tended to side with the Germans. First, they admired the fierce fighting strength of the Germans and chose what they thought were the strongest party. Secondly, more than the Germans, the French and English had tended (and would continue to tend) to rule indirectly through the local Fulbe elite; in siding with the Germans, therefore, the Mandara peoples were trying to avoid a renewal of Fulbe dominance. Of course, their backing the wrong horse resulted in fierce revenge on the part of the Fulbe. Later the threat of slavery subsided; the colonisers moved in, set up their administration and started to pacify the area in earnest, not just from the slave raids, but also from the internal fighting, which seems to have flared up strongly after the removal of the slave threat. Indeed, it was some time before these little wars ceased, in fact not until well after World War II. The last internal wars and skirmishes date from the late 1950s, and even into the 1970s occasional fighting broke out. Of course, the disruption of World War II itself, with its *levée en masse* of Cameroonian soldiers and the reduced attention given to internal government, did not exactly hasten pacification. By about 1950, the dominance of the Cameroonian and Nigerian colonial states had been sufficiently restored to bring the fighting to a close. One major innovation in this period was the institution of weekly markets, a phenomenon unknown to the area before the pacification, though now much appreciated.

It was therefore in these decades that the Kapsiki ventured out on to the plateau itself (van Beek 1989), cautiously at first, more boldly later. The first step was to establish wards some kilometres on to the plateau; the village of Mogode quickly grew from four wards in the centre to fourteen wards, which formed a large crescent on the plateau rim. Some small settlements on the very slopes towards Nigeria, one of the best protected against slave-raiding cavalry, were deserted at these times, as the more easy cultivation of the plateau offered better prospects. Though the old centre retained its political and ritual pre-eminence, the 'outlying wards', where people could live close to their new fields, became more extensively used for agriculture.

One stimulus has been the introduction of peanut cultivation, probably through the colonisers. *Arachis hypogea* was quickly taken up by the Kapsiki, for

two reasons. It is an easy crop to rotate with the main staple, sorghum, and they were already familiar with a similar crop, the indigenous Bambara nuts (same species, different variety). The new peanuts occupied the same ecological niche and thus became the domain of the women, who had also cultivated the earlier varieties. The men had too many new fields in which to cultivate sorghum and millet to concern themselves very much with peanuts. An export crop from the start, Kapsiki women learned to use it in their sauces as well. Between the wars, peanut cultivation gradually spread throughout the Kapsiki's villages, furnishing the women with their first cash income. The former source of cash, the men's tobacco, did not grow proportionally and even declined.

This period therefore saw a rapid increase in the acreage under cultivation, for both the staple and peanuts. Many fields at modest distances from the village centre originate from this period, and thus many fields have been in the possession of patrilineal families for about three generations now. Maize, as the earliest crop, became more important as *soudure*, as the importance of small crops, cultivated in the immediate vicinity of the compound, dwindled.

The next period, 1950–1980, that of the 'mature colony' and first 'neo-colony', saw some changes in line with these developments. Pacification was completed,<sup>1</sup> and the people started to move around the area with greater freedom. The plateau and the plains in between the different villages were claimed for agriculture, and by about the end of the period 'no more bush', as informants put it, was available. Cultivation huts sprang up all over the plateau, and families dared to build individual compounds out of sight of the village wards. The government and some development projects introduced some changes, stimulating use of ox-drawn ploughs for plateau cultivation. Though this met with limited success, it became an established practice. Other experiments, like the planting of *mouskwari* sorghum, failed. On the plateau, especially in the vicinity of Rhumsiki, tourism increased (van Beek 2003), generating a demand for gardening: around the wet areas of the plateau in the neighbouring villages, people started to grow tomatoes, onions, radishes, lettuce and cabbages, stimulated by the particularly efficient manager at that time. Yet this only applied to a few individuals, mainly Christians who were taught this form of cultivation by their pastors.

Cattle also became more numerous. The Kapsiki had long kept a considerable number of cattle, and during this period the number gradually increased. They had their own brand of cattle that still predominated in their herds, but this slow-reproducing animal had to cede place to the *Bos indicus*, the Fulbe cattle. Yet in this period relations with the pastoral Mbororo Fulbe, who lived all over the plateau, grew more intense. Old scores having been settled, the Kapsiki and Fulbe moved into a kind of symbiosis in which the Fulbe herded the Kapsiki cattle together with their own, returning milk and manure to the agriculturalists.

1. The last war seems to have been between Mogodé and Sirakouti, in 1956 (van Beek 1987: 4)

The status of the Fulbe and the bush Mbororo was quite high, boosted by the support of the President of Cameroon, Ahmando Ahidjo, himself considered a northerner and a Muslim, and thus, in the eyes of the Kapsiki, a Fulbe. This period saw a clear growth of Muslim centres in the core of many villages, especially Mogode as the seat of the Lamido. As a *chef traditionnel*, he represented the government on the one hand, but still had enough political leeway to organise his court in accordance with traditional Fulbe style. Although he was a Kapsiki, he was a Fulanized Kapsiki. Fulanisation, or 'Fulbeisation' (Schultz 1984, van Santen 1993) became well known as a concept during this period. The Fulbe-ized Kapsiki set themselves up as merchants, first in peanuts, later to be supplemented by staple commerce. The civil war in Nigeria also provided considerable possibilities for commerce. Smuggling between the two countries, which is very easy for the Kapsiki, as they live on both sides of the border, became highly profitable: food and beer into Nigeria, enamel ware, gasoline and cloth into Cameroon. This period thus saw the establishment of Kapsiki traders, many from the central Mogode village, in the larger Mandara mountain area, as well as in Mokolo.

Agricultural labour became scarcer during this period; the extensification of agriculture increased the traditional bottlenecks in labour represented by the first and second weedings. One response was to break new ground in recruiting work parties more than had been done so far. Men organised the first breaking of a new field in large parties of twenty to thirty workers, with plenty of beer and food awaiting the party after completion. Labour was summoned by crying out in the night before the event, relying on the reciprocity of work done by others. The women, for their harvest and to a lesser extent for weeding, increasingly organised their own parties of about a dozen women from the neighbourhood; beans and especially peanuts were and still are harvested by working groups of women. The herding of goats and sheep, which are an important part of the Kapsiki's flocks, became something of a problem. Schools started to demand the attendance of the younger boys. Families with many children could afford to have one boy stay away from school and herd the goats and sheep, while the others went for education. Here the Kapsiki were helped by the decrease in child mortality that set in during this period. From a stable population up till the end of the 1960s with a fully traditional demographic pattern (high fecundity, high mortality; see Podlewski 1966), they entered the transition phase with a marked decrease in mortality, a situation that would also characterise the next period.

### The Demographic Boom

The last period, since 1980, is one of the demographic increases of both humans and animals. In and since the 1980s, improved health care, together with improved water provision, with quite a few additional wells and pumps having been constructed by development aid, resulted in fewer early deaths. The hospitals in Sir and Mogode and the health posts in practically all villages improved the pro-

vision of vaccinations. The fight against malaria and epidemic meningitis was reasonably successful, while the threat of measles has been greatly reduced. Though demographic figures for the 1990s do not have the same precision as earlier ones (Podlewski 1966), the general trend is clear: the mortality rate is declining.

The mean number of living children has increased from 3.5 to between 4 and 5. Transition theory stipulates that increased fertility figures should follow decreases in mortality, though after a time lag. Figures for fertility are not available; the impression is some decline in fertility but not a large one. One field indication is the near disappearance of names with *meba* (literally 'old'), meaning the 10th, 11th etc. child, and suggesting that there is now a tendency to have fewer than ten pregnancies. Nonetheless any serious fertility decline is still far off, and Kapsiki society is fully exploding, with high fertility and decreasing child mortality.

The second demography concerns cattle. The mean number of cattle per household between 1973 and 1995 rose from 1.3 (van Beek 1978: 317) to 3.6 (Avontuur 1997: 44). This rise favoured the Fulani type of cattle, the classic long-horned humped *Bos indicus*, which almost characterises the West African savannah. The Kapsiki do have their own traditional brand of cattle, *Bos taurus*, short-horned, black-and-white cattle without a hump. These demand less food and fodder, and feed more readily on poorer grasses. Though the Kapsiki highly value their own type of cattle, they produce less meat for the market. Nonetheless, especially for ritual purposes, some proper Kapsiki cattle should be part of the herd (van Beek 1998). Herd increases were aimed at meat production, and the new flocks containing the *indicus* cattle consume considerably more grass and fodder than the older ones and as such bear heavily on the savannah vegetation.

The expansion of cattle-grazing, plus the expansion of agriculture, resulted in bringing almost all the plateau under either cultivation or grazing in the mid-1990s. One clear indication was the cost of roofing straw. In the 1970s almost all houses consisted of straw-roofed round huts, and bundles of roofing straw were almost never bought or sold. The usual way to roof a new hut was for the proprietor to collect the straw and then to call in his friends for a work party. Together the men plaited the straw rope for roofing, and produced the loosely tied straw lining for the roof. During the 1980s this changed. Long grasses suitable for roofing became scarce, and corrugated iron became a routine substitute. In the 1970s this was considered quite expensive, though 'modern' Kapsiki who had some cash like tailors or merchants had already started the trend. Only recently have people become aware of a receding water table, probably the result of fewer rains and more animals. One culprit, the Kapsiki indicate, are the eucalyptus forests which now dot the plateau through reforestation programmes. Though no exact measurements are available, surface water is becoming scarcer.

### Agricultural Transformations

The whole of Kapsiki agricultural dynamics must be seen against a background of climate change. As elsewhere in west and central Africa, the climate seems to have become dryer. Mean annual rainfall in the period 1955–1969 was 1109 mm (Hallaire 1991: 20), and from 1970–1984 1012 mm. In Sir the mission measured a mean of 926 mm in 1992 and 1993. However, this decline in precipitation is not so clear. For instance, the 1994 figure greatly exceeded these figures, with over 1400 mm of rain. As elsewhere, drying up implies not just less rain, but more erratic rainfall, with wild fluctuations. Also, the rains now tend to fall somewhat later in the year, especially the heavy rains in the middle of the season, which have shifted from July and August to just August. Nonetheless, in 1994 as in 1972, most households could produce enough for their own needs, at least enough staple, sorghum, millet and maize (called 'sorghum of the Marghi', their neighbours in Nigeria). Some poor families have to rely on kinsmen and neighbours for their needs, but this is the exception rather than the rule. Nonetheless subsistence accounts for 62% of the crop production, the remaining 38% being sold in the market. Although Kapsiki society may no longer be '*la société qui suffit à elle même*' (Podlewski 1966), as it was in the early 1960s, the subsistence orientation is still quite marked. People are used to consuming what they produce and are loath to produce a cash crop that they do not consume themselves (Avontuur 1997: 27). No farmer places a priority on cash crops. According to Avontuur, crop yields in 1994 indicated that 32 out of 38 families examined produced enough staple to feed themselves, while 6, equally distributed over the mountains and the plateau, were short of staple. However, most of these were blacksmith families, who easily make up for a lack of harvested crop, while the others produced enough plaited utensils (mats, chicken fowls etc.) to buy the rest of the staple they needed. Two families are in dire straits. One is a settled cattle-less Mbororo (Fulani) family, where the husband refuses to cultivate ('not his way of living'), and the wife, while occupying herself in agriculture, cannot make up for this. The other two are old people, living with a small grandson or granddaughter. They rely on the kinship network to be fed (Avontuur 1997, 29). Though quite individualistic, the Kapsiki still honour these requests, albeit somewhat grudgingly. Poor people are routinely described as 'lazy', just about the worst accusation possible (cf. van Beek 1987). In 2003 this tendency is still recognisable.

The Kapsiki fully recognise the variations in soil fertility, such as those produced by volcanic remains: the soils on the slopes, they say, is the 'shit of the mountain', yet fertile as such. The plateau itself varies from red laterite to loamy black soils, with occasional rocky patches. Also, the plateau sports river gullies as well as some permanent waterholes. On the whole, the Kapsiki recognise the plateau fields to be less fertile than the slopes and more prone to weeds. Fallow periods need to be longer on the plateau (cf. de Steenhuijzen Piters 1995).

Thus the two main ecotopes, the mountain slopes and the plateau, offer specialised niches for various crops. The main crops, sorghum and maize, grow on both, with some ecotopical variation for the many varieties of sorghum: red on the poorer soils, the high-yielding yellow variety on the mountain slopes. Maize needs the richer patches anyway, and is often grown close to the homestead in order to profit from household refuse and to guard against thieves taking it just before harvest. Pearl millet, yams, tobacco, garlic and macabo (in small quantities) grow better on the slopes, yellow sorghum, peanuts and beans better in the mountains. On the plateau, by contrast, the 'wetter' crops thrive, namely sweet potatoes, black potatoes, sugarcane (near open water), rice, manioc and fruit trees, the latter near seasonal rivers. As Kapsiki villages spread out over the fields, especially in the last phase of history, an increasing number of them aim to cultivate fields both in the mountains and on the plateau. Though those that move out on to the plateau try to retain their earlier fields on the mountain slopes, this dual strategy is easier for those who stay in their mountain homes and open up fields on the plateau.<sup>1</sup> The reason is clear: claims to the plateau fields are less detailed and less dense than those to the mountain fields (cf. van Andel 1998).

The Kapsiki invest little in manure for the fields, but they practise mixed cropping to a large extent. Maize and sorghum are intercropped with beans, sesame, sorrel, peanuts, okra, pumpkin and bambara groundnuts. Monocropping, though always on a small scale, is adopted for tobacco, eggplant, rice, tiger nuts, sugarcane, garlic, sweet potatoes and black potatoes. It is realised that intercropping increases fertility and decreases weeding. Trees such as *Acacia albida* and *Ficus ingens* should remain in a field to enhance fertility. Other trees are for timber only, and shade is not considered important for plant growth. The timing of burning off the fields right after the harvest is somewhat puzzling; the dry Harmattan does not allow nutrients to be infiltrated, and the only result is to render the fields unusable for cattle-owners, which in fact is one of its motives.

Just as important as soil type is the angle and presence of rocks. All slopes are strewn with rocks, both large and small, and they can only be cleared and cultivated by gathering the stones into terraces, which is obviously also a measure against run-off. The plateau fields are much less rocky and do not require extensive terracing. Thus, for the cultivation of all mountain fields the hoe is by far the most suitable instrument, whether with a pointed blade on the most rocky fields, or with a wider blade at the foot of the hills. On the plateau the hoe is being replaced by ox-drawn ploughs, which were introduced in the area in the late 1970s, though adoption of this new technique has been very slow. The cost of feeding the oxen and the disappointing results led to many of those who had adopted it early on to abandon the plough, eat the oxen and return to hoe cultivation. Grad-

1. In Roufta the mountain inhabitants had 40% of their fields on the plateau, while the plateau inhabitants had 14% of their fields in the mountains, all in the village of Roufta (Avontuur 1997: 24).

ually, a smaller plough drawn by donkeys was introduced, with better results. In 1972 only four farmers in Mogode were using a plough (out of a population of 1800). In 1994, in the more remote village of Roufta, about four out of ten farmers own a plough. Yet although people like to cultivate with a plough, they recognise the loss of soil fertility that a plough may cause (it is said to 'bury' the fertile top-soil), and insist that in many cases the soil has to be 'healed' by reworking it with the hoe. Everywhere, plough cultivation reflects the polarisation of wealth in the village: the rich men own plateau fields and are able to use ploughs. Total investment in agriculture has not risen, whether as investment in land or in implements. The total amount of ploughs, oxen and other investments is still very low. Everywhere the basic type of agriculture has remained the same, namely the hoe-type of horticulture that has characterised African cultivation for so long. One reason for this persistence of the old tried and tested technology is the environment itself, another backdrop of the whole century of agricultural activity we are discussing.

One technology that did change agriculture is the coming of the grain mill. At the end of the 1970s some enterprising outsiders introduced grinding mills in the villages. After some misgivings from the men that machine-ground sorghum did not taste good, the women quickly settled the question by using the device en masse. The 1980s saw a gradual expansion of the mills, and in 1994 almost all villages had access to one. In 2003 some excess competition was threatening to emerge between mills. The main change was the impact on maize cultivation. Maize had been a *soudure*, a modest crop serving as a first harvest, to bridge the gap until the main sorghum crop. The maize kernels were not well suited to the hand-driven stone mills of the Kapsiki, and the women disliked grinding maize. The coming of machine mills changed all that. Maize became a major crop that was easy to cultivate, with a good yield per hectare and an early harvest.

### Strategies for Adaptation

Tenure is changing in the direction of more individual ownership. Title to land in principle, and to a large extent in fact, follows patrilineal kinship organisation: clan, lineage, sub-lineage. In principal land belongs to those who have cleared it, a general rule still in operation on the fringes of the village territory. However, on the slopes all fields have been cleared for several generations, at least three, while on the plateau recent decades have seen the division of new fields, usually determined by first clearance. In principal, therefore, the land belongs to the patrilineal descendants of those who cleared it. Though living dispersed throughout the ward and beyond the village wards,<sup>1</sup> the lineages and sub-lineages still control most of the fields. In 1994 and 2003 about half of the fields had been inherited, about the same proportion as in 1972. What had changed were the gifts given in return for loans. In 1972 these still amounted to some pots of beer, or herding the lender's animals for a time. By the 1990s, borrowing land had become more com-

plicated. A field is considered to have been borrowed so long as the full amount of gifts to the lender has not been paid in full. Besides the beer, money, goats and utensils were also given, and then on a regular basis. Without new gifts, the field might be taken back. This new trend shows most clearly when a field has been borrowed to build a compound, as often happens. Without gifts each year, the builder of a house may be thrown out of it by the owner of the land. One inducement actually to do so would be the increased fertility of the plot after several years of accumulating household refuse. In the 1970s this was unthinkable: building and living had clear priorities over cultivation. Fields can also be rented, in which case an agreed sum is paid beforehand. House plots were often being bought in 2003, because of the possibility of conflict. Gradually, the bulk of court cases have shifted from brideprice to land issues, especially those linked to habitation.

Sales of fields have increased only slightly in recent decades. In 1994 only 6% of fields were bought; sale was possible but discouraged in the 1970s, as it still is in the 1990s. Often, the sale of land is an indication of tensions between agnatic kinsmen, brothers, half-brothers and lineage brothers. In the Kapsiki social system the (sub)-lineage cannot prevent one of its members from selling land, even though he is taking it out of the lineage's total stock of land. Often, therefore, the other members decide to buy it back. This is still the case, though increasingly the land is being bought back by individual lineage members, which provides a clear individual title contractually. The accumulation of land in the hands of individuals still is a long way off, but the tendency is there. Finally, borrowing land against sizeable counter-gifts is not that far removed from the actual sale of land. Even when borrowing was 'cheap', the lines between borrowed and owned fields tended to become blurred, especially when loans were inherited over generations. Then both the actual limits of the fields and the kind of title involved became unclear. The present tendency towards individual ownership has led to clearer boundaries.

Throughout the past three decades, differences in wealth between Kapsiki have increased. Cattle is becoming monopolised in the hands of fewer and fewer individuals. Especially in roadside villages, many Kapsiki have taken up commerce. Smuggling, trading in peanuts and recently trading in cattle have produced a small Kapsiki merchant class in the Mandara area, both within and outside Kapsiki territory. They routinely invest in cattle, bringing herds from the Diamare plains into the mountains to add to the Kapsiki herds. Kapsiki who have

1. The village of Roufta, site of Avontuur's research (1997), is something of an exception in this respect, since the clans, lineages and sub-lineages follow territorial lines, each ward being associated with a particular clan. Migration here means a gradual change in clan affiliation. In the practice of land tenure, this reinforces the claims of the patrilineal units, even though they are not composed strictly in accordance with the patrilineal ideology, due to immigration.

made a career as officials also invest in cattle, which they keep on the plateau, guarded by their younger kinsmen.

Raising livestock for cash has also become more important in recent decades, at least for some. The number of people owning one or two cows has not grown (Avontuur 1997: 34; van Beek 1978: 316) and hovers at around one third. More people were cattle-less in 1994 than in 1972. In the latter year, however, the richer cattle-owners had more than five cattle, while in 1994 about the same proportion of people had more than sixteen. The number of goats and sheep doubled between 1972 and 1994, with a tendency towards more goats and fewer sheep. Donkeys were scarce in 1972, but had become omnipresent by 1994, mainly to draw ploughs. Within the family, the situation has hardly changed at all. In principal the men own the livestock (except poultry), though a woman can also invest her earnings in livestock, and then she may own cattle, sheep or goats. However, selling them is another matter, as this is the husband's task, either for his own profit (just as he may sell her peanut produce for his own benefit) or for hers. However, he runs serious risks if he pursues his own advantage too much, first, because his wife may leave him, and secondly because all the neighbours will know what is happening, and a man enriching himself from his wives' livestock is not much respected.

Diversification is not new, but it is clearly happening. By far the greatest amount of time is still spent on agriculture, by both men and by women. Though men also spend some time on stock raising and the women on household activities, agriculture easily ranks first in the expenditure of time and energy. Also, agriculture provides the first cash income. Almost all households earn money by selling crops, though the differences between households are considerable. The most important cash crop, as in the whole region, in fact, is peanuts. For women who sell their own produce, peanut sales comprise 69% of their income, the rest coming from other small crops, such as other nuts, okra or garlic. Income sources for men are more diversified: in 1994 Roufta peanuts amounted to 13% of their income, tobacco 16%, sweet potatoes 12%, sugar cane 12%, and cassava 13% (Avontuur 1997). The largest slice of income for men derives from stock sales (37%). This has therefore not changed lasting recent decades, as in 1972 the proportion of income by cattle sales was at the same level (van Beek 1978: 44). However, a large proportion of men's agricultural sales comprise the products of their wives, such as peanuts and cassava, and men depend on their wives' labour for the cultivation of sweet potatoes. Produce tends to be sold immediately after harvest. Farmers would obtain better prices if they could wait for prices to go up towards the end of the dry season, but most of them do not have enough cash reserves for school fees, taxes and the debts they have incurred during the cultivation season. Again, the more wealthy farmers can make more of their produce by waiting for the market to rise.

Alternative earnings from agriculture have always been quite important and are becoming more so. All women trade, and most men do so too, at least occa-

sionally. Most women brew and sell *mpeldi*, the white Kapsiki beer brewed by women. In 1972 this brought them about 70 per cent of their cash income, a figure that had not declined in 1994. Towards the turn of the century women started to brew the red variety, which was formerly reserved for male production, as a market product with great success. One main advantage for the women is that they can keep the profits from beer themselves; their husbands never have access to it. Only when they invest in livestock do things change. Beignets and other small foodstuffs are also a favourite women's produce for sale, usually at the weekly market. Besides crops and cattle, men sell plaited straw products (ropes, baskets, mats, even granaries). Other men supplement their agriculture by working as tailors or butchers or trading in soft drinks and industrial beer from Nigeria. Small products, such as dried fish, medicines, kola nuts, the occasional bottle of whiskey, cigarettes, salt, sugar, soap or matches, can be traded by anyone, though some people set up a proper shop on market days. For many, a box of matches or sweets is an excellent excuse to go to another market, visit another village, and spend the meagre earnings on samples of the local beer. In 1972 as in 1994 (Avontuur 1997: 49), the men were complaining that ultimately all the money ends up in the hands of the women. That, at least, did not change, though women's control over any form of invested capital, such as cattle, did not change much either.

Most non-farm production, such as house building, roofing, plaiting, basket weaving (this may be specialised work), is intended for the use of the household and is not marketed. The exception, all important in Kapsiki society, is the work of the blacksmiths (van Beek 1992a), to whom working in iron (though not smelting; see Sterner 1997), burials, drumming and other music and many medicinal tasks are relegated as specialists, for which they have to be paid. Blacksmiths' wives make pottery and have their own medicinal specialisation, often for children. This caste-like group, which combines labour specialisation, endogamy and ritual obligations with notions of pollution, might be called 'general specialists', and they have strong associations with death. They were richer than the average non-smith (*melimu*) Kapsiki in 1972, and to all appearances still were in 1994 and 2003. Though Islamisation has made some dents in their marital isolation, allowing some of their girls to marry into Fulanised Kapsiki families, the distinction between the two groups has hardly shifted at all over 25 years.

### The Making of an Environment

Thus processes of intensification and expansion see-saw through Kapsiki agricultural and political history. The general trend is one of labour economics: intensification occurs only if required, if external circumstances make more extensive methods unfeasible.

The Kapsiki try to harvest as much produce as possible per unit of labour. As long as land is not scarce, this is a viable strategy. The tendency towards expan-

sion has been most marked on the plateau, especially with those who can plough. The gradual increase in the number of ploughs, as already noted, represents a shift towards expansion, as in fact all plough agriculture is done on the basis of the fallow system. Some five to eight years of fallow are deemed sufficient to restore fertility, counting on the resilience of the volcanic soils in particular. Ploughs, then, are used to increase area cultivated with the same amount of labour, especially for weeding. The risk of soil degradation becomes clear at this juncture (Avontuur 1997: 46), but the main option still seems to be to increase the acreage under cultivation, not to invest in the soil. The consequences of a possible scarcity of water are not as yet clear.

When required, intensification seems to have happened in the past, both during the intense periods of slave raiding, and for specific crops, such as those cultivated for the hotel. In this respect, the Kapsiki do not have any problem with the technicalities of more intensive agriculture, and they seem to switch quite easily from one approach to the other, but only if required or if it is profitable to do so. Thus Kapsiki society will continue for some time to follow a course towards the polarisation of wealth, favouring a few, but disadvantaging most. Then intensification should be adopted due to population pressure, which is definitely increasing (cf. van Oostrum 1993).

Obviously the territory available to the Kapsiki is limited, for what are their options for expansion of the area under cultivation? To the north, east and south, Kapsiki country is hemmed in by groups with at least similar population densities. To the south the Hina and Bana are in a similar situation to the Kapsiki, while expansion towards the north is blocked by the massive population of the Mafa. In the Nigerian west, the Higi are moving into the plains of the Margui population. However, the international border represents a restriction: Nigeria does not welcome too many immigrants, and relations between the two countries are tense. After all, the very area where the Kapsiki and Higi live is one of the disputed border zones between the two countries.

However, adapting to changing times also changes the environment. Several factors have repeatedly changed the ecology. Climatic changes, with a gradual reduction in moisture and more erratic rainfall, are an independent variable, but most factors for change are cultural. Political insecurity, for instance, and the constant threat of war and raids, have drastically influenced interaction with the environment. Knowledge and technology have had an impact as well, such as changes in cultivars, like peanut cultivation and the rise of maize, and the occasional flourishing of horticulture. Moreover the introduction of the plough, though still on a small scale, not only means more outfields being used as acreage, it also creates a sharper distinction between types of fields: flat, without stones, versus the mountain slopes. Obviously this technology is changing both the fields themselves and their water management.

A fourth factor is labour, hence demography. The most spectacular environmental change is, of course, terracing. Like their neighbours in the area, the Ka-

psiki have changed the face of the hillsides. Though not as intensively as the Mafa, they have changed run-off patterns, creating a new niche for both plant cultivation and non-cultivars. In turn, the terraces require maintenance, as water erosion and cattle tend to disrupt them. Thus changes in the environment influence cultivation and labour input.

Husbandry has been a crucial input. Goats and sheep seem to have been a continuous presence without much dynamic impact, but cattle-herding has changed. Though the Kapsiki *Bos taurus* has long had a presence in the mountains, the arrival of the Fulbe, bringing their own brand with them, has undoubtedly intensified cattle-herding. Thus, from the late eighteenth century the plateau has been grazed much more extensively. This increased the exploitation of the plateau, and in fact changed the typical *brousse* into pasturage. This relationship with the pastoral Fulbe has been quite dynamic, and the ethnic distinction between the two sides of the ecological picture – agriculturalists and pastoralists – has proved highly fluid, changing the characteristics of the ‘bush’. (van Beek 1998).

Incorporation into a market economy has redefined the territory further, with the special characteristic of being straddled on an international border, with tourists finally coming to *le pays Kapsiki* and paying for the aesthetic enjoyment of a part of the landscape that for the Kapsiki was neither interesting nor productive (van Beek 2003).

We return at this point to the debate of Boserup and Netting with the ‘Malthusians’. First, in the case described here the physical environment has proved flexible, at least sufficiently so to allow for a dynamic cultural definition and to provide for different degrees of land-use intensity: environment and culture continue to determine each other in the ecological history of these mountains. The final question is whether this flexibility has any inherent limits. Recognising the mutual interdependence between the environment and the human adaptive response, varying scenarios for the future become feasible. The first question is how far the malleability of the environment can be stretched. Both the physical geography, including rainfall, and the political situation provide limits to flexibility. A further reduction in rainfall will affect the ecology, for instance, as will the political futures of both countries, Nigeria and Cameroon. But other limiting factors are important. Market characteristics, logistics and – certainly demographics will bear their mark. Considering other cases from the Mandara mountains (Zuiderwijk 1998, van Andel 1998) or from elsewhere entirely (McNetting 1993), and taking into account Kapsiki ecological history, options for intensification, diversification and other adaptive strategies are still very much present for the Kapsiki and will undoubtedly lead to different definitions of the environment. But the difference between ‘equilibrium’ and ‘exploitation’ will become less and less marked, as the more recent periods of this ecological history have in fact shown. Ecological engineering, from terracing to gardening and from cultivar selection to intensive manure application, makes this opposition less relevant. An increasing variety of individual choices for the Kapsiki, an increased

awareness of the long-term ecological costs and benefits accruing from adaptive responses and a heightened degree of interaction with external forces will increasingly cause the two paradigms to merge.

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