Evaluation of Mbororo Transhumance Routes in the Tchabal Mbabo-Dodeo Region of Cameroon

Conducted For: BirdLife International
Gashaka Gumti- Tchabal Mbabo Transboundary Conservation Project

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Arthur Green
North Carolina State University

Jonas Tchinlé
University of Ngaoundéré, Cameroon

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The Lamido of Galim-Tignere
The Lamido of Lompta
The population of Bontodjé

Cover page: Djafoun'en Mbororo herder passing through the Yanagaré mountain region of the Hore Deo transhumance zone. (Gill 2004)

Abstract

The goal of this study is to build up a precise and reliable database on Mbororo herdsmen's uses of natural resources in a proposed conservation area in the Tchabal Mbabo-Dodeo region. The geographic focus of this study, therefore, is located in the underdeveloped and sparsely populated area between the Tchabal Mbabo cliffs and Dodeo village in the Western Adamaoua province, Cameroon. The herder's main impacts on natural resources are intrinsically related to their use of trails and resources during their seasonal migration (*transhumance*) through the region. By documenting the Mbororo transhumance routes and the natural resource management (NRM) upon these routes, this paper gives the information necessary to negotiate and collaborate with local stakeholders in order to introduce sustainable development and conservation into this region.

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Executive Summary

This study documents the *transhumance*[1] routes and natural resource management (NRM) of Mbororo[2] pastoralists in the Tchabal Mbabo-Dodeo region of Cameroon. This information is a necessary component in developing regional conservation plans and for understanding and resolving regional cattle issues such as the lack of rational grazing plans, proper management of fires, and disease vector control for domestic and wild animals. The information this study provides will aid efforts to collaborate with local populations and to appropriately zone the region for a proposed integrated conservation and development project (ICDP).

Conservation organizations have recently shown intense interest in this region due to a rapid degradation of the rare and diverse flora and fauna found in the zone. The Tchabal Mbabo[3] region is characterized by a large escarpment that creates massive geomorphic contours and, thereby, unique ecological microclimates and high endemic diversity. The Tchabal Mbabo region contains the northernmost limit of *Afromontane*[4] ecologies in Cameroon as well as a rare, continuous transition between montane, dry-forest, and savanna ecosystems (BLI 2003). It contains a largely unexplored source of rare botanic species (Thomas 1996), supports an equally rare population of avifauna, and serves as one of the last regional refuges and uninterrupted wildlife corridors for large mammals in the area (Bombome et al. 2004). Ecological studies have found that causes of a rapid degradation of these rare Afromontane ecosystems are largely anthropogenic: over grazing, uncontrolled bush fires, commercial hunting, deforestation for farming, chemical fishing, firewood extraction, and commercial bark harvesting (BLI 2003). For this reason conservation interests are in the process of crafting and proposing an ICDP to evolve local behaviors that can support long-term conservation and development goals throughout the region.

National governments and international NGOs (mainly BirdLife International) are leading the ICDP proposal process by gathering detailed information on regional resources and resource uses. Such information will help formulate appropriate and efficacious approaches for a regional ICDP. This study is part of that information gathering process. It is specifically focused on local Mbororo cattle raisers because they are a crucial local stakeholder group and information on their NRM practices has never been comprehensively studied.

The administrative needs of the proposed ICDP define the goals and geographic scope of this study. Documentation of herder transhumance routes and natural resource uses serves the proposed ICDP administration's need for detailed information of NRM in the region. Mbororo herders are the main users of this region in number of users, frequency of use, and ecological impact. The information gathered will contribute to efforts to design appropriate interventions and to implicate this community in early project-planning phases. The broad geographic region of

[1] *Transhumance*: The seasonal migration of pastoralists between highland wet season pasture and lowland dry season pasture.

[2] Traditionally, Mbororo pastoralists are considered as part of the Fulbe (Fulani) Diaspora. However, the complex and unique social history of the Adamaoua region has shaped an evolving ethnic divide that was once considered largely an urban (Fulbe) and rural (Mbororo) juxtaposition of Fulbe (Nelson 1999). In fact, the label of Mbororo, which was once considered derogatory, is now proudly used as an ethnic self-identification by herders in this region. It serves our purpose here to emphasize this ethnic divide because there are clear differences in natural resource management strategies, population dispersion, and cultural priorities. Moreover, emphasizing the ethnic divide gives a more accurate and explicative description of ways to collaborate with local populations. Therefore, this study will refer to Fulbe and Mbororo as separate ethnicities; as well, the complex divisions of Mbororo clans and sub-clans will be ramified by locally accepted terminology. For example, Mbororo can be broken into Akou'en and Djafoun'en clans; Djafoun'en can be broken into numerous sub-clans like the Gosi and Faranko (Boutrais 1995).

[3] *Tchabal Mbabo*: In the Fulfuldé language this means the "abandoned plateau." *Tchabal* means "plateau" and *mbabo* means "no man, empty, or abandoned."

[4] *Afromontane* ecosystems are rare floristic communities that occur only in the highland regions of Africa.

concern for the ICDP outlines the perimeters of the study; the study is limited to the northern face of the large escarpment known as the Tchabal Mbabo and the plains located between this escarpment and the Dodeo village (Thomas 1996).

The study documented all transhumance areas and natural resource management within the following geographic coordinates:

N: Dodeo to Mayo Riga (N 7°48)
W: Badjara (E 011°97)
E: Next to Hore Garbaya (E 012°23)
S: The cliffs between Badjara, Fungoy, Hore Kui, and Hore Garbaya (N 7°23)

In this study a clear difference was noted between ***transhumance routes*** and ***transhumance zones***. A *transhumance route* possesses a central passage through an area; settlement and natural resource uses are largely consolidated to a central corridor. A *transhumance zone* typically shows many small trails and more widespread settlement and grazing patterns. Preliminary studies found that the region had seven routes. However, this study finds that certain reported "routes" encompassed multiple small routes; no central passage could be distinguished. The classification of *transhumance zone* is much more suitable for such acephalous regions. Therefore, a reclassification finds four *transhumance routes* and three highland *transhumance zones* in the region.

Transhumance Routes

The transhumance routes covered over 120km of paths in and around the proposed conservation region. The four transhumance routes are (listed from west to east):

1. Route de Fungoy-Dodeo
2. Ngel Akou
3. Yukol
4. Ñdogawa

The most important routes are *Ñdogawa* and *Route de Fungoy*. These two routes are used by the majority of the transhumance herds moving to dry-season pasture in the Dodeo region. These routes also serve as the main access roads for local foot transit and herds headed to Nigerian cattle markets. Moreover, the multiple pastoral settlements along these two routes also make them the most important areas of temporary and permanent settlement in close proximity to the proposed project's core region. Although the roads are used year-round, cattle traffic is heaviest on these routes in November (descending to Dodeo) and April (ascending to the *tchabal* highland region).[5]

Transhumance Zones

This study found that three previously reported transhumance routes are actually better characterized as highland transhumance zones. These regions cover over 60 km² that are grazed primarily during the dry season. The zones of transhumance are:

1. Badjara
2. Hore Deo (Yangaré, Hore Kui, Pinkou)
3. Kinel

The largest highland zone of transhumance was found to be *Badjara*, but the most important zone was *Hore Deo*. The *Hore Deo* region serves as the most popular highland grazing zone during the dry season. Part of the popularity for the zone is due to its easy access and central location on the Tchabal Mbabo cliffs. The *Hore Deo* zone covers a wide swath of the northern face of the

[5] However, rather than specific dates, cattle movement depends on the time of seasonal rainfall and other ecologic indicators.

Tchabal Mbabo cliffs that borders the core of the proposed conservation area and the thickest forests in the region.

The above zones of transhumance only consider highland areas. There are, obviously, transhumance zones in lowland areas. The lowlands around Dodeo River and Dodeo village are the end destination for most northbound transhumance routes and serve as the transhumance endpoint and the most important transhumance zone in the entire region.

Natural Resource Impacts

The herders' major impacts on natural resources are primarily concerned with:

- Widespread bush and forest fires
- Firewood harvesting
- Overgrazing that degrades pasture into unpalatable *Sporobolus indicus* and poses competition for food resources to wild animals migrating through the area (Bombome et al. 2004)
- Deforestation of gallery forests for maize farming

Herders do not participate in any of the other natural resource-extractive trades (namely, commercial hunting, chemical fishing, and commercial harvest of *Prunus Africana*) that currently jeopardize the *Afromontane* ecosystems and the delicate *Ecotones*[6] region (Thomas 1996).[7] This study found that there are clear differences between areas used by sedentary herders and herders practicing the transhumance. The main differences are that Fulbe and some sedentary Mbororo herders continually overgraze a region (causing species change and heavy erosion) and they practice some form of highland agriculture and, in the process, denude gallery forests in order to farm rich alluvial soils.[8]

Permanent herder settlement is strictly limited to the highland areas because of natural limitations (forests and tsetse flies in the lowlands) and the more attractive, highland pasture resources. Permanent settlements usually consist of a few family units. Permanent settlements are located on the gentle slopes of the southern side of the cliffs; the few exceptions are a small settlements on the northern cliff face near *Ndogawa* and some scattered settlement along the *Route de Fungoy*. Although permanent herder settlements are spread throughout the plateau, they tend to cluster along the main trails. The heaviest amount of permanent settlement near the proposed project region is found in the following regions: along the highland sections of the *Route de Fungoy*, around Fungoy and Hore Mayo Selbe villages, near Yangaré mountain, and in the Bontodje and Mbabo village regions.

Settlement is sparse to nonexistent on the northern cliffs, in the lowland regions, and in the highland zones west and north from the *Route de Fungoy* towards the border of Nigeria. The few settlements in these regions are small temporary huts (known as *walde*) located above 1000m. Individual herders commonly use the walde for 3-4 months during the dry season. Occasionally young herders bring their small families with them. These temporary settlements (*walde*) show changes in local vegetation due to the heavy manure concentration, occasional fruit tree planting, firewood harvesting, and consistent cattle grazing. No agriculture is practiced in the

[6] *Ecotones*: as defined by Thomas (1996), this region shows a rare gradation of ecosystems from *Afromontane* to dry woodland savanna. The importance of this transition is that it offers many microclimates where rare or endemic species may thrive.

[7] Bark harvesting is currently limited to deep forest and gallery forests to the west of Yangare mountain. Commercial hunting occurs throughout the forested region.

[8] Although both ethnicities cultivate maize, anthropological studies find that Mbororo agriculture methods are substantially different from those of the Fulbe. Fulbe agriculture is most common along riverbeds; Mbororo agriculture often takes place on hilltops. This occurs due to cultural valuations of the cow: the Mbororo preferring to sleep near the cows and the Fulbe near the crops. This difference in land and resource use is another reflection of the inherent psychological and cultural differences between the two ethnicities (Boutrais 1995).

walde. There were a few scattered abandoned or incipient agricultural areas near *Badjara*, but the only permanent settlers were a few herding families.

The fauna rich region between the escarpment and Manaré village is largely uninhabited. The transhumance and market-bound herders follow trails that pass through this fauna rich region (the center of the proposed project), but they usually pass without stopping. They drive herds of 30 or fewer cows through the region in less than one day because the area is severely infested by tsetse flies, herders fear the wild animals, and the stretch of rolling hills in the lowlands is easy to quickly traverse. Estimates of the number of cows that annually pass on these trails for either transhumance or to go to Nigerian cattle markets (in Gagne) are generally around 20,000-25,000 cows.[9] Agricultural settlements of Ndoro, Djubu, Koutine (Pere), and other tribes, who rely heavily on forest resources, start approximately 3 kilometers south of Manaré.

Regional Economy

The more important transhumance routes and zones are crucial to the local economy. They are the main roads for cattle and foot transit between the Banyo and Kontcha regions. Some 20,000 cattle use these roads on an annual basis. The critical nature of these roads to the traditional cattle economy in the Western Adamaoua is obvious and cannot be overstated. However, due attention should be given not only to the important role these routes play in the cattle industry, but also in the entire regional economy. Local livelihoods are intrinsically related in this region: lowland farmers in the Dodeo region depend on the transhumance to give them manure, meat, and other benefits; herders depend on the local farmers to supply them with corn[10]; and a long list of businesses are based on the money that filters into the region from cattle raising. A decision to seriously limit transhumance would be a drastic, misinformed, and misfortunate decision that would give the entire system of local livelihoods a grave shock and hamper ICDP initiatives.

Final Conclusions

Mbororo herders are the main resource user group for the region between the Tchabal Mbabo escarpment and the Dodeo village. The cattle transhumance and local transit pass through the periphery and core of a proposed ICDP region on two main routes (*Ñdogawa* and *Route de Fungoy*). These routes play a crucial role in the regional economy and Mbororo cultural patterns. Mbororo NRM in the core area entails certain environmentally damaging factors, but it seems that an innovative NRM intervention may help change herder behaviors. For example, improvement of the above routes may encourage herders to gradually phase out use of less important transhumance zones and routes, like the routes of *Ngel Akou* and *Yukol* and the zones of *Kinel* and *Badjara*. If, in the future, these areas lose their pasture or transhumance value they could then be closed off to cattle and managed for reforestation or other conservation purposes that can help provide some non-pastoral employment to the local populations. Strategically introducing improvements to cattle raising and transhumance will give incentives to herders to change customary routes and behaviors. It will allow gradual local acceptance and ownership of a long-term sustainable NRM strategy for the region. After all, considering the widespread skepticism prevalent in the large herding community here, it would be best to focus on incentives rather than restrictions.

Limiting access to such socio-economically important regions is not the best strategy for an ICDP. Besides being costly, enforcement of such a decision would be largely ineffective and alienate most of the local population. Closing such zones and routes would lead to conflict with local populations, possible economic crises in the region, and probably costly failure of the ICDP.

[9] However, reliable estimates are not available, so the number above should be considered a provisional estimate until further studies can be carried out.

[10] Boutrais (1995) documents the fact that all sedentary herders supplement their corn harvest by purchasing additional corn from lowland markets.

On the contrary, developing long-term collaboration with herders to strategically improve the major regional routes and the most important transhumance zones will allow the project to eventually meet its conservation goals and the community to reach its development goals. Due to cultural, economic, and even ecologic concerns the major transhumance routes (*Ñdogawa* and *Route de Fungoy*) and zone (*Hore Deo*) should remain open for transhumance.

In conclusion, drastically limiting or barring the transhumance routes serves no immediate purpose for an ICDP. In fact, such actions would be premature and would jeopardize any future collaboration with regional farmers, cattle raisers, and local administrators. Well-planned long-term programs of improved pasture, infrastructure development, and transhumance route improvement can influence local cattle raisers to adjust their behavior to project goals. Some suggestions for collaboration with Mbororo herders to achieve conservation goals in this region are:

- Improve the *Route de Fungoy* and *Ñdogawa* trails with local labor; location of insecticide baths; and possible presence of other resources like salt licks. Opening up these areas to vehicles should be severely limited since such access will certainly lead to an increase in wood cutting and higher hunting rates in the lowland forest areas.
- Attempt to setup experimental systems to better coordinate herder use and management of the core and periphery areas of the project. For example, an entrance fee for market-bound cattle transiting the region or an enforceable licensing system for transhumance (MINEPIA lacks the manpower to enforce their own in this region).
- Zone project limits that avoid around possible conflict regions, like the Fungoy and Hore Mayo Selbe area.
- Attempt to incorporate and reward herders in a conservation monitoring service that reports hunting activities, tree felling, bark harvesting, and other natural resources uses.
- Support improved pasture programs for the entire Tchabal Mbabo; the most appropriate approaches seem to be contracting with an NGO like APESS, doing extension on an individual basis, or working with GICs established through UGICETA. Subsidize *Bracharia ruzensis* seeds, barbed wire, tree nurseries, and other agroforestry technologies and seeds for the first few years of improved pasture development and agroforestry efforts in the region.
- Improve pasture in the *Hore Deo zone of transhumance* region while looking into the possibility of closing off access to nearby forests and implementing rotational grazing or other intensive grazing programs for the *Hore Deo* region.
- Employ local community members to collect seeds and run nurseries. *Yukol*, *Ngel Akou*, and *Kinel* could be future reforestation zones for *Prunus africana* and other Afromontane species. Develop improved pasture; tsetse fly-free zones or subsidized insecticide baths; and other resources to attract herders to the Dodeo lowland area. Make the Dodeo lowlands a more attractive place to spend the dry season than the highland *zones of transhumance*.
- Support improved pasture in the Badjara region, but put an emphasis on the Dodeo region and moving Badjara herds to Dodeo. There are not many herds here, but the herds are owned by powerful traditional authorities that can be counted-on to be problematic if moved from their grazing lands.
- Hire or contract Muslim workers for the ICDP. This will resolve many problems with the cattle raisers because they place great confidence in those with whom they can pray.
- Contact community members before any tree planting near the *tchabal*; many cattle raisers are terrified that planting trees will bring the tsetse flies to the highlands.
- Value cultural conservation as well as ecologic conservation. The tourism value of Mbororo herdsmen and the history of their people in this region can serve as a great income-generating source through tourism and research in the region.

Photos of Natural Resource Management in the Tchabal Mbabo-Dodeo Region

Figure 1Ñdogawa Trailhead divides three lamidats

Figure 2Walde Dalle harbors *Prunus africana*

Figure 3 *Abreuvoir:* managed water source

Figure 4 Cattle barrier managed on Ñdogawa

Figure 5 Jonas Tchinle, El. Boubajam, El. Elwammi

Figure 6 Traditional honey harvesting near Mayo Bontodjé

Photos of Natural Resource Management in the Tchabal Mbabo-Dodeo Region

Figure 7 Ñdogawa trail

Figure 8 Mayo Liddi: Tchinle and El.Elwammi

Figure 9 Entering Manaré seasonal wetlands from transition forests

Figure 10 Research on herder activities near Manaré

Figure 11 Farm with temporary herder dwellings on it near Dodeo

Figure 12 Djafoun'en cattle cross Mayo Riga

Photos of Natural Resource Management in the Tchabal Mbabo-Dodeo Region

Figure 13 Woody vegetation and open trail near Manaré

Figure 14 Mayo Badjara

Figure 15 Badjara forests are remain relatively intact

Figure 16 Nigerians open gallery forest for farming

Figure 17 Burning gallery forests for farming in Badjara

Figure 18 Typical walde in highland Badjara

Photos of Natural Resource Management in the Tchabal Mbabo-Dodeo Region

Figure 19 El. Elwammi with the Badjara family head

Figure 20 Typical housing for single herders on walde

Figure 21 On the Route de Fungoy grazing pressure increases

Figure 22Hossere Ka'i-tan west of Fungoy

Figure 23 Heavy grazing near Hore Mayo Selbé

Figure 24 Large herder Hamidou in Hore Mayo Selbé

Photos of Natural Resource Management in the Tchabal Mbabo-Dodeo Region

Figure 25 Typical gallery forest settlement of Fulbe, HMS.

Figure 26 Heavy grazing and settlement near Fungoy

Figure 27 Escaped bushfire in gallery forest near Hore Kui

Figure 28 El. Elwammi with Djarou Bakari of Fungoy

Figure 29 Typical bark harvester camp with drying racks

Figure 30 Forested Hore Deo, grazed Hore Kui

Photos of Natural Resource Management in the Tchabal Mbabo-Dodeo Region

Figure 31 Heavy forests in the Pinkou region, looking west

Figure 32 Heavy forests near Hore Deo blocks cattle access to northern face of cliffs

Figure 33 Lowland forests of Hore Deo in the Yangaré zone

Figure 34 commercial harvesting of *Prunus africana* bark destroys trees

Figure 35Harvesting of *Prunus africana* bark near Hore Kui/ Yangare destroys an entire forest

Figure 36 Traditional *Prunus africana* bark harvest for medicine lets the tree survive.

Photos of Natural Resource Management in the Tchabal Mbabo-Dodeo Region

Figure 37 Burning and open pasture on the northern face of the cliffs near Hore Deo-Yangaré Zone

Figure 38 Kinel highlands and trailheads for Ngel Akou and Yukol

Figure 39 Researcher Arthur Green and El. Elwammi at touristic site of Yangaré.

Figure 40 Heavy grazing near Hos. Nannané.

Figure 41 Heavy grazing and steep decline to Ngel Akou route.

Terms of Reference

Objectives

1. Interview local cattle raisers to solicit preliminary information and community maps on transhumance routes.
2. Document transhumance routes using GPS technology.
3. Describe route locations and ecologies.
4. Describe natural resource management (NRM) activities on the routes and nearby areas.
5. Describe possible collaboration opportunities with local populations.

Personnel on Expedition

Team members:

Arthur Green, North Carolina State University, team leader
Jonas Tchinle, University of Ngaoundere, research collaborator
Alhadji Elwammi of Bontodjé, guide
Ousmanou of Manaré, porter

Thanks to the following parties for their assistance in this study:

Dennis Anye, BirdLife International
Issa, Saidou , and Yaya Bello of Lompta
Professor Ousseni Wadjiri of Lompta
The population of Bontodjé
Lamido of Galim-Tignere
Lamido of Lompta

Schedule of Activities

March 2004

8-10:	Galim-Tignere. Preparation and purchases of necessary articles. Recieval of backup GPS unit from BLI.
11-12:	Travel from Galim to Mbabo. Meet with local authorities. Get guide.
13:	Mbabo to Ñdogawa.
14:	Ñdogawa to Dodeo. Meeting with Lamido of Dodeo. Meeting with Djarou of Manaré. Meeting with Sarki Sama (charged with cattle control in the region). Obtain porter.
15:	Manaré to *Badjara*
16:	*Badjara* to Hore May Selbé
17:	Hore Mayo Selbé to Fungoy to Hore Deo to Yangaré.
18:	Yangaré to Hossere Nannané to Ngel Akou to Yukol
19:	Yukol to Kinel to Mbabo village.
20:	Mbabo village to Galim-Tignere.
21:	Data Analysis and visit to Hospital in Galim-Tignere.
22-23:	Galim-Tignere to Ngaoundere to Yaounde.
23-27:	Yaounde work at Peace Corps and BLI headquarters. Obtain mapping software. Return GPS unit to BLI.

Methods

The steps leading to completion of this research were as follows:

1. Consultation with MINEPIA representatives, administrative authorities, and traditional authorities in Galim-Tignere in order to get approval to conduct research in the region.
2. Community meetings and household surveys to establish baseline data on route use by cattle raisers. Collaboration with BLI.
3. Further interviews to verify and deepen the actual data on routes taken and problems encountered. Collaboration with the University of Ngaoundere.
4. Establishment of parameters for fieldwork.
5. Fieldwork with local guides consisting of documentation of *pertinent waypoints* and *tracks* (see below) with GPS *Garmin 72* units. Collection of observations on ecologies, NRM, and other pertinent data. Informal interviews with people encountered in the field.
6. Data analysis and organization in Galim-Tignere.
7. Map creation with *Adobe Illustrator* in Yaounde.

Tracks were recorded under the following parameters:

- Recording took place at 200 meter intervals
- Recording was performed for the duration of the trip

Pertinent Waypoints were taken as follows:

- At no more than 1km apart, to maintain route integrity.
- When significant (more than 20°) change in route trajectory
- Human settlement or construction
- Natural resource extraction (wood cutting, cattle grazing, hunter traps, etc.)
- Vegetation change
- Vegetation of interest (*Prunus africana* and other notable species)
- Presence/ Sightings of animals
- Possible tourist sites
- Important natural phenomena (mineral springs, river crossings, etc.)

Introduction

This study is concerned with the establishment of an integrated conservation and development project (ICDP) in the Tchabal Mbabo-Dodeo region. Below is a brief history of the region and the nature of the ICDP. This background will help the reader understand why a study on the natural resource management of itinerant Mbororo herders has currently been undertaken.

Background

While much of Cameroon has significantly developed over the last 50 years, the Tchabal Mbabo-Dodeo region has remained severely underdeveloped. The lack of local infrastructure forces local populations to continue to rely directly on the natural environment for their livelihoods. The people engage in traditional activities such as farming, cattle raising, and fishing without the benefits of modern methods or inputs. Reliance on the environment for human and veterinary medicine, housing materials, drinking water, and other basic needs is elemental to survival. Access to medical facilities, schools, improved water sources, state extension services, electricity, or any other facilities is severely limited.

This region's rich flora and fauna have supported permanent human settlements for at least 200 (and probably more than 500) years (Eldridge Mohamed 2004). However, the delicate balance between sustainable natural resource use and human needs is currently in trouble. As human populations increase and commercial enterprises (hunting, *Prunus africana* extraction, and cattle raising) demand more resources, there has been a rapid degradation of the region's natural resources. Until the last 50-100 years, traditional natural resource management (NRM) strategies have served the people here well. Yet it is becoming obvious that without intervention to improve NRM and confront new ecological challenges, the quality of local biodiversity, watersheds, human health, and economic security in the area will soon decline. This is, of course, troubling from an ecological standpoint. Yet it is important to note that the direct connection between natural resources and livelihoods in this region makes natural resource degradation a serious economic and health threat as well as conservation concern. For these above reasons, the region has recently been the focus for a possible integrated conservation and development project (ICDP).

Various state agencies and international NGOs have recently undertaken field studies examining the region's biodiversity, the local socioeconomic and cultural milieu, and the feasibility of introducing an ICDP. These studies have found the region to be an extremely biologically rich area housing many endemic species (JGI 2004: Thomas 1996). They found that the local diversity of flora and fauna is partly due to the plenitude of microclimates found in the expansive and steep northern face of the escarpment called the "*tchabal*." This *tchabal* region creates massive geomorphic contours (elevation varies rapidly between 600-2380 meters), is home to rare Afromontane ecologies, serves as the main watershed for the Deo River, and creates isolated areas where wildlife may still thrive. This region also provides the source for resources that sustain traditional livelihoods (hunting, water, wood, etc.). Most of the recent ecological studies have come

to the conclusion that some sort of official status of protection for these areas close to the *tchabal* is a necessary component of future natural resource management in this region. Among the international NGOs that have played a major role in gazetting the region and proposing the project, BirdLife International (*BLI*) has taken the lead. BLI is currently collaborating with state agencies in both Nigeria and Cameroon to look at the possibility of implementing the above recommendations in the form of an ICDP.

Along with the studies to accumulate ecological data, great efforts have been made to understand the local populations and their traditional natural resource management strategies. This is a necessary component to local involvement in a successful ICDP. Therefore, socioeconomic information and local collaboration has been something valued since the beginning of the research stage. Even so, in this region, the success of gathering socioeconomic information is complicated by two factors: the geographically secluded nature of the region and the often-insular disposition of its people. Anthropologist Jean Boutrais carried out the most thorough socioeconomic studies of the region in the 1970's (Boutrais 1994). However, this information is largely outdated with recent changes in local demographics, natural resources, and NRM. More recently, BirdLife International (*BLI*) has supported two socioeconomic studies exploring local demographics as well as documenting current socioeconomic data. The first of these studies took a brief look at three villages (Sambo Labbo, Mbabo, and Dodeo) that surround the periphery zone of the proposed ICDP project. This study, led by a staff member from the Jane Goodall Institute (*JGI*), focused on capturing village demographics. This study's final results incorporated some of the sporadic socioeconomic observations made by JGI biologists transecting the forested zone. Yet, even with these observations, the study's conclusions on activities in the proposed protected areas were vague and not truly representative of field observations by other socioeconomic researchers. BLI led a second study into the area in February 2004 in order to deepen the current data and establish contact and relationships between all stakeholders. This second study also focused on three basic zones (Mbabo, Dodeo, and Mayo Kelelé). This study had the benefit of more time and more official collaborators than the first study. The results of this second study give a much more in-depth understanding of the socioeconomic dynamics in the periphery zones as well as the human activities in the proposed protected regions.

Combining these two socioeconomic studies gives one what seems to be a comprehensive vision of what types of activities occur around and in the proposed protected area, but there is some crucial missing information. The above studies incorporate tools (such as *community mapping*) in order to get ideas of the general locations of certain critical zones in the proposed project area. However, upon reviewing the community maps and the information on NRM for the core regions of the project, one finds that the information is often very imprecise and potentially controversial due to the multiple stakeholders involved in this project. In fact, both of the above studies lacked enough time and resources to expand their information collection and observations to encompass *the heart of the proposed region*. They focused primarily on zones peripheral to the core of the proposed project and could not verify community maps of the core regions with field observations.

So, currently there is a glaring absence of precise information on the uses of natural resources by at least one of the main (and certainly most difficult) stakeholder groups in the core area of the proposed project, the Mbororo cattle raisers. The local cattle raisers are mostly of the Mbororo ethnicity, specifically of the Djafoun'en tribes. The Djafoun'en Mbororo, traditionally nomadic herders, have gradually become semi-sedentary and sedentary on the *tchabal* over the last 150 years. These Mbororo herders own most of the over 27,000 cattle on the *tchabal* (MINEPIA 2004). Most of the Mbororo participate in a seasonal *transhumance* wherein thousands of cattle disperse into lowland areas surrounding the highlands in search of fresh pastures. While some cattle are sent to the south, northeast, east, and west of the *tchabal*, many of the cattle go north through the proposed core regions of the ICDP project. So these herders are the main users (in sheer numbers as well as intensity) of natural resources in the proposed project area. A lack of information on their NRM and a lack of collaboration with them will pose serious problems to the future viability of an ICDP in the region.

There is a critical imperative to implicate and collaborate with local cattle raisers in order to design a project that can be successful over the long-term. Many of the problems of protected areas in this ecologic region come from misunderstandings between traditional cattle raisers and state agencies or international NGOs. The challenges of this particular project (Tchabal Mbabo) seem, ostensibly, daunting. This region has been called "the last pastoral refuge" in Cameroon, it is cited as one of the last tsetse fly free zones in the Adamaoua province, the Jane Goodall Institute study on mammals in the region made references to the major impacts cattle create by competing for resources with wild animals, and there is a long history of animosity and mistrust between conservation officials (and other state representatives) and local cattle raisers. Mistrust and stereotypes built upon previous conflicts are a recurring theme in conversations with stakeholders. The challenges to implementing a project here are not only ecological, but also deeply cultural, sociological, and economic. The region is highly valued by pastoralists who are deeply mistrustful of authority. Without the collaboration of these cattle raisers the project risks encountering the same problems of other protected areas in this ecoregion. Despite the apparent challenges to collaboration and conflicting interests here, a careful approach to collaboration will yield a great opportunity for an ICDP in the region.

Over recent years, neighboring parks have explored innovative strategies, like systems of enclaves and corridors that seek to avoid serious future problems and seek to promote collaboration with local parties (Dunn et al. 2000). Unfortunately negative stereotypes still persist among herders and administrators and lead stakeholders to make assumptions about other parties or miss opportunities to try such innovative strategies of collaboration. Typically, cattle raisers are seen as enemies of conservation. They are told that their cows will be banned access to most or all protected regions. This unfortunate dictum often occurs because it is difficult to set up collaborative relationships with the herding communities: negotiations are often fruitless with migrating communities, leadership is hard to identify and not consistent. Internal problems in heterogeneous and autonomous herding communities do not guarantee that the "herding community" will be totally complicit with negotiations. Resultantly, herders are often not fully implicated in project

plans. This has led to problems like those of the Bouba-Djida/ Rey Bouba conflict[1]. Many ancillary problems occur when herders are not implicated in protected areas. The sudden lack of pasture often causes a local domino effect; nomadic and semi-sedentary herders, having lost their traditional pastures, search elsewhere and often cause major farmer-herder conflicts. Despite the recurring regional problems of protected areas, one must note that the Tchabal Mbabo region is unique and the Mbororo of the *tchabal* are somewhat different from other cattle raisers.

One thing that sets the Djafoun'en Mbororo tribes apart from others in this eco-region is that they are somewhat sedentary and have a vested interest in maintaining the current ecologies. Another is that they have a long history of collaboration with farmers in the Deo River Basin; farmer-herder conflict is currently very rare. The differences may seem subtle, but they change the intrinsic nature of the herder relationship to protected regions. The typical problems between itinerant herders and conservation officials may be avoided here if the unique situation of the Djafoun'en Mbororo is carefully studied. This author, as well as some others (Thomas 1996) sees the herdsmen and cattle raisers of this region as possible allies for conservation interests.

Collaborations between administrators and stakeholders must occur and they cannot be static recipes, they must be quite dynamic processes where exact needs, situations, and possibilities are stated and evaluated for all the stakeholders. The uneducated and mostly illiterate herders have certain problematic stereotypes and assumptions of state power that must be resolved. Likewise, stereotypes of herders and assumptions about their NRM are serious problems that block effective collaboration. In short, in order to collaborate with local parties one must have extensive information on NRM and local collaboration from stage one; nebulous data and reliance on assumptions or stereotypes will inevitably lead to missed opportunities, conflict, and costly future expenditures.

The goal of this study is to build up a precise and reliable database on Mbororo herdsmen's uses of the proposed project area. This study focuses on documenting the transhumance routes and the natural resources uses that occur as the herders pass through the deepest parts of the proposed project region. For the Mbororo, the most critical uses of the proposed project region are associated with cattle raising: the practice of *transhumance* and further access to dry season pastures. The secondary goal of this study is to explore to collaborate with or modify herder behavior and NRM patterns. Conservation interests may succeed if carefully meditated steps are taken to implicate the herders in project design and maintenance. There is no reason why the region's most important occupation (cattle raising) should be the anti-thesis of conservation, and many ways that the two sides can collaborate for improved NRM.

Geographic Focus

The field team documented all transhumance routes within the following limits:

N: Dodeo to Mayo Riga (N 7°48)

[1] This conflict in the North Province of Cameroon is a recurring problem of itinerant herders who have lost traditional grazing lands in the face of protected areas, increasing private reserves, and government supported migration of farmers from the Extreme North Province.

W: Badjara (E 011°97)
E: Next to Hore Garbaya (E 012°23)
S: The cliffs between Badjara, Fungoy, Hore Kui, and Hore Garbaya (N 7°23)

The omission of data on transhumance routes for other regions (to the south, east, and northeast) around the *tchabal* does not mean that the routes documented in this study are the only transhumance routes taken by herders from the *tchabal* area. There are significant transhumance destinations outside of the study area, such as: Mayo Dankali, Kofaru, Hore Djem, Ndjaram, and regions near Banyo. However these above destinations and routes are not part of the proposed project area. Moreover, they are in less-secluded zones, zones that are easy to access with vehicles and easy to document through aerial photography and interviews. The zones outside of the Tchabal Mbabo-Dodeo region are not at this point critical to project planning processes so they were not included in this study. However, these other routes and destinations should eventually be systematically noted for project planning purposes.

This study's focus region is an extremely isolated area where collection of data on transhumance by other means has been hampered due to lack of resources and the insular nature of the local cultures. Aerial photography of transhumance paths is not possible due to the heavy forest cover, and local interviews are often misleading without field context. This team was able to focus on this area because they found themselves in a unique position of confidence among Mbororo herders. This trust facilitated logistical needs of the study and also lent to a high degree of integrity in the information acquired through multiple local interviews and observations. Other reasons that this team conducted such a study were because the routes and NRM in this area have never been thoroughly documented and because the results of this research have direct and immediate implications on how the integrated conservation and development project (ICDP) should operate in this region.

Route and Zone Summary

The study found four *transhumance routes* and three highland *zones of transhumance* in the target region. The transhumance routes covered over 120km of paths in and around the proposed core conservation region. The four **transhumance routes** are (listed from west to east):

1. Route de Fungoy-Dodeo
2. Ngel Akou
3. Yukol
4. Ñdogawa

An attempt to value the relative importance of each route was undertaken to inform future management strategies for each route and its collateral zones. The frequency and number of herds that pass through each route were the primary criteria used to determine the relative importance of the routes. This information was solicited through interviews with locals. The information obtained in interviews was easily verified by field observation of the route conditions and evidence of local efforts to improve or manage paths.

The most important routes are, in the following order:

- *Route de Fungoy* and *Ñdogawa* (these are the two main routes on the far west and east, respectively, of the proposed project area);
- *Yukol and Ngel Akou* (which follow almost exactly the same trajectory).

This study found that three previously reported "routes" are actually better characterized as highland ***zones of transhumance.*** These regions cover over 60 km² that are grazed primarily during the dry season:

1. Badjara
2. Hore Deo (Yangaré, Hore Kui, Pinkou)
3. Kinel

Badjara, Hore Deo and *Kinel* can be considered as *zones of transhumance*. In these zones of transhumance cows are widespread and they graze most of the region. Although these areas do have central trails running through them, the idea of a corridor is not truly applicable to the use patterns. Therefore the idea of a "route" was abandoned in favor of the idea of a "zone." The criteria used for the routes was also used to judge the relative importance of the zones of transhumance, the order of importance is as follows:

- *Hore Deo*
- *Badjara*
- *Kinel*.

The above zones of transhumance only consider highland areas. There are, obviously, transhumance zones in lowland areas. The lowlands around Dodeo River and Dodeo village are the end destination for most northbound transhumance routes and serve as the most important zone of transhumance for the entire region.

The Djafoun'en Mbororo constitute the majority of herders participating in transhumance through this region. Most of these pastoralists come from their respective private ranches in the Hore Garbaya, Mbabo, Bontodjé, Yangaré, and Bourdu village areas. Other ethnicities, above all the Akou Mbororo and Fulbe, occasionally lead cattle herds north on the routes in order to reach Nigerian cattle markets. Outside of the herder presence, it is quite common to see locals traveling by foot without cattle on the transhumance routes between Dodeo and regions to the south. These routes and zones are most heavily used during the dry season between November and April. Herds descend the cliffs and go to the lowlands in November, they return to the highlands after the first rains that fall traditionally sometime in April.

Natural Resource Management

Herder presence and transhumance in this region have a major influence on how local resources are managed. Often local herders act as and are considered caretakers of routes and local resources. Their role is substantially different than hunters because they: spend longer periods of time in different areas of the region; have vested interest in many of the resources that support the cattle and forests; dominate local traditional authority; and have little or no vested interest in commercial hunting or plant harvesting.

Different ethnicities consistently reveal different resource management strategies directly related to their duration of stay in a region and the value they place on agriculture or cattle raising (Boutrais 1995). Most herder impacts on natural resources are directly related to their main occupation, cattle raising.

The impacts of non-sedentary herders on natural resources occur primarily during the dry season of November to April and consist largely of the following activities:

- grazing of fresh herbs and forest regeneration by cattle (changing ecologies);
- sporadic and scattered pasture, bush, and forest-understory fires;
- construction of temporary straw shelters;
- light extraction of firewood, medicine, walking sticks, cordage, and bows and arrows; and exclusively *defensive* killing of wild animals;[2]
- other subtle impacts on natural resources involve the competition and interaction of domestic cattle and wild animals: competition for food resources and zoomorphic disease transmission.

On the other hand, areas populated by sedentary cattle raisers show more major impacts on natural resources due to more intense and consistent resource extraction:

- heavy year-round grazing by cattle (seriously limiting natural regeneration);
- ubiquitous pasture, bush, and forest fires;
- heavy extraction of firewood;
- extraction of medicine, walking sticks, cordage, and bows and arrows from forests;
- occasional hunting;
- managed water sources;
- gallery forest destruction for maize-based agriculture.

The transhumance herders' and sedentary cattle raisers' most important impacts on natural vegetation and wildlife are:

- **Bushfires:** that limit vegetation and forest regeneration.
- **Grazing**: cattle dominate pasture (food resources) limiting food resources for wildlife migrating through the area (JGI 2004) and limiting natural regeneration of forested areas.[3]

Most of the herders use the transhumance routes as temporary corridors for travel to or from Dodeo or Nigeria, but some pastoralists settle around the routes to spend the entire dry season or to stay permanently. Not just anyone can set up camp next to a transhumance route; herders that stay near highland routes are typically subject to a complicated series of familial ties and permissions that give them access to certain regions. They also often give "gifts" to local elders who manage the trails. The lowlands are considerably more vacant and socially accessible than the highlands. Yet, herders rarely setup camp in lowland regions next to the trail; the lowlands are heavily infested with tsetse flies, often extremely isolated, and much more forested (less pasture) than highland regions.

[2] Buffalo that occasionally integrate into cattle herds pose a risk to the cattle and the herders.

[3] "En effet, la recherché de fourrage et d'eau pour le betail domestique a un moment ou la survie de la faune sauvage en depend le plus, represente une menace directe pour cette derniere." (JGI 2004)

All of the transhumance routes and zones show evidence of permanent or temporary settlements. All of the routes showed evidence of temporary settlements called *walde.* A *walde* is camp where herders modify the local vegetation during their dry season sojourn of three to four months. A *walde* is commonly made up of one or more small (2x3x1.5 meter) straw huts accompanied by a salt lick and a dry area where cattle spend the nights. *Walbe* (Fulfuldé plural of *walde*) are usually posed on a hillside or near a peak with fresh breezes. Such areas are chosen because they are considered more salubrious for cattle. The dry area (averaging about 10m x 15m) is heavily-manured by cattle and, according to some ecologists, can pose a disease risk to wild animals (JGI 2004). However true, wild animals usually avoid *walbe*, so the seriousness of this disease vector is questionable. *Walbe* are most commonly used by a single young man who stays in one shelter. In some cases, the young men expand the temporary housing and bring their small families to sojourn the dry season at the *walde* with them. In conclusion, *walbe* usually show high deposits of cow manure, minor anthropogenic changes in vegetation, and serious impacts of heavy grazing nearby. Rarely is there any evidence of agriculture or other domesticated animals.

The areas of heaviest human and bovine impact are located near the two main regional routes. The most important routes, *Ñdogawa* and *Route de Fungoy*, have *walbe* as well as scattered permanent settlements along them. Such permanently settled areas, in contrast to *walbe*, show massive anthropogenic change of the ecology and they are usually surrounded by improved water sources, domesticated crops, and other domesticated animals (sheep, goats, dogs, chickens, donkeys, and horses). The zones of transhumance (like the routes of transhumance) all show presence of *walbe*, but among them only *Badjara* seems to have any permanent settlement (fewer than five spread out families).

The following route and zone descriptions examine each route and zone of transhumance separately in order to offer specific, detailed information. Furthermore, they include suggestions for collaborative management strategies that meet local population needs and do not alienate the already skeptical Mbororo pastoralists.

Detailed Route and Zone Descriptions

The following explanations of each route and transhumance zone are based on a sectional approach. Each route has been divided into sections according to pertinent and important geographical or sociological phenomena. This approach allows administration to break apart and appropriately value and manage different areas of routes and zones. *Zones of transhumance* should not be confused with the sectional names. For example, *Badjara* is a *zone of transhumance*, but *Ñdogawa* has been divided into three distinct sections or zones that follow the route.

Ñdogawa

The *Ñdogawa* route, located to the far east of the proposed ICDP region, serves as one of the two main transhumance corridors (with *Route de Fungoy*) in the Tchabal Mbabo-Dodeo region. Djafoun'en Mbororo herders traveling to Dodeo or Nigeria and originating

in the Hore Garbaya, Tchabal Kesse, Mbabo, and Bontodjé regions are the main users of this route. According to local estimates, 300-500 herds per year use this trail.[4]

Ñdogawa starts on a cliff edge next to a mountain called Gongonyel (near Hore Garbaya[5]) and runs W-NW to a central crossroads just south of the small village Manaré. At the Manaré crossroads all the region's transhumance routes become one larger route and go on to pass Mayo Riga and continue to Nigeria. *Ñdogawa* covers approximately 24 km, dropping from 2150 meters at peak elevation to a low of 628m. Of this elevation difference of 1522m, 1270m are lost over the 10km of the trail that pass through the heavily-grazed cliff region. The remaining 14km of the trail, losing only 252m, follow Mayo Bontodjé, Mayo Liddi, and Mayo Deo[6] through a gentle rolling region of transition forests. As *Ñdogawa* leaves the highland pasture areas it enters into *Lophira* dominated bush and then dense forest. As it enters the forest, it almost immediately meets Mayo Bontodjé and a trail crossroads. At this crossroads *Ñdogawa* takes in a trail to the south. The trail to the south is the combined route of *Yukol*, *Ngel Akou*, and *Kinel.* From here all the routes run together to Manaré where they combine with transhumance routes coming from western regions (*Route de Fungoy*) and then, as mentioned above, pass to Nigeria.

Ñdogawa has scattered *walbe* and permanent settlement in the highland region. In its central zones (Mayo Bontodjé and Mayo Liddi) there is no evidence of temporary or permanent settlement. Near Manaré, herders are commonly found camped on farmlands and grazing throughout the area. Such clear geographic changes and human settlement patterns on this route allow the route to be divided into three distinct zones: a highland region, a forested region following Mayo Bontodjé and Mayo Liddi, and the Manaré village zone. Natural resource management follows very different patterns in these three areas. Following is a zonal breakdown that lists important facts and NRM for each area:

[4] Herds can number anywhere between 30-100 head of cattle.
[5] *Hore* refers to the headwaters or source of a river: Hore Garbaya is the source of Garbaya River, Hore Deo is the Source of Deo River, Hore Kui is the source of Kui River, and so on.
[6] *Mayo* mean river: *Mayo Bontodjé* is the local name for Bontodjé River, *Mayo Deo* is the local name for Deo River, and so on.

1. Highland Zone:
    a. This area begins with the trailhead next to Gongonyel (N07º301/ E012º224) and ends in the forest at the crossroads of the routes of *Yukol*, *Ngel Akou*, and *Kinel* with *Ñdogawa* (N07º333/ E012º155).
    b. The area can be characterized as a heavily grazed area with small Afromontane gallery forests and scattered permanent residences.
    c. The trailhead marks the borders of three traditional chiefdoms (*lamidats)*: Tignere, Galim, and Dodeo. One begins in the Galim *lamidat.* Upon descending the cliff to the north one briefly enters the *lamidat* of Tignere and then spends the remainder of the trail in the Dodeo *lamidat.*
    d. This region is managed by **Djarou Djabbe**, who lives next to the trailhead and manages donations for the *lamidat* of Tignere, maintains a vaccination closure that is visited by MINEPIA officials from Mayo Baleo, and manages resources on the cliffs and in an area called *Walde Dallé.* In the center of this area, the family of **Elhadj Elwammi** manages a critical point-barrier fence that divides the route so that cattle cannot pass to regions on either side of the fence. **Elhadj Boubajam** lives high on the cliffs where cattle pass his home to descend the trail and he manages another *walde,* called *Walde Kulahi*, located near the bottom of the highland zone. Any changes to this route will best be collaborated with these families.
    e. The above families use this area for dry season pasture, to extract firewood and cordage from gallery forests, to grow small corn plots, and they extensively burn the local highland areas.
    f. Despite the heavy grazing pressure here, gallery forests show unexploited populations of *Prunus africana* (specifically noted at *Walde Dallé* and *Hore Mayo Sembé*).
    g. Improved pasture and possible improvements to the fencing, vaccination center, and other road areas could turn this area into a very effective m*anaged* transhumance departure point and zone of improved pasture.
2. Mayo Bontodjé and Mayo Liddi Zone:
    a. This zone begins where the trail crosses Mayo Bontodjé (N07º333/ E012º155) and finishes near Mayo Deo and Manaré (N07º443/ E012º075). It runs through transition and gallery forests, crossing small rivulets and rivers multiple times. It seems to have a high level of animal activity and shows no signs of settlement. Herders passing through commonly burn areas next to the trails, the burning is ubiquitous but not extremely damaging since grazing pressure is not high.
    b. There is no settlement in this region of some 14km.
    c. Resource extraction in this area includes hunting, burning, very little grazing, honey harvesting, and other low-level extraction of medicines and natural goods.
    d. Important to this area are natural mineral springs (*laore*), which attract wildlife; they are located next to Mayo Bontodjé and Mayo Liddi.
    e. The research team sighted *Cobus ellipsiprymnus, Tragelaphus scriptus, Papio cyncephalus,* and *Cerocpithecus aethiops.*
    f. If this route portion is to be improved, areas important to wildlife could be isolated from the passage of cattle, cattle movements could be coordinated, improved campsites could be created for tourists, and burning could be lowered through restriction and strategic placement of food sources or plantings of improved pasture.
3. Manaré Zone (N07º443/ E012º075):

a. The Manaré area begins as one leaves the forest (N07º438/ E012º082) and enters a flooding area (638m), next to Deo River, vegetatively dominated by *Gramineae* species.
b. This region is heavily used for agricultural production. During the dry season Djafoun'en herders camp on farmland next to water and fresh herbs. Cows graze throughout the area covering at least 50km^2.
c. Natural resource extraction is heavy in this region. Beside the lands cleared for agricultural purposes, hunting, fishing, widespread grazing, wood cutting, and extraction of medicines and other NWFP (Non-Wood Forest Products) drive the local sustenance and commercial economies.
d. This region may have little to no conservation value, but a great value as a buffer region. The possibility of developing improved pasture in this region can offer an alternative to grazing in the sensitive highland areas. The main constraints to improving this region for herders during the dry season may be the ubiquitous presence of tsetse flies (*Glossine* sp.). Work in this area should be coordinated through the *lamido* (chief) of Dodeo and his *sarki sama* (chief of cattle, located in Manaré).

Yukol and Ngel Akou

Yukol and *Ngel Akou* are being treated together here because they have a high degree of similarity and share most of their trajectories. The two routes, both approximately 12km long, share approximately 8km of their respective trajectories. Where the two trails separate there is less than 3km dividing them; 2.2km separates their respective trailheads. They both begin on the highland cliffs near Bontodjé village. After a long, very sharp descent down the cliffs (2028m) to the north into the Mayo Bontodjé watershed (about 1200m), the two trails join and become one trail. This trail is then soon joined by the *Kinel* access route and follows Mayo Bontodjé on to meet *Ñdogawa.*

These trails are used as a western shortcut to access the *Ñdogawa* route. However, these routes see nowhere near as much traffic as *Ñdogawa*. Local estimates say that less than 30 herds pass here annually. A big difference between these routes and *Ñdogawa* is that the lowland area here shows higher temporary settlement and impacts on natural resource by herders than in the *Ñdogawa* area. At least four *walbe* are located on the trails and in nearby bush in the lowlands area of *Yukol* and *Ngel Akou*; the highland areas, being so steep, show less signs of the intense management evident on *Ñdogawa.* The family of **Elhadj Elwammi** manages these trails and gives permission to herders to inhabit *walbe* around the trails.

Of the two trails, herders considered *Yukol* the easier and better of the two because the descent is not as steep. When given a choice most herders choose *Yukol*. *Ngel Akou* means, in Fulfuldé, the "little road of the Akou Mbororo." In previous times, Akou Mbororo were forced by Djafoun'en Mbororo to use this path when they traversed the region. Currently Djafoun'en Mbororo from Mbabo or Bontodjé regions are the main users of these routes. The low presence of herders in the region and the interest of Elhadj Elwammi in reforesting the area with *Prunus africana* indicate that this area could eventually be a model conservation area. Especially if other regions (Dodeo, Manaré, or Hore Deo) are made more attractive to herders, they may have no problem abandoning these steep cliffs.

These routes can be divided into two distinct areas: a highland zone and a zone following Mayo Bontodjé.

1. Highland Zone:
    a. The highland regions, between 2028m and 1200m, have four *walbe*. The trailheads for Ngel Akou (N07º252/ E012º179) and Yukol (N07º254/ E012º199) are not far apart.
    b. Steep descents (with over 45^{o} grade) for the first 4km of both trails are heavily grazed until 1300m. Above 1300m, the area is dominated by *Croton macrostachys*, thistle, and heavily grazed pasture. At this point the trails follow along the edge of thin mountain chains that protrude and drop precipitously into the valley.
    c. Forest is still relatively dense below 1300m. Below this elevation one passes through *Lophira* dominated bush and then steep cliffs and ravines (inaccessible to cattle) that show more forest and Afromontane vegetation. The presence of *Khaya senegalensis* (at 1300m) and *Prunus africana* (unexploited) make this a unique area for reforestation efforts.
    d. In the highland area natural resource uses consist of: grazing, burning, firewood extraction, and extraction of walking sticks, medicine, and bows and arrows. Herders burn everything throughout these zones, entering even the forests on the steep cliffs. Yet, resource extraction is still rather mild outside of heavy grazing.
    e. *Yukol* shows evidence of trail management; it has a barrier at approximately 1990m, near its trailhead, that is used to keep cows from descending the trails.
2. Mayo Bontodjé (Lowland) Zones:
    a. This region starts around 1200m and ends at the crossroads of Ñdogawa (880m). Forest was denser here than in the highland regions.
    b. As mentioned above, this lowland region shows numerous herder impacts due to grazing and temporary settlements. Even so, these temporary settlements do not go much farther than 6.5 km from the trailheads (or below 1000m). Beyond this the trail shows little grazing and burning impacts.
    c. There were at least three *walbe* in this region. Each *walde* (temporary settlement) was inhabited by only one young man. The young men would sometimes hike to Mbabo village in order to sell walking sticks, bows and arrows, and other NWFP they made in the bush.
    d. The natural resource uses were, like the highlands: grazing, burning, wood extraction, and extraction of walking sticks, medicine, and bows and arrows.

e. *Yukol* and *Ngel Akou* combine to form one route at approximately 1150m (N07º278/ E012º177). Then the access route to *Kinel* enters the combined route of *Yukol* and *Ngel Akou*.
f. The presence of a mineral spring called *Laore Ka'i* (at 1100m) was a unique feature of the Bontodjé River (*Mayo Bontodjé*). Mineral water was easy to catch in bottles and very palatable. Locals report that wildlife regularly visit this *laore*.

Kinel

In original interviews, *Kinel* was reported as a transhumance route. In fact there is a trail that connects a highland *Kinel* region to a lowland *Kinel* region that feeds into the *Yukol* and *Ngel Akou* paths. However, the extremely steep slopes of this trail between the highland and lowland region effectively cutoff and isolate the two regions, cattle regularly fall to their death if they attempt to pass through this trail. Because of the above facts, we reevaluated the region as a *zone of transhumance.* The zone of transhumance includes a highland and lowland zone. These zones show high potential for reforestation and improved pasture development.

1. Highland Zone:
    a. This area (N07º276/ E012º187), located directly to the northeast of *Yukol*, covers less than 10km^2 of highland pasture. Average elevation is between 1800-2000m.
    b. Locals estimate that less than 5 herds use this highland region; many reported only two herds. Although occasionally accessed during the rainy season, cattle come to gaze here primarily during the dry season.
    c. This region could be developed into improved pasture or could be converted into a conservation area. It seems that improved pasture would be a better option for this small area since it is located in close proximity of cattle raiser homes.
2. Lowland Zone:
    a. This zone, covering less than 4km^2, is located directly to the east of *Yukol.* Elevation is generally between 1100m and 1700m. Elhadj Elwammi (the same as for *Ñdogawa*, *Yukol*, and *Ngel Akou*) manages this lowland region.
    b. Vegetation and natural resource management were exactly the same as for the *Yukol* and *Ngel Akou* trails. The lowland zone had one herd and one *walde* located on it.
    c. Due to the lowland isolation from the *Kinel* highlands, the herd using the *Kinel* lowland hillsides was forced to access them via the *Yukol* route.
    d. This zone may be easily converted into a conservation and reforestation zone if *Yukol* and *Ngel Akou* are also managed in such a way.

Hore Deo

This region serves as the most popular highland grazing zone during the dry season. Its popularity is probably due to its extensive size and location. The region, centrally located on the Tchabal Mbabo cliffs, is actually the heart of the Deo River watershed. *Hore Deo,* meaning the head of the Deo River, covers an approximately 25km^2 swath of the northern face of the Tchabal Mbabo cliffs. This region includes the core of the proposed conservation area and the thickest forests in the region. The slopes of the northern cliff face are nowhere near as steep as those to the east. The dense forests on the northern face of the cliffs effectively limit the highland pasture region and bar cattle access to lower elevations. Cows cannot descend and enter the deep forests, but hunters and bark

harvesters often descend into these forested regions. The cattle are mostly concerned with elevations between 2200m and 1700m.

There is no settlement on the northern side of the cliffs, yet herders have settled the southern side of the cliffs. Most of the herders are Djafoun'en Mbororo, but there are also many Fulbe in this region. East-west foot traffic through the region is quite common due to the decent paths on the southern side of the cliffs. In fact, these paths are also part of the transhumance corridors used by herders exiting the eastern *tchabal* to arrive in the western regions of the plateau (*Badjara* or the *Route de Fungoy*). Road improvement in this region may be quite straightforward since much of the paths are quite open and already accessible to automobiles.

This region experiences heavy grazing and burning during the dry season. Extraction of wood and NWFPs is heavy in this region. Perhaps most important and distressing among the NWFPs collected is the unmonitored and devastating extraction of *Prunus africana* bark which is shipped out of the region to the south. The locals receive little or no benefits from such harvests. Most harvests take place without proper provincial certification from MINEF and without proper techniques to ensure that trees survive. There is a rapid and veritable slaughter of *Prunus africana* currently occurring in this region.

Improved pasture and reforestation in the Hore Deo region can coexist. The success of improved pasture on the northern face of the cliffs in this region could help to take the place of pastures in the *Badjara* or other regions deigned to conservation status. Since gallery forests are not threatened by such improved pasture systems, there is a good chance that reforestation of Afromontane species (such as *Prunus africana*) can take place simultaneously in the many gallery forest and forest border regions.

Locals recognize three zones of Hore Deo; these three zones are managed differently according to their unique geography and vegetation. They are Pinkou, Hore Kui, and Yangaréé.

1. Yangaré Zone (N07º229/ E012º123):
    a. Located in the far east of the Hore Deo zone, Yangaré is so named because of the large peak on the southern side of the cliffs. This area has high potential for tourism because of its scenic vistas. Elevation varies around 2000m.
    b. The northern face of the cliffs has possibly 10km^2 of grazing lands. The southern side of the cliffs is settled with sporadic herder and agricultural homesteads along creeks.
    c. This region is quite easy to pass through on foot or horse; road improvement would be straightforward. However, as of the present, vehicles have not arrived here.
    d. This region is on the border of *Prunus africana* exploitation. To the west heavy extraction has killed entire forests. To the east are the unexploited stands near Yukol and Ñdogawa. This region still preserves a few unexploited stands that will probably be destroyed by the time the ICDP can become operational.
    e. Traditional authority rests largely with the **Djarou Bourdu** who is a vessel of the Lamido of Galim-Tignere.
2. Hore Kui (N07º231/ E012º103):
    a. This region is the central region of the Hore Deo zone of transhumance. It derives its name from the watershed located on the southern side of the cliffs. The *Hore Kui* is itself the head of a large watershed to the south, but here the name refers to the northern area of cliffs and the Hore Deo watershed. This region may have over 10km^2 of grazing lands on the northern face of the cliffs.
    b. Elevation of grazing lands is approximately 1700-2000m.
    c. Vehicles are capable of arriving in the Hore Kui region on the southern side of the cliffs. Vehicles coming from Sambo Labbo, May Kelelé and Fungoy reach the end of the road here, this is as far east as they can currently pass.
    d. Prunus extraction has been especially marked in this region and may have completely decimated all the local populations. Local report that Prunus harvesters bring gifts for **Djarou Bakari** of Fungoy as he is considered the traditional authority and natural resource caretaker as far as Hore Kui. Djarou Bakari is a vessel of the Lamido of Galim-Tignere.
    e. Settlement is limited to scattered permanent cattle raiser ranches. Temporary camps of bark harvesters can be found next to many of the gallery forests. Plastic garbage, empty boxes of sugar, a fire pit, a stand to dry bark, and small pieces of bark throughout the site typically mark the camps. Nearby, one finds the remnants of dead, debarked Prunus trees.
    f. Herders do not participate in bark harvesting. Their natural resource impacts in this region are mostly limited to bush and forest fires and heavy grazing.
    g. Gallery forest reforestation and improved pasture operations are likely to succeed here if herders can be convinced to block *Prunus africana* harvest and hunting activities of people from regions from the south.
3. Pinkou (N07º236/ E012º058):
    a. This region of the Hore Deo zone is named for the head of the Pinkou river and the Pinkou forest area. It is the far western part of the Hore Deo zone.
    b. The elevations here reach up to 2100m, but these high and steep peaks on the cliffs' northern face have little interest to the herders. The southern slopes, alternating between 1800-2000m are heavily grazed.
    c. This region (the northern cliffs) is largely unused by herders because of the steep and heavily forested slopes. Some wood cutting and burning occurs as well as

NWFP collection. The main natural resource impacts in this region are limited to hunting and bark harvesting by outsiders.

d. The relatively easy accessibility of this region by cars traveling from Sambo Labbo and Banyo means that its potential for tourism is higher than perhaps the regions farther to the east (Mbabo and Ñdogawa).
e. Ecological studies have indicated that this is one of the most diverse areas in the region (JGI 2004; Thomas 1996)
f. Improved pasture should be supported on the southern side of the cliffs, but the northern side of the cliffs should be limited to conservation activities.

Route de Fungoy (*Lawol Fungoy*[7])

The R*oute de Fungoy* is arguable the most important route in the entire Tchabal Mbabo-Dodeo region. The heaviest users of the road are Mbororo and Fulbe herders, but the road serves many populations throughout the region. According to local estimates, over 500 herds pass through here each year. Some regions, like the *Badjara* zone of transhumance, are only accessible via the *Route de Fungoy.* This road is obviously extremely important to the transhumance, but it is also commonly used for foot traffic between Dodeo and regions to the south. Heavy permanent settlements in the highland region of the road must use this route as their main access to all regions.

Occasionally this road is referred to as the "Old German Road" and it is rumored that the Germans had plans to improve the road during their brief colonial tenure in Cameroon. In any case, the more than 30km that it covers have some of the gentlest slopes in the region, the best opportunities to develop tourism, and the largest permanent settlements next to the proposed ICDP core.

The road primarily follows a north-south access. It starts near the village of Fungoy (N07º234/ E012º047); many transhumance herders come form the Hore Deo region and pass near the Fungoy village or slightly to the north of the village in order to access the road. The road varies in elevation between 2000m and 650m. As it descends into the lowlands it closely follows Mayo Selbé until it reaches its final destination, the crossroads of Manaré. At the crossroads of Manaré the roads combines with other transhumance routes and passes near Mayo Riga and on to Nigeria.

[7] *Lawol* means "road" or "route" in Fulfuldé. *Fungoy*, reportedly means "highest point" in Vouté.

If improved, this route would be useful for accessing different points of the core ICDP region. Local populations would welcome highland road improvements here, but access of vehicles to the lowland forested regions would lead to immediate negative impacts on wildlife and vegetation. The R*oute de Fungoy* can be divided into three zones: a Highland Zone, a Forested Zone (Mayo Selbé), and Manaré.

1. Highland Zone;
    a. The highland zone, covering approximately 12km of route, starts at the village of Fungoy (N07º234/ E012º047) and passes through many areas heavily settled by permanent domiciles and herders' temporary huts. The zone then descends towards Mayo Selbé at 1100m. To the east of the road are thick forests, home to dense wildlife populations (JGI 2004). To the west of and surrounding the road are highly populated zones of cattle raisers' permanent settlements.
    b. Due to the permanent settlements, this region is under heavy resource extraction. Permanent settlements and their natural resource impacts are most evident near Hore Mayo Selbé and next to some of the major *walbe* (*Walde Ibbé* and *Walde Ka'e*). However, throughout the highlands permanent domiciles are common.
    c. The main natural resource uses of cattle raisers consist of grazing, bush fires, forest destruction for maize agriculture, firewood extraction, and NWFP extraction.
    d. The cattle raisers are not typically involved in hunting or bark harvesting. Yet, in the forested areas (near Pinkou, Mayo Selbé, and in gallery forests) both of these activities are extensively pursued by outsiders from the south and west.
    e. **Djarou Bakari** (who has been mentioned above, see *Hore Deo*) is the primary caretaker and traditional authority for this region. However, other powerful cattle raisers (such as Elhadj Hamidou) also have substantial vested interests near Hore Mayo Selbé.
    f. The zone's transhumance herders are largely Mbororo, yet substantial amounts of Fulbe are permanently settled in this region.
    g. As the region's conservation value may be relatively low and improved pasture projects could liberate some of the zones of transhumance to conservation interests, improved pasture should be adamantly promoted in this region.
2. Forested Zone:
    a. This secluded and vacant zone stretches over 15km from the foot of the cliffs (N07º311/ E012º005) to the Manaré zone. It follows Mayo Selbé for most of its trajectory.
    b. In this zone settlement becomes rare as forest cover increases. Grazer pressure is light. The natural resource use revolves around hunting. Herders still graze and burn here, but their impact is limited because the dense forest is not as open as the highland pastures and tsetse flies are abundant.
    c. This zone would best be promoted as a conservation region as it would facilitate the open corridors of wildlife movement through the region (JGI 2004). Yet it must remain an open corridor for transhumance and other local traffic in order to avoid serious conflict.
3. Manaré Zone (N07º443/ E012º075):
    a. The Manaré zone can be considered to start as the first villages are encountered in the lowlands. The village Njiam (N07º430/ E012º072) is the first small village encountered when going north from the forested zone. In the approximately 3km

between this village and Manaré there is little wildlife in the mostly agricultural fields.

b. In the Manaré zone the natural resource uses revolve mostly around hunting, fishing, extraction of firewood, and extraction of other NWFP.
c. This zone's pasture resources could be improved to attract herders from the *Badjara* region. Its conservation value will probably remain relatively low due to the common vegetation types and heavy reliance of local villages on forest resource extraction.

Badjara

In early interviews, *Badjara* (N07º351/ E011º994) was reported as a route of transhumance. Field observations indicate that it is a vast region that is populated by temporary shelters of herders. *Badjara* may cover more than 50 km^2 of undulating hills (1200-1600m) to the west of the R*oute de Fungoy*. The zone supports as many as 15 herds, locals say 10. Only 2 permanent settlements are in the isolated region. The wide dispersion of *walbe* and lack of a coherent encompassing route for the entire zone (there are multiple small routes) led to this area's classification as a zone of transhumance.

Badjara is primarily a highland region that stretches from the eastern limit of the *Route de Fungoy* trail to the headwaters of Mayo Riga and Nigerian border in the west. To the south and southwest of Badjara are some permanent agricultural settlements that are based near Malela, Luggol Koumbi, or in the Mayo Yim watershed. The north trail from *Badjara* to Manaré follows a steep and difficult slope next to Mayo *Badjara*. This trail is extremely difficult, but offers some incredible vistas of the region as well as access to a forested area (near Hore Mayo Riga) that seems largely unspoiled. Camping sites and abandoned *walde* are present at the bottom of the cliff next to Mayo *Badjara*. Herders have relatively free access to this lowland area of *Badjara*, but the ubiquitous tsetse flies drive them back into the highlands where they must negotiate *walde* rights with other local parties. Space seems relatively open even in the highlands, where there were numerous abandoned *walbe* among the few inhabited ones. Most of the herds in *Badjara* are Djafoun'en that come from the Mbabo and Bourdu regions of the eastern *tchabal*.

In the highlands above 1200m, there is very little forest cover, mostly limited to gallery forests. Herder's natural resource use is basically limited to grazing and burning, occasional wild fruit collection, and light firewood collection. There was no sign of

agriculture in the *walbe*. The permanent settlements each had less than one hectare of maize and they were located on highland areas, not in gallery forests. According to locals, Nigerians sometimes cross over, cut down gallery forests, and begin to perform agriculture in the free lands here, but then they abandon their fields. It is not clear what tribes (some locals speculate they are Mambila) come here or why they leave.

It seems that this region would best be managed as a conservation region. Although it is now under heavy grazing pressure, the region serves as a major corridor for wildlife (JGI 2004) and does not have heavy permanent settlement. The main barriers to liberating much of this land for conservation interests are, first, to offer a reasonable, alternative dry season pasture to the owners of the transhumance cattle here and, second, to give just compensation to the few local families who would need to move out of the region or be integrated into some NRM strategy. The first problem seems to be much more delicate. The owners of cattle in this region are powerful traditional authorities or elders from Mbabo and Bourdu. These men were originally opposed to the ICDP project and may find reason to stir up trouble even if a reasonable alternative pasture is offered for their cattle. The second problem, of compensating or incorporating local families, can easily be negotiated; the remaining families could even be part of a conservation watch that reports activities in the region.

Conclusions and Recommendations

A carefully planed ICDP in the Tchabal Mbabo-Dodeo region has excellent potential to support sustainable NRM. In order to do so, it must collaborate with the main stakeholders in this region. The main local stakeholders and users of core regions of the ICDP are Mbororo pastoralists. During the dry season, these Mbororo pastoralists use four transhumance routes and three zones of transhumance directly in or next to proposed conservation areas. These regions undergo dramatic ecological change because of the natural resource management practices of these herders. The herdsmen's behavior is not, however, impossible to change and, fortunately, the majority of herders seem willing to cooperate with an ICDP.

Cattle raising and transhumance play central roles in the livelihoods of most of the local populations here. For example, the cooperative relationship between ethnic Ndoro (and other) farmers of the Dodeo plains with Djafoun'en herders is a rare success story in this region of herder-farmer conflict. If such relationships are not respected the regional economy and environment will be damaged. The farmers will be hurt by the loss of free manure and the need for the introduction of expensive chemical fertilizers. The loss of access to dairy and meat products for a substantial portion of the year could create health problems in farming populations. The lack of a viable and direct route to traditional cattle markets in Nigeria would cause economic problems amongst the cattle raisers and dependent economies (restaurants, farmers that sell corn to pastoralists, veterinary product suppliers, etc.). Livelihoods are tightly interwoven in this region. A plausible strategy of ICDP implementation must integrate and not negate these local interconnections.

Conflict between conservation and cattle raising interests seems to be more likely in the highland transhumance zones than on the transhumance routes crossing through the lowland forested areas. The transhumance corridors do pass directly through some important conservation areas such as *Mayo Selbé*, *Mayo Liddi*, *Mayo Bontodjé*, and *Badjara*. However, transhumance impact on lowland forests is seasonal, light, and manageable. Herder behavior along certain transhumance routes can be managed and improved through a long-term collaborative development program. Moreover, the transhumance routes circumnavigate the most heavily forested and critical conservation areas such as the *Pinkou* forest and other forests located near *Hore Deo*. Highland grazing zones, such as *Badjara, Hore Deo,* and *Kinel* play crucial roles as dry season pastures for at least 30 Djafoun'en Mbororo herds. Yet, it is in just such highland, tsetse fly-free zones that conservation, wild animal repopulation, and reforestation may best succeed. Considering the small number of herds using these areas it may seem quite easy to affect a program of pasture change or limitation. However, such actions must take into account the powerful parochial influence of the cattle raisers that send their cows to these regions (for example, the chiefs and elders of Mbabo and Bourdu send their cow to *Badjara*) and who are also quite skeptical of the ICDP. Improving and managing pasture resources in other regions, like Dodeo, will offer realistic alternatives to grazing in the highland zones of transhumance. Yet still, the highland zones will be difficult to change and open for conservation. A well-developed strategy of route management will be easier (especially if *Route de Fungoy* and *Ñdogawa* are improved) to manage than conflicts over NRM in the highland grazing zones.

The NGO APESS, under the management of El. Youssouf of Tibati is currently attempting to spread improved pastures (*Bracharia*) in the highland regions. APESS (run by many Fulbe and Mbororo based in Garoua) may be a valuable contact for improving highland pasture resources and human development. UGICETA serves similar functions as APESS, but by the nature of its efforts it has been more involved in transhumance than improved pasture. Recent attempts to coordinate transhumance departures and route management have fallen under the auspices of UGICETA[8] and GESEP[9]. Although these efforts to control the transhumance were only mildly successful, there is a structure of GICs under UGICETA that with further effort can improve the synchronization and management of routes.

In the future, two of the transhumance zones (*Badjara* and *Kinel*) and two transhumance routes (*Yukol* and *Ngel Akou*) could possibly be converted into and managed as conservation areas. However, the most used routes, *Ñdogawa* and *Route de Fungoy*, should be continuously maintained and improved for cattle passage. The most important highland zone of transhumance, *Hore Deo*, should also be left open and considered as a place to implement permanent improved pastures.

Despite the apparent conflict in highland buffer regions and other obstacles that the herders pose to improved NRM and ICDP development, there is ample reason to believe that improved NRM is possible here. Herder behavioral change can be affected and

[8] Union de GICs pour l'Elimination de TseTse dans L'Adamaoua
[9] Gestion et Securitization d;Espace Pastoral

managed. A collaborative program introducing improved pasture, reforestation schemes (providing jobs), infrastructure development in communities, and strategic route improvements (salt, insecticide baths, managed camp areas, etc.) on major trails such as the *Route de Fungoy* and *Ñdogawa* could take place over a number of years. This would maintain local power over resources, maintain current livelihood interconnections, and ease local communities into assuming vested interests in a sustainable NRM system. Moreover, the majority of herders and cattle raisers could actually be a bonus to ICDP establishment in the area. Their knowledge of the area, need for jobs and development outside of the pastoral sphere, willingness to cooperate in improved pasture programs, and ability to monitor violation of conservation guidelines (hunting, harvesting of *Prunus africana*, etc.) may all benefit an ICDP's ultimate goal of conservation of Afromontane vegetation and fauna.

A successful ICDP must be willing to work over long-term strategies to change the herder NRM patterns. These changes will be best introduced by creating incentives for behavioral change rather than simply introducing restrictions on project areas. Concrete examples of such incentives are:

- Improvement of pasture resources in the strategic zones of Mayo Riga, Manaré, Dodeo, highland Kinel, Hore Deo, and possibly other regions. These improvements will offer a more attractive pasture option for herders than areas like *Badjara*, Yukol, Ngel Akou, and lowland Kinel. A future move of herders to improved pasture regions could be collaboratively planned with local communities. This would offer power of NRM to local communities and support a gradual, non-traumatic shift in regional NRM. However difficult such a process would be, it would probably be less costly than trying to renegotiate misinformed, non-collaborative ICDP administration decisions on zoning or attempting to restrict access to traditional grazing areas.
- Improvement of routes. Improve the *Route de Fungoy* and *Ñdogawa* trails with local labor; cattle insecticide baths; monitoring posts; improved campsites; and possible presence of other resources like salt licks. Opening up these areas to vehicles should be severely limited since such access will certainly lead to an increase in wood cutting and higher hunting rates in the lowland forest areas. However, certain improvements would facilitate transhumance management and strongly demonstrate the ICDP's commitment to local priorities, collaboration, and jobs.
- Employ local pastoralists. Local pastoralists are keen to see jobs offered by the project. As mentioned above, road improvement would provide an obvious source of employment for many people. Other such projects could include local conservation vigilance teams or rewards to herders that cooperate with the project; reforestation campaigns; construction of new health centers; training and service as ecological or cultural guides[10]; or maintaining a local office.

[10] Herders were quite knowledgeable about the ecologies and social significance of their local areas. Herders were able to indicate where outsiders had come from Banyo to extract *Prunus africana,* they were able to indicate mineral springs used by wild animals, and they could also list off the closest neighboring herders and whose cows they were watching. Their camps were the only regular outposts in many areas

- Expedite formalities for clais of damage. Proof of assistance and direct action to the herding community will mean a great deal in the early years. If a lion attacks a herder's cows, all efforts should be made to assist and expedite the herder's claims to the government.
- Provision of veterinary supplies or other benefits in accordance to cooperation with and success of conservation goals. For example, in Gashaka-Gumti National Park in Nigeria efforts were made to connect subsidized cattle vaccinations with the rising or falling numbers of wild animal populations (Dunn et al. 2000).

- Support improved pasture programs for the entire Tchabal Mbabo; the most appropriate approaches seem to be contracting with an NGO like APESS, doing extension on an individual basis, or working with GICs established through UGICETA. Subsidize *Bracharia ruzensis* seeds, barbed wire, tree nurseries, and other agroforestry technologies and seeds for the first few years of improved pasture development and agroforestry efforts in the region.
- Improve pasture in the *Hore Deo zone of transhumance* region while looking into the possibility of closing off access to nearby forests and implementing rotational grazing or other intensive grazing programs for the *Hore Deo* region.
- Develop improved pasture; tsetse fly-free zones or subsidized insecticide baths; and other resources to attract herders to the Dodeo lowland area. Make the Dodeo lowlands a more attractive place to spend the dry season than the highland *zones of transhumance*.
- Plan on *Yukol*, *Ngel Akou*, and *Kinel* as a future reforestation zone for *Prunus africana* and other Afromontane species. Employ local community members to collect seeds and run nurseries.
- Work through other local NGOs that can serve project needs include Projet d'Appui au Developpement Integre (PADI) based out of the Lutheran Church of Ngaoundere, but working on local road improvements in the field near Galim, Gadjiwan, and Sambo Labbo. The presence of the United States of America Peace Corps volunteers in Galim, Tignere, and Mayo Baleo may also serve as a collaborative network for the ICDP.
- Hire or contract Muslim workers for the ICDP. This will resolve many problems with the cattle raisers because they place great confidence in those with whom they can pray.
- Contact community members before any tree planting near the *tchabal*; many cattle raisers are terrified that planting trees will bring the tsetse flies to the highlands.
- Value cultural conservation as well as ecologic conservation. The tourism value of Mbororo herdsmen and the history of their people in this region can serve as a great income-generating source through tourism and research in the region.

In conclusion, drastically limiting or barring the transhumance routes serves no immediate purpose for an ICDP. In fact, such actions would be premature and would

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where agriculture was not practiced or had been abandoned. The herders make up the only reasonable-sized population throughout the project's core region.

jeopardize any future collaboration with regional farmers, cattle raisers, and local administrators. Well-planned long-term programs of improved pasture, infrastructure development, and transhumance route improvement can influence local cattle raisers to adjust their behavior to project goals. All efforts should be made to create an atmosphere of incentives instead of a series of restrictions. The Mbororo cattle raisers and herders are the main local stakeholders in this region; their cooperation will be the most effective way to ensure the future success of the proposed ICDP. A decision to seriously limit transhumance would be a misinformed and misfortunate decision that would give the all regional livelihoods a grave shock and hamper ICDP initiatives in the future.

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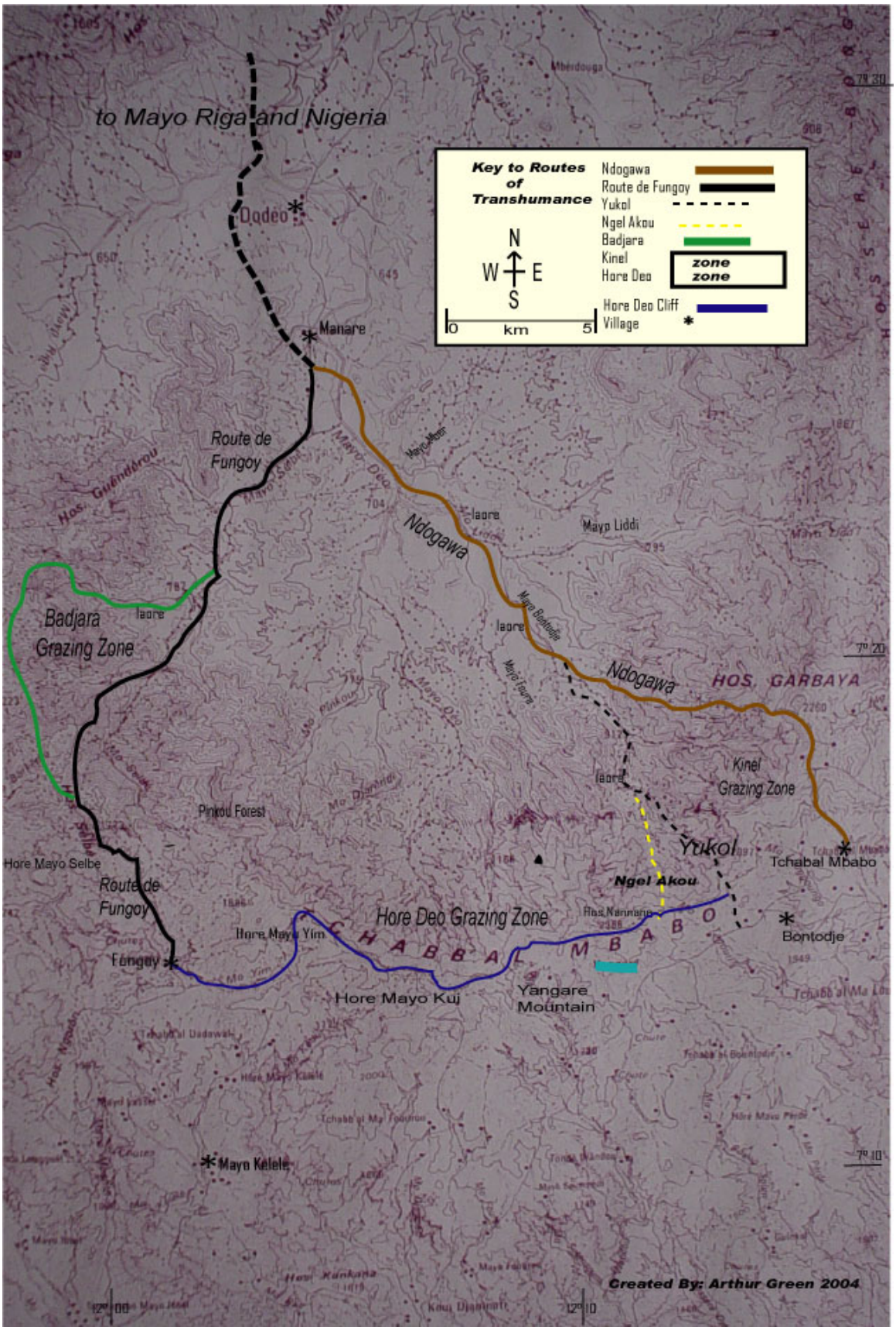
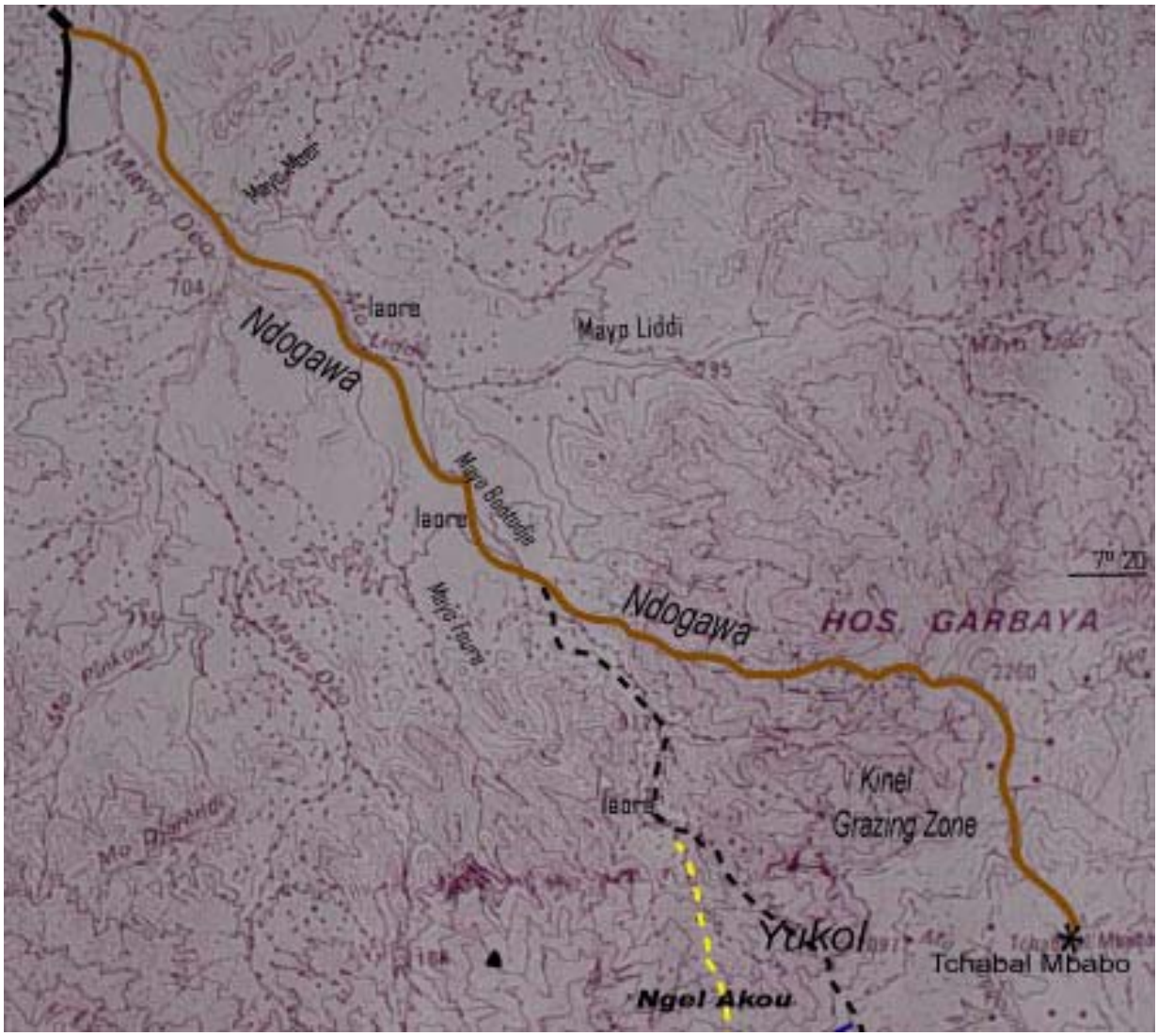
Appendix I:

Map of Transhumance Routes in the Tchabal Mbabo-Dodeo Region



Appendix II: Ñdogawa

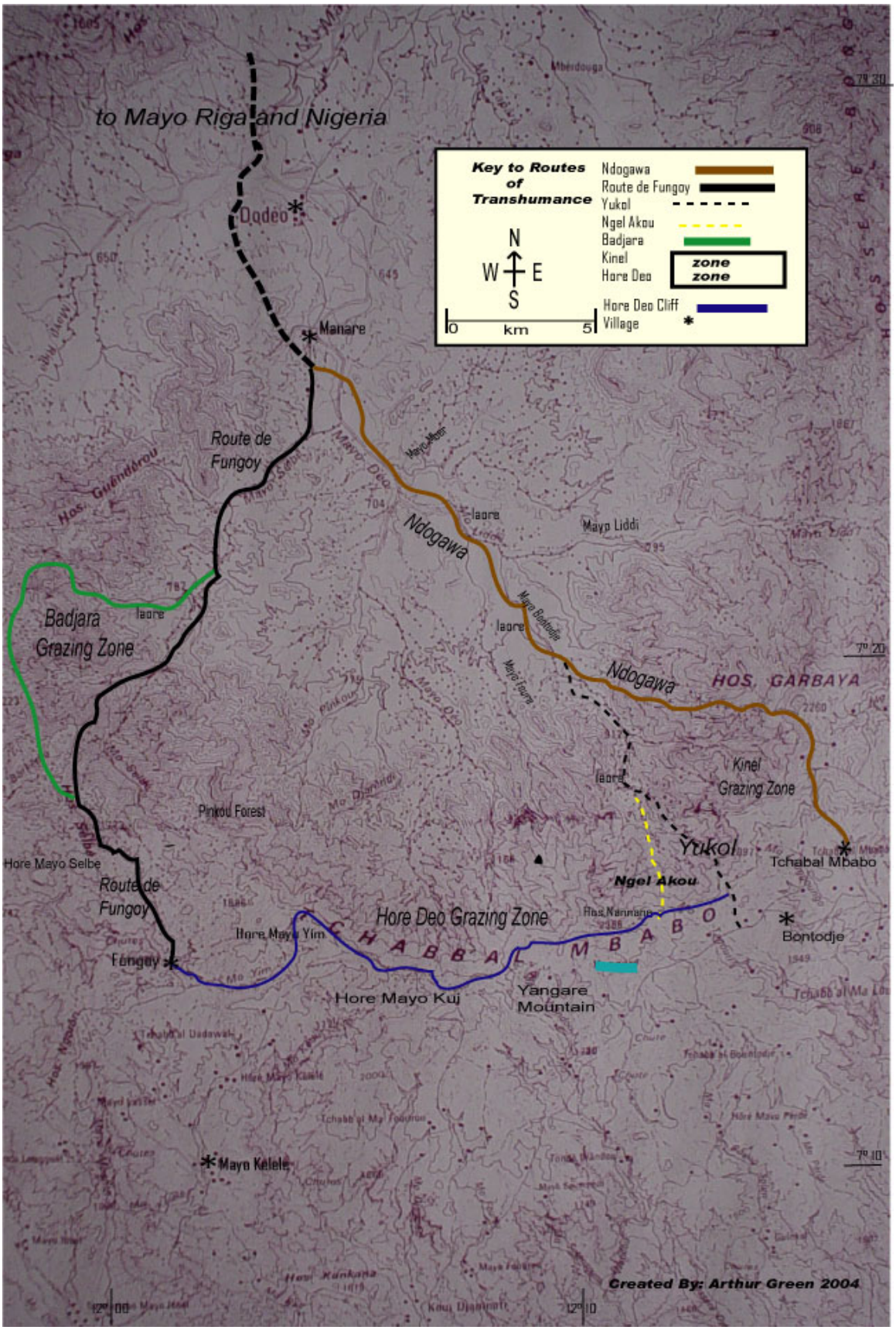


Appendix III: Yukol, Ngel Akou, Kinel/ Hore Deo

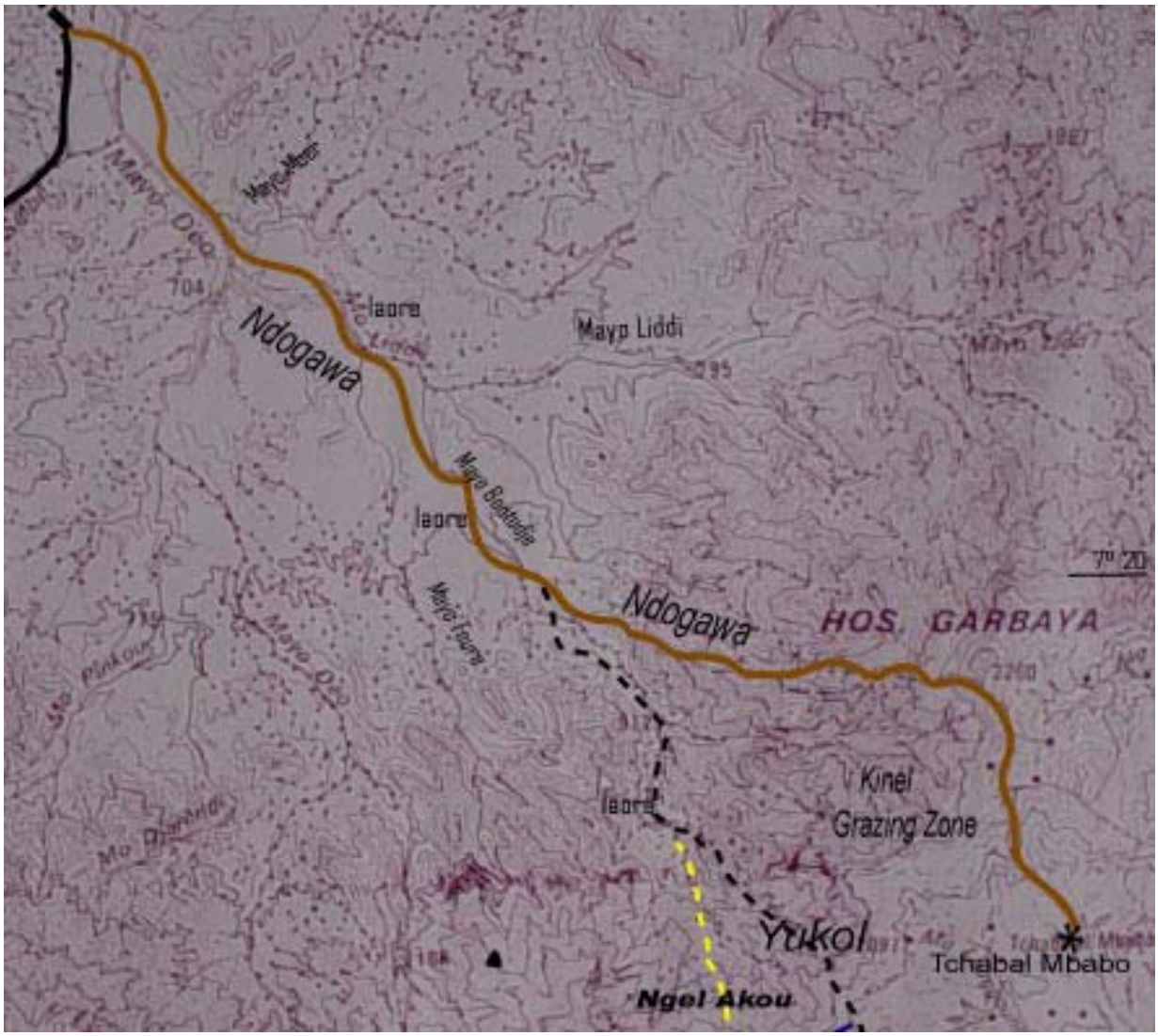
Appendix IV: Route De Fungoy and Badjara

Appendix I:

Map of Transhumance Routes in the Tchabal Mbabo-Dodeo Region



Appendix II: Ñdogawa



Appendix III: Yukol, Ngel Akou, Kinel/ Hore Deo

Appendix IV: Route De Fungoy and Badjara