Sharing Knowledge

Intra-cultural variation of ethnobotanical knowledge and the factors that pattern it in a Mambila community in the Cameroon-Nigeria borderland

Réka Komáromi

MSc Ethnobotany, 2009

University of Kent at Canterbury

Department of Anthropology

rekomaromi@googlemail.com

Sharing Knowledge: Intra-cultural variation of ethnobotanical knowledge and the factors that pattern it in a Mambila community in the Cameroon-Nigeria borderland

Réka Komáromi

MSc Ethnobotany
University of Kent at Canterbury
Department of Anthropology

Submitted in partial fulfilment of the requirements for the degree of Master of Science in Ethnobotany with the University of Kent at Canterbury, the Durrell Institute of Conservation and Ecology and the Royal Botanic Gardens, Kew

September 2009

16,000 words

Abstract

This dissertation is an outcome of a collaborative work with the Mambila Dictionary Project, to which it contributes Mambila names for 173 vascular plants (65 identified with scientific names), and voucher specimens of 60 plant species deposited at the herbaria at Yaounde, Cameroon, and Kew, UK.

Situated within the wider debate concerning the preservation and loss of biocultural diversity, I focus on the plant knowledge of 39 Mambila women and men of varying ages. As this study is the first ethnobotanical project conducted in the area of Somié, in the Cameroon- Nigeria borderland, I aim to establish the basic categories in the local classification of plants. I also aim to identify the factors influencing the general pattern of ethnobotanical knowledge and the degree of knowledge sharing and knowledge loss, particularly in relation to age, gender and level of education measured in years spent at school. I primarily focus on theoretical and practical knowledge, that is, the ability to name plants, and the practical skill to identify plants and their uses as well as to put this knowledge into practice.

Table of contents

Acknowledgements.....8

Chapter 1: Introduction

1.1 Theoretical context and background.....9
1.2 Aims and objectives.....11
1.3 Hypotheses..... …...11
1.4 Chapter contents.....12

Chapter 2: Ethnography

2.1 Geography …….....13
2.2 The Mambila…….....14
2.3 Religion…….....15
2.4 Demography and social organisation…….....16
2.5 Subsistence agriculture…….....18
2.6 Education and language…….....19
2.7 The market…….....19
2.8 Agro- pastoralist conflict…….....21

Chapter 3: Data collection, methodology and ethics

3.1 Informants……..…… 22
3.2 Research assistants …….. 22
3.3 Freelist and questionnaire interview…….....23
3.4 Plant identification trailwalks…….....23
3.5 Interviews…….....24
3.6 Voucher specimen collection and identification…….....24
3.7 Participant observati…….....25
3.8 Data analysis…….....26
3.9 Permissions and ethics…….....27

Chapter 4: Local systems of plant classification

4.1 Categories of Mambila ethnobotanical classification……..…….....28
4.2 Nomenclature……..…….....29
4.2.1 Generic names…….....29
4.2.2 Folk- specific names…….....29
4.3. Ethnoecological categories……..…….....31
4.3.1 The Field *(***ŋuen)**.....31
4.3.2 Coffee plantations and oil palms…….....32
4.3.3 The Homegarden (**kapti**)…….....32
4.3.4 The Savanna ……..…….....32
4.3.5 The Forest (**homo**)…… ……..…….....33
4.3.6 Lake, water, stream (**dua**)…….....33
4.3.7. The village (**lɔɔ)**.....33

4.3.8. The Courtyard *(càgà)* 33

Chapter 5: Domains of plant knowledge

5.1. Knowledge of medicinal plants……..……...34
5.1.1. The concept of disease and medicine in Mambila culture…..…….....35
5.2.1 Knowledge of food plants and their preparation……...……...36
5.2.2. Semi wild and wild foods …….....…….....37
5.3 Famine foods……...……..37
5.4 Firewood……...……....38
5.5 Cash crops……...……..39
5.6 Plants for construction and crafts…….....……...39
5.7 New and introduced species.....39
5.8 Multi- purpose species.....39

.

Chapter 6: Patterns in the variation of ethnobotanical knowledge

6.1 Theoretical and practical ethnobotanical knowledge …….....41
6.1.1 Lexical plant knowledge …….....…….....41
6.1.2 Substantive plant knowledge…….....….....42
6.1.3 Specialist plant knowledge…….....…….....43
6.1.4 Flexibility and change…….....…….....44
6.1.5 Knowledge erosion…….....…….....45
6.2 Informant consensus……..…….....45
6.2.1 Consensus among group…….....…….46
6.2.2 Formal education as an independent variable…….....47

Chapter 7: Discussion and conclusion

7.1 Factors that influence ethnobotanical knowledge variation and its patterning
7.1.1 Age.....52
7.1.2 Gender roles.....52
7.1.3 Ethnic mixing and the effects of "Fulbeisation".....54
7.1.4 The role of formal education.....54
7.1.5 Patterns and fluctuations in the transmission of plant knowledge.....55
7.1.6 Socio- economic changes.....56
7.1.7 Individual motivation and preferences.....57
7.1.8 Knowledge loss.....57
7.2 Methodological constraints and inconsistencies.....58
7.3 Conclusion

Appendices

Appendix I: Photographs

Aerial photographs of Somié illustrating the extent of deforestation.....64
Miscellaneous photographs taken in the field.....65

Appendix II: Tables

Table 1: Socio- demographic data for 37 research participants 68
Table 2: Freelist and interview form.....70
Table 3: Form used to record demographic data collected during structured interviews.....72
Table 4: Summary list of tree species mentioned on freelists and collection walks 73
Table 5: Summary list of plant species mentioned on freelists 76
Table 6: Summary list of "top 22" plants from freelist mention 80
Table 7: Individual knowledge scores based on trail walk.....81
Table 8: Individual knowledge scores based on identifying and naming uses in the field 82
Table 9: Yearly activity calendars for men and women.....83
Table 10: Freelist mentions of tree/ plant varieties and tree/plant uses by groups.....84
Table 11: Summary table of plants used medicinally and in ritual.....85
Table 12: Food plants based on information from freelists and trailwalks.....86
Table 13: Trees mentioned as firewood by different groups 88
Table 14: Trees and other plants mentioned as sources of food (wild or cultivated).....89
Table 15: ANTHROPACcluster analysis of freelist data(trees).....90
Table 16: ANTHROPAC cluster analysis of freeelist data (other plants).....91
Table 17: ANTHROPAC regression analysis of trailwalk data (trees).....92
Table 18: ANTHROPAC regression analysis of trailwalk data (other plants).....94
Table 19: Summary list of transmission channels of ethnobotanical knowledge.....96
Table 20: Knowledge transmission summary list for all participants.....98

Appendix III: Statements

1 : Note on orthography.....100
2 : Voucher specimen collections.....101
3: Letter from the mambila Dictionary Committee to the University of Kent at Canterbury.....105
4: Reflections on the fieldwork.....107

References.....110

List of Figures and Tables

Figure 1: Map of Cameroon.....13
Figure 2: Map of Cameroon with Tikar Plain indicated 14
Figure 3: Yamba ceremony in front of the Chief's palace.....16
Figure 4: Typical Mambila house in the centre of the village.....18
Figure 5: Veyo Marguerite in her groundnut field.....19
Figure 6: Girls at the market selling maize-based snacks.....20
Figure 7: Cattle herds of sedentary Fulbe moving through savanna.....21
Figure 8: Observing 88-year old Wuwea Barabas fixing a fishtrap.....25
Figure 9: Making maize beer (**kpata)**.....26
Figure 10: Home garden (**kapti**).....32
Figure 11: Teaching Mambila literacy in the courtyard.....33
Figure 12: ' Tradi- practitioner' in his office 36
Figure 13: Ring- barking trees for firewood.....38
Figure 14: Unidentified bulbous plant at male specialist's house, used against spiritual poisoning.....42
Figure 15: Young boy with **njàgà** (*Cyperus articulatus*) 45
Figure 16: Unidentified **fleur** (introduced species) 47
Figure 17: Plant uses mentioned on trailwalks 49
Figure 18: Young girl with her certificate of excellence from school 51

Table 1: Plants on the "top 22" list that were mentioned in multi-contextual uses ……..40
Table 2: Medicinal plants and plants used in 'ritual' medicine as mentioned on trailwalks…….43
Table 3: Trail walk data for *Epathorium odoratum*…….44
Table 4: Agreement on plants as food (trail walk data) ……46
Table 5: Total number of plants in different category uses as mentioned on freelists and on trail walks…….48
Table 6: Individual knowledge scores based on identifying and naming uses on trail walk….50
Table 7: Linear regression model for the relationship between plant knowledge/ age, gender and education……50

Acknowledgements

Being a nomad and a sailor has taught me, over the years, that we are never alone on the journey of life long learning and in the search for Truth and Reality.
I would like to express my deepest gratitude to the angels in my life, dead and alive, for having believed in my passion for people and plants, and for manifesting in the most crucial moments of this project : my father Mihály and my sister Anemi; my mother Mária and my daughter Priska.

I would also like to acknowledge all those people, who were my companions in this year of academic exploration:
My supervisors, Professors Roy Ellen and David Zeitlyn; your wise guidance and excellence in the field has been my constant lighthouse on these often "choppy seas".
All my friends and colleagues from the Kent University; you were all instrumental in this dance of balancing work with fun, tears with laughter. A special thanks to Eibes for "holding the fort" in Canterbury, while I was in Cameroon, to my "good good friend" Djeouli, who has lured me from my life of adventure onto the path of Africa, culture and academic ambition, and to the "Islington Twins" for guiding me through the lows.

Thank you Mark Nesbitt for your encouragement with my fieldwork, Xander Van de Burgt and Laura Pearson for all your kind help and patience, and for allowing me to be part of the "Kew Herbarium family".

I wish to thank everyone who graciously facilitated my fieldwork in Cameroon; this project would not have been possible without the goodwill, generosity and patience of a number of individuals in Yaounde and in and around the village of Somié, especially the many participants in my study, and the friends I was privileged to make in the village.
May our paths cross again in future projects and discoveries!

Finally, this project was gratefully facilitated by the financial support of the Mambila Dictionary Project and the Kay Williamson Educational Fund.

Chapter 1. Introduction

1.1 Theoretical context and background

Traditional knowledge embodies ecological adaptations of humans to diverse environments and has the potential to serve as a basis for the preservation of biological and cultural diversity (Brush 1993, Maffi 2001). Many of the ecological relations recognized by traditional peoples are often little, if at all, known to Western science because they tend to be place-specific and shared only by the resident cultural groups. The concept of culture as "shared knowledge" (Kroeber and Kluckholm 1952) or a "pool of shared information" (D'Andrade 1987, in Reyes-Garcia 2001) is well established in anthropology and implies that people differ in the amount of information they share. Scholars have studied intra-group variability of knowledge (Romney, Weller and Batchelder 1986:325; Berlin 1992, Boster 1986, Ellen, 1979, Hunn 1982) and have found that this distribution is not random, but patterned. Among the variables that have been found to pattern the intra-cultural variation of ethnobotanical knowledge, in particular, are age (Phillips et al. 1993), gender (Boster 1986), kinship (ibid), acculturation (Zent 2001), level of integration with the market economy (Benz et al. 2000, Caniago et al. 1998, Reyes-Garcia 2001), national language (Benz et al. 2000, Zent 2001) ethnicity, and informants' type of activities. Studies on the intra-cultural variation of ethnobotanical knowledge in various cultures have given clues to the reasons and the extent of knowledge loss and decay (Zent 2001, Hill 2001), the patterns of ethnobotanical knowledge transmission (Lozada et al, 2006) the implications for the conservation, protection and resilience of traditional knowledge and biodiversity (Nemoga 2004; Zent, 2004; Ghimire et al, 2005), and to mechanisms of adaptation to environmental changes (Muller-Schwarze 2005) in various populations.

Since the 1990s, numerous studies have raised our awareness of the fact that "the ongoing loss of biodiversity is paralleled and interlinked with the "extinction crisis" affecting linguistic and cultural diversity" (Maffi, 2001:601; Turner, 1995).

Many of the knowledge systems of the innumerable traditional cultures in resource-rich African countries such as Cameroon have not been documented and are currently facing growing threats of knowledge erosion related to language loss, acculturation, migration,

growing population densities and rapid changes in social structure. This dissertation approaches 'traditional' ethnobotanical knowledge as the body of plant knowledge shared and orally transmitted among the Mambila in Somié village, constantly produced and reproduced as a "consequence of a practical engagement with everyday life" (Ellen, 2003: 65). It aims to examine individual ethnobotanical knowledge shared and orally transmitted among the Mambila of Somié in order to potentially contribute to " a systematic understanding of humanity's most widespread and ancient form of knowledge" (Reyes-G. 2007:introduction).

To date, only a few ethnographic works exist about the Mambila (Rehfisch, 1956; Zeitlyn, 1994). Ethnobotanical surveys in the wider area have mainly focussed on the ethnobotanical lore and management practices of the Tikar (Zapfack, 1999; Dounias et al, 2001) and the Fulbe (Blench, 2006), and the only existing Mambila plant names documented in Mona Perrin's dictionary of the dialect of Atta village (Perrin and Mouh 1995) were more linguistically than ethnobotanically informed. Considering this lack of scholarly literature and the differences in dialects between the Mambila villages, it is of interest both for the disciplines of ethnobotany and linguistics to document valuable ethnobotanical knowledge as well as the factors that influence its variation and sharing within a community. There is consensus among linguists and educators that mother tongue education is vital for effective teaching, and it is stated in the UNESCO resolution of 1952 that "mother- tongue education on the formative level is most desirable" (Batibo, 2001). Bearing in mind that a large percentage of any traditional language is related to plant and animal names (Pawley, 2001: 236), properly prepared literacy materials such as a dictionary are of urgent necessity for language preservation and, consequently, the preservation of biocultural diversity, especially in areas with high language endangerment such as the Cameroon- Nigeria borderland.

"Nigeria and Cameroon are recognized as being the two most linguistically heterogeneous countries in Africa; indeed with 700 - 800 languages between them (roughly 12% of the world's languages), they constitute one of the most linguistically diverse areas in the world, despite having well below 1% of the world's population. The borderland shared by these countries is perhaps their most densely populated area, linguistically speaking. It might come as no surprise then that today we find this to be a region with a relatively high incidence of language endangerment" (B. Connell, pers. communication, and http://lucy.ukc.ac.uk/dz/connell/Mori/Moribundlngs.html).

The Mambila Dictionary Project has been carried out by Bruce Connell from York University, Canada in collaboration with David Zeitlyn from Kent University and the local Mambila language committee. It began as a spin-off of other funded research on Mambila and related languages (e.g. Connell 1998), in part as it related to that work, and in part because it was seen by both the researchers and the local community as a means of contributing something to the community" (B. Connell, pers. communication 2009). Based on the data of this ethnobotanical "groundwork", future studies interested in the preservation of biocultural diversity will be able to examine how new independent variables such as socio-economic change or increased ethnic and religious mixing affect the intra-cultural variability of ethnobotanical knowledge among the Mambila of Somié.

1.2. Aims and objectives

The objectives of this dissertation are:

- to document Mambila domains of plant knowledge and identify culturally salient plants.
- to find out the variance in naming (theoretical knowledge), and identifying plants, their habitats and their uses (practical knowledge).
- to find out the variance in the knowledge of preparing and using plants .
- to study the relationship between this variability and independent variables such as age, gender and level of education (measured in years spent at school).
- to collect voucher specimens of approximately 80 named Mambila plants and supply their uses and scientific names for the Mambila Dictionary Project.

1.3. Hypotheses

My working hypotheses at the onset of the study were:

- older women/men are expected to have a higher level of ethnobotanical knowledge than younger women/men.
- individual ethnobotanical knowledge will be influenced by gender; names and knowledge of plant use might show differences due to different gender roles.
- level of formal education measured by years spent in school is expected to be negatively associated with ethnobotanical knowledge.

1.4. Chapter contents

After the introduction of theoretical context and background, aims, objectives and hypotheses stated at the onset of the study, chapter two introduces geography and history of the area, and describes the ethnographic background of the Mambila in Somié village. Ethical background to the project and methodologies used in sampling informants, collecting, storing and analysing data, and in collecting and identifying voucher specimens, are explained in chapter three. The following chapter describes the local system of plant classification, and focuses on basic plant categories, nomenclature and ethnoecological categories established through free lists and questionnaires. Chapter five gives an overview over the basic domains of Mambila plant knowledge, which were established through quantitative and qualitative methods. The next section of the dissertation aims to examine patterns in the variation of ethnobotanical knowledge with regards to lexical and substantive knowledge and the levels of consensus within and among the focus groups. In the final chapter, I present a discussion of the factors that influence patterns of knowledge variation established in chapter six, followed by a final conclusion of the outcomes of the project.

Chapter 2 Ethnography

2.1. Geography

The Tikar Plain is situated in the Northern part of Cameroon and is bound on three sides by the Adamawa Plateau, the Mambila Plateau, and the Bamoun Plateau (fig. 2.1). Its fourth boundary is demarcated by the river Mape (Zeitlyn, 1994: 20). This highly fertile forest-savannah environment, classified as a mix of Sudano- Zambezian and Guinea Sudanian phytogeographical zones (Letouzey, 1985, in Zeitlyn 1994), has an annual rainfall of 2200-3000mm/yr with a mean annual temperature of approximately 29Cº. It is considered as extremely diverse with local variations of plants not found in other places (Dounias et al., 2001). Somié village is located at 6.30° N 11.30°E at an altitude of 750 metres[1] and has a single annual rainy season from March until October with November to February being the dry season (fig.1).

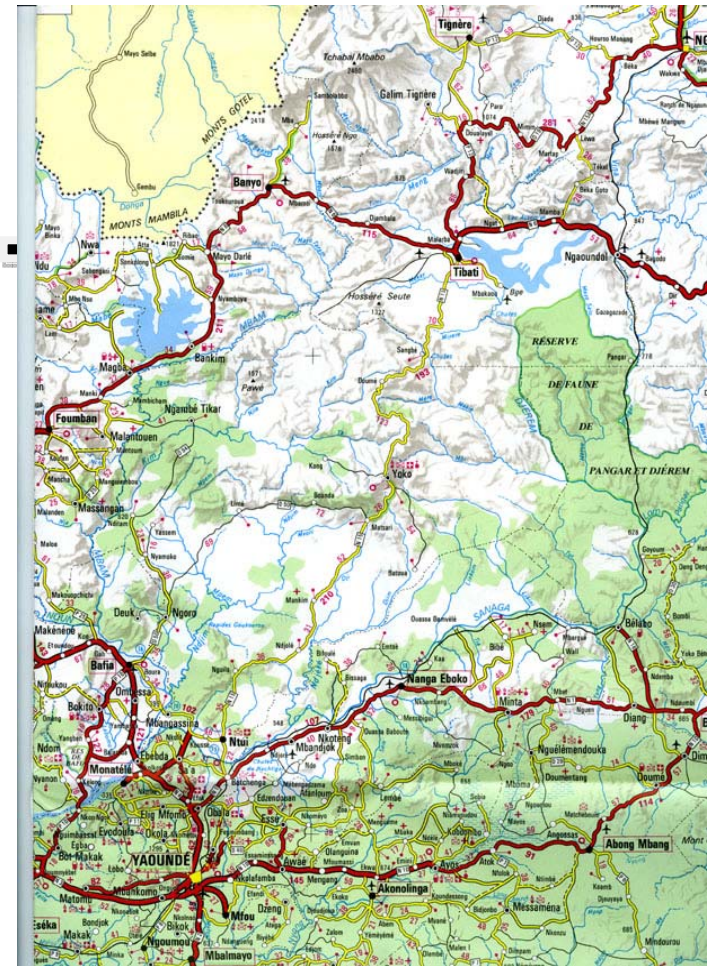


Figure 1. Arrow indicates location of Somié (map from Institute National de Cartographie; scale 1: 1 500 000).

[1] See Appendix I, fig. 1

Figure 2. Circle shows the Tikar Plain[2]

2.2. The Mambila

The Mambila on the Tikar Plain arrived in the last 150-200 years in three migration waves from the Mambila Plateau and the adjoining areas of the Adamawa Plateau (Zeitlyn, 1994: 24), conquering earlier immigrants, at times, with the help of slave-raiding Fulbe, and pushing the autochthonous Tikar further south into the Tikar Plane.The canton of Somié extends over an area of approximately 240 square kilometres and had, at the date of the 1986 tax census, a population of 1,777. Great population shifts have affected the area as a consequence of the completion of the Mape River dam in 1987 and have led to increased immigration into the Somié canton. Today, the Mambila are spread over three villages (Atta, Sonkolong, and Somié) and make up an estimated population of 10,000-15,000 (Zeitlyn, pers. comm., 08.08.09). Low population densities and prospects for fertile farmland and other jobs in the area have been attracting large numbers of immigrants mainly from neighbouring Nigeria where the Mambila have been facing a serious land crisis (Hurault 1998).

From the 1950s onwards, immigration has affected biological diversity mainly by deforestation for cash cropping coffee and for farmland[3] as well as by hunting[4], while

[2] Link to photo: Cameroon Information from the Translation Site

cultural diversity has been influenced by a process of rapid changes in the religious and ethnic composition of the village. Due to the historic dominance of the Fulbe who raided the Mambila for slaves, there has been pressure toward converting to Islam for prestige. However, there is a strengthening ethnic pride amongst the Mambila. Speaking in the local Mambila dialect[5] and practicing the traditional religion of the **Sua** are effective ways to express this cultural and ethnic pride and resilience in the face of cultural and political pressures related to the old conflict with the Fulbe, which is, most recently, reflected in the agro-pastoralist conflicts.

2.3. Religion

Somié is a village rich in religions that coexist in a considerably harmonious relationship. Beside the traditional religion, **Sua,** which is practiced by most of the ethnic Mambila and arrived with the first wave of Mambila immigration in the 18th century, the main world religions present are Christianity (66%) and Islam (approximately 33%). There are two Christian churches and, presently, a mosque is being built to accommodate the growing numbers of Nigerian Mambila immigrantas as well as other Muslim ethnicities. The coexistence of these religions is promoted by flexibility around the timing of ritual events, and chiefs of Mambila villages have been rescheduling dates for the **Sua** masquerades in order to enable Muslim Mambila to practice Ramadan as well as to participate in the masquerades.

The practice of **Sua** can be considered an ethnic marker and is the most important feature uniting Nigerian and Cameroonian Mambila. In addition to this, Mambila commonly subscribe additionally to one of the other world religions. To illustrate the widespread practice of **Sua** in Somié, Zeitlyn notes that he only knew "of one man (a catechist) who refused to use divination because of his Christian belief" (Zeitlyn, 1994:15). The main features of the Mambila traditional religion are the belief in witchcraft (**lɔp**), oath taking, and the **Sua** masquerades, which are held separately; the men's every year and the women's every two years.

---

[3] See Appendix I, figure 1 and 2.

[4] Large mammals in the area had been decimated by the early 80s, and the last hippo that inhabited the Lake Myam, died in 2002 (D. Zeitlyn, pers. comm.).

[5] Nigerian and Cameroonian Mambila dialects vary greatly and Fufulde is commonly used as a language of communication (D. Zeitlyn, pers. comm.)

2.4. Demography and social organisation

Somié is the smallest of the three Mambila villages. Its nucleated settlement of approximately 2000 is surrounded by farmland and outlying hamlets whose residents raise the population of the village to approximately 3000 (Zeitlyn, pers. comm.).

Ethnically, Fulbe, Konja (also called Kwanja) and Mambila migration into the area has characterized the inter-ethnic knowledge exchange between the various cultures, and it is not uncommon for people to speak several local languages. The population of Somié is made up of Mambila, Fulbe, Yamba, Tikar and Mbororo with the village centre being to a large extent inhabited by Mambila. The official language of education is French and the commonly spoken *lingua franca* of the area is Fufulde.

The phenomenon of "Fulbeisation" is based on the historic status of the Fulbe as the dominant ethnic group and former slave raiding people (Gausset 1998). Still today, there is a certain level of distinction between Fulbe and non-Fulbe people, which is demonstrated by their monopoly over cattle breeding, and the fact that a Fulbe woman cannot marry a non-Fulbe man. However, ethnic mixing has been taking place between the Mambila and the more sedentary Fulbe, and mixed marriages between Fulbe men and Mambila women are accepted. In recent years, the political head of the wider area, the Lamido of Banyo, has emphasised the importance of a more egalitarian attitude, and the Mambila in Somié have experienced a strengthened sense of ethnic pride (D. Zeitlyn, pers. comm.).

Figure 3. Yamba ceremony in front of chief's palace (photo R.K.)

As political and spiritual head of the village, the chief **(mgbe***)* exercises executive authority (such as organizing communal labour), and acts "as an arbitrator in the first instance and as a chairman in tribunal hearings before the village Notables" (Zeitlyn 1994: 41). He is also the political representative of the village and the mediator between the village and the external authorities. The Notables (**Bɔɔ̀ Kuku bɔɔ̀)** are older men who are "recruited by a combination of age and both peer and self- selection" (Zeitlyn, 1994:44). They assist the chief with decision- making, and may, in his absence, hear cases. The outlying hamlets are headed by headmen (**Jauro**), who are under the authority of the chief.

The large majority of the Mambila population are agriculturalists farming individually owned fields. Over the past 20 years various other occupations (i.e. healers, barbers, teachers, market vendors), which are exercised in tandem with farming, have diversified the income base of the village[6]. By 1985, the amount of surplus income had been made visible by the replacement of two thirds of thatch roofs with metal roofs (Zeitlyn, 1994: 54), and more recently, by the growing number of little shops (at least 5 in the village centre), bars selling expensive bottled beer, motorbikes and cars. Men also search for employment in the surrounding area, and Cameroon- wide.

The typical Mambila compound in the centre of Somié comprises of more than one household with kin clustering together without a fixed pattern (Zeitlyn, 1994:29) Muslim Mambila and Fulbe often fence their compounds with a brick wall, while Christian Mambila live in open, unfenced compounds or enclose their residential units with hedge forming plants. Compound structures include huts built of sun dried bricks with thatch or metal roofing, and include indoor and outdoor cooking places, granaries (due to theft increasingly replaced by storage areas above fire hearths), small huts for live stock, and outdoor bath houses. In polygamous marriages, wives tend to have their own houses, although there are individual arrangements where wives live under the same roof but have their own sleeping quarters.

[6] See Appendix II. Table 1.

Figure 4. typical Mambila house in the centre of the village (photo R.K.)

2.5. Subsistence agriculture

As in many other parts of Africa (Etkin, et al, 1994) the economic base of Somie is intensive, largely non-mechanized agriculture supplemented by live stock raising (cattle monopolised by Fulbe people, pigs by Mambila, goats by both) and trade in food crops and plant products, as well as locally manufactured commodities. Corn (*Zea mays)*, cassava (*Manihot esculenta)*, yam (Dioscoreaceae), cocoyam (taro, *Colocasia esculenta*), oilpalm (*Elaeis guineensis)* and groundnuts (*Arachis hypogaea)* are grown as staple crops and, since the 1950s, coffee (*Coffea robusta)* as a major cash crop. Corn and groundnuts are increasingly being grown as a cash crop, by both men and women (figure 5). This production is supplemented by various leafy vegetables, wild plant collecting, small-scale livestock management (chicken, pigs, goats), fishing, trading plant related products (such as plantains (*Musa* spp.), basketry and crafts. Land tenure is gendered and men and women have their own fields, sharing the responsibility for household food production. Crop production is largely polycultural in fields and home gardens (**kapti***)* of different sizes that host plant assemblages of varying complexities. Cultivation, weeding and harvesting are labour intensive human activities assisted by hired tractors for initial ploughing, and periods of intense fieldwork are often organised in work parties in order to get optimum access to labour from the community (Zeitlyn, 1994:54)[7].

[7] There are men's work parties to work on men's fields, house construction and communal work such as fixing roads and bridges, as well as women's work parties to organize work on women's fields. Work parties supply food and beer and are financed through credit union affiliations.

Figure 5. Veyo Marguerite in her groundnut field.(photo R.K.)

2.6. Education and language

Somié has one state and one mission primary school and is currently building a secondary school. Formal education follows the French system of primary education[8] and is exclusively held in French language with most teachers being employed from outside the community. How many children from one household will attend which of the two schools and at which age, depends largely on the family's income. While the government school is cheaper, the quality of education is believed to be better in the mission school. Generally, parents prioritise boys' education over girls, and it is uncommon for a girl to continue in secondary education after the age of 15.

2.7. The market

Located in the centre of the village, the market of Somié is renowned in the wider are where vendors from as far as Bankim (c. 70 km away) trade imported consumer goods (torches,

[8] Primary education takes place, generally between the ages of 6 and 11 and leads to the CEPE : certificat d'études primaire élémentaires (accessed on 29.08.09 on http://www.pon.nic.in/rti/schooledu/faq.pdf

radios, cloth and clothing, domestic utensils, farming implements, cosmetics, paraffin and both Western and traditional medicine) with the villagers who trade cash crops such as corn (*Zea mays*) coffee (*Coffea robusta*) and the medicinally valued seeds of **métok** *(Voacanga* spp.), sell staple crops, fruits and vegetable, palm oil, crafts as well as cooked food and snacks and locally produced corn beer (**kpata***)* and palm wine. Since 1952, the market has been held every Saturday in order to increase chances to make money (Zeitlyn, 1994: 55). Fluctuating prices for cash crops have been a concern for the chief, lately, who complained about difficulties to regulate prices, as villagers tend to sell their staple crop stores too cheaply. This tends to happen anytime people need money for various reasons, such as illness in the family, funerals and weddings, schooling expenses, bride wealth or the reroofing of a house. Some of these financial needs are met by membership of rotating credit societies, but petty cash for the commodities needed for everyday life is still largely generated by women's trading activities in the market.[9]

Figure 6. Girls at the market selling maize based snacks (photo R.K.)

[9] This emphasis on trading has been expressed by the recent use of the word **gu** for both buying and selling, whereas literally, it means strictly "buying" (Zeitlyn, pers. comm.)

2.8. Agro- pastoralist conflict

The main conflict between the cattle raising Fulbe and other transhumant groups such as the Mbororo has bee caused by complex social, political, cultural and historical factors" (Gausset, 2005: 90; Hurault, 1998) and is known locally and Cameroon- wide as the "agro-pastoralist conflict". The Tikar Plain borders the Mambila Plateau in Nigeria, and has, for the past 30 to 40 years, been a transhumance destination during the dry season when cattle moves largely unsupervised during the night, eat cassava and dry season maize, damage coffee plantations and eat maize from storage granaries in the fields. "What is seen as a resource by herders (grass, movement, random bush fires) is seen as a nuisance by farmers, and vice versa (fields, fallow, and forested areas)" (Gausset, 2005:98). In sum, these dissonances lead to conflicting systems of management, rights and ownership, conflicting structures of power and justice (as the Muslim pastoralists have the support of the Lamido of Banyo), and conflicting ethics over who should come first (Gausset, 2005).

Figure 7. Cattle herds of sedentary Fulbe pastoralists moving through the savanna (photo R.K.)

Chapter 3: Data collection, methodology and ethics

3.1. Informants

In order to maximise the difference between informants and to find cross-sectional representation, I identified 39 individuals for participation in the research, representing women and men below and above 30 years of age. I sampled informants by using snowball and referral methods, as well as adventitious sampling (Bernard2006:187-198) in social settings such as market day, funeral ceremonies and chance meetings with potential candidates. The four focus groups were made up of 10 women aged 30 -80 and above (Women 1), eight younger women between 15 and 30 (Women 2), 11 men of the ages 30-80 and above (Men 1), and 10 men between 15 and 30 (Men 2). I chose the distinctive age limit of 30 for purely pragmatic reasons: many of the youth under 25 showed little interest in cooperating in the research, were too busy or did not appear for arranged meetings. Cooperation rate and understanding for the research purpose was much higher among older women and men. In individual sessions, socio-demographic data were collected, and informants given free list exercises and a questionnaire interview. In a follow-up session, four individuals from each group (including with an older woman and a younger man with specialist medicinal plant knowledge were asked to identify plant and their uses on a walk through a test field.

3.2. Research assistants and translators

Veyo Marguerite and Tchiebeu Daniel acted as my female and male research assistants and translators. As members of the Mambila Dictionary Committee[10], they are both literate in French and Mambila[11] and had previous research experience working with Dr. David Zeitlyn and Dr. Bruce Connell on the Mambila Dictionary Project. Daniel also assisted me with questions about differing pronunciations and correct transcription of plant names. Daniel Gangfi, an older Notable of the chief with previous experience in plant collections assisted me with the voucher specimens in the field and supplied me with much additional information about plants and their uses.

[10] The Mambila Dictionary Committee was established in 1998 by Dr. Bruce Connell
[11] See Appendix III. 2.

3.3. Free list and questionnaire interview

Reasonable session duration and appropriate interview questions were established after piloting free list exercises and questions with my two research assistants[12]. Sessions were run on an individual basis with translation help in French and Mambila (nine sessions) and without a translator in French (23 sessions). At the beginning of the sessions, demographic data were elicited[13]. Free listing of plant names was kept open in order to elicit the largest possible number of plant names for the Mambila Dictionary and to get an idea of the basic categories existing in the local classification system of plants. As there is no word for "plant" as a unique beginner in Mambila, informants were asked to free list the Mambila names for 10 trees and 10 other plants. Subsequent interview questions targeted informants' knowledge of ethnoecological categories, naming abilities in languages other than Mambila (mainly French and Fufulde), theoretical and practical[14] knowledge of plant use, and knowledge transmission patterns. For these elicitations I chose three tree and three other plant species randomly from the free list with the objective of covering as great a range of plants as possible. Sessions lasted on average 30 minutes and were recorded through note taking and on a digital voice recorder or a minidisk player.

Free lists supplied names for a total of 73 trees and 100 other plants (grasses, vines, herbs and bulbs, as well as uses for 47 trees and 37 plant species[15]. At times, data had to be eliminated from the free list analysis as in the case of **jogo,** which was mentioned as a tree in three free lists but turned out to mean simply "root" without denominating any tree in particular.

3.4. Plant identification trail walks

Based on the frequency of mentions and the salience of trees and plants I established a list of the "top 22" trees and other plants[16] and chose a trail walk locality for these plant species based on accessibility and proximity to the village. I identified trees and plants for the identification tasks with the help of an older, knowledgeable informant and memorised their location. The trail walk identification tasks required a great deal of flexibility in terms of timing. Initially, I aimed to take informants in groups of three on trail walks in order to

[12] See Appendix II, table 2.
[13] See Appendix II, table 3.
[14] Theoretical plant knowledge can be understood as the ability to name plant uses while practical plant knowledge is the practical skill to identify plants, name their uses and have the ability to apply these . .
[15] See Appendix II, table 4 and 5.
[16] See Appendix II, table 6.

record agreements and disagreements between informants. However, individuals seemed to influence each others' responses and it was difficult to tell how much people really knew when they were more hesitant with their responses. Under additional time constraints, I continued the trail walks on an individual basis with four people from each group eliciting name and use of trees and plants pointed out to them on the walk. In the case of two particular plants, which had been free listed under their generic names, informants were asked to show me all plants that matched the name. Informants were given knowledge scores [17], which I designed based on their knowledge in identifying plants and naming at least one use for them.

3.5. Interviews

In individual semi-structured focus interviews with key informants from both sexes, I elicited information for a yearly activity calendar for men and women[18] and gained insight into young women and men's activities, interests and their attitude towards education and traditional practices. I also interviewed the chief of the village and his Notables about history, socio-demographics, land tenure practices, culturally important plants, reforestation issues, and the effects of commoditisation on peoples' farming regimes and plant use.

3.6. Voucher specimen collection and identification

The aim of the voucher specimen collections was to collect, in two sets, as many specimens listed in the free lists as possible for taxonomic identification purposes. However, this proved quite difficult as many of the mentioned tree and other plant specimens were not in flower or were too difficult to access without hired climbers and better collection equipment such as poles. One set was subsequently identified and deposited in the National Herbarium in Yaounde, and the other set in the Herbarium at the Royal Botanic Gardens Kew. In total 131 voucher specimens were collected of 62 plant species. 39 of these species were mentioned on free lists, while the remaining 23 were collected on plant collection walks with my assistant, mainly following specifications set out in Forman and Bridson (1991)[19]. Early experimentation with drying specimens was necessary in order to ensure good quality, and I initially collected plants with the assistance of my female research assistant on walks to and from her cornfield. As I was gradually shown more plants in the village, I also

[17] See Appendix II, table 7 and 8.
[18] See Appendix II, table 9.
[19] See Appendix III, 1.

collected on my own and showed the voucher specimens to various people with special plant knowledge for identification and confirmation on vernacular names. In addition to this, I utilised certain reference books and plant lists to help me identify plants in the field (Blench 2006, Perrin et al. 1995, Assi et al. 1985, Letouzey 1986). Scientific names of plants in the summary list[20] are based on identifications from the National Herbarium in Yaounde (Y), *Mabberley's Plant Book* (Mabberley 2008), and the online digital library Aluka[21], Of the 131 voucher specimens collected, I lost 12 to mould or inappropriate drying. A total of 54 species were identified at the National Herbarium in Yaounde and are currently in the process of being mounted and identified at the Kew Herbarium.

3.7. Participant observation

As most of the daily activities take place in the unfenced compound in front of the house (with the exception of Muslims who often fence their compounds), it was very easy to observe men and women going about their work. In most cases, people were happy to talk about what they were doing, and I observed men weaving baskets and fishing traps, fixing bath houses and buildings in the compound as well as making carpentry objects. I gained much insight into the lives and concerns of young men by taking taxi rides on motorbikes, or chatting with them in the local shops or while observing their card games. I learned about young women's plant management skills by helping with and observing preparation chores from collecting wood to making the fire, from dehusking the dry corn and cooking the daily corn meal to preparing the traditional corn beer **kpata** (figure 9).

Figure 8.Observing 88-year old Wuwea Barabas fixing a fishtrap (photo D. Zeitlyn).

Occasionally, I accompanied them to the fields, and I also witnessed the various steps of palm oil production and observed the preparation of locally popular snacks, which are sold on the market (i.e. the **bâton,** a gelatinous stick of boiled fermented manioc paste).

[20] See Appendix II, Table 4 and 5.
[21] www.aluka.org

Cracking oil palm kernels (*Elaeis guineensis)* for the "black oil" was a favourite pastime with the old women as was the weekly participation in the beer drinking circles at the local market.

Figure 9. Making maize beer (kpata) (photo R.K.)

3.8. Data analysis

Some of my preliminary data analysis such as the "top 22" list, which was based on frequency of mentions, was done in the field in handwritten form or on my laptop computer. I also entered free listed plant names into an excel sheet, noting their vernacular names and elicited uses. The free lists also informed about the total variety of plants listed by the different focus groups.

I listened to interviews in Mambila with my male assistant in order to correctly transcribe the plant names in Mambila. I also devised knowledge score values to test my participants' plant knowledge on the identification trail walks, which were later used in multiple linear regression analysis[22]. Plant data were organized by creating card files on free listed plants similar to those developed by Berlin and his colleagues in Chiapas (Martin 2004:13), and all data were kept mainly in handwritten form, with photographs of plants being regularly downloaded and backed up on a USB stick. Preliminary identification of some plants was facilitated by existing literature[23]. However, most of the collected voucher specimens were identified taxonomically in Yaounde and are presently awaiting identification at Kew.

Further data analysis involved the creation of an attribute matrix of the numerical data, which was used in a cluster analysis to show similarities and dissimilarities between participants' free lists[24]. Relationships between free listed plants, sex and age were analyzed

[22] See Appendix II, Table 8.
[23] Referencing a plant list compiled by Roger Blench (2006) of plants in Fufulde language and by comparison with dictionary entries of Mona Perrin's dictionary of the Mambila dialect of Atta village (Perrin 1995).
[24] See Appendix II, table 15 and 16.

with the help of ANTHROPAC 4 (Borgatti 1996). Regression analysis demonstrated the agreement on plant uses on trail walks in relation to age, sex and level of education[25]. Multiple linear regression in SPSS software was used to correlate plant knowledge with the independent variables age, sex and education measured in years spent at school (see page 47).

3.9. Permissions and ethics

Preliminary permission for plant collection was obtained from the Cameroon Ministry of Research in collaboration with the National Herbarium in Yaounde. Upon my arrival in Yaounde, I discussed plant collection methods with the director of the National Herbarium and made arrangements for voucher specimens to be identified and deposited there upon my return from the field.

My acclimatisation and sensitisation to Mambila culture was greatly facilitated by Dr. David Zeitlyn who introduced me to the village in informal meetings, instructed me in the local ways of speaking, expressions, gestures and other body language used by my local counterparts. Due to the chief's illness, I was unable to get his formal permission to conduct the research and to explain my aims and objectives until one month later upon his return. Dr. Zeitlyn was instrumental in explaining the purpose and nature of my research to the most important people in the village, and in establishing fair compensations and payments for assistants and research participants. A small field guide of most mentioned plants, with photographs, vernacular as well as scientific names, and mentioned uses will be prepared as compensation for the village and will serve the community as a reference document.

[25] See Appendix II, table 1 and 18.

Chapter 4: Local system of plant classification

> The study of folk classification is concerned with discovering the principles by which classes of organisms are naturally organized in the preliterate mind, whereas nomenclatural studies are devoted to the description of linguistic principles of naming the conceptually recognised classes of plants and animals in a particular language.
>
> (Berlin, 1973: 259)

Most folk classification and nomenclatural systems in traditional societies are orally transmitted, rooted in a clearly defined geographical area and inextricably linked to cultural cognition and representation.

This dissertation aims to gain insight into the basic principles of this local classification system, with regards to basic plant and ethnoecological categories and nomenclature, as well as domains of plant knowledge. I focus on vascular plants only and present the ethnobotanical data collected through my research based on current theories of folk biological classification, especially the hierarchical system of classification developed by Berlin (1973, 1992). Berlin and his colleagues suggest a conceptual organization of the biological world organized through a set of hierarchical ranks: kingdom, life form, generic, specific and varietals, with intermediate categories that can be named and occur between the life from and generic ranks.

4.1. Categories of Mambila ethnobotanical classification

Mambila folk classification of plants is a general purpose classification system with some special purpose groupings and is based on cultural consensus. The plant kingdom and unique beginner is recognised covertly but remains unlabelled. Life forms that were found in this study are based on a distinction between tree (**tuú**), vine (**tubu)** herbaceous plant, grass/ sedge and bulbous plant (**logo*).*** Herbaceous plants, grasses and sedges are seen as one category and labelled "grass" (**nyuri, nyuru**). I found evidence for the existence of an unnamed intermediate (certain plants recognised as weeds based on their uselessness or their invasiveness in the fields) and a named intermediate rank (e.g.**fleur, nyuri fé*)*** for introduced or new species that did not exist in the old village and are believed to have been introduced by cows as a consequence of transhumance. When these plants are used ornamentally for the aesthetic value of their flowers, they are labelled **fleur** (French loanword)**;** otherwise they are referred to as **nyuri fé** ('new grass'). Although categories such as 'bush' and 'palm' are

known by French speakers as ‘arbuste’ and ‘palmier’, there is no Mambila word to specify these life forms (also trees that are said to be “more like vines") indicating a possible intermediate rank. Certain plant species, such as the conspicuous food/medicinal plants **yoó** (*Vernonia amygdalena*) and **teér** (*Elaeis guineensis)* were free listed by individuals in the categories of both ‘tree’ and ‘herb’.

Some plants are grouped into cross- cutting categories based on their appearance, their widespread use or cultural importance- **logo** is a generic label for bulbous plants of which particular species are used in magico-ritual medicine; **yoó** (*Vernonia amygdalena)* and **teér** (*Elaeis guineensis*) are conspicuous food plants and sources of petty cash.

No word was found for the category of weeds, but most informants indicated a covert category by using such phrases as “it destroys the field” or “it is a bad herb”.

Folk generics are abundant and common for salient and culturally important plant species such as **cèb** (*Cucurbit* spp.), **nwàgàm** (*Zea mays),* **nder (**leafy green vegetable species belonging to diverse families), **ngan** (*Kola,* **loro** *Raffia* spp**., lemú** *Citrus* spp*.,* **kunu** *Musa* spp*.,* **càgàmbor***Eleusine* spp*).* Although not mentioned in free lists, a large percentage of the elicited generics contained specifics that had a descriptive modifier (e.g. **nwàgàm masara** *Zea mays*, **càgàmbor tela** *Paspalum paniculatum).*

Under-differentiated lumping under the generic name **nder** was observed in the case of **nder toón, nder noón** [26] and **nder mvomdé** (*Amaranth* spp).

4.2. Nomenclature

As far as the limited scope of this dissertation was able to establish, the Mambila nomenclature of plants presents a reasonable, although not always perfect guide to classification.

4.2.1. Generic names

In naming generics, both arbitrary and non-arbitrary words are employed and can refer to plant behaviour or their use and activity context. The name for **càgàmbor** *(Eleusine indica* and *Paspalum paniculatum)* is made up of the words for ‘dawn’ and ‘courtyard,’ and **cinjolo** *(Bidens pilosa)* loosely translates as ‘movement of the eye’. Other generic names are metaphors for plant morphology, like **ŋulamar** (*Nauclea latifolia*) ‘swollen abscess’ and

[26] Both unidentified.

tiendoop *(Emilia coccinea*) meaning 'rat's ear'. The generic name for a particular tree species with peeling bark (**kuliweéh)** can be translated as 'young-old' or 'I come back renewed'. Due to this name it sometimes gets confused with **lamngér**[27], another, unrelated tree with peeling bark. Similarly, **njamjer** (*Markhamia tomentosa*) gets its name from **njam** ' urine'.

4.2.2. Folk-specific names

Clues to ethnoecological or plant classification, new or introduced species, as well as plant use and activity context, are often embedded in the Mambila names of plants.

Adjectival markers in binomials can clarify plant category (**nyuri cimi, nyen suàgà)** and are especially helpful with homonyms, when plants of different categories have the same generic name as in the case of the herbaceous plant **cinjolo** *(*B*idens pilosa*) and a tree with the same name (**tuú cinjolo***)*[28]. The generic name **cinjolo** refers to the opening and closing movement of the eye and both plants are used medicinally in a way that makes the patient sneeze. Adjectival markers also act as pointers to taxonomy as is demonstrated by **san mabonn** and **san tela**, two different *Ocimum* species in the Lamiaceae family differentiated by contrastive use of the words for male (**tela)** and female (**mabonn**) based on morphological difference. They can also mark cultural importance (**libi bâ** 'libi of the Mambila'; the ceremonial ointment **beér** uses bark ingredient of **tuú beér** *(Baphia nitida*). Furthermore, they can denominate vegetation zones (**ngèna fií**: 'ngéna of the savanna', **nyuri sem '**grass of wet area'*)* or refer to introduced or new species (**nyuri fé** 'new grass'*)*. A good example of this is **libi nàgà** *(Malvaceae* ssp.) as opposed to the culturally important **libi be beér** (*Sida rhombifolia*). **Nàgà** means 'cow' and is used in several plant names to indicate that it was introduced by transhumant cattle herds (i.e **feér nàgà** (*Solanum* spp.). Folk-specific plant names often represent plant use or activity context (**nyuri kwaá '**cough grass', **tuu huôm'** blood tree'*),* some of which have already been forgotten or are not applied anymore (**tuú tuɔm '**salt tree'). In the case of particular plant species that are employed in different uses by male and female specialists, the same plant can have two different names and refer to its activity context or use. The plant species *Scropalia dulcis* was called **nyuri njuaa** 'good luck grass' by a male specialist healer and **nyuri hwaŋ nar '**childbirth grass' by a specialist female healer**.** Introduced plant species are often binomials

[27] Both still unidentified.
[28] Unidentified.

constructed from their life form label and a loanword from the language through which it was introduced *(***nyuri tî** 'tea grass', **tuú maŋgoro**' Mango tree'*).*

4.3. Ethnoecological categories

Understanding how local people name, classify and categorise their natural environment is an important factor in gaining information about the active ethnobotanical knowledge of an individual and informs about subsistence management and land tenure. Among the Mambila, some vegetational units established within the framework of this dissertation are distinguished by morphology, habitat and composition of the flora (eg forest, savanna, transition zone between forest and savanna, areas close to water, river banks, fields), while others refer to another status such as land tenure or human habitation (eg. field, **kapti '**home garden', village, courtyard). Sometimes, ecological zones for certain species were lumped together in a sort of a residual cross- cutting category such as "everywhere except in the forest", reflecting species invasiveness, commonness and distribution.

4.3.1 The Field *(* **ŋuen***)***.** Among the Mambila, cultivated vegetation is characterised as **ŋuen**, which translates to 'field'. These vegetation types are agro-ecosystems, which are characterised not only by the dominant cultivated species, but by the various cultivated and non-cultivated plants that grow in association. Each kind of **ŋuen** is identified by the name of the dominant or culturally most significant species cover. The different types of **ŋuen** are: **ŋuen nwàgàm** ('corn field'*),* **ŋuen sèngâr** *(*groundnut field*),* **ŋuen kúkúm**, *(*'manioc field'*).* Generally, cornfields are the most important for the local subsistence management and are planted with one or more of the four local varieties of corn (*Maize* ssp.): "**bafia", "**j**along**", "**masara**" and "**nyecar**" (old variety, now rarely found). Cornfields vary in size between 3 - 10 ha, and are located at varying walking distances of up to a maximum of one hour from the village. They are intercropped with various leafy vegetables (predominantly from the families of Cucurbitaceae, some Amaranthaceae, as well as the culturally salient *Solanum nigrum).*

4.3.2. Coffee plantations and oil palms

I have not been told a Mambila word for coffee plantation; people use the French loanword 'champ de café' and refer to site associated species as plants that " grow with the coffee" (such as *Musa* ssp. and two wild growing *Voacanga* species, the seeds of which are used in

the pharmaceutical industry). Intercropping coffee fields has become important due to the destructive effects of fires on sparse plantations.

Oil palms (*Elaeis guineensis)* grow in the village as well as in various locations in the wild and were traditionally semi cultivated in the wild.

4.3.3. The home garden **(kapti)**

The **kapti** is a type of a home garden around the house and can be very small with only a few fruit trees and a few cultivated plants, or spread over a larger area and be a miniature version of an intensely cultivated field with a complex plant assemblage. Cultivated plants in a **kapti** are usually conspicuous food plants such as mango and avocado trees, banana, maize, taro, and some condiments. Some **kaptis** also have plants for medicinal use, some flowering ornamentals**,** and they often represent an opportunity for individualistic experimentation with plant species**.**

Figure 10. Home garden (kapti) with some maize and *Cucurbit* ssp. (photo R.K.)

4.3.4. The Savanna

There are two different words for the savanna indicating the importance of this ecosystem to the Mambila:

-Fií: Savannah vegetation zone, with a variety of herbaceous plants, shrubs, grasses, sedges and medium to tall trees and wet areas. small shrubby, fire-resistant trees

- La Brousse*:* This French loanword demarcates a dryer savanna that is more open, with small shrubby, fire-resistant trees, and that is subject to seasonal fires.

4.3.5. The Forest **(homo)**

Homo (' unmarked forest') signifies both primary and secondary tropical forest with tall, large canopied trees, vines, and a large variety of herbaceous plants.

4.3.6. Lake, water, stream **(dua)**

Dua demarcates any area in the proximity of water, be it the creek where the women wash clothes or trap fish, by the lake, or where there is a wet area in the savanna.

4.3.7. The village **(lɔɔ)**

Participants often were more precise and named specific areas in the village (i.e. behind the Catholic mission, next to the dispensary, at someone's house, along the path, etc.).

4.3.8.The Courtyard ***(càgà)***

Certain plant species are planted in the immediate surroundings of living compounds, either for culinary purposes or as charms and to dispel witchcraft.

Figure 11. Sondué Michel teaching Mambila literacy in his courtyard; note the bulbous plant at the wall (photo R.K.)

Chapter 5: Domains of plant knowledge

> " Plant utilization in Africa includes a vast array of foods, drugs, building and other raw materials, fuels, fibres, and even a much more recent utilization of ornamental plants."
> (Kokwaro, 1995: 224)

The concept of domains is pragmatic, and I will aim at establishing domains of plant knowledge in an emic way. However, as it facilitates talking about these domains in the framework of this dissertation, I will label them in English, using common consensus terminology, such as 'medicine', 'food', 'firewood' etc. I acknowledge that separating medicine and ritual as categories is problematic and might tend toward an etic view, but I aim to highlight the fact that knowledge of the different areas and applications of Mambila traditional medicine is subject to specialisation and domain-specific interest and, therefore, affects the variation of ethnobotanical knowledge. From the free lists and trailwalk data, I collected use categorisations for a total of 47 trees and 37 other plant species, of which 16 were mentioned to have no use or were considered weeds. The main plant domains were food (F), medicine (M), ritual (R), firewood (FW), construction (CO), craft (CR), weeds, and plants that were said to have 'no use' (both NU). Some plants were mentioned in ways that did not fit in any of these categories (O), including uses from the past (traditional 'torch') plants used in erosion control, as seasonal markers, or ecological markers (all categorized as 'other').

5.1.Knowledge of medicinal plants

The existence of a domain of 'medicinal' plants is well established although I found no specific Mambila word to label plants as 'medicinal', and plants in this category were generally referred to as "it helps with…" "it heals…..", or "it is used in tradition". Based on this form of reference, and based on the Mambila concept of disease and healing which I describe below, I chose to refer to these domains with a distinction into 'medicine' (M), as in herbal remedies and applications, and 'ritualistic' medicine or simply 'ritual' (R), emphasising, however, the inextricable link between these domains.

From the free lists and identification trail walks, I found a total of 21 trees and 19 other plants that are being used in both medicine (herbal remedies, baths, incenses) and ritual (i.e.

divination, oath swearing, repelling thieves, protection, plants used in **sua** ceremonies, public addresses).

5.1.1. The concept of disease and medicine in Mambila culture

The Mambila concept of disease and healing is based on "personalistic" and "naturalistic" etiologies (Etkin 2002, Moerman 1988, Foster 1976) and has many similarities with other healing traditions in Africa (Kokwaro 1995, Murdock 1980; Jackson 1975:389, in Zeitlyn 1994: 70; Lamar 1995), that differentiate two categories of naturally caused and unnatural or supernatural diseases. Lexically, however, the Mambila word for medicine (**lə***)* does not make this differentiation, and spans a wide range of treatments for minor physical afflictions and chronic diseases, as well as bewitchment, poisoning, potions and magical charms (i.e. for luck, love or protection against thieves). Illnesses of the first type are considered to be caused by **Chàŋ** (the remote creator and supreme god), which renders investigation of its cause unnecessary (Zeitlyn, 1994:70). These diseases are treated in physical terms with plants (and since the opening of the village dispensary in the early 1960s, increasingly also with synthetic drugs which are considered to be a powerful **lə**). Common fevers and flus, coughs and other bacterial infections, common and recurring illnesses such as diarrhoea, malaria, yellow fever and hepatitis, as well as the most common ailments pertaining to the female reproductive system, including childbirth, belong in this category. Older women who are specialists in fields such as midwifery, child illnesses and other female reproductive health are often consulted as first option for herbal treatment of such ailments, but male specialists and professional healers also provide numerous remedies.

In the case of prolonged, wasting illnesses that have not reacted to previous treatments of the kind mentioned above, "divination will be consulted in order to determine the cause and thus the proper course of action" (Zeitlyn 1994:70). Such unnatural illnesses are believed to be caused by 'bad people' ('witches') and can enter the body in many ways, including through dreams. As has been pointed out in the healing practices of other cultures (e.g.Moerman 1988), disease is not perceived to be the consequence of a body/mind dichotomy, but is rather attributed to human emotions that have profound effects on the body and health. Illnesses in this category are always treated by older men specialising in various disease contexts (such as illnesses related to lungs, heart, 'poisoning', physical deformations, etc.). Treatments include the slaughter of a chicken accompanied by an

address, herbal admixtures administered orally or via scarification, as well as public hearings and oath- takings (Zeitlyn 1994:71).

The belief in witchcraft is deeply ingrained into the Mambila culture, regardless of level of education or religious denomination. Therefore, it is not surprising that much of traditional Mambila healing is a form of symbolic healing in which "the metaphorical structure, the system of a healing discipline is decisive in its effectiveness" (Moerman, 1979:60). As the most basic preventative measure of protection against sorcery, life is kept "in the open", in front of the house, so as to "not hide your affairs behind closed doors", and food is always consumed in company of others.

Figure 12. Mama Simón, a renowned 'tradi-practitioner' in his "office"

Traditional practitioners (known as 'tradi-practitioners') are nation - wide recognized professionals who make their own plant based remedies, and work, to a large extent, with trees, their barks, roots and resins, from which they produce powders, incenses, fresh concoctions and poultices.

Older men use preparations made from both tree and other plant ingredients according to their area of specialisation, generally using a synergy of plants and ritualistic applications (divination, sacrifice of a chicken), and often administer their herbal remedies via scarification. Of special importance are certain bulbs, which have a notion of secrecy attached to them and are used only by men. Women specialists tend to use various other herbaceous plants for home remedies and herbal preparations administered in conjunction with incantations and ritual (as far as I know, women never sacrifice chicken).

5.2. Knowledge of food plants and their preparation

Based on data from free list interviews, trail walk identification exercises and participant observation, food plants can be categorized as cultivated crops, 'semi-wild' (Etkin, 1994), and wild foods (some grasses and several tree species). Some participants mentioned a type

of wild yam, **tieé** (*Dioscorea* spp.) and the legume **kweri** (*Cajanus cajan*) that are cultivated in the savanna as foods that are eaten "when there is not much other food", qualifying them to be categorized as 'famine foods'. As in other parts of Africa (Etkin, 1994) local pharmacopoeia inform food selection and food plants often also fit into the category of 'medicine' and are recognized and utilized as such (more so by older women and men).

Free lists and trail walk data yielded names for 36 plants in the following food use categories: 11 cultivated, 10 semi-wild, and 15 wild food plants. In the category of cultivated and semi wild foods, predominantly grasses and herbaceous plants were mentioned, whereas trees outnumbered other plants as wild food. [29]

5.2.2. Semi wild and wild foods

Etkin (1994) defines wild food plants as those that are neither managed nor cultivated. There are several plants used in Mambila diet such as **tindar** *(Solanum* spp.) or **san** (*Ocimum* ssp.) which fit Etkin's definition of 'semi wild' as plants that are 'neither explicitly cultivated nor actively tended but nevertheless affected by human activity' (Etkin et al, 1994), and might best be described as 'managed'.

5. 3. Famine foods

The traditional staple crop of the Mambila used to be a *Sorghum* species until transhumant herds of cattle and shifts in social structure related to education[30] made it impossible to have three crop harvests a year. Today, by June most peoples' maize stores are used up and subsistence switches to cassava. This used to be the time for the sorghum harvest.

In an interview, the chief acknowledged climate that change and the consequences of agro-pastoralist conflict put stress on the local subsistence system in famine times. However, he saw increasing commercialisation to be significant in the context of famine and was concerned about the fact that villagers are selling their surplus corn often below a fair price. The mention of **kweri** (*Cajanus cajan*) as "something you can eat when there is not much food around" is evidence that famine food is recognised as a category, but I found no term for it.

[29] See Appendix II, table 12.

[30] Children have less time to help with work in the field due to time spent in school. This is of particular relevance for the traditional sorghum staple as it is very susceptible to bird predation and children used to be employed to chase away the birds.

5.4. Firewood

Firewood was generally referred to as "it is for cooking" (pour la cuisine), and knowledge of trees in this category showed great variation among all groups.

Firewood is generally cut in the dry season.

Ring-barking trees in the wet season is often applied as a convenient method to kill a tree so it dries out by the dry season (figure 13). Women and men both collect firewood in the dry season in the savannah, the forest and on individual fields, and store it under cover, next to their huts. Anyone can ask the owner of a field for permission to collect firewood on his land, especially when stores are dwindling by June. Numerous evidence from participant observation showed that knowledge of firewoods is widely shared and highly varied[31], and that trees that are generally mentioned in the use context of food, can easily cross categories and become firewood (i.e. Avocado, *Persea americana*[32]).

Figure 13. Ring barking trees in the savanna for firewood (photo R. K.)

5.5.Cash crops

The major cash crops in the subsistence base of Somié are coffee (*Coffea robusta)*, oil palm (*Elaeis guineensis)*, corn (*Zea Mays)* and the medicinal seeds of **métok** (*Voacanga* spp.). Trucks come regularly to the market to buy coffee beans and take them to the nearby decorticising factories. Both women and men work on coffee plantations, and corn has been increasingly planted and managed also by women in " own account enterprises" (Roberts 1988). Women trade many plant related products and foods on the market (such as groundnuts, fruits, foods and snacks made from maize, manioc, plantain, leafy greens, vegetables, palm oil), and often young girls and boys as young as 12 are sent with baskets of

[31] See Appendix II. Table 13.

[32] On one occasion I witnessed a woman in her late thirties cutting down about one third of a large avocado tree that had just finished bearing fruit. As a reason she mentioned tat she needs wood for cooking and that she has no time and no help to go far to look for firewood that has become scarce by then.

fruits and other crops to markets that are in close proximity. In this sense, the category of cash crops is wide and includes any plant that is traded for money. This might explain why their uses as commodities were hardly mentioned. Only three younger women mentioned specific plants as being "for the market", validating this as a recognised but unnamed category.

5.6. Plants for construction and crafts

Free lists identified 11 plant species- trees, palms and grasses that are used predominantly by men as providing materials for construction and craftwork (i.e. e. house construction, enclosures of bath houses, basketry, slingshots, pestle and mortars, mattresses, rope-making). Imported goods from the market have, largely replaced plants that were traditionally used in the production of cloth.

5.7. New and introduced species

In informal discussions on walks through the village, I asked various community members irrespective of age and sex the names of several plant species that are mainly grown for ornamental purposes (i.e. *Poinciana pulcherrima*, *Vinca* spp.) or are widely dispersed as weeds (i.e. *Mimosa pudica*). All villagers agreed on their name as **fleur** or **nyuri fé** *('*new grass'*)*, considered them as introduced species, speculating on transhumant cows as the importers, and had no uses for them except for the aesthetic value of their flowers.

5.8. Multi purpose species

According to Etkin, plants that overlap in several use contexts are engrained more deeply in the communal consciousness of a people (Etkin 2002). This seems to be true for the Mambila in Somié, as illustrated by the fact that 41% of the plants that were mentioned most frequently have multi-contextual uses (Table 1).

Name	Species name	M	F	FW	CO/CR	R
kékéma	*Pilostigma thoningii*	x	x		x	
lií	*Erythrophlaeum guineense*			x	x	x
tùbù	*Anogeissus leiocarpus*	x		x	x	
teér	*Elaeis guineensis*		x		x	
tulu	*Terminalia macroptera*	x		x		
njieè	*Cyperus procerus*	x	x		x	
yoó	*Vernonia amygdalena*	x	x			
guií	*Pennisetum purpureum*		x		x	
càgàmbor	*Paspalum paniculatum*	x			x	x

Table 1. Plants on the "top 22" list that were mentioned in multi-contextual uses (codes on page 31).

Chapter 6. Patterns in the variation of ethnobotanical knowledge

In this chapter, I present quantitative results from free lists and trail walk exercises that were analysed with the aim to find patterns in the variation of ethnobotanical knowledge with regards to naming and identification as well as the ability to name plant uses. I examined levels of knowledge sharing by analysing consensus among informants on trail walks. Individual knowledge scores from the trail walks were used to analyse the relationship between formal education and ethnobotanical knowledge in a linear regression model. Besides these quantitative data, I have added qualitative information based on informal discussions and participant observation.

6.1. Theoretical and practical ethnobotanical knowledge

Plant knowledge can be viewed as a "clearly bounded cultural domain" (Berlin 1992:7; Gardner 1984: 259) contributing to understanding human cognition. When conducting fieldwork, language is the first key to enter this domain, and knowledge that is encoded in nomenclature has been described as "lexical" knowledge (Ellen 2003: 48). Other scholars differentiate "theoretical"(ability to name) and "practical " dimensions of ethnobotanical knowledge (Reyes- Garcia et al. 200), and have found that while ethnobotanical nomenclature is acquired by adolescence (Hunn 2002), practical skills are often only gained in adulthood (Ohmagari and Berkes 1997).

6.1.1. Lexical plant knowledge

According to the number of plant names mentioned on free lists, and knowledge scores from trail walks, old Mambila men and women hold a higher lexical knowledge than their younger counterparts, especially in the domains of medicine and ritual[33].

Men, in general, were also able to name plants in a language other than Mambila (Fufulde or French) more frequently than women, even though these names often reflected incorrect use. Such confusions in naming could be related to morphological similarities, similar use contexts, or similar colour. The tall 'kapokier' (*Ceiba pentandra)* was called **baobab**, which is another widely distributed, large African tree, 'iroko' (*Milicia excelsa),* the famous 'African teak', was, at times, misnamed 'mahogany' (which as an industrial category refers to trees from sometimes widely different genera), and 'acajou', which generally refers to

[33] See Appendix II, table 10

cashew (*Anacardium occidentale)* and has a reddish heartwood, was mentioned by one informant as the French name for 'camwood' (*Baphia nitida*), the source of a red dye. One older man misidentified the culturally significant tree **lií** (*Erythrophlaeum guineense)*, which has been used in traditional oath takings, as **luú** [34], of which he knew that the resin is used as incense.

Lexical knowledge of the various landraces of corn, however, was widely shared and consistently named among all groups, as were the names of the most conspicuous food plants on the freelists and on trailwalks.

6.1.2 Substantive plant knowledge

However, a large part of ethnobotanical knowledge is embedded in the practices people engage in (such as weeding, watching parents manage plants) and is not articulated in language. Mimicking thus transmits latent knowledge which has been called "substantive", "bodily" (Ellen 2003:48) and "practical" ethnobotanical knowledge (Reyes-Garcia et al 2007). Interestingly, some of the most conspicuous food plants such as maize, and the culturally very important Kola nut (*Cola* ssp.) were hardly ever mentioned on free lists, which might indicate that they are "too visible" to be mentioned.

Although the oil palm **teér** (*Elaeis guineensis)* was only mentioned five times on free lists (mainly by men of both age groups) and never in medicinal use contexts, older women praise its medicinal value, and young women rub their infants with it "to make them strong " and "so they won't get the cough".

Plant identification as "practical" plant knowledge took various forms in individuals, and was multisensory, using smell, touch and taste. One young man recognised **nyuri cimi** (*Ageratum conizoides)* as medicine but did not make the connection to the name.

Figure 14. Unidentified bulbous plant at male specialist's house, used against 'spiritual' poisoning (photo R. K.)

While only a few women above the age of 60 knew a particular *Crotalaria* species by its name as **bɔɔ̀ veéh**, 'of the women'(*Crotalaria* spp.), its popular use by women in promoting healthy menstruation was widely known among men and women of all age groups. Similarly, certain

bulbous plants that are used exclusively by men (especially by older men) in the context of 'ritual' medicine (poisoning, charms) are not necessarily known lexically to younger men and women by their specifics, but inter-group sharing of their activity contexts is high. Some of these plants can be found planted next to the walls of peoples' huts, especially around the huts of male specialist healers.

6.1.3 Specialist plant knowledge

The existence of a pool of specialised individuals within the "pool of shared knowledge" became apparent on the trail walks where two specialists in medicinal plant knowledge outscored all other groups in both number of plants mentioned as medicine and the number of their medicinal and 'ritual' uses. It must be noted here that the male specialist mentioned many medicinal plants emphasizing ritual aspects of their use while the female specialist observed a more refined differentiation between the two categories (table 2). She was also the only person who clearly stated that the tree **lií** (*Erythrophlaeum guineense)* had no use, which demonstrates that she did not connect its use in divination with what she perceives as medicine.

Great variation in older men's free lists[35] was found to be related to occupation with regards to carpentry, construction and forestry, and to specialisation in different healing techniques, and men above the age of 60 often mentioned specific plants they employed in their herbal or ritual treatments. This was demonstrated by an 88- year old male specialist in 'ritual' medicine who named three plants that no other participant mentioned, one of them being the tree **luú**[36] the resin of which is used to "chase away the demons".

	number of medicinal plants	**number of medicinal uses**	**number of 'ritual' uses**
Women 1	6	6	3
Women 2	4	4	1
Men 1	7	5	4
Men 2	6	6	3
Female specialist	10	9	1
Male specialist	**11**	**8**	**5**

Table 2. Medicinal plants and plants used in 'ritual' medicine as mentioned on trail walks

[35] See Appendix II, table 14 and 15
[36] Unidentified.

The same plant can take on different names depending on what activity context is stressed. The plant species *Oxalis radicosa* was mentioned by a female specialist with childbirth expertise as **nyuri huaŋ nar** ('childbirth grass') while the same plant was referred to as **nyuri njuar** ('good luck grass') by a male traditional practitioner who stressed the plant's application as a charm. Neither of the two individuals knew the name given by the other.

6.1.4 Flexibility and change

Both lexical and substantive knowledge can be subject to flexible cultural learning, change and revision(Ellen 2003: 62-63). Newly introduced species that are often used as ornamentals because of their flowers, are generally known among all members of the community as "fleur" and form a residual category of culturally uninteresting plants. Some introduced species, however, such as *Titonia diversifolia (***fleur jalusi***)* or plant species that have been adopted from the Fulbe, such as the edible leafy greens **lalu** and **gubudo** [37], are aggregated into the language as loanwords from other languages (mainly French, Fulfulde and Pidgeon English), and are commonly known.

	Informant	**Cut wounds**	**abscess**	**Use unknown**
Women1	1	x		
	2	x		
	3	x		
	32	x		
Women2	9	x		
	18			X
	27			X
	31	x		
Men 1	8			X
	11	x	x	
	20	x		
	26			X
Men 2	12	x		
	23	x		
	25	x		
	33	x		

Table 3. Trail walk data for *Epathorium odoratum*

On the other hand, substantive knowledge of the highly invasive *Epathorium odoratum*

[37] Still awaiting correct identification.

(**bìnjammê**, possibly from the French name Benjamin) as a medicinally valuable plant showed variations among trailwalk participants, especially young women and older men (table 3), signalling a potentially slower inclusion into a generally shared knowledge pool.

6.1.5 Knowledge erosion

Substantive knowledge can also disappear and the lexical link between plant, its use and the term might get lost. This is reflected in the comment " I don't know its use" being more common with younger informants compared with older individuals. Some old women pointed out a grass to me that was used traditionally as a torch but said that "no one knows that anymore", and a younger man knew that the palm species **soú** [38] was very soft, that one is not supposed to cut it, and that it "was used for something in the past"[39].

I also observed some variation between the theoretical and the practical (skill oriented) knowledge concerning particular plant species, which might indicate knowledge erosion. While **njàgà** as a generic name was among the most frequently mentioned plants on both means' and women's' free lists, the identification of its two types caused some difficulties among individuals on the trail walks and also on informal occasions such as during my daily voucher specimen sorts. One young man correctly identified a cultivated type of **njàgà** *(Cyperus articulatus),* and knew its traditional use in the treatment of malaria related fevers, but when his wife fell ill, he admitted his preference for Western medicine from the dispensary (figure 15).

Figure 15. Young boy with njàgà (*Cyperus articulatus*) growing in the village (photo R. K.).

6.2. Informant consensus

Cognitive anthropologists have developed a Concrete, measurable definition of knowledge as agreement among informants (Romney et al. 1986).

When attempting to measure individual ethnobotanical knowledge, one must bear in mind that people will always confer with each other and that responses given by individuals might be artificial, and subject to a multitude of factors including personal attitudes toward the

[38] Unidentified.

[39] It has a very soft wood and was used in funerary rites to cover the body of the deceased before burying it.

research, simply forgetting on the spot, the desire to demonstrate expertise, and so on.

Cluster diagrams of Mambila plant use agreement show, in general, great variation among informants with regards to both uses of plants and trees.[40] However, patterns become more apparent when analysing variations within and among groups.

6.2.1. Consensus among groups

Knowledge of food plants was widely shared among all groups, in particular with respect to cultivated plants (table 4).

Cultivated trees		**Agreement in number of mentions**	**Agreement in %**
maŋgoró	*Mangifera indica*	18	100%
píâ	*Persea americana*	18	100%
Semi-wild trees			
Yoó	*Vernonia amygdalena*	10	55.50%
Wild foods (trees)			
tulu	*Terminalia macroptera*	1	5.50%
tùbù	*Anogeissus leiocarpus*	1	5.50%
mvuúr	*Vitex doniana*	14	77.70%
kékéma	*Pilostigma thoningii*	9	50%
mbikú	Unidentified	16	88.80%
Cultivated plants		**Agreement in number of mentions**	**Agreement in %**
cèb	*Cucurbit* spp	18	100%
njebanyɔɔŋ	*Solanum nigrum*	18	100%
Wild food (grasses, sedges)			
guií	*Pennisetum purpureum*	5	28%
njieé	*Cyperus procerus*	1	6%

Table 4.Agreement on plants as food (trail walk data)

Interestingly, some of the most conspicuous cultivated and semi-wild food plants (such as corn and oil palm) were only freelisted on a few occasions. On the other hand, cultivated

[40] See Appendix II, table 15 ,16, 1 and 18.

trees that were producing fruit at the time of the study made it onto the "top 22" list of most frequently mentioned plants and showed 100% consensus on names and uses among all groups[41].

All informants unanimously agreed also upon name and use (or in this case non-use) of **kabe,** making it the most salient weed.

High agreement among research participants and other community members existed in the case of introduced species, some of which are being used as ornamentals. Consensus on this species is based on naming them all **nyuri fé** if they are herbs with no known use**,** and **fleur** if they have flowers that make them applicable as ornamentals and for spiritual use as in decorating churches to "chase away the bad". These represent temporally and spatially dynamic people- plant relationships in the sense that people who encounter these plants on their travels or strangers coming to the village (myself included) might bring back new knowledge about them and lead to new levels and degrees of agreement and disagreement as people incorporate these plants into their daily use.

Figure 16. Unidentified 'fleur'. Introduced species that is planted ourside of churches and next to houses to "keep away the bad".

6.2.2. Agreement and disagreement within groups

Consensus within the four groups revealed an interesting pattern. All groups agreed among each other on the uses of the most salient food plants as mentioned above (table 4). Both groups of females showed, in general, more homogeneous agreement on plant uses than men, especially the group of younger men, where variation was high. Interestingly, young men named the same number of medicinal uses as did women above 30, but they did not show high agreement amongst each other on these uses. One 28year old man was the only trail walk participant to mention **nyuri cimi** (*Ageratum conizoides)*, which he could not correctly

[41] See Appendix II, table 13.

identify, as a remedy to treat eyes, and he was the only individual in his group to know of the medicinal use of **Kékéma (***Pilostigma thoningii).* Another young man of 16, who had only moved to the village four years previous to this study, was quite different from the other young men in the sense that he knew of edible roots in certain grasses and sedges, said that he makes brooms out of a plant that everyone else called a weed, and that he was the only person ignorant of the tree **mbikú**[42] being a source of wild food.

Older men and women mentioned more medicinal plants in their free lists than their younger counterparts (table 6), and they were more knowledgeable about ritual uses of plants on the trail walk (fig.12).

	Food	**Firewood**	**Medicine**	**Ritual**	**Constr.**	**Craft**	**Other**
Women 1 (30+)	13	12	25	5	4	0	4
Women 2 (30 -)	22	9	6	1	3	0	1
Men 1(30+)	20	10	25	12	6	7	0
Men 2 (30-)	18	18	17	3	8	5	1

Table 5. Total number of plants in different use categories as mentioned on free lists and on trail walks

Generally, older women agreed on more medicinal uses for plants, while younger women agreed on uses such as firewood and food to a higher degree than medicinal contexts. All women as well as the older men agreed on the ritual use of the plant **libi** (*Sida rhombifolia)*, while only one of the younger men knew of this use.

The pattern of older women's' agreement shows that one woman in her early thirties was both times slightly separate from the other women, who were above 50. This may be because the three older women did the trail walk as a group and conferred among each other on responses, while the younger woman did the walk as an individual. Interestingly, none of the three older women remembered to mention the use of **mvuúr** *(Vitex doniana)* as food, although it is one of the most salient wild foods and is undoubtedly known as such. The younger woman omitting the tree's use as firewood is equally implausible and highlights the fact that measuring plant knowledge in single interviews and formal elicitation techniques can be misleading.

Lower consensus was displayed on the trail walk for certain plant species with medicinal properties, such as **nyuri cimi** *(Ageratum conizoides)* and **bînjammè** *(Epathorium*

[42] Unidentified.

odoratum). Most of the older women agreed on the medicinal use of **nyuri cimi** while most of the younger women did not know a use for it, at all, while both groups of men showed a 50% consensus on its medicinal use. While older women and men agreed fully on the medicinal use context of **bînjammè**, only one young woman and two young men knew of this application.

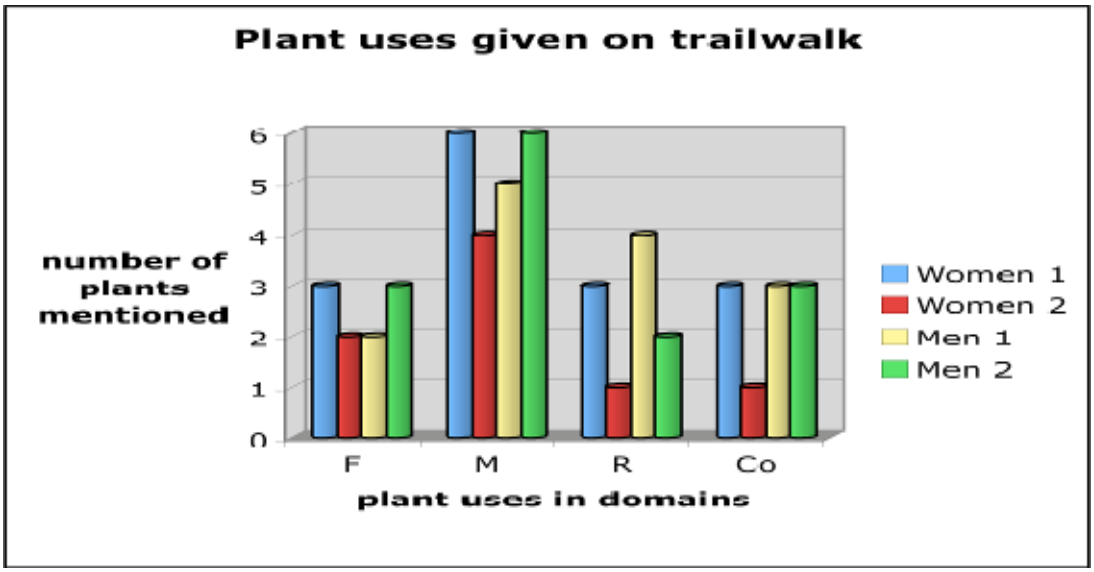


Figure 17. Plant uses mentioned on trailwalks

Agreement on the sedges **njieé** (*Cyperus procerus)* and the two types of **njàgà** *(Mariscus alternifolius* and *Cyperus articulatus)* showed also great variation. **Njieé** was mostly considered a weed and was given different uses only by one older (20-M-52) and one younger man (12-M-16), and knowledge of one type of **njàgà (***Mariscus alternifolius)* as a remedy against malaria related fevers was common among the older participants and the younger men, but showed only a 25% agreement among the younger women.
Some variations in agreement existed also in the case of firewoods, and were more pronounced among the younger participants[43].

One of the most widely distributed plants that is also a marker species of grasslands is the **guií** (*Pennisetum purpureum).* While all informants showed consensus in naming and identifying this grass, only one older woman, two older and two younger men knew of its use either as food or as a construction material

[43] See Appendix II, table 13

6.2.3 Formal education as an independent variable

The relationship between plant knowledge and the independent variables age, gender and education was analysed through a multiple linear regression model (SPSS software; table 6.8) and was based on informants' knowledge scores (table 5) from the trail walks.

1	no name or wrong	0
1	name generic local	1
2	name/ use	2
3	binomial local/use	3
4	diff. types	4
5	all/use	5

Table 6. Individual knowledge scores based on identifying and naming uses on trail walk:
Sample size: 18 individuals

In the regression results columns I to III correspond to the regressions run. Coefficient values of the regression equation are shown in the cells. P values are shown in parenthesis. A cell with X means that the variable was excluded from the regression.

	dependent variable plant knowledge		
independent variables	I	II	III
Age	**0.2531935 (0.005)**	**0.3377799 (0.001)**	**0.337181 (0.001)**
Gender	3.642564 (0.160)	-0.221205285 (0.911)	X
Education	X	**1.054692 (0.005)**	**1.036044 (0.001)**

Table 7. Linear regression model for the relationship between plant knowledge/ age, gender, education

Model I : regressing age and gender against plant knowledge.
Model II regressing age , gender and education against plant knowledge.

Model III regressing age and education against plant knowledge.

According to this analysis, education was positively correlated with plant knowledge (table 8). However, qualitative observation did not support this analysis and will be discussed below.

Figure 18. A young girl with her certificate of excellence from school. She wants to continue in education (photo R. K.).

7. Discussion and Conclusion

7.1. Factors that influence ethnobotanical knowledge and its patterning

7.1.1. Age

With respect to the initial research hypothesis stated in this dissertation (page 8), it can be concluded that age correlates positively with ethnobotanical knowledge. Older men mentioned 63.9% of the total variety of plants as opposed to 36.6% mentioned by the younger men, while older women named 49% of the total plants mentioned as opposed to 42.6% named by younger women. With growing age and experience, specialisation in certain areas and methods of healing expands, and older men and women shared a higher lexical as well as substantive knowledge of medicinal and ritualistic uses of plants. The younger generation relies on these specialists, and acknowledges, in general, that " the old ones know more ". It is also commonly believed that women under the age of 30 should not engage into healing with plants, as “their blood is still too hot”, meaning that they are in the height of their reproductive age. Domain specific interest, however, can motivate individuals to apprentice with their elders or specialists in specific areas of expertise, which will enhance their knowledge of domain- specific plants. A 47- year old man, son of a renowned elder and specialist healer for back, chest and lower back pains, has worked with Dr. Zeitlyn on an ongoing reforestation project and also has a tree nursery next to his house. His specialist knowledge in cultivated and introduced tree species was also reflected in his younger wife’s free list.

7.1.2. Gender roles

Scholars have emphasized gender as a particularly critical variable in ethno-biological knowledge, as it is highly correlated with other socio-cultural factors, including birthplace, residence, occupation, educational background, social status and networks, resource access, and income class (di Leonardo 1991; Sarin 1998, in Pfeiffer and Butz, 2005).

The role of gender as a factor influencing variation of ethnobotanical knowledge was not found to be very pronounced, and presents the Mambila as a considerably 'egalitarian' society. Fieldwork activity calendars for women and men show very similar roles and distribution of labour. Women, and men farm, fish, trade plant products on the market (men

mainly coffee and, seasonally *Voacanga* seeds), and they make largely independent decisions about the use of their surplus crops.

Nevertheless, some distinct gender roles contribute to differences that were reflected by a certain extent of domain specific plant focus. As main carers for the household and children, young women mentioned mainly plants that are used as food and firewood, and older women added their knowledge of basic household pharmacopoeias. Young women's' focus on work in the fields was reflected by their high knowledge of weeds that "spoil the field". Men, on the other hand are responsible for house construction and maintenance, as well as certain crafts (such as basketry), which explains their more apparent knowledge of plants used in construction and crafts.

However, plant knowledge is influenced in domains such as medicine by different types of specialisation and participation in the **sua** masquerades. As the chief pointed out in an interview, women share practical knowledge about specific 'ceremonial ' or medicinal plants, which don't concern men, while men share use contexts of particular plants, especially in connection with 'ritual' medicine. One example I found for this was women's' equally shared knowledge of the plant **libi** *(Sida rhombifolia)* which is an important ingredient in the ceremonial ointment '**beér'** that is rubbed into women's skin during the **sua** dances. Mambila women also anoint their skin with '**beér**' when they get married. I was told that for one month, the new wife is supposed to stay home, eat a lot and abstain from work. Rubbing her body with the red oil is said to help her put on weight and prepare for the bearing of children. Although men are perfectly aware of the ointment and its ritual and cultural significance, young men's knowledge of the plant libi itself, showed disparities, both in its identification and the knowledge of its uses.

Gender based specialisation was furthermore observed to pattern ethnobotanical knowledge sharing. Older men's higher knowledge of 'ritual' applications of medicinal plants stems from their medical specialisations and modes of treatment. On the trail walk, the older female specialist listed more medicinal uses in a strictly physiological use context, while her younger male counterpart knew different applications for the same plant, which referred to ritualistic contexts.

7.1.3. Ethnic mixing and the effects of "Fulbeisation"

An interesting question arose about the considerably large variation in knowledge sharing between men, both within the groups and across the generations. Looking at individual cases suggests birthplace and residence as a cause. Variations in the plant knowledge of a 16- year old boy might stem from the fact that he had moved to the village only four years previously as an orphan from a nearby small town, where he possibly knew plants by different names, hence he confused Fufulde and Mambila names in his free list. A 52- year old man who had emigrated from Nigeria 10 years previously might have drawn upon his plant knowledge from Nigeria. He was the only informant to mention the most salient weed kabe *(Echinochloa colona*) in the context of ritual, and he also knew more Fulfulde and English names for plants.

In the past, social prestige has been coupled in a " package of being ethnic Fulbe, being Muslim and speaking Fulbe " (D. Zeitlyn, pers. comm.), and this has had some influence on the younger generations of Mambila who incorporate more Fulbe words into their language and exchange knowledge of foods and other plant uses. As gradually more Fulbe trade their nomadic lifestyle with a more sedentary life as cattle breeding village members, their knowledge of certain plants becomes commonly shared, as was observed with **lalo** and **gubudo (***Allectra* spp.**),** two plant species that were lumped under the Mambila name **mgbéra**[44] by many older Mambila women, while several younger women reminded me that it is necessary use the Fulbe term "so everyone knows what you are talking about".

7.1.4. The role of formal education

Quantitative analysis of formal education as an independent variable suggested a positive correlation with individual ethnobotanical knowledge. Closer investigation raised methodological questions about the accuracy of the analysis and called for a more qualitative approach. The relationship between formal education and plant knowledge was analyzed using knowledge scores from trail walks, where older men scored highest. However, taking trail walks alone as a measure for plant knowledge proved to be flawed.

Although most families try to send their children to school, the traditional pattern of prioritizing boys' education over that of girls' still prevails, and consequently, men, in

[44] To be identified at Kew as the herbarium at Yaounde was uncertain of the species' scientific identification.

general, spend more time in school than women. High levels of education measured in years spent at school might have biased the analysis, as most of the older men on the trail walk spent more years in education than the older women. From informal discussions, I perceived many of the younger female participants to be more interested in getting married and maintaining the traditional village life than continuing in education. Success in formal education often leads to parents' expectation of financial support, which might entail a move from the village. Whereas for young men, travelling and searching for work and, sometimes, adventure, is more common and accepted, young women seemed reluctant to engage in such a lifestyle, as one 17 year old woman told me who left her husband to return to the village because she felt out of place and lonely in the city. However, I have also encountered young girls who showed ambition to excel in school and were encouraged by their parents, teachers, as well as the church community, to pursue the path of education, and most young mothers I spoke to, told me that they want their daughters to go to school.

It is difficult to judge how formal education will affect plant knowledge in the future. Villagers lament that the decline of **yulu (***Sorghum* spp.) as a staple crop is linked to children having to spend time at school, and, therefore, not being able to chase away the birds when the crop ripens.

7.1.5. Patterns and fluctuations in the transmission of knowledge

Considering that the Mambila are farmers who base their life, their social structure and many of their rituals on subsistence agriculture, it is not surprising that the knowledge of food plants is highly developed and shared to a high degree by all members of the community. Already in early years, children, irrespective of gender, observe their mothers and female family members preparing food and learn to participate in food-related chores. As soon as they are considered strong enough, they accompany their parents into the fields to help with weeding and food gathering, and learn names and management practices of the most conspicuous food plants through a seamless transmission of knowledge and experience. As they grow up, young girls are the principal labour force that women can access and are generally expected to prepare the midday meal in times of heavy workload in the fields, while boys often stay with their fathers or male family members to help in their fields and cash crop related plantations. While knowledge of food is mainly transmitted through mothers or other female family members, transmission of medicinal plant knowledge is gender- influenced and is passed down from mothers to daughters and fathers, or male

family members, to sons. Therefore knowledge sharing in these domains will be higher among the same sex than across genders[45].

A further dimension in the transmission of knowledge shows that learning is an organic and spatially fluid process, in which information is circulated not only in a traditional "top down" way but also through social networks such as peers, neighbours, relatives and even strangers. Young women and men exchange knowledge about plants among each other and discover new uses in childhood, as was illustrated by young participants who use certain grasses and sedges as food which older participants considered as weeds. Through the increased ethnic mixing with the Fulbe, names and uses of plants that are not part of the traditional Mambila ethnobotanical repertoire or are newly introduced plants, can be learned via these channels, and can be incorporated into the local knowledge system. The field guide that I will prepare as compensation for the village will represent such a contribution in knowledge transmission, as I will list names and cross- culturally applied uses of plants encountered in the Somié area, but which are new or unknown to the Mambila population.

7.1.6. Socio- economic change

Even though the Mambila are a subsistence- based society depending largely on the environment for their survival, socio- economic changes based on varying levels of integration into the cash economy have influenced the young generations' attitude towards subsistence and, hence, towards their environment. Most young women today engage with the market to some extent and spend, in general, more time on " own account enterprises"(Roberts, 1988: 103) within "female farming systems" (Roberts 1998) than did their mothers and grandmothers, as they are living "in the times of the money"[46]. While they still have to bear the burdens of child rearing and farming, often as single mothers, these time constraints affect the ways in which they learn about plants with a focus on utilization in the household or as trade goods and commodities.

Similarly, new, cash- based subsistence choices have been adopted by young men affecting their relationship with plants. Young men engage in businesses such as bars, shop keeping, driving motor bike taxis, and their pastime activities (card games, drinking, watching movies, socializing in the market place) and conversations often reveal a more pronounced

[45] See Appendix II, table 16
[46] Quote from Barmi Marie (in her late forties) in an informal interview.

preoccupation with " finding money" than I observed among the older men. However, I felt that data might have been biased by the fact that young women and men were less cooperative in telling me everything they knew about plants than were older village members who were eager to share their knowledge and memories of plants.

7.1.7. Individual motivation and preferences

Personal tastes and preferences can often influence what plants are in our consciousness. Lacking more data that could have been obtained from pile sorting and weighted ranking exercises, certain differences in the free listing of plants can be also potentially ascribed to such individual factors. Similarly, personal attitudes toward the research and interest in specific domains such as 'ritual' medicine explained why a 30 -year old man insisted on being part of the study and why his responses displayed a high level of phyto-therapeutic and 'ritual' plant knowledge. As the son of a highly reputed traditional healer, this man was exceptional for his age group in the unusually early choice to apprentice in traditional medicine and to maintain the practice of ritual. His individual character, as well as a tragic accident that left his father dependent on his son's help to bring plants from the forest influenced his early specialisation in the field.

Disagreements can also indicate participant responses influenced by spatial -temporal factors. As shortages of firewood began to set in, people had to go further afield into the forest or the savanna, or revert to cutting trees in the village. Consequently, they might have prioritised a certain species' use as firewood over its use as traditional medicine or food. However, this is not clear proof that they don't know other uses they omitted to mention. One trail walk was conducted with a focus group of three older women between the ages 54 to 70 and above, and the women agreed on **mvuúr** (*Vitex doniana*) as firewood, which does not mean that they don't know its fruit as a wild food resource but might have found it too obvious to mention, simply forgot to mention it, or rather wanted to share with me and amongst each other their knowledge of various other plants encountered in the field.

7.1.8. Knowledge loss

Knowledge loss has been found to be partly related to environmental and socio- cultural changes. The younger generation has grown up with the availability of Western medicine, which is considered to be a potent remedy and is often preferred to herbal remedies. Thus, the

theoretical knowledge of certain medicinal plants might prevail but knowledge of its practical application is beginning to erode. Similarly, certain plant species that have been traditionally employed in use contexts such as roof thatching, salt production, sources of fuel for lamps or in clothes manufacturing and cosmetics, are being increasingly replaced by material goods purchased on the market and have faded in the memory of the people.

Increased logging has resulted in the loss of certain plant species, which were mentioned by a few older participants as "too rare to find in the forest, anymore". None of the younger participants knew the culturally important tree **tuú beér** (*Bathidia nida*), the bark of which supplies the red dye for the ceremonial red ointment used by women in the **sua** dances and at weddings. I was told that the last big tree in the area had been cut approximately 20 years ago to build a bridge and, since then, the bark has been sold on the market by non- Mambila vendors who "bring it from far away".

7.2 Methodological constraints and inconsistencies

Free listing as a method is a good first approximation of plant knowledge in a broad domain such as ethnobotanical knowledge. Although general patterns relating to age, interest and expertise, and the salience of certain plant species could be identified through quantitative analysis of free list mentions by groups, it proved advisable to maintain a critical attitude toward some of the data.

In free lists, old men came up with the highest number of plant names, but walks into the field with older women clearly showed that they know many more plants and their uses than they mentioned in the free lists. A further example are data obtained on the oil palm **teér** *(Elaeis guineensis*), which supplies the highly nutritious palm oil, a Mambila staple food. **Teér** was only mentioned a total of five times in free lists, and only once by a young woman. However, women are responsible for the production of the oil and both theoretical and practical knowledge of the plant, its management and its many uses are widely shared among everyone in the community. In several cases, uses for the same plant were mentioned in the free listing environment and not mentioned when asked during the trail walks or vice versa, making comparisons between individuals' plant knowledge inaccurate.

Similarly, trail walks present only a snapshot of plant knowledge and are subject to influences as far ranging as weather conditions, researcher – participant rapport, and personal attitudes toward the research, which, in turn depend often on factors such as an individual's character or their state of health. One young man who had difficulties identifying some plants in the field and initially confused some of their uses, admitted that he had taken several painkillers because of back pains, and that his " thoughts were with his wife", who had fallen ill with malaria. On other occasions, I perceived two young women to be slightly embarrassed about their lack of good conversational French and to rush through the naming of plant uses. Inadvertently, I cannot assume that what they told me is truly all they know.

Knowledge scores designed for the trail walk exercises were too broad and included both elicitation for use and identification. It might have been better to separate these exercises and give separate scores for each.

Consistent eliciting of uses from all informants about all plants on their free lists would have also helped to analyse disagreements on uses encountered on the trail walks and supplied more accurate data about certain conspicuous food plants with multi-contextual uses such as **yoó** *(Vernonia amygdalena).*

Working with translators often distorted data, and I believe that some of the details and nuances of plant knowledge in the interviews with older men and women got lost due to the translators' casual attitude. On one occasion a mentioned tree (**luú)** was repeated by the translator as a completely different plant species (**yoó),** which I only noticed after listening intently, and repeatedly, to the interviews.

It would have been beneficial to repeat some of the free list based interviews once I had more understanding of the mentioned plant species, as often plants were only mentioned with their generic name and specifics or binomials would have clarified which plant was meant. In this perspective, the free lists proved a little too vague and broad but a good approximation for getting a basic idea of folk classification principles.

I also experienced difficulties in accurately translating plant names and determining their referents, which made the explanation of their overall meaning and significance in Mambila culture difficult.

Voucher specimen collections presented a challenge due to time and equipment constraints, and I feel that it would be beneficial and important to return to the field in order to complete collections of elicited plant species in flowering season, and with better equipment (such poles and saws for tall trees) or hired climbers.

7.3 Conclusion

The outcome of this study has successfully provided the Mambila Dictionary Project with Mambila names for 173 vascular plants, which comprised of 73 trees and 100 plant species (grasses, herbs, vines and bulbs). It has also supplied uses for 92% of the trees and for 62% of grasses, vines, herbs and bulbs. Furthermore, it has provided the herbaria at Yaounde and at Kew with 60 well-presented voucher specimens, which are the first plant collections made in the area around Somié[47].

The results of this study suggest that differences in the individual ethnobotanical knowledge of Mambila women and men in Somié vary considerably and are patterned with regard to age, domain specific specialisation and, to a lesser degree, gender.

While different areas of specialisation, between women and men might account for gender-based differences for the elder and adult generation, specifically in the domain of medicine and ritual, variations of individual plant knowledge among men suggested other variables to be of influence.

Variations in the knowledge sharing of men were to some extent explained by individual case stories relating to ethnic mixing, specialisation, personal interests and place of origin. However, I suggest that socio- economic changes could potentially be affecting traditional patterns of knowledge transmission from old to young, gradually altering young men's' repertoire of plants. The traditional Mambila social structure, as referred to by the chief of Somié, in which knowledge is passed on through "stories around the fireplace" or by accompanying parents into forest and field might possibly get affected by changing subsistence choices as young men search for alternatives to supplement their income in areas such as commerce or wage labour, or through continuing in formal education outside the village.

[47] See Appendix III. 1,Figure 9.

Similarly, young women's' growing focus on managing plants in 'own account enterprises' and increasing numbers of imported material goods available on the market can be expected to influence their plant knowledge, in the future, eroding knowledge of plants used in cosmetics, crafts, and medicine.
Shifting preferences for Western medicine among the younger generation have been furthermore observed to cause a potential loss of both theoretical and practical medicinal plant knowledge.

With regard to lexical knowledge of plants, data suggest a high level of knowledge sharing and confirm the qualitatively observed ethnic and linguistic unity among the Mambila community of Somié. Elders and older adults of both sexes expressed an explicit interest in the preservation of this cultural heritage, which includes traditional uses of plants in medicine, and in ritual contexts. Young adults supported this attitude, but tendencies of increased inter-ethnic knowledge sharing and Fulbeisation, both in lexical plant knowledge and practical uses of plants, were observed to varying degrees among young women and men.

Methodological shortcomings and a small sample size made the examination of education as a factor influencing individual ethnobotanical knowledge difficult. Although quantitative data suggested a positive correlation between plant knowledge and years spent in formal education, qualitative observation did not support this relation and has led me to conclude that further, and more case specific research would be necessary to validate the quantitative results obtained in this study.

The collection of voucher specimens, Mambila plant names and uses relates to an academic concern with the preservation of bio-cultural diversity, and more specifically the link between language, as part of culture, and biological diversity.
From informal discussions, it has become apparent that, in the light of climate change and the increased pressures of immigration, commercialisation and integration into the market, adaptations to new, more productive and reliable plant varieties might be required, which are expected to alter variations in ethnobotanical knowledge as well as the biological and cultural diversity of the area. The planned ethnobotanical field guide of Mambila plants

explored in this study presents a contribution to the preservation of this bio-cultural diversity.

Change is an intrinsic part of the human condition, and changing patterns in the sharing of ethnobotanical knowledge within a community are indicative of both the health of a culture seen as a "pool of shared knowledge", and of the health of the environment they call their home. Therefore, they inform both ethnobotanical and linguistic debate concerning intra-cultural knowledge diversity and help develop more integrative approaches for the preservation of biocultural diversity in traditional societies currently facing the challenge of adaptations to changing ecological, socio- cultural and socio- economic environments.

APPENDIX I

PHOTOGRAPHS

Aerial photographs of Somié, illustrating the extent of deforestation that has taken place between 1948 and 1984. Photographs courtesy of D. Zeitlyn.

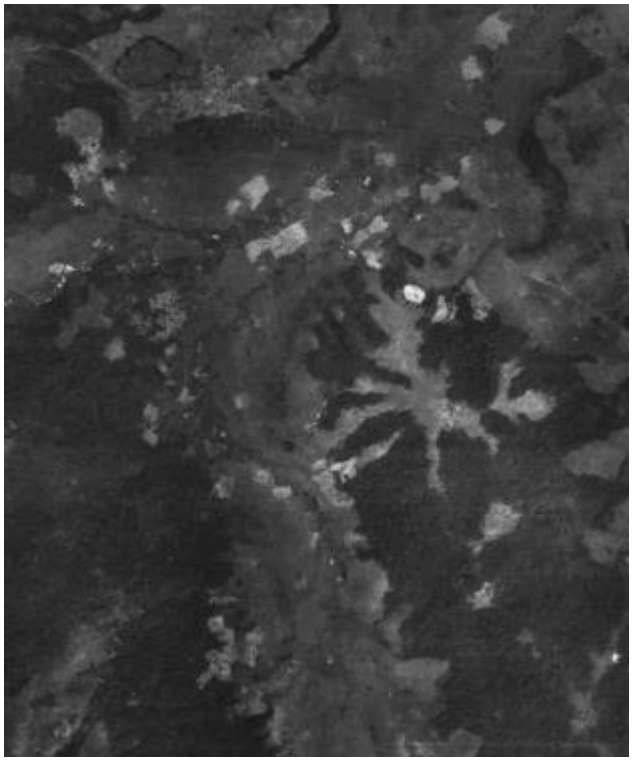


Figure 19. Aerial photograph from 1948 .

Figure 20. Aerial photograph from 1984.

PHOTOGRAPHS TAKEN IN THE FIELD (R. Komaromi)

Generally, everyone in Somié, young or old, female or male, was delighted to have their photograph taken and took pride in posing. The only exception were Fulbe girls, who adamantly refused and took equal pride in **not** letting me take their picture.

Figure 21. Young Mambila boys who accompanied me on a walk across the ridge overlooking Somié village (in the background). They showed great interest in me looking at plants, although they knew very few names for wild tree species far from the village.

Figure 22. A nine year old girl who, in spite of having malaria was sent home by her mother from the field to start the long process of boiling the "black oil" from the kernels of the oil palm (*Elaeis guineensis*).

Figure 23: Fulbe woman showing the leafy green **lalo**

Figure 24. Daniel Gangfi, my plant collection field assistant, recording information about a tree in the savanna (photo R.K.).

APPENDIX II

TABLES

Table 1

Socio- demographic data for 37 research participants

E: Years spent in school

L : Number of languages spoken

YOS : Number of years spent outside of Somié

Name	Code	Sex	Age	E	L	Occupation	YOS	Occupation codes
Veyo Marguerite	1F57	F	57	5	6	1	10	**1**: agriculturist
Waŋ Christine	2F70	F	70	1	3	1	4	**2.**healer
Kea Monique	3F60a	F	60a	2	2	1	0	**3 :** housewife/cook
Tua Julienne	4F60a	F	60a	0	3	1	1	**4:** market vendor/commerce
Theya Monique	10F60a	F	60a	1	2	1	0	**5:** carpenter
Wom Marguerite	16F80a	F	80a	1	2	1,2	0	**6:** artist/musician
No Henriette	17F47	F	47	6	3	1,3	0	**7:** palm nut, coffee farmer
Leke Regine	21F35	F	35	9	3	1	0	**8:** construction
Lofe Monique	32F35	F	35	7	3	1	1	**9:** mechanic
Tabesam Louise	39F50a	F	50a	5	2	1,2		**10:** driver
Mbiti Martine	9F19	F	19	6	4	1,4	10	**11:** fishing
Lomi Clarisse	18F24	F	24	8	3	1.4	6	**12:** government work
Tiesam Elisabet	19F26	F	26	6	3	1	0	**13:** forestry/nursery
Ge Marie	27F18	F	18	7	3	1,4	0	**14:** student
Temagoue J.	31F24	F	24	13	3	1,3,4	4	
Fadi Matu	34F20	F	20	8	3	1,3	0	
Vekuu Baba M	35F19	F	19	6	4	1,3	2	
Mea Mirabel	36F18	F	18	5	3	1,4	6	
Nyagati Francois	5M80a	M	80	0	2	1,7,8	20a	
Lilie Jonas	6M33	M	33	7	4	1,9,10	8	
Leban Gevede	7M80	M	80	0	2	1,5,7	5	
Bekimi Jean C.	8M40	M	40	10	7	1	8	
Baba Joel	11M58	M	58	9	4	1,5,8,10,11, 12	3	
Yilyioko Martin	14M47	M	47	6	3	1,10,13	0	
Djidabe Jonas	15M32	M	32	15	5	1,6,12	20	
Sule Bager	20M52	M	52	14	5	1,8	29	
Ndissam Claude	26M34	M	34	11	3	1,4	4	

Mama Simon	28M77	M	77	5	3	1,2,7	9
Djumbiti Elouard	12M16	M	16	8	4	1,14	13
Candel Mela	13M16	M	26	11	4	1	4
Kounaka Prosper	22M23	M	23	7	3	4	5
Nuarsam Antoine	23M27	M	27	6	3	1	17
Leju Lazare	24M26	M	26	17	3	1	0
Kunaka Fidel	25M28	M	28	15	3	1	2
Juni Robert	30M27	M	27	10	3	1,7	9
Bondjou Fabien	33M23	M	23	9	3	1	4
Suop Silvestre	37M30	M	30		3	1, 2	

Table 2

Form used to record data collected during freelist exercises and structured interviews

Inf ID:

Date:

A. Dites- moi, en Patois (Mambila les noms des arbres que Vous connaisez.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

B. Dites- moi, en patois (Mambila), les noms des autres plantes qui ne sont pas des arbres, comme par example des herbes et des vignes.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Questions for interview questionnaire

(Example ; questions repeated for three trees and three other plants):

T1a: Est-ce que tu connais des autres noms pour ça (en Fufulde, Français ou des autres langues)?

T1b: Où est-ce que ça pousse?

T1c: Est-ce que tu peut me montrer ça?

T1d: Est-ce qu'on utilise ça pour quelque chose?

T1e: Pour quoi?

T1f: Quel partie est-ce qu'on utilise?

T1g: Comment est-ce qu'on utilise/ prépare ça?

T1h: Est-ce que tu peut préparer/ utiliser ça toi meme?

T1i: Qui t'a enseigneé sur ça?

Table 3

Form used to record demographic data collected during structured interviews

Inf ID:

Date:

1. Nom

2. Age:

3. Sex:

4. Vous parlez quelles langues ?

5. Vous avez passé combien d'années à l'école?

6. Vous est né où?

7. (if not born in Somie) ça fait combien d'annés que Vous êtes à Somié?

8. Est-ce que Vous avez passez du temps en dehors du village?

9. (if yes) Combien d'annés est-ce que Vous avez passé en dehors?

10. Quel est votre occupation?

Table 4.

Summary list of tree species mentioned on freelists and collection walks

Species and family name supplied by the National Herbarium in Yaounde (Y);
By reference in D.J. Mabberley' s *Plant Book* (2008).
Uncertain names marked with *

Coll #	Species	Family	Mambila name	Code	Uses
			bàgà	T1	
			bàm	T2	Leaves help banana to ripen
			bachet (Fr)	T3	
			ba	T5	
	Ficus thoningii Blume	MORACEAE	bó	T6	planted for twin births
			b b	T7	edible fruit
	Albizzia Benth.	LEGUMINOSEAE	boob wulei	T4	firewood
			boob bli	T8	
	Coffea robusta	RUBIACEAE	(luye) café	T9	
			dùlùmber	T68	incense chases snakes
			fuo	T11	
			fuú	T12	
			f g	T13	
24	*Trema orientalis* (Y)	ULMACEAE	fúrúkùm	T14	low quality firewood
			giliba	T15	medicinal
58	*Psorospermum febrifugum* (Y)	HYPERICACEAE	gela		
			gò	T16	planks, roofing
			gombo	T17	sweet edible fruit
			gùm	T18	
	Psidium guajava L.	MYRTACEAE	guàyámé	T20	edible fruit
28	*Syzigium macrocarpa* (Y)	MYRTACEAE	hibí	T21	edible fruit
6	*Tephrosia vogelii* *	PAPILLONOIDEAE	jársár	T22	fallow crop, firewood

			jogo	T23	medicinal
	Pilostigma thoningii (Schumach.) Milne-Redh.*	LEGUMINOSEAE	kékéma	T24	fix hoe handles, medicinal
			kpalekok	T25	
			kimbán	T26	enclosures
			kumbu	T27	
			kundu	T28	
			Kúmu	T71	
	Ceiba pentandra (L) Gaertn.	BOMBACACAEA	komó	T29	construction
			kúliweéh	T30	enclosures
	Citrus L	RUTACEAE	lemú	T31	edible fruit
	Erythrophlaeum guineense (D.) *	CESALPINOIDEAE	lií	T32	firewod; planks; poison in divination
			lamgér	T33	enclosures
			liíkùlù	T34	used in divination
	Raphia spp	PALMAE	loro	T35	
			marafi	T36	
			mafani	T37	medicinal
			mandélêm	T38	
			mbikú	T39	edible leaves
	Mangifera L.	ANACARDIACEAE	magoró	T40	edible fruit; firewood
			mvua	T41	
17	*Vitex doniana* (Y)	LAMIACEAE	mvuúr	T42	
70	*Voacanga thouarsi (Y)**	APOCENACEAE	mèt k	T43	medicinal; cash crop
			mangalí	T44	
	Milicia excelsa (Welw.) C. Berg	MORACEAE	ndo	T45	
			nyanbendo	T46	
			gií	T47	
3	*Nauclea latifolia* (Y)	RUBIACEAE	ulamar	T19	medicinal
50	*Markhamia tomentosa (B*entham) K. Schum.ex. Engl (Y)	BIGNONIACEAE	njàmnjér, suár	T66	
	Persea americana Mill.	LAURACEAE	pía	T48	edible fruit; firewood
5	*Crossopteryx febrifuga* (Y)	RUBIACEAE	se	T49	firewood

			tablár	T50	timber
	Elaeis guineensis Jacq.	PALMAE	teér	T54	oil, wine, broom , medicinal
8	*Anogeissus leiocarpus* CD Guill pen (Y)	ANOGEISSUS	tùbù	T51	firewood, medicinal
	Baphia nitida Afzel. Ex Lodd	LEGUMINOSEAE	tuú beér	T55	construction; red dye used in ritual ointment
32	*Terminalia macroptera* (Y)	COMBRETACEAE	tulu	T52	
			tuú hu ôm	T53	
			tuú ngaà	T56	medicinal
			tuú soú	T64	in funerary rites
			tuú tu m	T58	
			tuú yuama	T69	fishpoison
			tuú yilî	T59	traditionally used as cotton
			tuú Yùòm	T63	edible fruit
			van	T60	edible fruit
			w bè	T61	
			wurdé	T67	incense chases snakes
38	*Vernonia amygdalena* (Y)	COMPOSITAE	yoó	T62	edible leaves, medicinal

Table 5.

Summary list of plant species (grasses, herbs, vines and bulbs) mentioned on free lists and collection walks

Species and family name supplied by the National Herbarium in Yaounde;

By reference in D.J. Mabberley's *Plant Book* (2008).

Uncertain names marked with *

Revised identifications by Kew.

Coll #	Species	Family	Mambila name	Code	Uses
			bàwè	H1	helps take off palm nuts
			bubogó	H2	edible seed
64	*Crotalaria*	PAPILLONOIDEAE	bɔ̀ veéh		medicinal
	Epathorium odoratum	COMPOSITAE	bìnjammê	H3	medicinal
7	*Eleusine indica* (L.) Gaertn (Y)	POACEAE	càgàmbor mabonn	H4	
11	*Paspalum paniculatum* (Y)	GRAMINAE	cagàmbɔr tela	H5	
			càgàndoŋ	H6	
	Cucurbita L. ssp	CUCURBITACEAE	cèb	H7	edible leaves and fruit
34	*Bidens pilosa* (Y)	COMPOSITAE	cìnjolo	H8	medicinal
15	*Euphorbia hirta* (Y)	EUPHORBIACEAE	ceìŋ	H9	
	Ipomoea ssp. L.	CONVOLVULACEAE	Dàŋkélaŋ	H10	edible tuber
	Hibiscus sabdariffa L.	MALVACEAE	Daar	H11	
4	*Cyphostemma adenocaule* (Stend.) Descoing *(Y)	VITACEAE	daar tèrè	H12	edible leaves
	*Dicrocephala integrifolia**	COMPOSITAE	dor, nyen suàgà	H13	
			Dùr	H14	
	Tithonia diversifolia (Hemsl.)	COMPOSITAE	fleur jalusi	H15	
20	*Solanum torvum* (Y)	SOLANACEAE	Feér		
45	*Martynia annua* (Kew identification)	PEDALIACEAE	Fleur 1		ornamental
	Caesalpinia pulcherrima L.	FABACEAE	Fleur 2		

67	*Plectranthus glandulosus* Hook f. (Y)	LAMIACEAE	Fuo uye	H101	in funerary rites; ritual medicine
	Plectranthus esculentus N. E. Br.	PLECTRANTHUS	gueè-tágie	H16	edible tuber
	Hibiscus abelmoschus L.	MALVACEAE	Gaŋ	H17	edible fruit
58	*Psorospermum febrifugum* (Y)	HYPERACEAE	Gela		
51	*Sesamum indicum (*K)	PEDALIACEAE	Gubudo	H47	
73	*Pennisetum purpureum* Schum.	POACEAE	guií	H19	enclosures; edible leaves, fruit
66	*Biophytum petersianum* Klotz (Y)	OXALIDACEAE	gùlù hin-cílí hin	H20	medicinal
			gwɔgɔb	H21	edible fruit
	Amaranthus L. ssp.	AMARANTHACEAE	huéh	H22	edible leaves
12	*Panicum maxima* Jacq. (Y)	POACEAE	jolo	H23	oath aswearing, ritual medicine
			k ɔ̀gɔ̀jùm	H24	
	Echinochloa colona Link. (Y)	POACEAE	kabe	H25	
31	*Mussaenda eritrophylla* (Y)	RUBIACEAE	kilikàŋ	H26	weed
			kukuii	H27	
			kaga	H28	weed
			Kògòjùm	H95	
			Kogombum	H98	traditionally used as torch
			kotemone	H29	
	Musa L. ssp.	MUSACEAE	kunu	H30	
	Manihot esculenta Crantz	EUPHORBIACEAE	kúkúm	H31	
	Colocasia esculenta (L.) Scott	ARACACEAE	kwéé	H32	edible tuber
	Cajanus cajan Linn. Millsp. (Y)	PAPILLONOIDEAE	kweri	H33	edible fruit
	Sida acuta Burm. f. (Y)	MALVACEA	libi nàgà	H34	edible root
65	*Sida rhombifolia* Linn. (Y)	MALVACEAE	libi beér	H35	in ceremony and medicine
	Solanum L.	SOLANACEAE	luàgà	H36	
	Imperata cylindrica (Y)	POACEAE	luií	H37	roof, mattress, enclosures
			lapsur (Fu)	H38	edible leaves
			lalo		edible leaves

			lɔgɔ sàb	H99	medicine
			lɔgɔ siéŋguií	H100	ritual medicine
56	*Lippia multiflora* *	VERBENACEAE	loro*		
			mágáfùm	H39	
			manabu/nemadu	H40	medicine; ritual
			mandué	H41	
			màkàbé	H42	
			màkpelaáŋ	H43	
			manjérêb	H44	edible leaves
			mbabur	H45	
37	*Alectra* ssp (Y)	SCROPHULARIACEAE	mgbéra	H46	
33	*Spilanthes filicaulis(Schum. Thonn.)* C.P.Adams (Y)	COMPOSITAEA	mbentò	H48	medicine
	Physalis angulata Linn. *(Y)*	SOLANACEAE	mvagaà	H97	
			mvu	H96	
			nder	H49a	
			nder noon	H49	
			ndèr tònn	H50	
30	*Clerodenron scandens*	Lamiaceae	Nó	H52	ritual medicine
62	*Cyperus articulatus L. (Y)*	CYPERACEAE	njàgà	H53	medicinal, antimalarial
10	*Mariscus alternifolius* Vahl	CYPERACEAE	njàgà	H54	edible roots; weed
			ndé		
49	*Phyllanthus muelleriana* (Y)	EUPHORBIACEAE	ndétogo		
	Amaranthus ssp. L.	AMARANTHACEAE	ndèr mvomndè	H55	
	Cucurbita L. ssp	CUCURBITACEAE	nàŋ (cèb nàŋ)	H57	
71			ngán		
	Capsicum frutescens L.	SOLANACEAE	ngan sar		edible fruit, medicinal
35	*Commelina benghalensis* (Y)	COMMELINACEAE	ŋngèna télaá	H58	medicinal
63	*Aneilema umbrosum* (Vahl) Kunth. (Y)	COMMELINACEAE	ŋgèna mabonn	H59	
48	*Solanum nigrum* L. (Y)	SOLANACEAE	njebanyɔɔŋ	H60	
			ndènŋdèŋ	H61	
	Zea mays L.	POACEAE	ŋgwàgàmè	H62	staple crop
	Cyperus procerus (Y)	CYPERACEAE	njieè	H63	

	Phyllanthus muelleriana (Y)	EUPHORBIACEAE	ndétogo		H97	medicinal
71	*Celosia leptostachya* Benth. (Y)	AMARANTHACEAE	ngán			
			njieè		H63	medicinal, edible leaves
30	*Clerodendron scandens* (Y)	LAMIACEAE	nó			
			nyànbendoŋ		H64	
52	*Scroparia dulcis* Linn. (Y)	SCROPHULARIACEAE	nyuri huaáŋ naár *			
18	*Ageratum conizoides* (Y)	COMPOSITAE	nyuri cimî	H65		medicinal
42	*Oxalis radicosa* A.Rich (Y)	OXALIDACEAE	nyuri sér	H66		medicinal
59	*Polygonum acuminatum* H.B.K. (Y)	POLYGONACEAE	nyuri sèm/ cap	H67		
53	*Impatiens irvingii* (Y)	BALSAMINACEAE	nyuri sèm/ cap			
			nyuri njuù	H68		medicinal
			nyuri mbàŋ	H69		
			nyàn	H70		
			nyèn	H71		
			nyuií	H72		medicinal
			nyúínjí	H91		
1	*Ocimum gratissimum (Y)*	LAMIACEAE	san mabonn			

68	*Ocimum basilicum* (Y)	LAMIACEAE	san tela		condiment, medicinal
	Cucurbita L. ssp	CUCURBITACEAE	sengar	H81	
			sesar	H82	spearshaft
	Arachis L. *ssp.*	LEGUMINOSEAE	sèŋgâr	H83	
64	*Aframomum cf melegata* (Y)	ZINGIBERACEAE	soó	H80	divination, base of healing
			sop	H84	
	Lageneria Ser. ssp. *	CUCURBITACEAE	sulimbié	H85	edible seed
	Tristemma leiocalyx Cogn.	MELASTOMATACEAE	tàgàmbè		
46	*Dioscorea* ssp. (Y)	DIOSCORACEAE	tìeè	H73	edible fruit
60	*Leea guineense* (Y)	LEACEAE	teéh		in funerary rites
	Elaeis guineensis Jacq.	ARACACEAE	teér	H74	
52	*Emilia coccinea* (Y)	COMPOSITAE	tiendoòb	H75	ritual medicine
60		SOLANACEAE	tíndar	H92	edible leaves
	Xanthosoma sagittigolium (L.) Schott]	ARACACEAE	tombi	H93	edible tuner
			tubu ŋgaám	H76	divination
			túbú	H77	erosion control, weed
			túùɔb	H78	
			wèlè	H86	indicates water
72	*Ipomoea* ssp. (Y)	CONVOLVULACEAE	wɔɔŋ		traditionally in soap making
38	*Vernonia amygdalina* Del. (V)	COMPOSITAE	yoó	H87	edible leaves; medicinal
			yuar	H88	
	Sorghum Moench	GRAMINAE	yulu	H89	staple food; used in ceremonies
			yuií	H90	

Table 6.

Summary list of "top 22" plants from freelist mention

Code	Mambila name	Species	Family	Other name	Freelist mentions
Trees					
T52	tulu	*Terminalia macroptera*	COMBRETACEAE	kuula-hi/je	22
T42	mvuúr	*Vitex doniana*	LAMIACEAE	galbiije	18
T8	boob/baŋgò	*Albizzia* spp	LEGUMINOSEAE		16
T32	lií	*Erythrophlaeum guineense* (D.)	CAESALPINOIDEAE		16
T24	kékéma	*Pilostigma thoningii* (Schumach.) Milne-Redh.	LEGUMINOSEAE	barkeji	16
T51	tùbù	*A. leiocarpus CD Guill pen*	ANOGEISSUS		15
T39	mbikú				13
T40	maŋgoró	*Mangifera* L.	ANACARDIACEAE		13
T45	ndoŋ	*Milicia excelsa* (Welw.) C. Berg	MORACEAE	Iroko	12
T48	píâ	*Persea americana* Mill.	LAURACEAE	avocat	12
T62	yoó	*Vernonia amygdalena*	COMPOSITAE	ndolé	12
Grasses, herbs,vines					
H19	guií	*Pennisetum purpureum* Schum.	POACEAE		22
H4	càgàmbor mabonn	*Eleusine indica* (Linn) Gaertn	POACEAE		both together
H5	cagàmbɔr tela	*Paspalum paniculatum*	GRAMINAE		16
H34	libi nàgà				
H35	libi beér	*Sida rhombifolia* Linn.	MALVACEAE		both together

					16
H37	luií	*Imperata cylindrica*	POACEAE		16
H60	njebanyɔɔŋ	*Solanum nigrum* L.	SOLANACEAE		13
H7	cèb	*Cucurbita* L. spp	CUCURBITACEAE	waigore	12
H63	njieè			gene(Fu)	11
H25	kabe	*Echinochloa colona* Link.	POACEAE		10
H3	bìnjammê	*Epathorium odoratum*	COMPOSITAE		9
H53	njàgà	*Cyperus articulatus* L.	CYPERACEAE		
H54	njàgà	*Mariscus alternifolius* Vahl	CYPERACEAE		both together 9

Table 7

Individual knowledge scores based on trail walk

Sample size: 22 plants

ID	total number of plants correctly identified in the field
U	total number of plant uses given on trailwalk

	ID	U
GROUP 1		
01F57	22	18
02F70	22	18
03F60a	22	21
32F32	22	17
39F50a	22	23
GROUP 2		
09F25	22	13
18F24	22	14
27F18	22	14
31F24	22	14
GROUP 3		
08M40	22	23
11M58	22	23
20M52	22	28
26M34	22	20
GROUP 4		
12M16	18	14
23M27	20	14
25M28	21	18
33M23	21	20
37M30	22	20

Table 8.

Individual knowledge scores based on identifying and naming uses in the field

0	no name or wrong	0
1	name generic local	1
2	name/ use	2
3	binomial local/use	3
4	diff. types	4
5	all/use	5

Example:

Informant	**local name**	**Use**	**score**
001-F-54	Tulu	Firewood	2
	Boob/Baŋgò	Firewood	5
	Mvuúr	firewood	2
	Lií	poison	2
	Kékéma	Malaria, broken bones	2
	Túbú		1
	Mbikú	Edible leaves	2
	Maŋgoró	Edible fruit	2
	Ndoŋ	timber	2
	Píâ	Edible fruit	2
	Yoó	wounds	2
	Guii		1
	Cágámbor	medicinal	1
	Libi	Ritual ointment	5
	Luií	Roof construction	2
	Njebanyɔɔŋ	Edible leaves	2
	Nyuri cimí	wounds	3
	Cèb	Edible leaves	2
	Njiè		4
	Kabe		1
	Bìnnjamê	Cut wounds	2
	Njàgà	malaria	2
		Total	**49**

Table 9

Yearly activity calendars for men and women

Month	Women	Men
January	inspect and clean debris on field after burning collect dry wood	slash and burn fields, harvest coffee
February	clean burnt field with machete pay tractor to plough field plant yam, groundnuts	cut forest for farm, clean field burn forest
march	plant groundnuts, corn, women plant fields	women plant fields work in coffee, plant cassava, oil palm harvest
April	weeding fields, work in kapti	weeding in fields, oil palm harvest
May	weeding corn fields, peanut fields, kapti	weeding corn fields, peanut fields; work in coffee; pepper farm; oil palm
June	plant manioc, groundnuts	start harvesting corn
July	work on manioc fields, harvest, plant more	start harvest corn
August	harvest corn and groundnuts plant	corn harvest
September	weed manioc fields	
October	calm period	rest
November	cut firewood	rest; transhumance starts
December	cut firewood, two weeks celebration time and rest period	start harvest coffee

Table 10

Free list mentions of tree/ plant varieties and tree/plant uses by groups

Sample size: total of 74 trees and 98 other plants elicited through free lists from 36 individuals

	Women1	Women 2	Men 1	Men 2
TREES	39	35	50	28
PLANTS	42	36	60	33

TOTAL	**81**	**71**	**110**	**61**

Free list mentions of tree/ plant varieties and tree/plant uses by groups

	F	FW	M	TR	CO	CR	O
T TOTAL	14	20	17	5	7	6	1
P TOTAL	22	0	19	8	6	5	3
TOTAL T/P	36	20	36	13	13	11	4

TREES	**F**	**FW**	**M**	**TR**	**CO**	**CR**	**O**
Women 1	8	12	10	2	3	0	0
Women 2	10	9	3	0	1	0	1
Men 1	8	10	15	6	5	5	0
Men 2	12	18	12	2	5	4	0

PLANTS	**F**	**FW**	**M**	**TR**	**CO**	**CR**	**O**
Women 1	5	0	13	3	1	0	4
Women 2	12	0	3	1	2	0	0
Men 1	12	0	10	10	1	2	0
Men 2	6	0	5	1	3	1	1

Total number of all plants mentioned in use categories (free lists and trail walks)

Sample size: 39 individuals

	F	FW	M	R	CO	CR	O
Women 1	13	12	23	5	4	0	4
Women 2	22	9	6	1	3	0	1
Men 1	20	10	25	16	6	7	0
Men 2	18	18	17	3	8	5	1

Table 11

	Summary table of plants used medicinally and in ritual	
	Based on free lists (38 individuals) and ID trail walks (18 individuals)	
Trees	**Scientific name**	**Medicinal use**
bó	*Ficus thoningii* Moraceae	twin birth; broken bones
feér	*S.torvum* Solanaceae	chiggers; aches; male 'hernia'
giliba		abscess, lower back
gùm		jaundice', headache
liíkùlù		divination
mafani		teeth;chest; back
mandélêm		teeth
mètɔk	*Voacanga* spp. Apocynaceae	hernia, worms
tùbù	*A. leiocarpus CD Guill pen* Anogeissus	jaundice; stomach;diarrh;teeth
tulu	*Terminalia macroptera* Combretacea	diarrhea,intestinal worms
tuú tuɔɔm		to chase snakes
dùlùmber		TR incense chases snakes
Grasses,	**herbs, vines:**	
bìnjammê	*Epathorium odoratum* Compositae	cut wound; abscess
cìnjolo	*Bidens pilosa* Compositae	aches,jaundice
jolo	*Panicum maxima* Jacq. Poaceae	oath swearing, protection
manabu		child birth
mbentò	*Spilanthes filicaulis* Compositae	teeth; child birth
némadù		helps child to walk
nó	*Clerodenron scandens* Lamiaceae	umbilical chord
njàgà	*Cyperus articulatus* L. Cyperacea	malaria; fevers
ŋgèna télaá	*Commelina benghalensis* Commelinaceae	eyes; menstr
njieè		vertige'(epilepsy); malaria
nyuri cimî	*Ageratum conizoides* Compositae	chbirth; wounds;eyes;headache
nyuri sér	*Oxalis radicosa* A.Rich Oxalidaceae	gives appetite
nyuri njuù		teeth
nyuií		Stomach, headache
tiendoòb	*Emilia coccinea* Compositae	poisoning
tubu ŋgaám		divination
soó	*Aframomum cf melegata* Zingiber	divination,base of healing
yoó	*Vernonia amygdalena* Compositae	children crying; intestinal worms

Table 12

Food plants based on information from free lists and trail walks

Total number of foods mentioned as food from freelists and trail walk information: 35

Name	Other name	Scientific name	Part eaten
Total number of cultivated food plants: 11 (2 trees, 9 plants)			
Cèb		*Cucumis* spp. Cucurbitaceae	leaves and fruit boiled
Gueè-tágie	carotte	*Coleus esculentus* Plectranthus	tuber boiled
Kwéé	taro	*Iolocasia esculenta* Araceae	tuber boiled
ŋgwàgàmè	corn, maize, butali(Fu)	*Zea mays* Poaceae	grains
Sulimbié		*Lageneria* sp*p.*	seeds boiled in sauce
Gaŋ	okra		fruit boiled in sauces
Tombi	macabo		F/tuber, boiled
Maŋgoró			fruit raw
Yulu	mil	*Sorghum* spp. Poaceae	grains; trad. staple
Píâ	avocat		
Total number of semi-wild food plants: 10 (1 tree, 8 plants, 1 cross cutting category tree/plant)			
Daar tèrè		*Cyphostemma (*stend.) Descoing Vitaceae	leaves boiled in sauce
Daar		*Hibiscus sabdariffa* Malvaceae	leaves boiled, flower in drinks
Kweri		*Cajanus cajan* Linn. Millsp. Papillonoideae	dry seeds (pea) boiled
Lapsur (Fu)			leaves boiled in sauce
Mgbéra			leaves boiled
Tìeè	wild yam		fruit boiled
Huéh			leaves boiled
Tíndar		Solanum spp.	leaves boiled
Teér	palmier,darli(Fu)	*Elaeis guineensis* Palmae	oil, wine,broom of branches
Yoó	ndolé	*Vernonia amygdalena* Compositae	
Total number of wild food plants: 15 (9 trees, 6 plants)			
Manjérêb			leaves boiled
Bubogó			
Gwɔgɔb			fruit, eat raw
Njàgà		*Mariscus alternifolius* Vahl Cyperaceae	racemes raw, sweet
Njieè	gene(Fu)	*Cyperus procerus* Cyperaceae	race,mes raw, sweet
Bàgà			fruit raw
Bɔŋbɔŋ			edible fruit

Gombo			eat fruit ,sweet
Hibí		*Syzigium macrocarpa* Myrtacea	fruit raw
Mbikú			*leaves in sauce*
Mvuúr	galbiije	*Vitex doniana* Lamiaceae	fruit raw
Se	rima jogoo-hi/je	*Crossopteryx febrifuga* Rubiacea	fruit raw
Tùbù		*A. leiocarpus CD Guill pen* Anogeissus	fruit raw
Van			fruit raw
Tuú Yùòm			fruit boiled or grilled

Table 13

Trailwalk use elicitation exercise: Sample size: 16 individuals

<u>Trees mentioned as firewood by different groups</u>

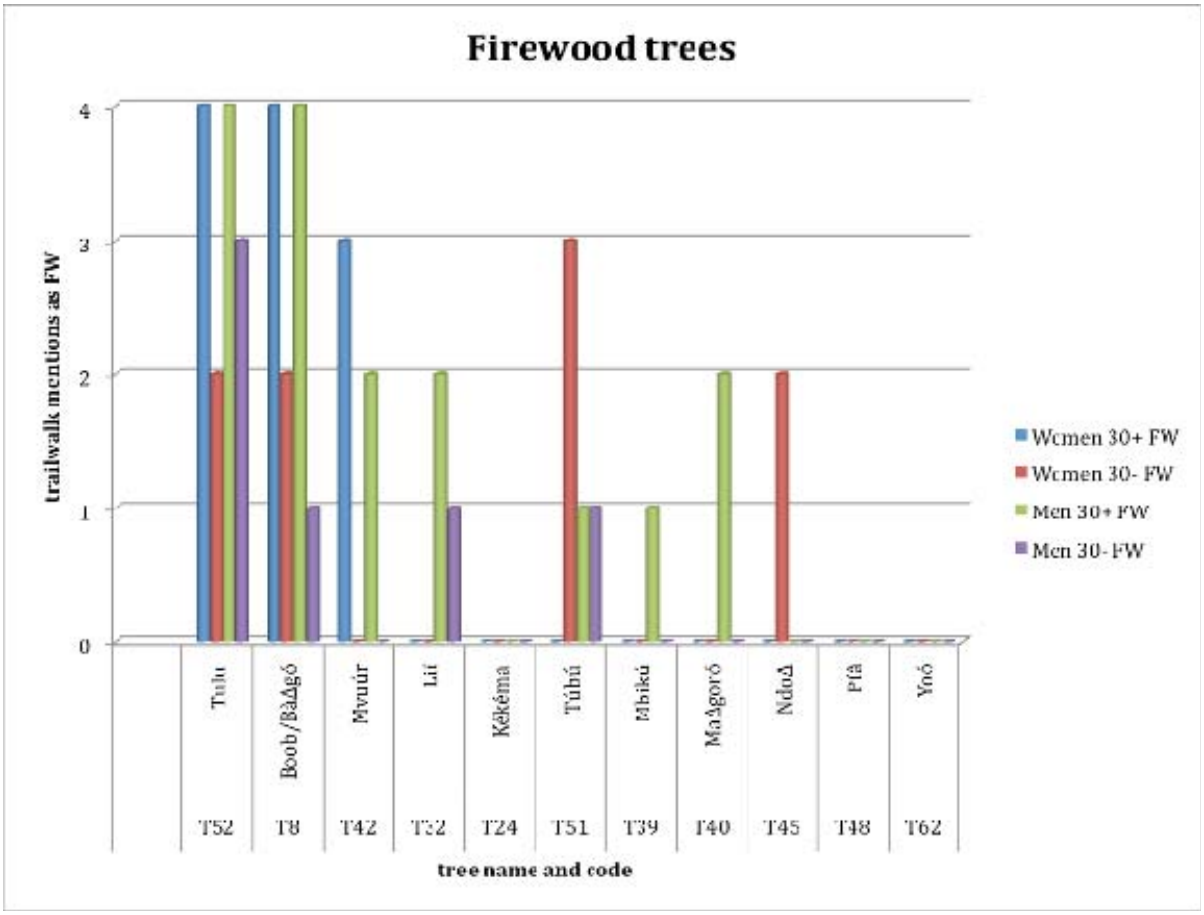
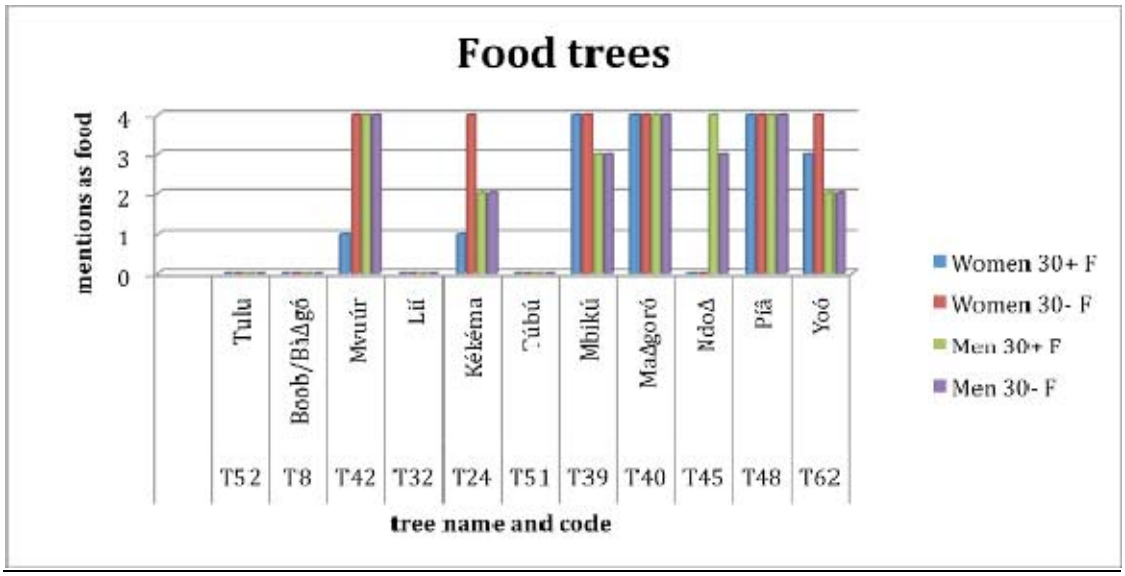


Table 14

Trees and other plants mentioned as sources of food (wild or cultivated)



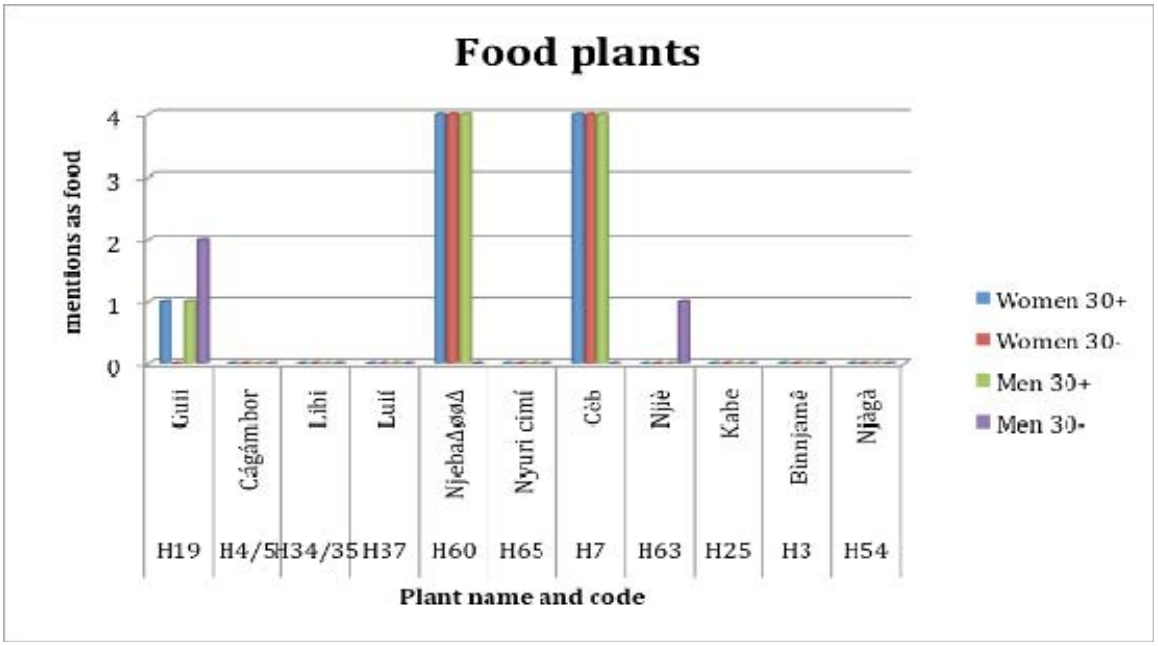


Table 15

Free list anlysis (trees) with ANTHROPAC showing variation in clustering of individuals in groups

Free list mentions of trees from 36 individuals

Women between 30 and 84 years

Women between 15 and 30 years

Men between 30 and 88 years

Men between 15 and 30 years

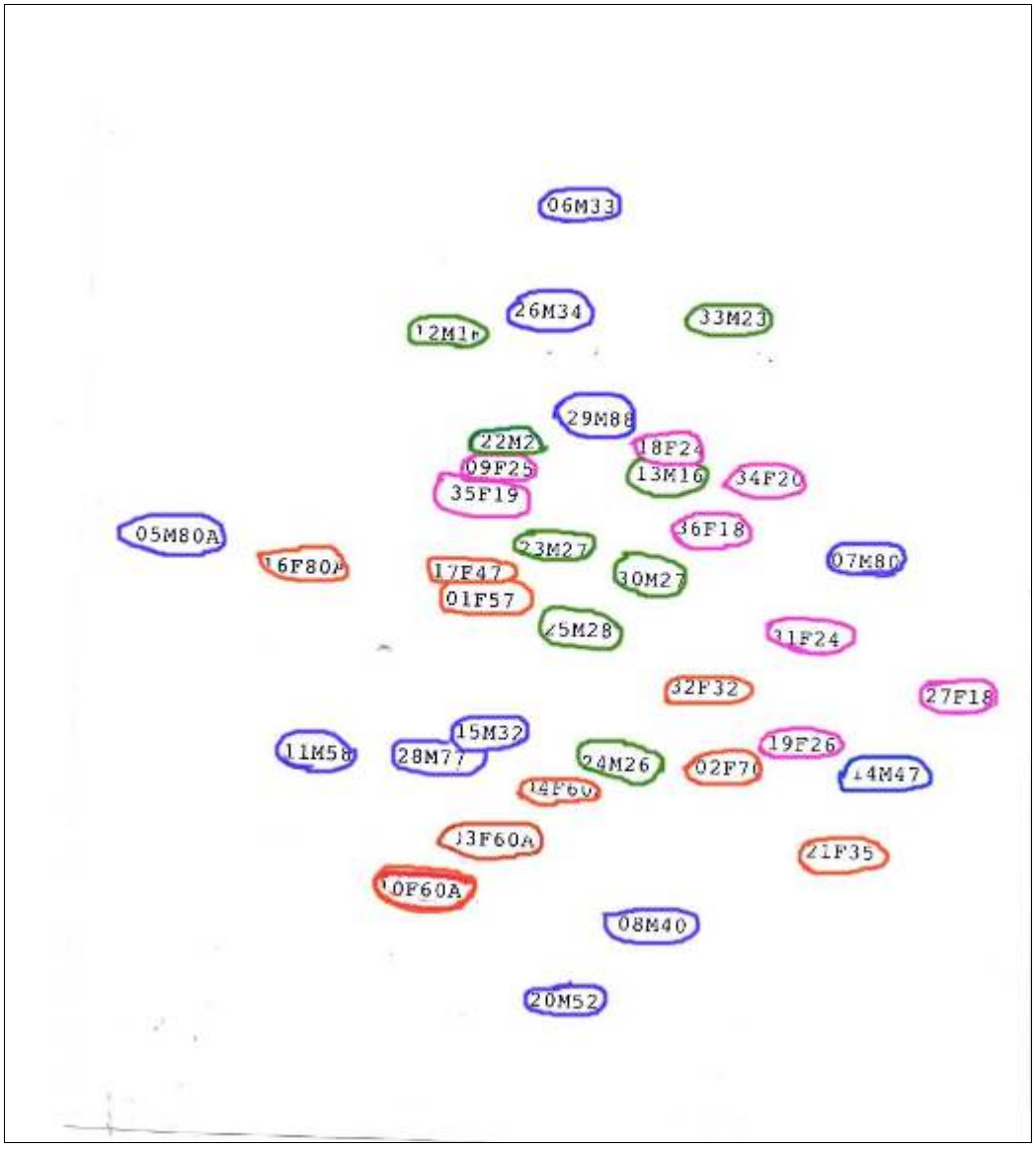


Table 16

Free list analysis with ANTHROPAC showing variation in clustering of individuals in groups

Free list mentions of grasses, herbs, vines and bulbs collected from 36 individuals

Women between 30 and 84 years

Women between 15 and 30 years

Men between 30 and 88 years

Men between 15 and 30 year

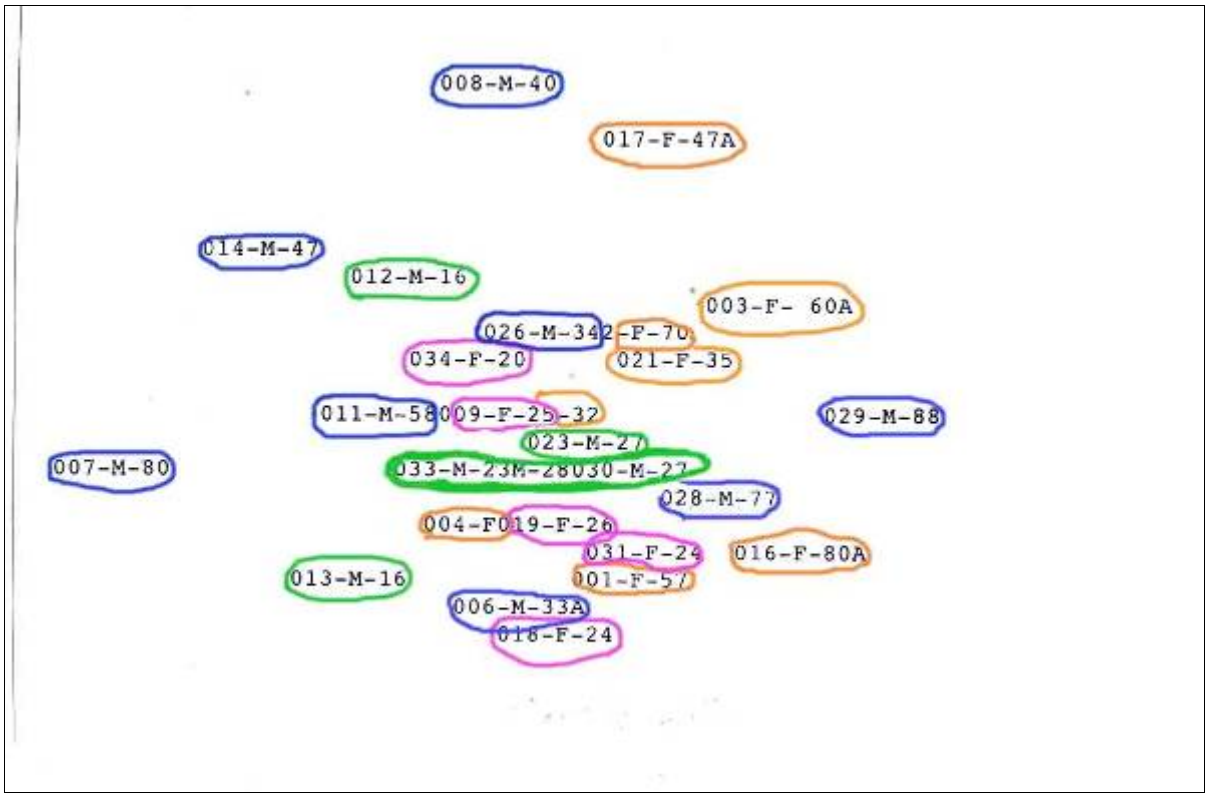
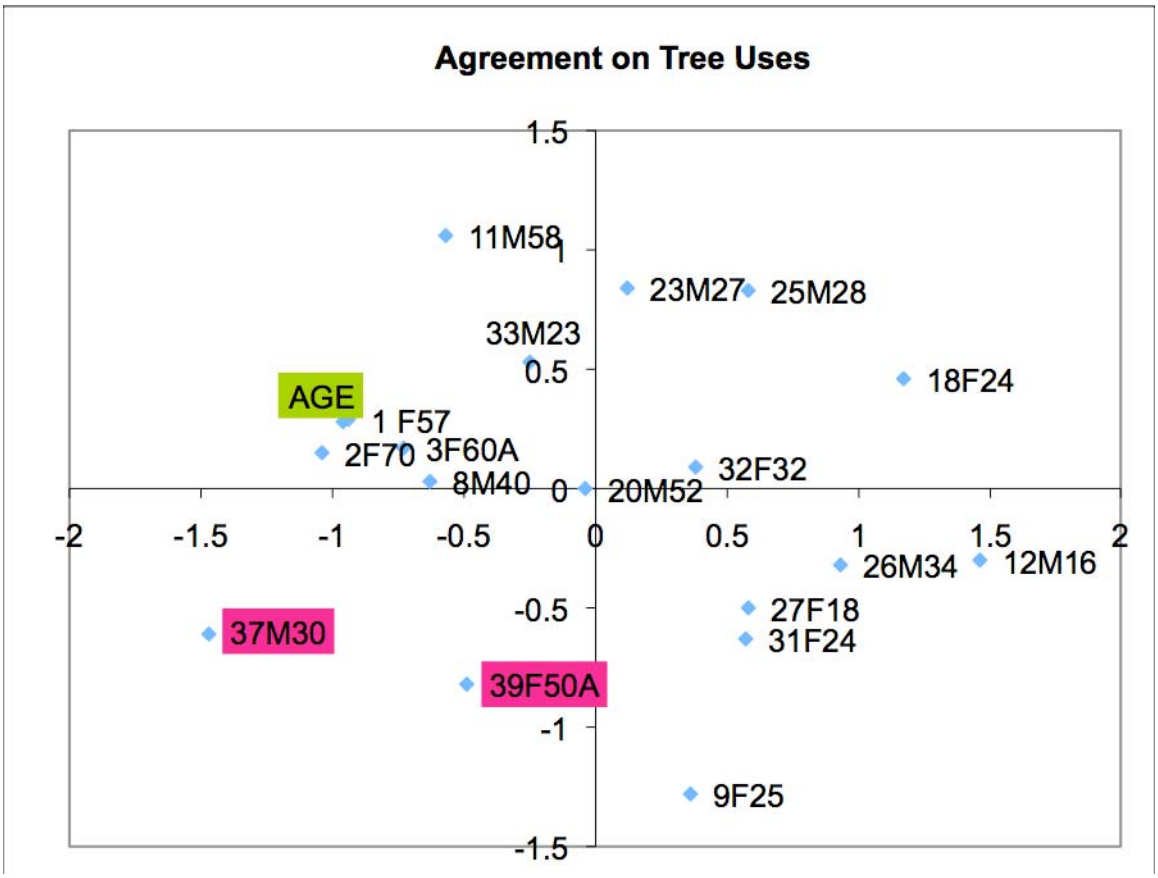


Table 17

Agreement on tree uses on trail walk analysed with ANTHROPAC regression analysis

Sample size: 18 individuals

Arrow shows AGE dimension increasing from lower right to upper left. This is a statistically significant relationship ($p<.013$) that explains about half ($r2= 0.48$) of the variation among informants with regards to uses of trees given



Agreement on tree uses on trail walk

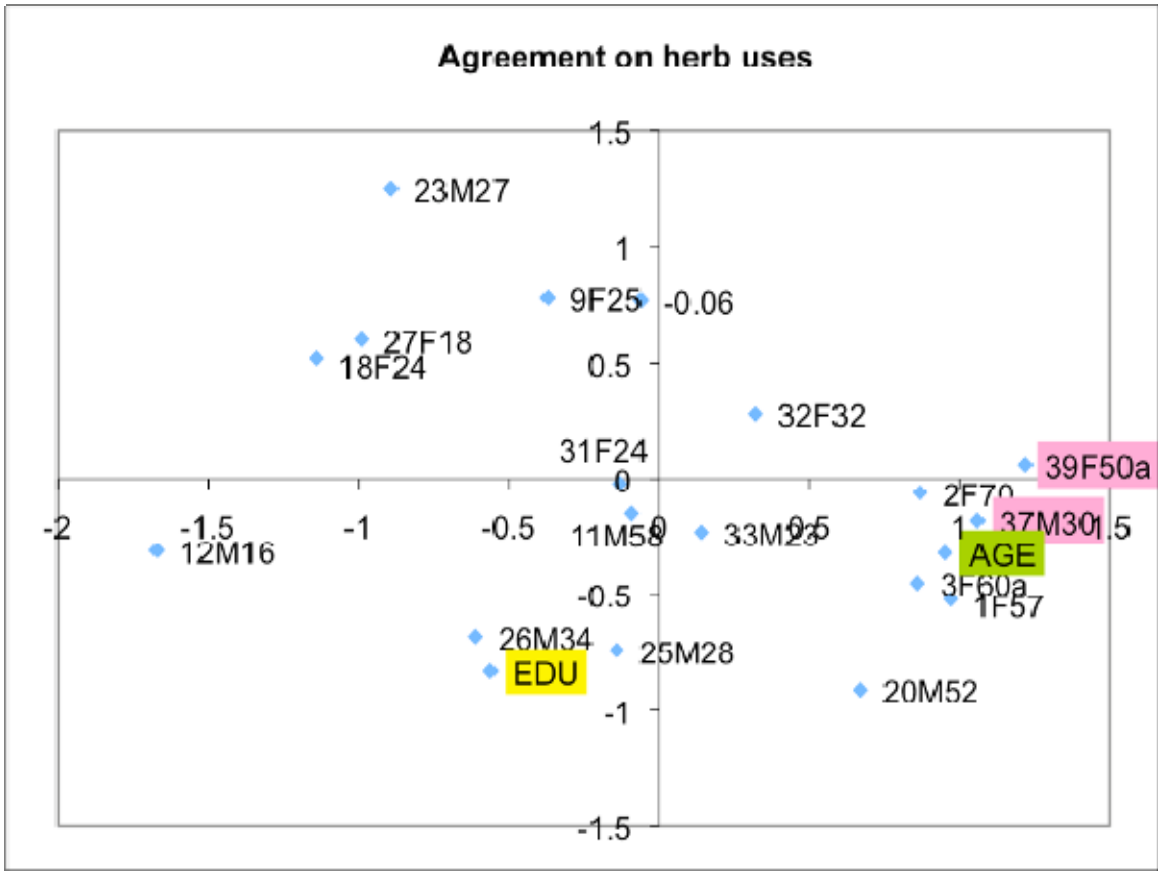
Variable	Mult R	R-Squared	Probability	
AGE	0.691	0.477		0.013
EDU	0.468	0.219		0.163
SEX			0.002	0.548

X	Y
01F57	0.29
02F70	0.15
03F60a	0.17
08M40	0.03
09F25	-1.28
11M58	1.06
12M16	-0.3
18F24	0.46
20M52	0
23M27	0.84
25M28	0.83
26M34	-0.32
27F18	-0.5
31F24	-0.63
32F32	0.09
33M23	0.53
37M30	-0.61
39F50a	-0.82
AGE	0.28

Table 18

Agreement on plants (grasses, herbs) on trail walk analysed with ANTHROPAC regression analysis

Sample size: 18 individuals



Agreement on plant uses (grasses, herbs) on trail walks

PROFIT: Regression results against MDS plot of agreement on herb uses

Variable	Mult R	R-Squared	Probability
AGE	0.708	0.501	0.005
EDU	0.535	0.286	0.089
SEX		0.001	0.59

x	Y
01F57	-0.52
02F70	-0.06
03F60a	-0.45
08M40	0.77
09F25	0.78
11M58	-0.15
12M16	-0.31
18F24	0.52
20M52	-0.91
23M27	1.25
25M28	-0.74
26M34	-0.68
27F18	0.6
31F24	-0.02
32F32	0.28
33M23	-0.23
37M30	-0.18
39F50a	0.06
AGE	-0.32
EDU	-0.83
+	0

Table 19

Summary list of transmission channels of ethnobotanical knowledge

Patterns in ethnobotanical knowledge transmission

Data based on freelists illustrating how knowledge about plants in particular domains is transmitted

1 mother
2 friend
3 grandparent
4 father
5 child experience
6 family member
7 spouse
8 friend
9 specialist
10 village member
11 stranger
12 school
13 neighbour

NAME	Inf.code	Food	Medicine	Firewood	Ritual	Constr. /Craft	Weed
Veyo Marguerite	1F57	1	1,2,6	1	5		1
Waŋ Christine	2F70		1,6				
Kea Monique	3F60a		1,4,6				
Tua Julienne	4F60a		1,4,6				
Theya Monique	10F60a		1	1			4
Wom Marguerite	16F80a		4	4	6	4	4
No Henriette	17F47	1,4,5	1,4,11				
Leke Regine	21F35			1,7,12			5,6
Lofe Monique	32F35		1,6,13	1			
Tabesam Louise	39F50a						
Mbiti Martine	9F19	1		1			

Lomi Clarisse	18F24	1,5		1			
Tiesam Elisabet	19F26	1,11	3	1			
Ge Marie	27F18	1		1,3			3
Temagoue Josephine	31F24	1	1				
Fadi Matu	34F20	4					4
Vekuu Baba Marti	35F19	1					
Mea Mirabel	36F18	1		1			
Nyagati Francois	5M80a						
Lilie Jonas	6M33	5,7	4				
Leban Gevede	7M80		4	4	4		
Bekimi Jean Claude	8M40	8		4,5,8		4	4
Baba Joel	11M58	1	4	1,4,5	4	4	
Yilyioko Martin (Lugha)	14M47	1,11	4,9,11			9,11	
Djidabe Jonas	15M32	1	1,4		4	4	
Sule Bager	20M52		4,8		1,5,6	4,6	
Ndissam Jean Claude	26M34	1,4		1,4		1,4,9	
Mama Simon	28M77		4		4		
Djumbiti Elouard	12M16	1,4,5					3
Candel Mela	13M16	1,4,5		1			
Kounaka Prosper	22M23	5		1			1,4
Nuarsam Antoine	23M27	1,5	4				
Leju Lazare	24M26	1,6		6		6	4
Kunaka Fidel	25M28		6			4,6	

Table 20

Knowledge transmission channels for different use categories based on free lists from 36 individuals

	Food	Medicine	Firewood	Ritual	CO\CR	Weed
Mother	17	10	11	1	1	2
Friend	0	1	0	0	0	0
grandparent	0	1	1	0	0	2
Father	7	12	5	4	7	6
child experience	7	0	2	2	0	2
family member	1	6	1	2	3	2
Spouse	1	0	1	0	0	0
Friend	1	2	1	0	0	0
Specialist	0	1	0	0	2	0
village member	0	0	0	0	0	0
Stranger	2	2	0	0	1	0
School	0	0	1	0	0	0
neighbour	0	1	0	0	0	0

Appendix III

Statements

1. Note on orthography

The orthography used in this study is based on Mona Perrin's (Perrin 1987) revised *Alphabet and Orthography Statement for the Mambila Language* (2005). Some deviations from the above-mentioned orthography stem from the fact that Mona Perrin's dictionary was written for the Mambila dialect of the neighbouring village Atta. As this study was done in collaboration with the Mambila Dictionary Project, which aims to compile dictionary data for the Mambila dialect of Somié, all orthographic transcriptions of Mambila plant names were supplied by my research assistant Daniel Tchiebeu, who is an active member of the Mambila Dictionary Committee and who was formally trained for this type of lingusitic work. He has worked extensively with Dr. Bruce Connell and Dr. David Zeitlyn on Mambila orthography. I am greatly indebted to his infatiguable help and assistance with the transcriptions.

Voucher specimen collections

80 Mambila plant names for the Mambila Dictionary Project. Initially, I had worries concerning plant collection in the wet tropics and identification in the field because many trees were not expected to be in flower, and because there was no botanical field guide available for the area of my study. Voucher specimen collection methods such as the Schweinfurt method, and carrying large equipment such as pruning poles and big saws presented logistical difficulties and were discouraged by my tutors at Kent and Kew, as well as by the director of the National Herbarium in Yaounde, Cameroon.
Equipped with a plant press from the Ethnobiology Lab at Kent University, jewellers tags and small zip lock bags donated from Kew, as well as 20 blotting papers and 20 corrugated metal separators, which I left with the National Herbarium, in Yaounde as a gift from Kew, I decided to follow the advice of Kew specialists, and organised the remaining collection materials onsite.
Newspapers are sold in Cameroon in bulk by shops that specialise in car repairs and painting, and cardboard is easy to come by on market day when vendors pack up their ware.

The three additional plant presses that a local carpenter in the village made for me were simple plywood sheets cut to size and with large holes drilled into them for air circulation. Straps to tie them together were cut from the inner tubes of car tires.

I generally took one plant press into the field and collected plant specimens in a preliminary press between sheets of newspaper (fig. 25), and subsequently arranged them between blotting paper and metal sheets upon my return to the house. I tried to collect mainly plants that were mentioned on free lists, however, fertile specimens were preferred and influenced my choice of specimen collection. For each voucher specimen, I noted GPS position, basic description of the plant and its surroundings. I also recorded the uses named for it by my field assistant (on tape) and tried to note uses mentioned by villagers who curiously followed my "daily drying routines". I also tried to take a photograph of the plant in the field or on a sheet of white paper (fig.26) for future identification purposes, but this was often difficult due to weather conditions or time constraints in the field.

Figure 23. Collecting in the field (photo D. Zeitlyn)

Figure 24. Voucher specimen of *Terminalia macroptera* (R.K)

I left the plants in the press overnight, hung them above cooking fires early in the morning, and took them into the sun later in the day (fig 26).

Figure 25. Drying secimens in the sun (photo R.K.)

collection, changing moist papers and rearranging the position of still moist plants in the presses. This system proved simple and effective, but it had a few organisational drawbacks.
As the number of voucher specimens increased, so did the time spent on their drying and sorting, as some plants that were more fleshy than others, needed special attention.
Too slow drying sometimes resulted in mould forming on the specimen, or leaves and flowers began to fall off. At the end of my stay, some people were happy to have the used newspapers, and accidentally might have taken some of the pressed specimens between the sheets.
I transported the specimens in a hard case donated by Kew and delivered one copy at the National Herbarium in Yaounde where they were taxonomically identified by herbarium specialists for a fee. As I had only one copy of some of the specimens, I was told to take some of the more common species to Kew as the herbarium in Yaounde neither has sufficient space for voucher specimen storage, nor enough material to mount specimens.
Export permits for the voucher specimens (phytosanitary form) were obtained at the Douala airport at a fee, before I left Cameroon.

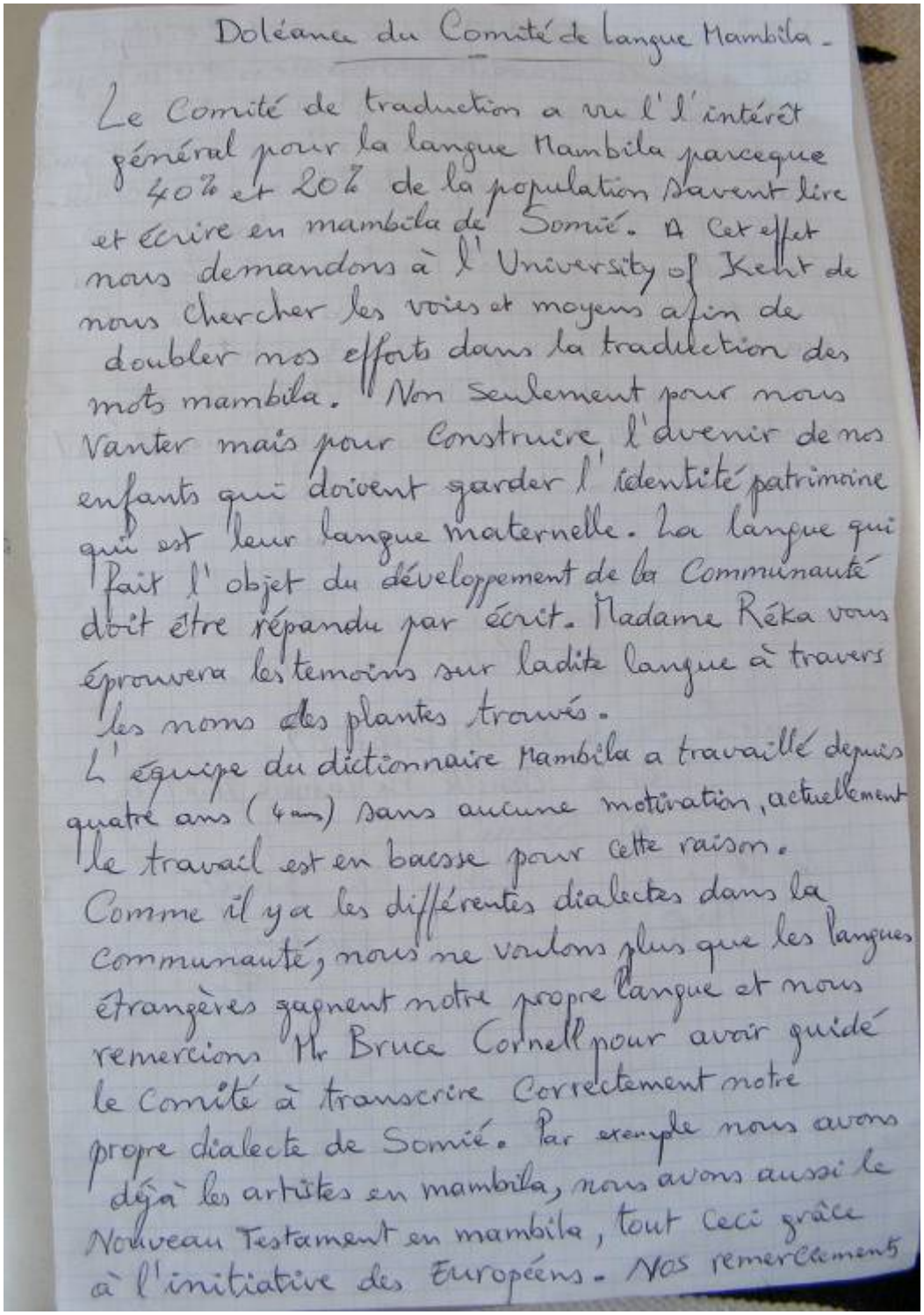
Labels for the herbarium specimens were handwritten onto printed label forms in Yaounde, and, at Kew, were entered into the Kew database and prepared according to specifications set out in Bridson and Forman (1999). Specimens were not sterilised or treated for pests in Yaounde but underwent a

48 hour sterilisation procedure in a freezer at Kew before being taken into the herbarium for further handling.

Currently, they are in the process of being mounted and subsequently, identified by Martin Cheek and other specialists in Cameroonian flora (fig.26).

Figure 26. Mounted specimen of **tulu (***Terminalia macroptera)*

3. Letter from the Mambila Language Committee to the University of Kent at Canterbury

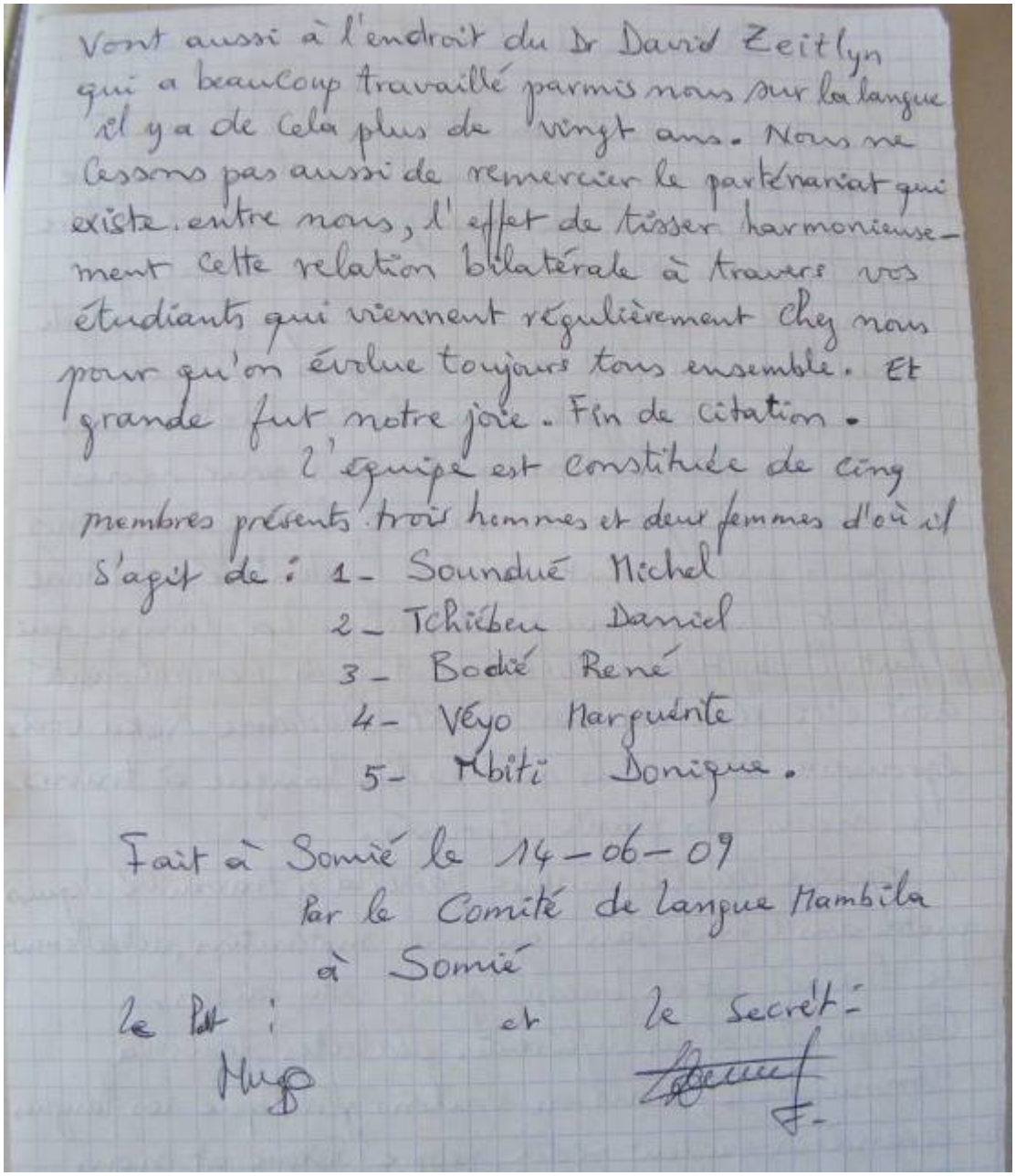


Doléance du Comité de langue Mambila.

Le Comité de traduction a vu l'l'intérêt général pour la langue Mambila parceque 40% et 20% de la population savent lire et écrire en mambila de Somié. A Cet effet nous demandons à l'University of Kent de nous chercher les voies et moyens afin de doubler nos efforts dans la traduction des mots mambila. Non Seulement pour nous Vanter mais pour Construire l'avenir de nos enfants qui doivent garder l'identité patrimoine qui est leur langue maternelle. La langue qui Fait l'objet du développement de la Communauté doit être répandu par écrit. Madame Réka vous éprouvera les temoins sur ladite langue à travers les noms des plantes trouvés.

L'équipe du dictionnaire Mambila a travaillé depuis quatre ans (4ans) Sans aucune motivation, actuellement le travail est en baisse pour cette raison.

Comme il y a les différentes dialectes dans la communauté, nous ne voulons plus que les langues étrangères gagnent notre propre langue et nous remercions Mr Bruce Cornell pour avoir guidé le Comité à transcrire Correctement notre propre dialecte de Somié. Par exemple nous avons déjà les artikes en mambila, nous avons aussi le Nouveau Testament en mambila, tout Ceci grâce à l'initiative des Européens. Nos remerciements



vont aussi à l'endroit du Dr David Zeitlyn qui a beaucoup travaillé parmis nous sur la langue il y a de cela plus de vingt ans. Nous ne cessons pas aussi de remercier le partenariat qui existe entre nous, l'effet de tisser harmonieusement cette relation bilatérale à travers vos étudiants qui viennent régulièrement chez nous pour qu'on évolue toujours tous ensemble. Et grande fut notre joie. Fin de citation.

L'équipe est constituée de cinq membres présents trois hommes et deux femmes d'où il s'agit de : 1- Soundué Michel
2- Tchibou Daniel
3- Bodié René
4- Véyo Marguérite
5- Mbiti Donique.

Fait à Somié le 14-06-09
Par le Comité de langue Mambila
à Somié
le Pdt : et le Secrét :

The Mambila Language Committee was established in 1998 with the aim to promote mother- tongue education in the Mambila dialect of Somié and to assist the Mambila Dictionary Project. According to their information, teaching efforts have, to date, resulted in literacy skills for approximately 50 villagers who can now read (only approximately 15-20 of these can also write). Presently, the committee is to a large extent inactive, due to a lack of funds for teaching materials. In this letter, the Committee expresses their gratitude to the University of Kent for their cooperation and interest, and for the students who keep coming to the village.

4. Reflections on the fieldwork

Conducting research in a foreign environment represents an adventure of inner and outer journeying. It is my passion for the discipline of people and plants, and my deep respect and sense of comradeship for all fledgling ethnobotanical fieldworkers that inspire me to share some of these deeply personal observations. May both the discipline and the disciples benefit from it.

The balancing act between objective, quantifiable observation and the more organic and human participant observation that is continuously present in any researcher-participant interaction, combined with the physical and psychological challenges of fieldwork affected me during my 5 week stay in the village in multitudinous ways.
Psychologically, I experienced a shift in the sense of privacy and the need to define my own cultural and personal identity as well as my role as a representative of Kent University. I felt observed by the "communal eye of the village" no matter what I did or where I went in the village and found that this affected my behaviour in several, often irrational ways. As my entire identity in the village was based on me being a student, and therefore on a very low budget, I was reluctant to spend money in the village on things that could have helped me when I was ill, depressed or simply in need of human company. I therefore initially avoided buying bottled water which is very expensive and a sign of relative "wealth", as well as cooked food on market day and gifts from the market for myself or for presents. Having to maintain a "hard" point on matters of finance when people came to ask me for money turned out to be the principal difficulty of my stay, often affecting me emotionally and creating a "me -and -them " feeling that was otherwise absent in my relations with the villagers.

Maintaining a cultural identity and at the same time respecting the local culture was, in general, an effortless dance. However, there are invisible processes at work when one is on unfamiliar grounds having to adjust to things that might be opposite to one's own belief systems. Having to sit through a church gathering on International Women's' Day when I was suffering of my third day of malaria-like fever, was one of these tests, and resulted in subsequent conversations with people about my, readily accepted, non- affiliation to any world religion. Similarly, I had to consciously distance myself from accepting "special remedies" from a traditional practitioner for certain health problems such as a sudden bout of severe constipation brought about (most probably) by the change in diet and as a result of high fever. I also observed that the belief in witches started to "contaminate" me, and I became very conscious of never closing the door while I was in the house during the day, or to consume food by myself behind closed doors.

As I encountered some plants that I had personal experiences with as herbal remedies, I started to

make my own ‘medicine' and shared knowledge of their preparation and use with anyone who showed interest. My ways of self- medicating without the use of Western medicine gave me a reputation of being knowledgeable with plants, and the chief, his first wife and several other individuals sought out my opinion on health issues .
The daughter of a renowned traditional practitioner accepted my powder made from a plant unknown to the Mambila (*Mimosa pudica*) as a relaxant and sleep inducer when she was suffering from fever and insomnia due to pains caused by her wisdom teeth. These interactions were the highlights of my stay in the village and gave me inspiration for further research ideas on the cross- fertilisation of medicinal plant uses across cultures. They also encouraged individuals who were knowledgeable in this domain to share their knowledge with me in exchange.

In retrospect, I want to emphasise that being open minded and patient with oneself and others is the best recipe for a " safe sail" on the deeply personal voyage into the field.

References:

Alexiades, M., Sheldon, J.W. (1996). *Selected Guidelines for ethnobotanical research.* New York Botanical Garden.

Assi, L.A., Abeye, J., Guinko, S., Giguet, R. and Bangavou, X. (1985) *Médecine traditionelle et pharmacopee*. *Contribution aux etudes ethnobotaniques et floristiques en Republique Centrafricaine.* Agence de Cooperation Culturelle et Technique.

at the Symposium on Language Endangerment in Africa. Leipzig.

Batibo, H.M. (2001). "The Endangered Languages of Africa, A Case Study from Botswana", in L. Maffi ed, *On biocultural diversity, linking language, knowledge and the environment.* Smithsonian Books.

Benz, et al (2000). *Losing Knowledge about Plant Use in the Sierra de Manantlan Biosphere Reserve, Mexico.* Economic Botany 54(2*):* 183-191.

Berlin, B. (1992). *Ethnobiological classification: Principles of Categorization of Plants and Animals in Traditional Societies.* Princeton University Press.

Berlin, B., D. Breedlove and P. Raven (1973). *General principles of classifiation and nomenclature in folk biology.* American Anthropologist 75: 215-242.

Bernard, H. R. (2006). *Research Methods in Anthropology: qualitative and quantitative approaches.* Alta Mira Press.

Blench, R. (2006). *Fulfulde Names for Plants and Trees in Nigeria, Cameroun, Chad and Niger.* http://www.rogerblench.info/Ethnoscience%20data/Fulfulde%20Plant%20names.pdf

Borgatti, S. (1996). *ANTHROPAC 4.0* Natick, MA: Analytic Technologies.

Boster, J.(1986). *Exchange of varieties and information between Aguaruna manioc cultivators.* American Anthropologist 88(3): 569-583.

Bridson, D. and L. Forman, eds (1991). *The Herbarium Handbook.* Royal Botanic Gardens, Kew.

Brush, S.B. (1993). *Indigenous knowledge of biological resources and intellectual property rights: The role of anthropology.* American Anthropologist 81:841-873.

Caniago, I., Siebert, S.F. (1998). *Medicinal plant economy, knowledge and*

Connell, B (1998). *Moribund Languages of the Nigeria- Cameroon Borderland.* Presented

Conservation in Kalimantan, Indonesia. Economic Botany 52(3): 229-250.

Dounias, E., Bahuchet, S., Froment, A., de Garine, I. (2001). *Connaissance et utilisation de l'environnement par les societes du Centre du Cameroun dans l'ecotone foret-savane*. Operation "Systemes Ecologiques et Actions de l'Homme", Programme "Environnement -Vie-Societe" du CNRS, Rapport final.

Ellen, R. (1979). *Omniscience and ignorance. Variation in Nuaulu knowledge, identification and classification of animals.* Language in Society 8:337-364.

Ellen, R. (2003). "Variation and uniformity in the construction of biological knowledge across cultures", in Selin, H. *Nature across Cultures: Views of nature and the environment in non-Western cultures.* Kluwer Academic Publishers.

Etkin, N (1994). *The Cull of the wild. Eating on the wild side: the pharmacologic, ecologic and social implications of using non cultigens*. The University of Arizona Press: 1-24.

Etkin, N.L. 2002. *Local Knowlegde of biotic diversity and its conservation in rural Hausaland, Northern Nigeria,* Economic Botany. 2002 56(1): 73-88.

Fowler,I., Zeitlyn, D. (1996). *African Studies. Vol.2. African Crossroads. Intersections between History and Anthropology in Cameroon.* Berghahn Books, Oxford.

Gardner, H. (1984). "The Development of Competence in Culturally Defined Domains: A Preliminary Framework", in Schweder, R. and Le Vine, R. *Culture Theory: Essays on Mind, Self, and Emotion.* Cambridge University Press.

Gausset, Q. (1998). *Historical Account or Discourse on Identity? A Reexamination of Fulbe Hegemony and Autotochtonous Submission in Banyo.* History in Africa 25: 93-110.

Gausset, Q. (2005) "Agro-pastoral conflicts in the Tikar Plain (Cameroon*)",* in *Beyond territory and scarcity : Exploring conflicts over natural resource management*. Uppsala : Nordiska Afrikainstitutet, 2005. 90-111.

Ghimire, S., McKey, D., Aumeeruddy-Thomas, Y.2005. *Heterogeneity in ethnoecological knowledge and management of medicinal plants in the Himalayas of Nepal: implications for conservation*. (online)URL: http://www.ecologyandsociety.org/vol9/iss3/art6/

Grimaldi, J. Bikia, A. (1985). *Le grand livre de la Cuisine Camerounaise.* Editions Sopecam

Hill, J.H. (2001). "Dimensions of attrition in language death", in Maffi, L. (2001). *On Biocultural Diversity: Linking language, knowledge and the environment.* Smithsonian Instiiution Press.

http://pagesperso-orange.fr/geza.roheim/tikar/Report-Zapfack.pdf (accessed 24.04.2009).

Hunn, E.S. (2002). " Evidence for the precocious acquisition of plant knowledge by Zapotec children", in Stepp, J.R., F.S. Wynfham, and R. Zarger, eds. *Ethnobiology and biocultural diversity.* University of Georgia Press.

Hurault, J. (1998) *Land Crisis on theMambila Plateau of Nigeria, West Africa.* Journal of Biogeography 25: 285-299.

Lamare, M. M., (1975). *La Médecine Bamoun. Etude d'Anthropologie.* Edition Lamaro. Yaounde.

Letouzey, R. (1986). *Manual of Forest Botany*. *Tropical Africa.* Centre Technique Forestier Tropicale. Nogent -sur-Marne.

Letouzey, R. 1985. *Carte phytogéographique du Cameroun. Herbier National, Yaoundé*; Inst. De la Carte Int. de la Végétation, Toulouse.

Lozada, M., Ladio, A., Weigandt, M. (2006). Cultural transmission of Ethnobotanical Knowledge in a rural community of Northwestern Patagonia, Argentina. *Economic Botany* 60(4): 374-385.

Mabberley, D. J. (2008). *Mabberley's Plant Book. A portable dictionary of plants, their classification and uses.* Cambridge University Press.

Maffi, L. (2001). *On Biocultural Diversity: Linking language, knowledge and the environment.* Smithsonian Instiiution Press.

Martin, G. (2004). *Ethnobotany. A Methods Manual.* Earthscan.

Materials of James Mooney", in Stepp, J.R., Wyndham, F.S. and Zarger, R.K. 2002. *Ethnobiology and Biocultural Diversity.* University of Georgia Press.

Moerman, D. E. 1979. *Anthropology of symbolic healing.* Current Anthropology, 20(1): 59-80.

Muller-Schwarze, N.K. (2005). *Antes and Hoy Dia: Plant Knowledge and Categorization as Adaptations to Life in Panama in the Twenty-First Century*. Economic Botany 60(4): 321-334.

Nemoga Soto, G.R (2004). *Inter and intra- cultural variation of medicinal plant knowledge in the tropical forest of Calakmul, Mexico: Implications for the conservation, protection and resilience of traditional knowledge*. PhD thesis, University of California.

Olorode, O. (1984). *Taxonomy of West African Flowering Plants.* Longman.

Pawley, A (2001) "Some Problems of Describing Linguistic and Ecological Knowledge" in L. Maffi (ed) *On Biocultural Diversity; Linking Language, Knowledge and the Environment.* Smithsonian Institution Press.

Perrin, M. (1987). *Alphabet and Orthography Statement for the Mambila Language*. Société Internationale de Linguistique. Yaoundé.

Perrin, M. and M. Mouh (1995). Lexique mambila-français. Yaoundé: SIL

Pfeiffer, J.M., Butz, R.J. 2005. *Assessing cultural and ecological variation in ethnobiological research: the importance of gender.* Journal of Ethnobiology 25(2): 240-278.

Phillips, O. and Gentry, A.H (1993). *The useful Plants of Tambopata, Peru: II. Additional hypothesis testing in quantitative ethnobotany.* Economic Botany 47(1): 33-43.

Rehfisch F. (1956): *The Social Structure of a Mambila Village. 1956*. University of London unpublished MA Thesis. Accessed on http://www.era.anthropology.ac.uk/ on 25.08.09.

Rehfisch, F. (1969). "Death, Dreams and the Ancestors and Mambila Culture." In *Man in Africa* eds.) M. Douglas, & P. M. Kaberry. London: Tavistock Press.

Rehfisch, F. 1972. *The Social Structure of a Mambila Village* Zaria: Ahamadu Bello University: Sociology Department (Occ. Paper 2).

Reyes- Garcia, V. (2001). *Indigenous People, Ethnobotanical Knowledge , and Market Economy. A Case Study of the Tsimane Amerindians in Lowland Bolivia*. PhD. Dissertation, University of Florida.

Reyes-Garcia, V., Marti, N., McDade, T., Tanner, S., Vadez, V. (2007). *Concepts and Methods in studies measuring individual ethnobotanical knowledge*. Journal of Etnobiology. 27(2): 182-203.

Roberts, P.A. (1988).”Rural Women’s access to labour in West Africa” in Stichter, S. B., Parpart, J.L. 1988. *Patriarchy and Class. African Women in the home and the workforce.* Westview Press.

Romney, A.K., Weller, S., and W. Batchelder (1986). *Culture as Consensus: A theory of culture and informant accuracy*. American Anthropologist 88:313-338.

Timber and non Timber Forest Products of the Tikar Plain. A Report for IR1/Carpe

Turner, N (1995) “Ethnobotany Today in Northwestern North America” in in R. Schultes and S. von Reis (eds) *Ethnobotany, Evolution of a Discipline.* Dioscorides.

www.era.anthropology.ac.uk

Zapfack, L. and Martine, N.N. (1999). *A Participatory Survey and Inventory of*

Zeitlyn, D. (1994). *Sua in Somie. Aspects of Mambila Traditional Religion.* Sankt Augustin: Academia Verlag. Germany.

Zent, S. (2001)."Acculturation and ethnobotanical kowledge loss among the Piaroa of Venezuela", in Maffi, L. (2001). *On Biocultural Diversity: Linking language, knowledge and the environment.* Smithsonian Institiution Press.

Zent, S. and Lopez- Zent, E. (2004). *Ethnobotanical Convergence, Divergence, anad Change among the Hoti of the Venezuelan Guayana.* Advances in Economic Botany 2004: 38-77. New York Botanical Garden Press