The interaction between market forces and management systems: a case study of non-wood forest products in the humid forest zone of Cameroon

H.C. PEACH BROWN1 and J.P. LASSOIE2

1 Department of Geography, College of Social and Applied Human Sciences, University of Guelph, Guelph, Ontario, Canada N1G 2W1
2 Department of Natural Resources, College of Agricultural and Life Sciences, Cornell University, Ithaca, NY, USA. 14853

E-mail: hcpbrown@uoguelph.ca and JPL4@cornell.edu

SUMMARY

In Cameroon, resources such as non-wood forest products are often managed as common pool resources in customary systems, which have been variously influenced by changes in policy, demographics and market opportunities. This research explored the effects of increasing commercialisation on the customary management systems for three commercially important species, Gnetum spp. (Gnetum), Irvingia spp. (bush mango) and Ricinodendron heudelotii (njansang) in two areas differentiated on the basis of level of commercialisation. Findings showed that increased commercialisation was leading to overharvesting of these products, particularly Gnetum. The customary rules of access were also changing as the perception of improved marketing opportunities was leading to restrictions on access to bush mango and Gnetum. The increasing privatisation of access for njansang has removed it from the common pool, which could negatively affect those women, with insecure access to land, who depend on its harvest and sale as a source of livelihood.

Keywords: Cameroon, non-wood forest products, common pool resources, markets, customary tenure

Interaction entre les forces de marché et les systèmes de gestion: une étude-cas de produits forestiers autres que le bois dans la zone de forêt humide du Cameroun

H.C. PEACH BROWN et J.P. LASSOIE

Au Cameroun, les ressources comme les produits forestiers autres que le bois sont souvent gérées comme une réserve de ressources dans des systèmes habituels, qui ont été influencés de manière variable par des changements de politique, la science démographique et les opportunités de marché. Cette recherche a exploré les effets d’une commercialisation accru sur les systèmes de gestion habituels pour trois espèces d’intérêt commercial: Gnetum spp. (Gnetum), Irvingia spp. (bush mango), et Ricinodendron heudelotii (njansang) dans deux zones différenciées sur la base du degré de commercialisation. Les résultats montraient qu’une commercialisation accrue conduisait à une récolte trop poussée de ces produits, le Gnetum en particulier. Les règles d’accès habituelles changeaient également alors que la perception des opportunités de marketing amélioré conduisait à des restrictions à l’accès au bush mango et au Gnetum. La privatisation croissante de l’accès au njansang l’a retiré du fond commun, ce qui pourrait affecter négativement les femmes ayant un accès non assuré aux terres, et qui dépendent de sa récolte et de sa vente pour leur moyens d’existence.

Interacción entre las fuerzas de mercado y los sistemas de gestión: un estudio sobre los productos forestales no madereros en la zona de bosque húmeda de Camerún

H. C. PEACH BROWN y J. P. LASSOIE

En Camerún, los recursos como los productos forestales no madereros son gestionados a menudo como fuente común de recursos dentro de sistemas tradicionales, que han sido influenciados de forma variable por cambios de política, tendencias demográficas y oportunidades de mercado. Esta investigación analiza los efectos de un aumento de comercialización sobre los sistemas tradicionales de gestión para tres especies de importancia comercial (Gnetum spp. (Gnetum), Irvingia spp. (mango de arbusto/africano) y Ricinodendron heudelotii (njansang) en dos zonas diferenciadas a base del nivel de comercialización. Las conclusiones demostraron que un aumento de la comercialización solía conducir a la cosecha excesiva de estos productos, sobre todo en el caso del Gnetum. El reglamento tradicional en cuanto al acceso cambiaba también, ya que se notaba que la percepción de una mejoría de las oportunidades comerciales llevaba a la imposición de restricciones sobre el acceso al mango de arbusto y al Gnetum. Este proceso de privatización del acceso al njansang lo ha excluido de la fuente común de recursos, lo cual podría afectar negativamente a aquellas mujeres que tienen un acceso poco seguro a la tierra y que dependen de su cosecha y venta como fuente de ingresos.
INTRODUCTION

Africa has experienced many changes which have influenced institutional arrangements that developed to govern natural resources. Initially these changes occurred over many centuries as people migrated across the continent gradually influencing each others’ culturally-based systems (Oyono 2003, Vansina 1990). European colonisation had a dramatic influence on this evolution, and when countries gained their independence in the 1960’s they often continued the same centralised systems introduced by the colonisers (Delville 2000, N’emarundwe 2004). Nevertheless, access to and management of natural resources often remained under the scope of the customary system so that local communities that do not have de jure rights often exerted de facto rights of ownership, use and access to natural resources in much of Africa (Delville 2000, Toulmin and Quan 2000). Today, these communal tenure systems or mixed tenure regimes comprise individual, family, sub-group and larger group rights and duties in relation to a variety of natural resources. The precise definition and articulation of these vary between ecosystems, areas, cultures, countries and regions, and can evolve quite rapidly in response to social and economic change (Cousins 2000).

Non-wood forest products (NWFPs) are valuable forest resources often managed as common pool resources in customary systems (Dia 1997, 1998, Neumann and Hirsch 2000). They are used for food, medicine, construction, cultural and religious purposes. In recent years an emphasis on the commercialisation of these products as a means to reduce poverty and conserve forests became prominent in the environmental and development dialogue (Arnold and Ruiz Pérez 1998, Kusters et al. 2006, Neumann and Hirsch 2000). These lofty goals have now been nuanced by a greater understanding of the complexity of the issues surrounding people’s livelihoods, different forest products and their ecology, and how they interact with market forces (Belcher and Schreckenberg 2007, Ruiz Pérez et al. 2004, Uma Shaanker et al. 2004). Therefore, promotion of the commercialisation of NWFPs is no longer seen as a ‘magic bullet’ to address both challenges in all situations. The monetary value of NWFPs may not form a large part of the livelihood strategies of forest people in all cases, however, it is often a significant supplementary source of cash to meet diverse needs (McGarry and Shackleton 2009, Paumgarten and Shackleton 2009, Ruiz Pérez et al. 2004, Shackleton et al. 2007, Shackleton et al. 2008, Sunderland et al. 2004).

Trade in NWFPs has been common in Africa since the seventh century (Sunderland et al. 2004). With an increase in commercialisation of NWFPs the challenge is how to adapt management systems in order to avoid degradation (Ticktin 2004, Wynberg and Laird 2007). Some feel that the erosion of the authority of hereditary leaders, through both their cooption by colonial regimes and the decentralisation policies of subsequent governments, have in some cases resulted in a situation similar to ‘open access’ in some parts of Africa (Shackleton and Shackleton 2004). In India, Ghate et al. (2009) emphasise the critical need to strengthen local institutions for sustainable forest management. Others feel that cooperation between government and traditional authorities is necessary in order to achieve optimal governance of commercially valuable NWFPs (Wynberg and Laird 2007).

In Cameroon, a factor challenging the management of NWFPs is their increasing commercial value. Research has shown that in the last 25 years in Cameroon, NWFPs have gone from being primarily valued for subsistence use, to being sold on expanding domestic and international markets, leading to concerns about over harvesting (Brown and Lapuyade 2001a, 2001b, Ndoye et al. 1999, Tabuna 2007). This trend has been attributed to the economic crisis beginning in the mid-1980’s and the structural adjustment program that followed. During this time, women, in particular, became increasingly dependent on forest resources for their livelihoods, with the sale of processed NWFPs becoming twice as important as a source of income (Brown and Lapuyade 2001a). In fact, a study of 25 markets in the humid forest zone of Cameroon showed that 89 percent of the NWFP traders were women (Ruiz Pérez et al. 2002). African immigration to Europe and North America resulted in a growing international market for NWFPs to provide consumers of African origin with a taste of home (Tabuna 1999). Increasing urbanisation also led to an expansion of the local NWFP markets (Ndoye et al. 1997/98). The increasing commercial value led to the reorganisation of the Ministry of Environment and Forests in 1998, with the creation of a Department for the Promotion and Transformation of Forest Products with a sub-department to take charge of the Promotion and Transformation of NWFPs (Ndam and Tonye Marcelin 2004, Ngwasiri et al. 2002).

As stated previously, increased commercialisation often has a negative effect on a natural resource, leading to degradation (Agrawal and Yadama 1997, Belcher and Schreckenberg 2007, Crook and Clapp 2002, Ticktin 2004). However, sometimes the level of degradation can be mitigated by the extent of the community’s dependence on NWFPs, its ecological knowledge, low population density, the level of market organisation and availability of domesticated plants on the market (Uma Shaanker et al. 2004, Van Andel and Havinga 2008). According to Gibson et al. (2000) market, technological, demographic and political factors that affect individuals are normally filtered first by local institutions. Given that in Cameroon, local institutions play a predominant role in guiding the daily consumption of natural resources, this paper presents a case study which examines how a customary common pool management system for NWFPs is evolving in the context of increasing commercialisation of these products. Rather than conducting a marketing study which quantifies the dynamics of the NWFP market in terms of volume of trade and its relative contribution to household...
income generation, this research seeks to understand how increased commercialisation of NWFPs interacts with harvesting practices and customary governance at the local level. In particular, it provides insight into the perceptions of local people concerning the change in market forces and how that affects harvesting practices and rules of access for three commercially important NWFPs. In the absence of historical ‘time line data’ in a particular area documenting these described interactions, this study examines two areas in the humid forest zone that represent differing levels of commercialisation. The similarity of the forest ecology of the two areas enables a comparison of these complex interactions at a high and a low level of commercialisation.

First a general overview of past and current customary governance of natural resources, including NWFPs, in the humid forest zone of southern Cameroon is given. Following an outline of the methodology and study area, the results of a quantitative survey of perceptions of NWFP harvesters on market development and changes in harvesting practices are presented. The quantitative survey is complemented with qualitative data which describes local perceptions and changes in access norms. The paper ends with a discussion of the potential social and ecological outcomes under these changing conditions and potential alternative arrangements for sustainable management.

Customary institutions for managing NWFPs in the Humid Forest Zone

Prior to colonisation the management of forest resources in the humid forest zone of Cameroon can be characterised as predominantly ‘clanic ownership’. Semi-nomadism was the principal way of life for Bantu forest peoples. When they settled in a particular area, these ethnic-territorial groups confirmed their collective rights of first occupancy by putting it into productive use (Diaw 1997, Etoungou 2003). Their view of the forest was integrative rather than specialised as the forest, as well as fields, fallow land and swamps, were considered to be an integral part of agricultural lands. The resources contained therein were managed as common property by the lineage or the clan (Diaw 1998, Diaw et al. 1999, Etoungou 2003). This system differs from the management system in other parts of Cameroon, particularly in the west and northwest regions, which are characterised by more hierarchical societies.

A new era of state ownership of the forest began when Cameroon became a German protectorate in 1884. The colonial regime forbid further migrations and forced people to resettle along the roads. The newly created villages often consisted of members from different clans or lineages (Van Den Berg and Biesbrouck 2000). The colonisers claimed all the forest and land that was considered to be ‘vacant and without masters’ which erased, *de jure*, all the pre-existing local idioms on land, property and access (Oyono 2003). After the First World War, when power was transferred to France and Great Britain, they continued by a series of decrees the sovereignty of the colonial state on land and forest considered vacant. Some customary regulations were accommodated, however, and local people were allowed use rights (Oyono 2003, Van Den Berg and Biesbrouck 2000).

After Cameroon’s independence in 1960, the passing of the forest legislations of 1973 and 1981 continued the colonial legacy of state authoritarianism regarding forest land use and the marginalisation of local populations (Oyono 2003, Van Den Berg and Biesbrouck 2000). The 1974 Land Ordinances abolished customary land tenure and nationalised all land held under such tenure, except for land registered as public or private property and land under cultivation (Cleuren 2001, Delville et al. 2002, Van Den Berg and Biesbrouck 2000). Local people were granted user rights on National Lands to meet domestic needs, but these could be overruled by the state for reasons of public interest. The 1994 Forestry Law classified forests in Cameroon into two main categories: the permanent forest estate or classified forest, which can only be used for forestry or as wildlife habitat; and the non-permanent forest estate consisting of forested land, which can be converted to non-forest uses (Djeumo 2001).

Despite the imposition of the nation-state model since colonisation, social institutions at the community level in the humid forest zone are still rooted in rights based on kinship and descent. The clan is the primary social institution that is made up of lineages, both corporate and nuclear. The lineages are the essential units concerning land tenure which is based on genealogical rights, productive rights and succession rights (Diaw 1998, Etoungou 2003, Van Den Berg and Biesbrouck 2000). A territorial right in the forest is established by the principal of first occupancy, which is then passed to the male descendents of the founder, although the land remains the ultimate property of all generations, both living and dead. All individual rights to natural resources have a basis in usufruct. The duration and security of individual tenure is based on the productive right to live by one’s own labour, as demonstrated by the physical evidence of labour done. Succession rights to natural sources are accessed by male descendents through the nuclear lineage. Since women are required to marry outside of their village they are traditionally excluded from inheritance rights, but there is evidence that this may be changing in some parts of southern Cameroon (Diaw 1997, Tiani 2001).

Although the clan may have ultimate ritual ownership rights to land, it is seldom the operational level for land and natural resource management decisions. The key operational unit relevant to land tenure and resource management decisions is the corporate lineage, which relates to resources held under different access and property regimes (Diaw 1997, 1998, Van Den Berg and Biesbrouck 2000). The first one of collective ownership applies to all areas under human influence, including forests, rivers, wetlands and farmland. The corporate lineage deals with all aspects of the collective ownership system, such as land allocation, access, succession and litigation. As a result of colonial policy there often are several such corporate lineages, each endowed with their own exclusive land base, living in the same village. These corporate lineages also share common pool
resources and common governance institutions through the village council. It should also be noted that the clan retains collective ‘ownership’ over forest ecosystems know as bilik; sites of old villages that retain very important historical and anthropological connections for communities as well as provide many natural resources (Oyono et al. 2000).

Individual control can be established over natural resources through productive rights. The corporate lineage remains the collective owner of the resource base, but individuals through their household and nuclear lineage exercise actual exclusive control (Dìaw 1998). A nuclear lineage covers three generations, that is, parents, children and grandchildren through the male line (Dìaw 1997). This regime resembles permanent ownership when the investment is made on a yearly basis such as in plantations, crop fields or fallow lands and under certain conditions some trees (Dìaw and Oyono 1998). However, the individual has no right to sell the land.

Some natural resources, such as NWFPs, are considered to be common pool resources, as access is free to all members of the corporate lineages in the community. Since these forest products are not cultivated they are available for everyone to collect according to the explicit or implicit organisational principles of each community and are normally only removed from the common pool by the ‘rule of capture’ (Dìaw 1998, Oyono 1997). Although they technically are governed through the customary system, with the lineage heads making decisions about access and rights, there is normally no conflict over these resources (Dkamela 2001). All these different property regimes are nested in a variety of landscapes, primary, secondary forest, plantations and fields, in the humid forest zone. The management of such a complex system is facilitated by the socialisation of individuals within the values of the clan and lineage system (Dìaw 1998). In the context of increasing commercialisation of some NWFPs the customary land laws and arrangements still are the predominant force in shaping local management and exploitation of NWFPs (Van Den Berg et al. 2007).

**METHODOLOGY**

**Research area**

There is an absence of historical ‘time line data’ documenting the interactions between perceptions of changes in market forces, harvesting practices and rules of access in this region of Cameroon. Hence, our research was conducted in two similar areas that differed with respect to the level of commercialisation. Research focused on the collection and management of NWFPs in nine, primarily agriculturally based communities in the humid forest zone of southern Cameroon (Figure 1). The villages were located in two areas stratified on the basis of relative level of commercialisation for Gnetum spp. (Gnetum)\(^1\), Irvingia spp. (bush mango) and Ricinodendron heudelotii (njansang), which were identified as three of the nine dominant NWFP species in the markets of the humid forest zone (Ruiz Pérez et al. 2000). The market for the study species, Gnetum and bush mango, was not well developed in the six villages, located in the Eastern region. Given the low level of commercialisation in this area, it is hereafter referred to as the ‘low’ area. Marketing opportunities for Gnetum and njansang were well developed in the three research villages in the Central region, hereafter referred to as the ‘high’ area. The relative level of commercialisation in different areas for the study species was determined in consultation with the Center for International Forestry Research researchers in Cameroon and confirmed on site with local people.

The villages in these two regions were comprised of Bantu small holder farmers of various ethnicities. The villages in the Central region were settled by the Eton, part of the Bètì ethnic group, and those in the Eastern region were settled almost exclusively by the Ndzìme with a small enclave of Kako in two villages. Of the study communities found in the low area, several had camps of Baka Pygmies associated with the villages. However, for the purposes of this research the focus was on the management of NWFPs by the Bantu.

\[\text{FIGURE 1 Location of study communities in Cameroon}\]

\[\text{Description of species}\]

Gnetum spp., an understory liana, represents either of two species, Gnetum africanum or G. buchholzianum, which are not differentiated in the market due to the difficulty of distinguishing them and were therefore grouped for

\[\text{\footnote{Gnetum spp. is commonly called either okok, koko or eru depending on the region of Cameroon. Therefore, for simplicity, in this paper it will be referred to as Gnetum. Irvingia spp. is commonly called mangue sauvage, ndo'o or onou ah in local languages depending on the region. It will be referred to as bush mango, its common English name, in this paper.}}\]

\[\text{\footnote{Prior to colonization, among the Bantu in the humid forest zone, there were no institutionalized leadership positions above the corporate lineage. The village chief and village council are institutions that were introduced by the colonial administration and remain today. The chief and the village council settle disputes and judge the affairs of the village, including those related to natural resources (Diaw 1998, Van Den Berg and Biesbrouck 2000).}}\]

\[\text{\textcopyright H.C. Peach Brown and J.P. Lassoie, 2001.} \]
consumed as a vegetable. The bush mango tree is either
Irvingia gabonensis or I. wombolu, however, the centre
of diversity for I. gabonensis was determined to be southern
Cameroon and that of I. wombolu, in southeast Cameroon
and west Nigeria (Leakey et al. 2000). While it is recognised
that there are differences between the two species in terms
of timing of harvest and fruit characteristics (Asaah et al.
2003), market research on bush mango has shown that the
most important product from both these trees, the kernel, is
typically not differentiated in the market due to their very
similar characteristics (Ndoye et al. 1997/98). Following
this precedent, the differences between the two species
were not deemed sufficiently relevant for the purpose of this
research and so the two species were not differentiated when
collecting data. Ricinodendron heudelotii (njansang), a tree
species, grows naturally across the humid lowland rainforest
of southern Cameroon (Ayuk et al. 1999b, Fondoun et al.
1999).

A different fruit tree species was selected in each of the
two areas, because of the difficulty in finding one fruit tree
species that was abundant, as well as considered important for
collection and sale, in both areas. However, this difference
is overcome by the fact that both bush mango and njansang
are harvested in a similar manner and produce the same
commercial product, a kernel, which is used as a condiment.
They also both occur in primary and secondary forest as well
as forest fields and fallows (Ayuk et al. 1999a, Fondoun et al.
1999). The difference in the ecology between the two
fruit trees and Gnetum, the liana, provides a comparison as
they differ in their vulnerability to overharvesting.

Data collection methods

Data collection followed a mixed methodological approach
with some data being collected using a quantitative survey
and others collected using qualitative techniques, such as
semi-structured interviews and focus group meetings (Patton
2002). To begin the research in each village, a meeting
was held with the local chief, responsible leaders (les notables)
and any important heads of local groups or committees.
Separate meetings with men and women were held in
each community. Participatory mapping of village forest
resources was conducted and individual semi-structured
interviews were conducted with the local village chiefs.

Following on initial meetings, collectors of the study
species were identified by snowball sampling (Patton 2002)
and anonymous, individual surveys were administered.
In the study communities, these collectors were almost
exclusively women, but some men also were surveyed in
order to broaden the community sample (Brown et al. 2007).
In total, 155 surveys were administered with 56.1 percent
of respondents coming from the low area and 43.9 percent
from the high area. Women represent 71 percent of respondents
and men 29 percent with both groups representing an age
range from 16 to 77 years.

To confirm qualitative results from focus groups

concerning relative levels of commercialisation, respondents
were asked to assess the relative number of buyers (few, some
or many) for the study species over time. In order to assess
the level of exploitation of the study species, respondents
were asked to reflect on the length of time it took them to
collect a specified quantity of the products once they arrived
at a collecting area, and the distance in kilometres they had
to go to collect that amount. They were then asked whether
the time or distance travelled to collect the specified amount
had changed in the last few years, the magnitude of the
change (e.g., very slight increase or very large increase) and
the reason for the change. Using analysis of variance and
the Pearson chi-square test, differences for Gnetum were
explored between the high and the low commercialisation
areas. Survey results for njansang and bush mango were
compared within each area. A comparison of the perceptions
of respondents with results of a quantitative ecological
assessment of the study species in the field is beyond the
scope of this study. Data were collected on the harvesting
methods used by collectors for each of the three products to
assess the potential degradation of the study species.

Data collection took place during the months of June
to August 2002, May to September 2003 and February and
March 2004. Harvest periods for njansang and bush mango
overlapped with the data collection periods and Gnetum is
harvested throughout the year (Ayuk et al. 1999a, Fondoun
and Tiki-Manga 2000, Leakey et al. 2000, Ngo-Mpeck
et al. 2003). Analysis and interpretation of qualitative data
followed procedures outlined by Patton (2002) and Strauss
and Corbin (1998). All statistical analyses were done using
SPSS 12.0 for Windows.

RESULTS

NWFP market functioning and trends

The marketing strategies for Gnetum differed between the
high and the low areas. In the high area most women sold
Gnetum in their villages to wholesalers, who came three
times a week to buy the leaves and transport them to the
frontier market with Nigeria. In the low area, collectors sold
Gnetum to their neighbours but they also took it to sell in
the regional market in Lomié once a week. A few women
indicated that an occasional buyer would come from the
capital city to buy Gnetum. It is important to note that in
the low area, most women did not collect Gnetum and those
who did were primarily younger women. Older women
indicated that they did not have a tradition of eating Gnetum,
particularly among the Ngïme, and therefore were not used
to collecting it. The advent of Gnetum into the local diet
appeared to have been learned over the last few decades
from the Kakko, another ethnic group who live in the area.

Quantitative data confirmed the qualitative data from
focus groups on the general trends of commercialisation
in both areas. In the high area, respondents reported that
marketing opportunities for Gnetum were not well developed
in the early 1990’s although most respondents indicated that
there were a few buyers (Figure 2). This assessment of the market reflected the fact that some women occasionally took Gnetum to sell in the regional market of S’a’a or to the larger urban market of Yaoundé. The number of opportunities to market Gnetum began to increase, particularly in the high area during the period from 1995 to 2000 when some wholesalers began to come and buy regularly for export. Respondents reported that there were many more buyers after 2000 and this was evident during the data collection period. This increase in the number of buyers seemed to be related to the overharvesting of Gnetum in other parts of Cameroon, which had led to it being degraded to such a level that commercial harvesting became virtually extinct in some areas (Shiembo 1999).

In the low area, there was an increase in marketing opportunities for Gnetum during the period from 1995 to 2000, but most respondents indicated that there were relatively few buyers at that time. Since 2000 the marketing opportunities have increased, but have not achieved the level of the high area. When logging companies began to exploit timber in the low area in the early 1990’s the town of Lomié increased in population with people from other parts of the country. This presented an increased opportunity to sell products such as Gnetum that are more commonly consumed in other parts of Cameroon.

In the low area, similarly to Gnetum, 98 percent of respondents indicated that there were few buyers for bush mango before 1995 (Figure 3). The number of buyers increased during the period from 1995 to 2000 which corresponded to the advent of the logging industry into the region. Since 2000 the number of buyers has increased with a market not only in the town of Lomié, but with buyers coming from other parts of the country. Many women profit from the regular logging truck traffic and sell from their home by placing a sign by the road indicating that they have bush mango for sale.

The number of buyers for njansang has been higher, relative to the other study species, for a longer period of time (Figure 4). Respondents indicated that in the early 1990’s there were many buyers for the product. Since 2000, most respondents indicated an increase in the number of buyers. Njansang is typically sold to traders or market intermediaries know as buyam/sellams, who both buy and sell NWFPs for profit. They are often women who come to the village and buy either from the local market or go ‘door-to-door’ buying the kernels and then transport them to the urban market for sale.

Exploitation level and harvesting techniques
Survey results indicated that Gnetum was being overharvested in the high area and thereby affecting its availability, compared to the low area. In the high area most women said that the distance they travelled and the time needed to collect a specified amount had increased in the last few years while most in the low area said that both had remained the same (Pearson chi-square p=0.000) (Table 1). In both areas, most respondents (low area, 100%; high area, 81.8%) perceived any increases to be a result of an increase in the number of collectors who were exploiting the resource. Most respondents in the high area said that the increase in distance was very large (88.9%). The few reporting an increase in the low area said it was very slight.

In contrast to Shiemo (1999), harvesting techniques described for Gnetum were not very destructive in either...
The interaction between market forces and management systems

study area as collectors removed the leaves from the vine when collecting in the primary and older secondary growth forest, the preferred collection areas. Primary forest in this context refers to forest that has not been cut down in living memory or secondary forest that is more than 30 years old. This preference for primary forest is reflective of the fact that a larger volume of leaves are available to collect from mature vines. Secondary forest is defined by respondents as a fallow that has not been cut for over 10 years. In the high area, most women (94.7%) also collected Gnetum in fields, fallows and cocoa plantations where the plants were small, having not yet grown into a vine. Most respondents (81.6%) said they cut off the stem close to the ground and were careful not to uproot the plant, but they knew that some collectors did uproot. Continual harvesting from small plants reduces the vigour of the plant and stunts its growth, which impacts abundance. Mature vines were abundant in the extensive primary forest of the low study area so there was no need to collect from small plants in other areas.

In the high area, most njansang collectors (88.2%) said that the distance travelled and the time to collect a specified quantity had not changed. This result was not surprising as most women were collecting from trees in their husband’s cocoa plantations that were held under the traditional tenure system. Cocoa agroforests are very biologically diverse and farmers regularly protect valuable NWFPs species in their fields and plantations (Fondoun and Tiki-Manga 2000, Sonwa et al. 2007).

In the low area, respondents preferred to collect bush mango from trees found in the primary forest, but also collected the fruit in secondary forests, fields and fallows. Plantations were not as common in the low area. Most (60.2%) said that the distance they travel to collect had remained the same over the last few years. However, some women also travelled further distances to collect as the advent of logging roads had increased access into deeper parts of the forest. The long distance from the village meant that they had almost exclusive access to the fruit. Most respondents (81.9%) said that they could not estimate whether or not the distance travelled and the time to collect a specified quantity had not changed. This result was not surprising as both trees were seeds, it was not necessary to climb the trees to harvest unblemished fruit. These results differed from the findings of (Ayuk et al. 1999a, b) who reported that some people climbed bush mango and njansang trees to harvest their fruits. It is possible that the trees were not as tall in the area where that research took place.

Access and management of NWFPs

Low Area

Participatory mapping showed that all six villages had abundant primary forest resources as part of their village forests, with some being part of timber concessions and community forests. Some villages had all their primary forest absorbed by both these designations. A right to cut timber in certain areas is awarded to a forestry company by the national government, which is the legal owner of all forest land (Cleuren 2001). A community forest, under the 1994 Forest Act, is defined as a forest, up to 5000 hectares in size in the non-permanent domain, which is subjected to a management agreement between a village community and the administration in charge of forests. Community forest associations and management committees were responsible for managing the community forests with technical support from the forestry administration for a period of 25 years (Djeumo 2001, Vabi et al. 2000).

The abundance of primary forest meant that there were fewer limitations on forest access than in the high area. The primary forest, which was not in timber concessions or community forests, was under the jurisdiction of the village chief and council. Within the study villages, NWFPs were considered to be a common pool resource in all the primary forest, including timber concessions and community forests, as well as on lands held under the traditional tenure system such as fields, fallows, plantations or secondary forest. A chief in the low area stated, “This tree, it is not you who has planted it. The tree comes from nature. It is God who sent the tree. It is for everyone. It is for the benefit of everyone. You do not have the right to keep others from benefiting. That is our philosophy.”

### Table 1: Survey results showing estimates of change in time and distance to collect Gnetum

<table>
<thead>
<tr>
<th>Estimates of Change</th>
<th>Study Area</th>
<th>Decreased</th>
<th>Remained the Same</th>
<th>Increased</th>
<th>Varied</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Time to Collect</td>
<td>High</td>
<td>2</td>
<td>5.3</td>
<td>4</td>
<td>10.5</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>0</td>
<td>0.0</td>
<td>17</td>
<td>65.4</td>
<td>3</td>
</tr>
<tr>
<td>Distance to Collect</td>
<td>High</td>
<td>2</td>
<td>5.3</td>
<td>12</td>
<td>31.6</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>0</td>
<td>0.0</td>
<td>23</td>
<td>85.2</td>
<td>2</td>
</tr>
</tbody>
</table>
There were no rules that governed how much to collect or methods of collecting in any area. However, some villagers limited access to NWFPs in their fields during the time when crops were still growing to avoid crop damage. With such an abundance of resources and relatively low population there were very few conflicts over NWFPs. This is facilitated by the socialisation of individuals within the values of the clan and lineage system (Diaw 1998).

People do, however, limit outsiders from other villages from collecting NWFPs in their village forests, including timber concessions and community forests, and lands held under the traditional tenure system. A man in the low area said, “For bush mangos, in the past when a woman had a large quantity she would share them … But today, we have already begun to understand the value of these things. We have begun to prevent people from passing our village limits. When it is someone in the village it isn’t a problem because we are all together.”

Just a few years ago women would come from other communities to collect Gnetum, but the chief said that as people realised the commercial value of the product, he began to restrict access. Exceptions were made for outsiders who had relatives in the village or who were from the same clan as people in the village, as part of a reciprocal process of helping each other within kin relations.

**High Area**

Results of participatory mapping showed that in the high area there was little primary forest, except along the river and at the top of a high hill, and all other forest land was held through traditional tenure. At the time of the research, all this forest land had been reserved for the community forest and the communities involved were awaiting final government approval. There were no timber concessions in this area. Interviews with village chiefs revealed that in the past the chief and *les notables* were empowered to decide where people could clear primary forest for agriculture. With all the useable land being managed at either the household, nuclear lineage or corporate lineage levels, land use decisions are now being made at these levels. Survey respondents, however, indicated that for the collection of resources such as NWFPs, it was still the responsibility of the village chief to permit access to those from other villages.

All people protected njansang on lands held within the traditional tenure system. While not considered to be legal ownership under Cameroon law, the trees were considered to be private property and access was only gained with permission from the ‘owner’. Results from interviews and focus groups indicated that previously, the fruit was a common pool resource available to anyone in the village even when held under the traditional tenure system in plantations and fields. Respondents stated that in recent decades, due to increasing realisation of its commercial value, people had begun to limit access. This created conflicts at first, but incidents over njansang had diminished in recent years. The chiefs attributed this to the fact that everyone now knows who ‘owns’ which trees. Access by people from other villages to njansang continued to be restricted unless it was by family arrangement.

Gnetum remained as a common pool resource to villagers, but that system appeared to be in the process of changing. People had started to limit access to collectors in their fields, fallows and plantations in one village in the study area, Nkol bogo I in the previous five years. People still collected in secondary forests belonging to others, however, because it was hard to restrict access within the village as it was seen as a lack of neighbourliness. However, access was denied to those from neighbouring villages by the village chief.

In the other two villages, which had more forest assets, data showed that access to Gnetum was open in fields, fallows, plantations and secondary forest to women from within the village as well as those from neighbouring villages who sold to wholesalers. Most respondents (74.6%) stated that women and children commonly came to collect Gnetum from their village forest. However, change was slowly taking place in these two villages as some people were starting to limit access to collectors from other villages, as well as other families, because they felt that Gnetum was beginning to disappear. One man stated “If someone sees some Gnetum in the forest then they should ask who the land belongs to and then come and ask permission to collect it. The owner then in good faith might allow them to collect it or they may say no because they were planning to collect it themselves.”

While some land ‘owners’ refused access to people who were collecting to sell, they allowed others to collect small amounts for home consumption.

**DISCUSSION**

Management systems for common pool resources are continuously evolving in response to changing internal and external influences. Changing administrative frameworks, from colonial to post-colonial periods, weakened traditional institutions which were a product of ancestral, ritual and spiritual power before colonial times (Kayambazinthu et al. 2003). Changes in land use also evolve as each generation views the land differently from previous ones (Russell and Tchamou 2001). This evolution of customary systems appears to be continuing in the humid forest zone of Cameroon as a result of increased commercialisation. It was evident from survey results that there was a difference in the level of commercialisation of the two study areas with the high area having many buyers for both products. Therefore, these differences in marketing opportunities between the two areas provide a comparison between low and high levels of commercialisation. This comparison revealed differences in harvesting practices, exploitation level and rules of access. However, it is recognised that level of commercialisation was not the only driver of change in the area as similarly to other parts of Cameroon, changes are a result of a complex
mix of pressures from demographic change, economic forces and globalisation (Brown and Lapuyade 2001a, 2001b, Ndoye et al. 1997/98, Tabuna 1999). Other research in the communities also indicated that the presence of community forests and timber concessions, while not affecting access to NWFPs at the present time, could have an effect in the future (Brown 2005).

Survey results showed that increasing commercialisation was having a negative effect on the availability of Gnetum, the liana, in the high area. The resource was being degraded by overharvesting and poor harvesting methods in the high area as women responded to the market demand for the product. With an increase in harvesting pressure, the collectors perceived that the species had become scarce, so that it was collected not only from mature vines in the preferred areas, but also from small plants in the fields and fallows. Such continual harvesting from small plants reduces the vigour of the plant and stunts its growth, which impacts abundance. This overharvesting is not surprising as despite the debates as to whether traditional societies used renewable natural resources in a sustainable way, studies have found that irrespective of traditional practices, increasing integration into the market induces people to degrade renewable natural resources (Belcher and Schreckenberg 2007, Godoy et al. 2005). In contrast, Gnetum was not being overharvested in the low area as a result of fewer opportunities to sell. This could change, however, as marketing opportunities could increase if the region became more accessible in the future with improved infrastructure. As stated earlier, the trend in increased commercialisation in both areas is likely a result of overharvesting and degradation of Gnetum in other parts of Cameroon as a result of regional and global trade (Shiembo 1999). It is also related to the overall increased marketing trend that seemed to correspond to the increased reliance on NWFPs for cash in Cameroon since the economic crises of the 1980’s (Bikié et al. 2000, Brown and Lapuyade 2001a).

The results for the two fruit tree species showed that the harvest and number of trees available for collection in each respective area were remaining relatively stable because people did not damage the trees while harvesting their fruits. However, both species were heavily exploited as almost every fruit was collected. Studies of Brazil nut trees in natural populations in the Amazon indicated that populations subjected to intensive exploitation levels over long periods of time have insufficient juvenile recruitment to maintain populations over the long term (Peres et al. 2003). Although the populations of bush mango and njansang have not been so intensively harvested for such a long time, there is a risk that juvenile recruitment might be reduced if harvesting continued at the present level or increased. However, the planting of trees would offset this concern, which is happening to a limited extent with njansang in the high area. This practice could reduce the pressure on wild populations as shown in other countries (Van Andel and Havinga 2008). Other studies in Cameroon and Nigeria have shown that local people have begun to domesticate other fruit tree species that yield commercial products (Leakey et al. 2004). There is also considerable research being conducted in the region on the domestication of NWFPs (Atangana et al. 2002, Ngo-Mpeck et al. 2003, Simons and Leakey 2004).

Some studies have suggested that while increasing market availability typically leads to degradation of the natural resource, in some cases management systems may be able to adapt or new institutional arrangements may be put in place with systems to monitor and control the harvest (Agrawal and Yadama 1997, Crook and Clapp 2002, Ostrom 1990, 1999). The increasing scarcity of Gnetum in the forest in the high area showed that institutional arrangements were not adapting quickly enough to limit the negative effects of the market. Even though Gnetum had been sold in large quantities for a number of years, changes in access regimes were only beginning to occur. In one village in the high area, people had started to restrict access to outsiders from other villages. However, in the other two research villages only a few people had started to restrict access to outsiders. This may possibly be explained by the fact that as a result of its low, per unit market price, Gnetum may not have been considered important enough to warrant restriction of access.

It is interesting to note that despite a relatively low level of commercialisation in the low area, the perception of the commercial value of products also played a role in changing access norms. For example, the chief regularly refused access to women from other communities who wanted to collect Gnetum in the village forest, as he knew that they were intending to sell it in the weekly market in Lomié. This seemed to be a concern to protect the product for the future commercial exploitation by villagers. A similar pattern was noted for bush mango, as recognition of market value elsewhere influenced decisions to exclude collectors from other communities.

In contrast, a higher level of commercialisation appeared to have been at least partially responsible for the trend to privatisation of access for njansang in the high area. While in the past it had been managed as a common pool resource in the same way as bush mango in the low area, it was now essentially privatised under the traditional tenure system. However, the market was not the only influence in the high area as lack of primary forest resources due to increasing population and other land pressures also may have stimulated the trend to privatise access to njansang at the nuclear lineage and household levels. This trend towards privatisation has been observed in another part of Cameroon, where markets were well developed for NWFPs and there was demographic pressure on the land (Brown and Lapuyade 2001a, 2001b).

Trends toward privatisation in traditional common pool resource management systems have an effect on those who are often the marginalised of society. These different circumstances change the terms of access and may therefore change the specific individuals or groups most able to benefit from a set of resources (Ribot and Peluso 2003). Privatisation access to njansang, because it is on someone else’s land removes this resource from the common pool, and places those without land assets at a disadvantage. This is particularly important for women in these two regions of Cameroon who do not have secure land, and hence resource access through the traditional tenure system (Tiani 2001).
Lack of access to land for agriculture in Nigeria was found to increase women’s reliance for most of their income on NWFPs that were readily available from a common pool (Bisong and Ajake 2001). Furthermore, Coomes et al. (2004) showed that in villages in the rainforest of Peru, those with fewer land assets were more dependent on income from extraction of forest resources. In Cameroon, research has shown that divorced women and widows, who typically do not have secure land and resource access, depend on the NWFP trade as a survival strategy (Ruiz Pérez et al. 2002). Therefore, maintaining secure access to these resources as part of the common pool is critical.

With the institution of community forests in Cameroon, all products, wood, non-wood, wildlife, fishery resources and special products, with the exception of those forbidden by law, are deemed the property of the community concerned (Djeumo 2001, Vabi et al. 2000). Therefore, this institution may represent a possibility for maintaining NWFPs in a common pool that could then benefit those who do not have land-based assets. While most community forests in the humid forest zone have placed an emphasis on timber, some in other parts of the country have focused on harvesting and marketing NWFPs (De Blas et al. 2009, Oyono 2004, Oyono 2005). In fact, earlier research in the villages in the low and high area revealed that community forest organisers had considered exploitation and management of NWFPs to be one of the main purposes of the community forest (Brown et al. 2008). Unfortunately, new institutional arrangements such as community forests, sometimes exacerbate inequities, contribute to further social differentiation and lead to conflict and environmental degradation (Sick 2008). This has been an issue in some parts of Cameroon, where community forest management committees have been shown to be captured by local elites (Etoungou 2003, Oyono 2005). Therefore, further research would need to address the implementation of alternative institutional arrangements for NWFPs that could lead to maintenance of the resource for the future benefit of all important stakeholders.

CONCLUSION

Globally, non-wood forest products are an important source of livelihood for local people and particularly for women in many areas. While often managed as common pool resources under customary management systems, these systems have been influenced by colonisation, government policy, demographic and market forces. This research explored the effects of the level of commercialisation in Cameroon on the customary management systems for three commercially important species, *Gnetum* spp. (*Gnetum*), *Irvingia* spp. (bush mango) and *Ricinodendron heudelotii* (njansang). Using a mixed methodological approach, including quantitative surveys, focus groups, semi-structured interviews and participatory mapping, this research examined how a customary common pool management system for NWFPs is evolving in the context of a changing market and increased commercialisation of these products.

Results showed that a high level of commercialisation appeared to be leading to unsustainable harvesting methods and overharvesting in the high area, particularly for *Gnetum*, a liana. Both bush mango and njansang, tree species, were also intensively harvested, which could have ecological consequences in the long term. The customary rules of access were also changing as a result of the perception of future commercial value. In the area where level of commercialisation was low, villagers were actively restricting access to *Gnetum* and bush mango to outsiders as result of perceived potential marketing opportunities in the future. In the high commercialisation area, however, implementation of such restrictions was in the beginning stage for *Gnetum*, in spite of the high number of buyers. This could possibly be explained by the low, per unit value of the product. The privatisation of access for njansang has removed it from the common pool, which could negatively affect women with insecure access to land who must depend on NWFP harvest and sale as a source of livelihood. While community forests may be an institutional arrangement that could maintain NWFPs as a common pool resource, the results of community forests in Cameroon have been mixed. Further research would need to address the implementation of alternative institutional arrangements for NWFPs that could lead to maintenance of the resource for the future benefit of all important stakeholders.

ACKNOWLEDGEMENTS

The authors would like to recognise the Center for International Forestry Research for hosting this research and the Central African Regional Program of the Environment of the World Wildlife Fund and Cornell University for funding the field research. The cooperation of the local communities and government agencies and non-governmental organisations in data collection was greatly appreciated. We would also like to thank five anonymous reviewers whose comments substantially improved the paper.

REFERENCES


ATANGANA, A. R., UKAFOR, V., ANEGBEH, P. O.,


