Farmer Livelihoods in the Humid Forest and Moist Savannah Zones of Cameroon

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Abstract

Tree-crop or forest-based farming systems in the humid forest and savannah areas of Cameroon were, until recently, highly dependent on cocoa and coffee. This made farmers extremely vulnerable to fluctuations in world market prices. Consequently, farmers turned their attention to food cropping, thereby opening up new forest land where possible and shortening fallow periods elsewhere. This inevitably led to soil fertility problems, whereas rural households were still suffering from seasonality effects and cash shortages, due to the low added value of food crops. To address these two problems, poverty reduction strategies must thus focus on: (1) raising agricultural and natural resource productivity through the generation and dissemination of improved technologies and, (2) diversifying income sources in order to reduce dependency on few crops that are prone to price fluctuations and to smoothen seasonal fluctuations in income and consumption. However, the Central African region in general and southern Cameroon in particular, faces some major weaknesses that impede or, at least slow down research and development efforts. These include a weak human capital base, degradation of the natural resource base, insufficient and poorly maintained rural infrastructure and inappropriate pro-poor policies and institutions.

Résumé

Dans les zones de forêt et savane humides du Cameroun, les systèmes de production arboricole ont longtemps été basés sur quelques cultures de rente, telles que le café et le cacao. Ceci a rendu les paysans extrêmement vulnérables aux fluctuations des prix de ces cultures au marché mondial. En réponse, les paysans se sont tournés vers les cultures vivrières en défrichant plus de forêt pour ouvrir de nouveaux champs là où cela était encore possible, et en réduisant les périodes de jachères ailleurs. Cette évolution inévitablement cause des problèmes de baisse de fertilité des sols, sans résoudre les problèmes de vulnérabilité des ménages ruraux qui continuent à souffrir des périodes de soudure alimentaire et financière. Afin de résoudre ces deux problèmes, les stratégies de réduction de la pauvreté dans la région doivent se focaliser sur : (1) augmenter la productivité de l'agriculture et des ressources naturelles par la génération et la dissémination des technologies améliorées et, (2) diversifier les sources de revenus pour réduire la dépendance de quelques cultures dont les prix fluctuent beaucoup et pour alléger les effets saisonniers dans la consommation et les revenus des ménages. Cependant, la région de l'Afrique Centrale entière et le Sud du Cameroun en particulier, est victime d'un nombre de faiblesses qui freinent, ou au moins ralentissent, les efforts de recherche et de développement. Nous constatons un capital humain faible, une dégradation accrue des ressources naturelles, une infrastructure rurale insuffisante et mal entretenue et des politiques et institutions de lutte contre la pauvreté, mal adaptées au contexte actuel.

Keywords

Cameroon, poverty reduction, sustainable livelihoods framework, well-being

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Introduction

The forests of West and Central Africa, rich in flora and fauna, are degrading rapidly due to timber exploitation and devastating slash and burn agriculture from farmers in search of new farm land to respond to ever increasing population numbers (ASB 2003). For the specific case of Cameroon, UNDP (2003) recorded that 33.4 % of the Cameroonian population is living below the poverty line of USD 1 a day. In the forest areas, this proportion rises to 66 % of the population. Rural poverty was exacerbated in the early 1990s by the devaluation of the CFA franc and slumping coffee and cocoa prices in the world market, until then major income generators for farmers in the region (ASB 2003).

Traditional slash and burn cultivation, although it has shown its worth in the past, is becoming increasingly unsustainable today with the growth in population. According to MINEF (1996), slash-and-burn agriculture is considered responsible for almost 85 % of annually deforested surface area in Cameroon. Moreover, average yearly increase in Cameroon's population now stands at 2.2 % (World Bank 2002). In the context of unchanged farming systems, this growth rate implies that in the near future more land will have to be made available to farmers if they are to continue to produce enough food to feed the growing population. Responding to this land pressure, farmers have shortened their fallow period from 15-20 years to 3-4 years and less (Tonye *et al.* 1988), leading to soil degradation, declining soil fertility and thus crop yields and increasing weed infestation. Technologies are therefore urgently needed to sustain production systems based on short fallows.

In response to these evolutions, the 'International Centre for Research in Agroforestry' (ICRAF), now called 'World Agroforestry Centre', has been looking for agroforestry technologies that can reduce deforestation and soil depletion in the humid tropics of West and Central Africa (ICRAF 2000a). From 1987 to 1998, research was oriented towards the development of improved fallow management methods (ICRAF 1995; ICRAF 1996). The techniques that were tested and evaluated in collaboration with farmers included planting of fast-growing and nitrogen-fixing trees and shrubs that replenish soil fertility quicker than the natural vegetation (ICRAF 1995; ICRAF 1996).

However, soon it became clear that tackling the problems of shortening fallows and declining soil fertility alone would not raise farmers of the region out of poverty. This concern was much in accordance with the growing consensus among researchers and policy makers

worldwide that poverty alleviation in the tropics can only be achieved through combining increased agricultural production with increased and diversified income for rural households (IFAD 2001a). In 1999, ICRAF reoriented its research towards the domestication of indigenous fruit and medicinal tree species (Tchoundjeu *et al.* 1999; ICRAF 2003). The main objective of this research programme was to increase, stabilise and diversify farmers' income and to improve health care in rural areas, while at the same time encouraging the development of sustainable agroforestry practices that rehabilitate degraded farmland, sequester carbon and other greenhouse gases and enhance both biodiversity and the functioning of agroecosystems (ICRAF-AHT 2002; ICRAF-AHT 2003; Leakey *et al.* 2003). The research approach also emphasised farmers' active involvement in the development of new technologies in order to facilitate their adoption.

However, understanding the diversity of livelihood portfolios and the options rural people develop by integrating new opportunities in order to grow out of poverty is becoming increasingly complex. Furthermore, farmers in the tropics make decisions regarding a given field or a given practice, such as soil fertility management and agroforestry within the context of the whole farm and of the totality of resources and assets available to them, and not in isolation (Izac 2003). This paper therefore focuses on understanding issues at the level of households and villages, and on understanding the broader context in which farmers earn their living. It examines existing land-use systems and farmers' livelihood strategies in order to determine entry points for the proposed innovations.

Methodology

“Rural households operate complex farming systems, allocating their limited resources among many enterprises in a manner determined by their priorities, preferences and their biophysical and socio-economic circumstances and constraints”. (Franzel *et al.* 2002) In assessing the adoption potential of agroforestry technologies therefore, a systems approach is required. To unravel the complexities in which farmers operate and make choices, we used the sustainable livelihood analysis method as developed by DFID (1999). This method recognises that households pursue a range of livelihood strategies based on the assets (natural, financial, social, human and physical capital) they have to draw on and the livelihood outcomes they wish to achieve, be it enhancing household income, food security, health, social networks and savings (DFID 1999). In its simplest form, the framework views people as operating in a context of vulnerability. Within this context, they have access to certain assets or poverty reducing factors. These gain their meaning and value through the prevailing social, institutional and organisational environment. This environment also influences the

livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood objectives (DFID 1999).

Although the sustainable livelihoods framework was used to synthesise findings, the analysis itself incorporated a variety of tools, as presented in Table 1. We used a combination of quantitative and qualitative data collection methods (IISD 1995; FAO 2003). We also opted to involve the communities as much as possible in the gathering and analysis of information by using participatory survey tools, carried out with focus groups, such as village mapping, historical profile and Venn diagram. The study was carried out in 8 sites (ICRAF's pilot villages: Abondo, Bandjoun, Belo, Elig-Nkouma, Ngoumou, Nkolfe, Nkom-Efoufoum and Ting-Melen; Fig 1) in 2002-03.

Table 1: Participatory methods and their uses (inspired by IISD 1995; FAO 2003)

Method	Brief description	Used to collect data on:
Timeline	Historical profile of longer-term events or trends	Vulnerability context; changes in land use and agricultural activities; importance of trees
Resource maps	Maps identifying natural and other resources	Natural capital; land use systems; existence of and access to services and infrastructure
Venn diagrams	Diagrammatic representation of key institutional features and their interactions	Social capital; relations between social groups, institutional and policy environment
Wealth ranking	Assigning households to wealth categories	Socio-economic characterisation of pilot sites; strategies and assets needed to exit from poverty, relations between social groups
Agricultural calendars	Graphical depiction of agricultural activities	Knowledge on farming system; strategies; vulnerability context (peak and lean periods in labour); human capital
Household income & expenditure	Graphical depiction of income and expenditure	Vulnerability context (dearth periods); presence of financial capital

Research on livelihoods started with a complete household inventory in the 8 study sites (Fig 1). We recorded for each household in the community: age and sex of the head of household, household composition (number and age of spouse(s) and children), wealth level and type of livelihood strategy.

Figure 1: Location of study sites, humid forest and moist savannah zones of Cameroon (drawn by Makak 2005)

Nkom-Efoufoum is bordering Elig-Nkouma and is not shown on the map

In the light of this study and based on previous work, we identified livelihood categories that reflect the household's main sources of income in ICRAF's pilot villages:

1. *cocoa or coffee dominant*. Households that generate their revenues mainly from the "traditional" cash crops, mainly cocoa in the forest zone and coffee in the savannah zone.
2. *cocoa or coffee + food crops*. Households that generate an important part of their revenues from cocoa or coffee, but complement this income with food crops.
3. *cocoa or coffee + market gardening*. Households that generate an important part of their revenues from cocoa or coffee, but complement this income with market gardening (e.g. tomatoes, okra, green maize, green vegetables).
4. *food crops dominant*. Households that generate revenues mainly from food crops
5. *market gardening*. Households that generate revenues mainly from market gardening

6. *other perennials*. Households that generate their revenues mainly from perennial crops other than cocoa and coffee; these may include oil palm, fruit trees, etc.
7. *non-agricultural*. Households that generate their revenues mainly from non-agricultural activities, such as petty trade, pension, casual labour, etc.

Households were also classified into well-being categories. The criteria and categories used were gathered during earlier participatory wealth-ranking exercises in the zone (Degrande *et al.* 2006). First, in each community a list of all households was established. Then, four key informants from the village, two men and two women, ranked households into well-being categories with were grouped to give categories per village using standard wealth-ranking techniques, described in Pretty *et al.* (1995). For the present study, this information was used by enumerators to classify households into well-being categories. It is important to note that these categories are subjective and that comparison of households is only relevant within one village and not across villages.

1. *Very poor*. Households that lack land; generally do not own cocoa or coffee; households headed by very young, very old, disabled persons or immigrants; do not manage their money well (drink too much, lazy, ...). These households are not able to send their children to school or to ensure adequate healthcare; the state of their house also indicates the difficulties they must have to make ends meet.
2. *Poor or well-being below average*. Households that lack land and/or have a large family, generally don't have cash crops.
3. *Average level of well-being*. Households that generate sufficient income from cocoa, market gardening and/or food cropping, but have a large family and a lot of expenses.
4. *Well-being above average*. Middle-aged households with well-managed cocoa plantations, few children or grown up children or young households doing market gardening; hard working. This category can meet the needs of their household and have no problems with sending their children to school.
5. *Rich or well-off*. Households that generate income from non-agricultural activities such as pension, trade, wage labour, households with large cocoa plantations and good management of their money. These households can be identified through their clothing, food, health care, some assets (vehicle, house, ...). These people often lend money to others.

From the list of households, we sampled 1 household per combination (livelihood strategy x wealth level) per village and studied their main activities, revenue and expenditure profile. By doing so, a total of 112 households were interviewed¹.

Information more specifically related to numbers and diversity of fruit trees on farms was obtained from a tree inventory in 4 communities in Cameroon, carried out under a research project funded by the United Kingdom Department for International Development (DFID; R7190 Forestry Research Programme) in 1999 (Degrande *et al.* 2006). Here also, a stratified sampling procedure based on the well-being of households was used (Mbosso 1999; Schreckenberg *et al.* 2002; Degrande *et al.* 2006). First, in each community a list of all households was established. Then, four key informants from the village, two men and two women, ranked households into well-being categories which were grouped to give five categories per village using standard wealth-ranking techniques described in Pretty *et al.* (1995). From each category, four households were chosen at random for the on-farm inventory. In total, 72 households were interviewed. The researcher and each respective farmer visited all the farmer's plots, whether owned or rented/borrowed. Each plot was categorised by land use (home gardens, food crop fields, fallow land, cocoa and coffee plantations, oil palm fields and small orchards) and a record made of its tenure status, size (based on farmer and researcher estimate), distance from the homestead, age and land use history. The researcher and farmer systematically walked through each plot and recorded all exotic and indigenous fruit trees, whether planted or not. For each tree, a record was made of species and approximate age (from size), the reason for planting (e.g. for sale, consumption or shade), who planted and where the planting material had been obtained. The inventory data was recorded in an Access database and analysed in Excel and SPSS version 9 (Degrande *et al.* 2006).

¹ The total number of household interviewed was less than the theoretical number, i.e. (7 livelihood strategies * 5 wealth categories * 8 villages) = 280, because not all combinations were found in each village.

Results

1. Presentation of the Humid Forest and Moist Savannah Zones of Cameroon

1.1 Socio-economic Context

Population and Social Organisation (www.iss.co.za)

Cameroon is situated in western Africa, bordering the Bight of Biafra (6°00' N, 12°00' E). Neighbouring countries are Equatorial Guinea, Gabon and the Republic of the Congo (Congo-Brazzaville) in the south, Central African Republic in the east, Chad in the northeast and Nigeria in the northwest and west (Fig 2). Cameroon has a total area of 475,440 km² and is inhabited by various ethnic groups. The largest group are the Cameroon highlanders who comprise 31% of the population. Other major groups are the Equatorial Bantu (19 %), Kirdi (11 %), Fulani (10 %) and Northwestern Bantu (9 %). Total population was estimated at 16.2 million in July 2002 with an annual growth rate of 2.36 %. Forty-two percent of the population falls in the age category 0-14 years. Linguistically diverse with more than 200 local languages classified in 24 major African language groups, Cameroon has both English and French as official languages. While the people of the south and west have been profoundly influenced by Christianity, the people of the north are either Muslim or animist and have largely retained their traditional modes of life. One other major contrast in the social geography of Cameroon is between Anglophone northwest and southwest Cameroon, and the much larger, more populous Francophone area of former East Cameroon. The contrasting influences of British and French rule remain evident in many aspects of life.

Economy (www.iss.co.za)

Cameroon has a rich and diversified commodity-based economy. Agriculture was the sole engine of growth and foreign-exchange earning until the late 1970s when oil became the primary source of income. Food and export crops, livestock, fishing and forestry are the mainstay of the economy, accounting for about 29 % of GDP, employing some 50 % of the active population and generating more than half of total export earnings. The petroleum and manufacturing sectors represent 20 % of GDP. The secondary sector contributes 31 % of

GDP and employs 15 % of the population. Cameroon is the most important market in the *Communauté Economique et Monétaire de l'Afrique Centrale* (CEMAC).

Most agricultural production comes from smallholders, with the exception of rubber and oil palm, which are run under a plantation system. Millet, sorghum, rice, yam, cassava and plantain are produced for both domestic consumption and for exports to countries within the central African region. The main cash crops, which provide about 40 % of Cameroon's exports, are cocoa (Cameroon is the world's sixth-largest producer; FAOSTAT 2003), coffee and cotton.

With forests and woodland covering nearly 78 % of the country, the forestry sector is the country's second largest export earner after oil, generating around 20 % of export revenues and employing some 55,000 people. There is, however, a great untapped potential in the forestry sector – Cameroon could be one of the major exporters of timber and other wood products but is constrained by the lack of basic transport infrastructure, especially in the tropical rainforest region of the country. Five species, Ayous (*Triplochiton scleroxylon*), Azobe (*Lophira alata*), Iroko (*Milicia excelsa*), Sapelli (*Entandrophragma cylindricum*), and Sipo (*Entandrophragma utile*), traditionally accounted for more than 75 % of Cameroon's timber exports (Ndoye and Kaimowitz 2000). Logging is quite selective and rarely involves clearing of forests. Nevertheless, it significantly disturbs the forests affected, often reduces the availability of commercial timber species, and sometimes encourages hunting and agricultural activities in nearby areas.

Land Tenure

Cameroon's postcolonial land policy, established through the 1974 reform and currently still in force, has instituted the principle of the national land domain. "*The State shall be the keeper of all the lands. In that capacity, it can intervene in order to ensure a rational use or in order to take into account the imperatives defence of economic options of the nation*" (law 74-1 of 6 July 1974). The land law institutes only one judicial form, i.e. absolute and exclusive private property, and one procedure, i.e. the registration. The land title is the official testimony of land property. It can be obtained in many ways: purchase by mutual agreement, donation *inter vivos*, legacy or State's attribution with an obligation to land development. However, in spite of the compulsory aspect of land registration, the majority of farming lands remains under customary occupation (Bigombe and Biekie 1998). In 1987, less than 30,000 of the 1,145,700 rural farms in Cameroon were registered lands (Cameroon Agricultural Census 1987). Customary land rights are usually based on lineage (Stienbarger 1990). Original rights to land were gained through settlement or clearing. Settlers on formerly unclaimed land

“founded lineages”, which would exercise control over the land in the area. Access to land and generational transfer of property rights are determined by the type of descent groups. In most areas of Cameroon, property rights are passed from father to son. If a man has more than one wife, each wife with sons may be allotted an equal share of the father’s land to be distributed among the sons, although the wife may continue to work on the lands she worked while her husband lived. If a man dies without male heirs, his eldest brother will usually get control over the land. It is critical to realise that women are rarely allocators of land rights. Their right to use land generally comes through men, either from a husband as part of his holdings or from other male family members.

Poverty

Similar to most countries in the region, Cameroon has significant natural resources but many poor people. From 1977 to 1985, Cameroon enjoyed an export-led boom based on petroleum, coffee and cocoa (ASB 2003). This boom came to an end in the second half of the 1980s, as the country’s oil ran out and international prices of its main export commodities slumped. The fall in export revenues forced the government to stop subsidizing agricultural inputs and to cut the prices of coffee and cocoa offered to farmers. This was followed, in the early 1990s by serious cuts in public-sector employment and wages. Finally, Cameroon’s currency, the franc CFA, was devalued in 1994 (ASB 2003). Cash crops, which had earned 123 billion FCFA for rural households in 1984-85, only generated 6.3 billion FCFA in 1992-93 (Amin and Dubois 1999). Food crop production also fell in value from 417 billion CFA in 1984-85 to 378 billion in 1992-93 (Amin and Dubois 1999). Average consumption fell by 30 % from 1983/84 to 1996 (Cida 2000). Education was hard hit by financial constraints faced by the government in the early 1990s. School participation fell from full attendance in 1990 to 81 % by 1996 (Cida 2000). As a result, 29 % of young men and 46 % of young women in rural areas did not finish primary school. Poorly maintained health infrastructure and services – also a consequence of budget cuts since the early 1990s – have led to sharp increases in infant and child mortality rates and a decline in life expectancy.

Figure 2: Map of Cameroon (*Drawn by Makak 2005*)

The macro-economic context has improved since 1995: annual economic growth is stabilized around 5.0 %, inflation was reduced from 5.2 % to 2.8 % per annum, and the external deficit is maintained at about 2.4 % of GDP (Amin and Dubois 1999). Nevertheless, Cameroon is still beset with an unsustainably high level of foreign debt - an estimated USD 10.9 billion in 2000 (www.iss.co.za). In January 2001, the Paris Club creditors agreed to restructure Cameroon's public external debt under the enhanced Heavily Indebted Poor Countries (HIPC) initiative bringing a reduction in total debt services. The overall improvement of Cameroon's economy remains fragile because it is facing strong competition from outside, fluctuations of world prices for exports, and weak confidence on the part of investors, both national and foreign, in the country's future. The weak confidence is in large part due to the country's extremely poor ratings on indices of corruption, human rights, and democracy. Despite increases in GDP and private consumption per capita, poverty still remains significant. Today, measures of relative and absolute poverty thresholds show not only increasing poverty but also increasing inequality. About 5.6 million of Cameroon's 6.5 million poor live in rural areas, with the most intense poverty occurring in the plateau and forest zones (Cida 2000). In the forest areas, this proportion rises to 66 % of total forest population (Cida 2000). While GDP per capita was USD 559 in 2001, UNDP (2003) recorded that 33.4 % of Cameroon's population was living below the poverty line of USD 1 a day. Table 2 summarises some development indicators for Cameroon.

Table 2: Some development indicators for Cameroon

Population, total (millions) in 2003	16.1
Population growth (annual %) in 2003	2.0
Rural population (% of total)	51
Forest area (sq. km)	2,386,000
Annual deforestation (% of change, 1990-2000)	0.9

Source: The World Bank, World Development Indicators database, 2003

Figure 3: Overview of research sites following main vegetation types in Cameroon (drawn by Mbile 2005)

Figure 4: Overview of research sites following main soil types in Cameroon (drawn by Mbile 2005)

Figure 5: Main agro-ecological zones in Cameroon (IRAD 2004)

1.2 Biophysical Context

Humid Forest

Cameroon's forests are of vital importance to the country's economy, and perform ecosystem functions of immense regional and global importance. The rainforest in Cameroon covers 175,000 km² representing about 37 % of the national territory (Gartlan, 1992). The climate of the humid forest is equatorial with two rainy seasons corresponding to two cropping seasons: March to June and August to November. Average annual rainfall is 1692 mm with bimodal distribution (Fig 5). Mean daily temperature ranges from 19.2 to 28.6 °C. The soils are generally classified as Ultisols (Fig 4), characterised by low base saturation and a low cation exchange capacity. The climax vegetation is moist closed canopy tropical forest (Fig 3) now replaced by a patchwork mosaic of rotational fallow slash and burn agricultural systems and perennial crop systems (Gockowski *et al.* 2004).

The farming system is classified by IFAD (2001b) as a tree-based system, which is providing the majority of agricultural export revenues thanks to cash crops such as cocoa, coffee, oil palm and rubber. Fluctuation of world market prices for these cash crops is causing high vulnerability of such systems, often resulting in serious macro-economic effects for the country. Farming is essentially based on shifting cultivation and mixed cropping. Livestock is of minor importance. Major food crops grown in the area include groundnut (*Arachis hypogaea*), cassava (*Manihot esculenta*), maize (*Zea mays*), yam (*Dioscorea* spp.), plantain (*Musa acuminata*) and cocoyam (*Colocasia esculenta*); major tree crops are cocoa (*Theobroma cacao*), coffee (*Coffea arabica* and *Coffea robusta*), oil palm (*Elaeis guineensis*) and rubber (*Hevea brasiliensis*). Food crops are intercropped with several other legumes and vegetables on relatively small plots (< 0.5 ha). Tree crops are usually cultivated as plantations mixed with other fruit trees, medicinal plants and high-value timber trees. In this type of farming system, short annual cropping periods of 1 to 3 years alternate with 2 to 15 years of fallow. The fallow period is normally required to restore soil fertility, suppress weeds, and reduce pests and diseases through self-regenerating natural vegetation. In recent years however, population densities have increased causing reduction in fallow period length in some areas to 2 or 3 years, leading to enormous degradation of the natural resource base.

Moist Savannah

The moist savannah part of our study zone is situated in the West and Northwest provinces of Cameroon and occupies an area of 31,290 km². The climate is characterized by a long rainy season (April to November) and a short dry season (December to March) with annual rainfall varying between 1600 mm and 1750 mm. Maximum temperatures average 22 °C and minimum temperatures 17 °C (Tchouamo *et al.* 2000). The relief comprises of three parts

(FAO-UNDP 1979): plains and valleys below 800 m, highlands with altitudes between 800 m and 1500 m and mountains. The soils of the highlands are classified as Ferralitic, whereas the rest are old volcanic soils. Originally, the whole area was covered with forests, but due to human activities, such as agriculture, pasture, and bush fire, the area is now covered with different types of moist savannah vegetation (FAO-UNDP 1979). The only witnesses of the original forest vegetation, at present, are sacred groves and gallery forests along rivers. However, the population has re-afforested the area with timber (*Eucalyptus*) and fruit trees (*Cola acuminata*, *Dacryodes edulis*, *Persea americana*, *Mangifera indica*, *Canarium schweinfurthii*).

In 1987, its population was estimated at 2,577,129 habitants with an average density of 82 habitants km⁻² (Tchouamo *et al.* 2000). This population puts a lot of pressure on the land, resulting in 2 cropping seasons per year with fallow periods of less than 6 months. Main food crops include maize, plantain, beans, yam and cocoyam, often cultivated in association. The principal cash crop is coffee, which is cultivated in an agroforestry system with fruit trees in the upper layer and shade-tolerant crops in the under-storey.

2. Farmer Livelihoods

2.1 The Sustainable Livelihoods Framework Approach

The concept of livelihoods has moved analysis away from narrow parameters of production, employment and income to a much more holistic view which embraces social and economic dimensions, reduced vulnerability and environmental sustainability, all within the context of building on local strengths and priorities (Shackleton *et al.* 2000). This approach recognises that households pursue a range of livelihood strategies based on the assets (natural, financial, social, human and physical capital) they have to draw on and the livelihood outcomes they wish to achieve. The ability to access various combinations of assets helps to determine how vulnerable or robust a livelihood may be. The livelihoods of the poor are complex and dynamic, typified by a diverse portfolio of activities that not only enhance household income but also food security, health, social networks and savings.

The sustainable livelihoods framework (Figure 6; DFID 1999) is a tool to help understand and analyse these so-called livelihoods, particularly of the poor. Like all schematic representations, it is a simplification of the diversity and richness of livelihoods. The framework views people as operating in a context of vulnerability. Within this context they

have access to certain assets or poverty-reducing factors. These gain their meaning and value through the prevailing social, institutional and organisational environment. This environment also influences the livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood objectives. The livelihoods framework aims to help stakeholders to identify the many factors that affect livelihoods, their relative importance and the way in which they interact. This, in turn, should help in the identification of appropriate entry points for support of livelihoods.

Figure 6: Sustainable livelihoods framework (DFID 1999)

The **core concepts** of the sustainable livelihoods framework (DFID 1999) are as follows.

- *People-centred*: fully involves people and respects their views in order to support them to achieve their own livelihood goals.
- *Holistic*: attempts to identify the most pressing constraints faced by, and promising opportunities open to, people regardless of where these occur; helps to organise factors which constrain or provide opportunities, and to show how these relate to each other.
- *Dynamic*: seeks to understand and learn from change.
- *Building on strengths*: implies the recognition of everyone's inherent potential, whether this derives from their strong social networks, their access to physical resources and infrastructure, their ability to influence core institutions or any other factor that has poverty-reducing potential.

- *Macro-micro links*: emphasises the importance of macro-level policy and institutions to the livelihood options of communities and individuals.
- *Sustainability*: stresses the importance of livelihoods that are resilient in the face of external shocks and stresses, are not dependent upon external support, maintain the long-term productivity of the natural resources and do not undermine the livelihoods of, or compromise the livelihood options open to, others.

2.2 Vulnerability Context

The *Vulnerability Context* (DFID 1999) frames the external environment in which people exist. People's livelihoods are fundamentally affected by critical trends (population, resource, economic, governance, technological) as well as shocks (human health, natural, economic, conflict, crop/livestock health) and seasonality (of prices, production, health or employment opportunities) – over which they have limited or no control. Analysing the vulnerability context comprises of identifying those trends, shocks and aspects of seasonality that are of particular importance to livelihoods.

Historical Trends

Table 3 demonstrates the historical profile of one of the study sites. Overall in Cameroon, 4 main historical periods have shaped the economies of rural households as they are today.

1) 1880-1930: German colonisation, settling of population

Most of the villages in the Centre province (forest zone) were created late nineteenth century, when people from the 'Sanaga area' migrated in. The area was still under dense forest and people opened up small plots for subsistence farming. Hunting was also an important activity at that time. With German colonialism and the creation of roads, the population was asked to settle along these axes; the current pattern of houses in most villages is still witness of this movement. Agriculture was not diversified and consisted principally of the traditional groundnut field (*afup owondo*), associated with maize, plantain and cassava for home consumption. However, the Germans introduced some fruit trees like mango, citrus and banana, as well as cocoa and coffee.

2) 1930-1960: French colonisation; intensification of cash cropping and monetisation

Under the French mandate, cocoa farming was intensified as a means of levying taxes. Farmers, faced with the possibility of generating cash, now entered the market economy. The end of forced labour (to build the railway) in the '50s resulted in a rapid expansion of the population in rural areas. Young people stayed in the village and formed families. This phenomenon, together with growing demand for food in urban areas, generated the creation of periodic markets in rural areas. Consequently, food cropping was intensified with the objective of commercialisation.

3) 1960-1990: Independence and economic prosperity

Independence took place rather smoothly and did not much affect rural populations in the forest zone. Agriculture and especially cash crops benefited from government support. The creation of SODECAO (*Société de Développement de la Cacaoculture*) and the emergence of cooperatives boosted prosperity in the villages. It was also during that period that a lot of primary schools were built in the rural areas. This changed life in the villages completely because children could go to school close to home, leaving time free to help the parents in their farms and significantly increasing the number of children attending school.

4) 1990-to date: economic crisis and liberalisation

Things started to become hard for farmers from the mid-80s. The oil crisis and the launching of the structural adjustment programmes increased urban unemployment. A lot of young people came back to the villages and had no other option than to farm. This increased pressure on the land and some farmers had to look for new farmland elsewhere. In addition, cocoa and coffee prices fell drastically and government support stopped abruptly resulting in liberalisation of the sector. Farmers had difficulties in buying chemicals and fertilisers, and in negotiating prices for their cocoa and coffee with the multitude of traders. In 1992, the government (law 92/006) encouraged farmers to group themselves in "Common Initiative Groups" (CIG). The creation of CIGs however was often used with the sole intention of obtaining assistance from NGOs or government services, rather than as a motor to development (Oyono and Temple 2001). As a result of the problems in the cash crop sector, farmers progressively intensified food cropping. This change also affected the traditional distribution of tasks. Men no longer only concentrated on cash crops, but likewise engaged in food cropping for commercial purposes. To date, this intensification of agriculture still continues, although cocoa prices have gone up again in recent years. This is unlike the situation for coffee, which continues to fetch very

low prices in world markets. According to IFAD (2001), the demographic growth rate in urban areas of Cameroon has reached 6 % annually between 1960 and 1990. While the growth rate will probably not remain as high as 6 %, urbanisation will continue in the years ahead. To feed urban populations, farmers will have to intensify their food production, employing new techniques.

This historical perspective clearly shows that households adjust to changes in their environment by changing their livelihood strategies. First, farmers increased their food production to cope with population growth. In colonial times, farmers adopted the introduced cash crops (cocoa and coffee) to mark their land and to enter the market economy. Then, responding to ever increasing demand for food in urban areas, households started selling production surpluses and later engaged in commercial food cropping. Confronted with slumping prices of cash crops in the late 1980s, farmers were forced to diversify their activities in order to make ends meet and to keep their living standards. Farmers also formed common initiative groups with an aim of attracting technical or financial support for group or community projects. However, these efforts have often been in vain because of lack of focus in group objectives, lack of group cohesion and inefficient management.

Seasonality Aspects

Farming in the forest and humid savannah zones of Cameroon is characterised by peaks and slacks in labour demand. Tasks such as weeding and harvesting of food crops are very labour-demanding and generally do not allow for much flexibility. Therefore, the months of April-May-June are the busiest for farm households.

In terms of food supply, most (81 %) farmer households in the forest zone are self-sufficient all year round (baseline survey 2003). Those who are not, generally buy tubers and cereals in the months of March and April. In the savannah zone on the other hand, half (50 %) of the rural households were not food self-sufficient all year round (baseline survey 2003). Periods of food scarcity are the same as in the forest zone. These periods correspond to the inter-harvest, when food from the previous cropping season is finished and crops from the current season are not yet ready to be harvested. It should be noted that, unless the household has extra-agricultural activities (salary or pension, temporary jobs, trade), the period of food scarcity generally coincides with the period of income scarcity, hereby increasing household's

Table 3: Historical profile of Belo, moist savannah zone in Cameroon

Period	Event	Impact
1865-1912	Kom people killed 2 Germans	Because of the resistance and courage of the Kom people, the Germans promised to help the Kom people in the future
1919-1926	Arrival of first missionaries	Conflict between Fon and missionaries
1937	Introduction of coffee	Important source of income for farmers
1926-1954	Kom extended their settlement towards Njinikejem, chasing the Babangki; Harmony between tradition and administration; Tree planting was introduced (eucalyptus and tephrosia)	Population growth More farms Windbreaks, fuel wood, timber Soil fertility improvement
1954-1966	Women's riot; Hon. Jua won elections and contour farming was introduced	Ridges along contours to control erosion
1966-1974	Marked development in Kom land; development of churches, schools, technical services of government (ex. MIDENAO)	Social status was raised; facilities in education (secondary school, higher education)
1974-1982	50% of Njinikejem land was given to an individual for ranging	Considerable decrease in available farmland, while population increased; Cattle destroyed crops
1982-1985	Serious exploitation of forest (more farms and unsustainable exploitation of prunus)	Drought => hunger
1987	Electricity	Increase in commercial and socio-economic activities (bars, shops, ...)
Late 1980s	Community development organisations formed	Enhanced development: water, health, farm-to-market roads, primary schools, community halls
1992	Sensitisation on forest protection by Birdlife International and introduction of sustainable livelihoods activities	Rate of exploitation decreased Introduction of beekeeping, tree planting
1993	Start nursery initiatives, beekeeping, gardening	Increased tree planting Increased family income
1995	Union of farming groups was formed	Increased tree planting Increased family income
1995	Main road Bamenda – Fundong was tarred	Transport facilitated => increased marketing opportunities
1995-2000	More traders come to the area	Commercialisation increased by about 70%; increased production and increase in family income
1999-2000	Formation of community forest management institutions	Decreased access to forest resources; increased awareness and incentives for tree planting

Source: baseline study 2003

vulnerability. As shown in an example from Makenene, southern Cameroon (Figure 7; Schreckenberg *et al.* 2002), income and expenditure of rural households also follow seasonal trends. The seasonal pattern of income flows, however, differs fundamentally between men and women. Men primarily rely on income from their cocoa and coffee crops, which are harvested around November. Women tend to have a range of activities including food crops (particularly tubers and bananas) that bring them a steady stream of income throughout the year (Guyer 1989). Fruit trees, although often not fully exploited because of conflicting farming activities when fruit harvesting is due, also play an important role in household income generation. Often their total absolute contribution to household income is not very high, but the income is generated at a period where other revenues are rare and/or expenses are high. For example, the period of greatest expense in the year in Cameroon is generally considered to be September/October when school fees and related costs are due. For men this is a particularly difficult period as they rely primarily on income from their cocoa and coffee crops, which are harvested around November. The timing of income from *Dacryodes edulis* (Schreckenberg *et al.* 2002) is such that it covers the cost of school fees when few other income sources are available. Figure 4-7 shows the fruiting period for a number of fruit trees in forest zone in Southern Cameroon. In most cases, fruit trees play a more important role within the women's portfolio than for the men because it is women who take fruit to market for sale. The resulting income is used to pay for the family's daily needs including soap, salt and kerosene. Except for daily household needs and health, households adjust their expenses to their income flow. Because of lack of saving and credit facilities, major expenses (such as clothing, building and family celebrations) usually are scheduled immediately after cocoa or coffee sales.

Fig 7a: Main monthly expenditure of women in Makenene Est, Cameroon

(Source: Schreckenberg *et al.* 2002)

Fig 7b Main sources of revenue for women in Makenene Est, Cameroon

(Source: Schreckenberg *et al.* 2002)

¹ Participants in focus group discussions estimated relative importance of income and expenditure by distributing a fixed number of beans over their different activities and over the year. The higher the number of beans, the more money is

Figure 8: Fruiting calendar of some fruit tree species in the forest zone of Cameroon

(Source: Adapted from Tassi 2001; Vivien and Faure 1985; Vivien and Faure 1996)

2.3 Livelihood Assets

People require a range of *Livelihood Assets* to achieve positive livelihood outcomes. Taken on its own, no single category of assets is sufficient to yield the many and varied livelihood outcomes that people seek. As a result, they have to seek ways of nurturing and combining what assets they do have in innovative ways to ensure survival. Besides, lack of assets is an effect as well as a cause of poverty in terms of income, opportunities, consumption and capability building of people and the institutions they belong to.

a) Human Assets

Human Capital represents the skills, knowledge, ability to labour and good health. At household level, human capital depends on the amount and quality of labour available; this varies according to household size, skill levels, leadership potential, health status, etc. (DFID 1999)

Human development indicators for Cameroon (Table 4) are comparable to those of other countries in the central African region. The situation is of course worse for the Democratic Republic of Congo, coming out of five years of conflict, while it may be better for oil-rich countries such as Gabon and Equatorial Guinea, at least in urban areas. Growing poverty, decreasing public investments and escalating corruptive practices in education and health, however, are reasons for concern and may affect human capital negatively in years ahead. Unemployment in Cameroon is one of the highest in Africa: 24.6 % of the urban population is unemployed. Unlike in other developing countries, the higher the education level the higher the unemployment rate in urban areas. One third of the active population with a university qualification are seeking employment, while just 6.4 % of those without education are unemployed (Amin and Dubois 1999).

Table 4: Some human development indicators of Cameroon

Male life expectancy at birth, 2002	45.6 years
Female life expectancy at birth, 2002	48.1 years
Total fertility rate, 2000-2005	4.6 per woman
Infant mortality rate, 2002	95 per 1,000 live births
Under-five mortality rate, 2002	166 per 1,000 live births
Physicians, 1990-2003	7 per 100,000 people
Undernourished people, 1999-2001	27 % of total population
Children underweight for age, 1995-2002	21 % under age 5
Malaria-related mortality rate, all ages, 2000	108 per 100,000
Public health expenditure, 2001	1.2 % of GDP
Male adult literacy rate, 2002	77.0 % age 15 and above
Female adult literacy rate, 2002	59.8 % age 15 and above
Population with sustainable access to an improved water source, 2000	58 %
GDP per capita, 2002	575 USD
Population living below USD 1 a day, 1990-2002	17.1 %
Share of income or consumption, poorest 10%	2.3 %
Share of income or consumption, richest 10%	35.4%
Human Development Index Rank	141

Source: UNDP Human development report 2003 (http://www.hdr.undp.org/statistics/data/cty_f_CM.R.html)

Another epidemic likely to affect workforce in rural areas is HIV/AIDS. UN statistics (UNAIDS 2004) reported an adult HIV infection rate of 6.9 % in 2003, while unofficial sources estimate HIV prevalence rate to be closer to 11 %. This rate is one of the highest in Central Africa. In 2003, 49,000 people died of AIDS according to UNAIDS (2004).

During our baseline survey in 8 villages, we enumerated a total of 789 households of which 162 (20%) were female-headed. Details on population, and human and natural capital assets per village are presented in Tables 5 and 6.

Table 5: Population in study villages, humid forest and savannah zones of Cameroon

	Total number of households	% female-headed households	Total population
Abondo	104	16	700
Nkolfep	92	35	490
Nkom-Efoufoum	153	11	866
Elig-Nkouma	60	13	334
Ngoumou	106	32	661
Ting-Melen	58	24	199
Bandjoun	68	44	533
Belo	148	8	418

Source: Baseline study, 2003

Most households in the study sites seem to have at least 1 male and 1 female adult, and between 2 to 5 children under 15 years, living permanently in the household (Table 6). From this, it seems that farm work and off-farm activities, on average, rely on the head of the household and his wife, with the help of 1 other adult, often being the father or mother or a son or daughter, aged 15 or older. During weekends and holidays, younger children may help a hand, especially during land preparation, weeding and harvesting, which are traditionally peak periods for labour demand.

Our baseline survey showed that, on average, heads of households in the study sites are middle-aged and the majority has had primary education, suggesting that they are able to understand extension messages without problems. Moreover, a study in Esse area in the centre province of Cameroon (Bikoue 2004) revealed that more than 90 % of the interviewed farmers spoke French in addition to their local languages.

The study did not record number of years of experience in farming, but Bikoue (2004) showed that farmers in Esse, centre province of Cameroon, had on average 19 years of experience in agriculture. This suggests that most households are familiar with their environment and have developed adapted farming skills.

b) Social Assets

Social Capital (DFID 1999) means the social resources upon which people draw in pursuit of their livelihood objectives. These are developed through networks and connectedness, membership of more formalised groups and relationships of trust, reciprocity and exchanges.

According to Amin and Dubois (1999), social capital, or relational goods, may be understood to mean “*a combination of cultures, relations, interconnections, and synergy that enables average social productivity to be higher than that obtainable by individuals with the same level of human and physical capital operating in isolation or in a different relational system*”. Social capital can have a great effect on poverty and consequently cannot be dissociated from poverty alleviation policies.

Amin and Dubois (1999) recognise that at the micro-economic level, social capital involves the various links among family members; whereas at the meso-economic level, it covers the action of various groups of people—such as NGOs, for example;

Micro-Economic Level

In relations within the family, social capital is expressed by a series of obligations that generate financial transfers through giving gifts, participating in funerals, fostering and educating children, and so forth. These obligations also generate rights in the community, such as decision-making role and participation status, and allocation of land. Amin and Dubois (1999) found that during the economic crisis of 1986–94 in Cameroon, these family links helped households overcome the crisis’s financial impact. Then, with the deepening of the crisis, these links began to loosen, generating various situations of social debt. After currency’s devaluation and growth revival, the first objective was to reimburse this social debt and reinforce these social links.

In our baseline survey of 2003, we found that the proportion of household revenue from remittances only constituted 0.1 % in the forest and 7.2 % in the savannah zone. However, female-headed households usually relied more on remittances than male-headed households. Female-headed households in the savannah and forest zone respectively drew 44% and 0.4% of total revenue from remittances. The proportion of total household expenditure used for gifts and social assistance made up 4.7 % in the forest and 8.9 % in the savannah zone. There was no remarkable difference between male and female-headed households. From the above, it seems that people in the savannah zone have slightly stronger social bounds than in the forest zone.

Table 6: Human and natural capital assets in study villages, humid forest and savannah zones of Cameroon

Mean figures	Forest study villages					Savannah study villages		
	Abondo	Nkom-Efoufoum	Ting-Melen	Elig-Nkouma	Ngoumou	Nkolfep	Bandjoun	Belo
No of households interviewed	16	12	11	16	17	10	15	15
Household size	7.44	7.33	4.55	5.88	5.06	6.00	8.27	5.93
No of adult males	1.69	1.50	1.27	1.69	1.18	0.90	1.27	1.47
No of adult females	1.56	1.33	1.36	1.25	1.41	1.30	1.87	1.67
No of male children	2.50	2.58	0.91	1.63	1.76	2.60	2.73	1.60
No of female children	1.69	1.92	1.00	1.31	0.71	1.20	2.40	1.20
Age of household head	44.38	46.50	56.27	42.56	51.59	51.60	59.80	53.07
% of household heads with education level of CEPE (primary school) or above	31.2	58.3	54.5	75	76.5	80	33.3	64.3
Total farm size ² (ha)	11.13	2.87	8.16	8.92	6.20	4.94	1.74	4.72
- Area under perennial crops	3.03	1.09	1.68	2.58	1.62	1.06	0.13	2.02
- Area under food crops	3.63	0.82	1.25	2.05	0.93	1.31	1.01	1.53
- Area under fallow	4.47	0.96	5.23	4.07	3.65	2.58	0.60	1.17
Average fallow period (years)	3.13	2.17	4.55	3.86	4.06	2.78	0.33	0.94
% of households that have purchased or rented land	12.5	0	0	6.3	11.8	10.0	35.4	14.3
% of households that are food self-sufficient all year round	93.8	75.0	100.0	68.8	64.7	80.0	53.3	46.7

Source: baseline study 2003

² Farm size was estimated by the farmer with help of the enumerator. For each farming system, dimensions of all the fields were estimated and summed to obtain total area under perennial crops, area under food crops and area under fallow.

Meso-Economic Level

The following groups or associations exist in all ICRAF pilot villages: farming groups, mutual aid groups, cultural groups and church associations. Many of the groups are mixed, although some are exclusively for women and others for men. In addition, political parties often have representations at the community level. The groups that are mostly in contact with NGOs, extension services and projects from outside the community are farming groups, often with a legal status of Common Initiative Groups (CIG), according to the Cameroonian law 92/006 of 1992 on CIGs and cooperatives (Oyono and Temple 2001). They may have a variety of activities from agriculture, bee keeping, fish and poultry farming to cooperative commercialisation of agricultural products and cocoa/coffee. Mutual aid groups are formed to foster solidarity in the community; the members contribute regularly a certain amount of money that feeds into a solidarity fund, which is used to assist members during happy and sad events (weddings, birth, burials, ...). Moreover, these groups also function as informal saving and credit organisations (“*tontines*”). These groups are extremely important for rural households since they constitute a safety net in times of hardship. Church groups come together to pray, to maintain church buildings and cemeteries and to help the priest in his duties (parish committee). Each parish also has its choir(s). As an illustration, Figure 8 shows the different organisations operating in Belo and the interactions between them.

It seems that groups of all kinds play an important role in the life of rural households. It is difficult to find somebody who does not belong to a group. In the study sites, 80 % of the heads of households and 79 % of their spouses belong to at least one association. Most people even belong to different groups at the same time. Therefore, it is quite surprising that the interaction and collaboration between different groups in the village is generally weak or even non-existent. This lack of interaction between groups also poses problems for external organisations, wanting to reach a great number of people in the community by introducing new technologies to specific groups. The underlying rationale for this is that the innovation would spread from one group to another; and that this would be quite easy as people belong to different groups at the same time. However, this assumption is rarely confirmed in the field. Moreover, experience has shown that innovations do not diffuse automatically through that channel. When asked about major sources of information on agricultural and health issues (Essomba 2004), people ranked “groups” only fifth, after family, neighbours, research organisations and NGOs. Also, women tend to receive more information from groups than men and youth.

c) Natural Assets

Natural Capital is the term used for natural resource stocks from which resource flows and services are derived; examples are: land, forests, natural resources, water, erosion protection, biodiversity degree and rate of change (DFID 1999).

In agrarian societies, natural resources are key assets. Therefore, wealth is intricately linked to property rights over natural resources. Abondo, Nkolfep, Nkom-Efoufoum, Elig-Nkouma, Ngoumou and Ting-Melen are located in the forest zone of Cameroon, characterised by semi-deciduous forest vegetation, orthic ferralsols and a bimodal rainfall pattern (April-July and September-November) allowing cultivation of a diversity of crops twice a year (Figure 9). Natural forests have disappeared almost completely in these villages, although some patches of secondary forest or old fallows still subsist (Figure 11). Almost all the land in these villages is under private ownership, this means that land is owned by households or families and is inherited from father to son. Tree ownership is closely linked to land ownership. Where land is rented, farmers usually do not have the right to plant perennial crops except in agreement with the landlord. Generally, if land is sold, the purchaser obtains all rights to trees on that land. Land-use systems comprise of homegardens, cocoa plantations, food crop fields and fallows. The main cash crop in the study sites in the forest zone is cocoa. Farming is characterised by mixed food cropping based on groundnut, cassava, plantain and more intensive monocropping of horticultural crops and maize, especially where market access is good. Dry season cropping (mainly of vegetables and maize) is practiced in the swampy areas along streams. Despite increasing population pressure, short fallows (2-4 years) are still commonly practiced and form practically the only means of soil fertility management in these areas.

Most fruit trees are found in cocoa fields and in homegardens. A full-farm fruit tree inventory (Degrande et al. 2006) in 4 communities (3 in the forest and 1 in the forest-savannah transition zone of Cameroon) identified 34 fruit tree species, of which 22 were indigenous. Table 6 shows the most common species, i.e. safou (*Dacryodes edulis*), mango (*Mangifera indica*), avocado (*Persea americana*), *Citrus* spp. and guava (*Psidium guajava*). Cocoa-coffee plots, cocoa plots, homegardens and coffee plots had the highest number of fruit tree species. Taken together, this group of land-uses had a mean number of species of 7.09 ± 0.23 , which is significantly different (one-way ANOVA: $F = 94.715$; $p = 0.000$) from the other major grouping of land-uses (food crop, fallows, oil palms and orchards), which taken together had a mean number of species of 3.8 ± 0.25 . Reasons for integrating trees in cocoa agroforests is that they provide the necessary

shade for a good development of cocoa trees and also because here they receive a better protection against fire than they would in food crop fields.

Table 6: Most common fruit tree species in 4 communities in Cameroon

Rank	Species	% of all fruit trees in farmers' fields
1	<i>Dacryodes edulis</i>	42
2	<i>Persea americana</i>	16
3	<i>Citrus</i> spp.	13
4	<i>Mangifera indica</i>	11
5	<i>Psidium guajava</i>	3.4

Source: Degrande *et al.* (2006)

Bandjoun and Belo are situated in the humid savannah zone of Cameroon. There, agriculture is dominated by intensive cropping, using ridges and furrows where crop residues and grasses are incorporated into the soil to improve fertility. Natural fallows have shortened to 3-6 months. Acquisition of land happens through inheritance from father to son (in the matrilineal systems of Belo from uncle (mother's side) to nephew) or through buying. Annual precipitation follows a unimodal pattern (April-October) and allows for 2 cropping cycles (Figure 10). Main food crops include maize, plantain, beans, yam and cocoyam, often cultivated in association. The principal cash crop is coffee, which is cultivated in an agroforestry system with fruit trees in the upper layer and shade-tolerant crops in the under storey. Many of the farms are situated on steep slopes and are prone to severe soil erosion. The most common place to plant trees is the homegarden, but some families may have an extra piece of land where they can create an orchard. Some land on the hillsides is marginal and improper for cropping; here trees such as *Prunus africana*, can be planted to protect the soils against erosion. In Bandjoun area, trees are not tolerated in food crop fields. This can be explained by the small plot size (average of 0.33 ha) due to demographic pressure. In Bandjoun, the only remaining forest patches are the sacred forests around the "chefferies", where exploitation of any kind is strictly prohibited. Long fallows do no longer exist, nor does the village have any common land. Women often collect firewood and men tap palm wine in the raphia palm galleries along the streams. However, access to these swamps is not free but regulated by family. On the other hand, the landscape in Belo is characterised by patches of natural forest. Access to these natural forests is open for people within the tribe for hunting, harvesting of forest products, but the place cannot be opened for farmland. The nearby Kilum-Ijim Forest Reserve, however, used to be open to everybody but with the new regulations on

community forestry, access is now restricted and requires authorisation from the local communities managing these forests.

Crops	J	F	M	A	M	J	J	A	S	O	N	D		
Maize	□□□ ♀♂		--- ♀♂	— ♀♂		+++ ♀♂	□□□		---	—	+++	+		
Cassava	□□□ ♀		--- ♀	— ♀	— ♀	□□□		---		~ ♀				
Cocoyam/yam	□□□ ♀	□□	--- ♀	----	— ♀	—						~ ♀		
Sweet potato	□□□ ♀	□□		--- ♀	— ♀	—	+++ ♀	+++						
Groundnut	□□□ ♀♂	□□□	-- ♀	----	- ♀	— +	+++ ♀	□□□	---	—	+	+++		
Hot Pepper	---- ♀♂	— ♀		++ ♀			+++			+++		□□□ ♂		
Eggplant	---- ♀♂	— ♀		++ ♀		+++		+++				□□□ ♂		
Tomato	□□□ ♂H	---- ♀♂	--- ♀♂	— ♀♂	—	+++ ♀♂	□□□	---	—	+++				
Okra	□□□ ♀♂H	---- ♀♂	— ♀♂	++ ♀♂		□□□	----	—	++					
Green vegetables	— ♂	—	++ ♀♂							□□□ ♂		---- ♂		
Cocoa	□□□ ♂	□□□		— ♂	—	—	—	—	++ ♀♂		+++ ♀♂H	+++		
Banana/plantain	□□□ ♂	□□□ ~♀♂	--♂ ~	---- ~	~	~	—♂ ~	— ~	~	~		□□□		
Sugarcane	□□□	□□		----		—	—					+++		

key :	□□□	clearing and land preparation
	----	planting
	—	maintenance (weeding, etc.)
	+++	harvesting
	~	periodic or staggered harvesting
	♀	female task
	♂	male task
	H	hired labour

Figure 9: Agricultural calendar for forest zone of southern Cameroon
Source: baseline study 2003

Crops	J	F	M	A	M	J	J	A	S	O	N	D
Maize		□□□ ♂	□-- ♀	---	— ♀	—	+++ ♀	□□□	---	—		+++
Cocoyam		□□□ ♀	--- ♀	— ♀			— ♀					+++ ♀
Yam	□□□ ♀	□□	---							++ ♀	+++	
Sweet potato		□□□ ♂	--- ♀			+++ ♀		□□ ♂	---			+++ ♀
Irish potato		□□□ ♂	--- ♀		— ♀	— +	+++ ♀					
Banana/plantain	~	□□♂ ~♀♂	--♂ ~	-- ~								
Groundnut		□□□ ♀	--- ♀		— ♀	—		+++ ♀				
Beans		□□□ ♀	--- ♀		— ♀	+++ ♀		□□□ ♀	--- ♀	— ♀	+++ ♀	++
Cabbage/Tomato	+++ ♂									□□□ ♂	----- ♂	— ♂
Green vegetables			□□ ♀	--- ♀		~ ♀	~	~				
Coffee	++	□□□ ♂H	□□	— ♂		□□□ H			□□□ H		+++ ♂	+++
Kola nut				++ ♂	++							

key :

- clearing and land preparation
- planting
- maintenance (weeding, etc.)
- +++ harvesting
- ~ periodic or staggered harvesting
- ♀ female task
- ♂ male task
- H hired labour

Figure 10: Agricultural calendar for humid savannah zone of Cameroon
Source: baseline study 2003

Figure 11: Participatory map of land-use in Nkolfe, forest zone of Cameroon

Source: baseline study 2003

d) Physical Assets

Physical Capital comprises the basic infrastructure (roads, rails, communication, shelter, water supply, energy) and producer goods (tools and equipment) needed to support livelihoods (DFID 1999).

Most villages studied have basic infrastructure such as primary schools, churches and a commercial place (either weekly market, bars or small shops), although health centres and sound water points are often lacking. Electricity still is not widespread in rural areas, especially in the forest zone. Table 7 gives an overview of existing infrastructure and services in the different villages. The house often comprises the poor's main physical asset by value. Houses in the study sites were generally made of a wooden frame filled with mud (plastered or not) and covered with a zinc roof. Palm frond thatches are becoming rare and usually typify the poorest households in the village. On the other hand, houses built with cement blocks, as well as the presence of stuffed chairs, indicate higher levels of wealth.

Table 7: Infrastructure in study sites, Cameroon

Village	Primary school	Sound water source	Health centre	Church	Shop, market	Electricity
Abondo		✓		✓	✓	
Nkolfep					✓	✓
Nkom-Efoufoum	✓	✓		✓		
Elig-Nkouma	✓			✓	✓	
Ngoumou		✓		✓	✓	✓
Ting-Melen				✓	✓	
Bandjoun	✓	✓	✓	✓	✓	✓
Belo	✓	✓	✓	✓	✓	✓

Source: baseline study 2003

Assets found in almost all households included a set of pans, dishes and a transistor radio. Television, bicycles, hand-push carts and motorcycles were limited to a few privileged households. These results follow the same trend as found by Amin and Dubois (1999), where 43.3 % of rural households in Cameroon owned a radio, 15.2 % a bicycle and only 7.0 % had a television. As agricultural implements, the majority of households interviewed owned a machete and a hoe. Tools such as axes, wheelbarrows and motor saws were less common. Farmers involved in cocoa and market gardening often owned knapsack sprayers to treat against pests and diseases, although sometimes these were shared between neighbours.

Legend:

PREVFOOD = revenue from food crops
PREVJOB = revenue from temporary jobs
PREVCASH = revenue from cash crops
REVLIVE = revenue from livestock
REVREMI = revenue from remittances
PREVTREE = revenue from fruit trees
PREVWAGE = revenue from salary or

Sites in forest zone

Sites in moist savannah zone

All sites

Figure 12: Contribution of different sources of revenue to household income (all sites together, forest and savannah zone of Cameroon, respectively)

Source: baseline study 2003

e) Financial Assets

Financial Capital (DFID 1999) denotes the financial resources that people use to achieve their livelihood objectives; it captures the availability of cash. There are two main sources of financial capital: available stocks (savings: cash, bank deposits, livestock, jewellery, credit) and regular/reliable inflows of money (pensions, remittances).

The baseline study in ICRAF's pilot villages (2003) elaborated budgets with 112 households, estimating household revenue and expenditure over the year. Many farmers were not able to give amounts on a monthly basis, so that itemised revenue and expenditure is presented on a yearly basis.

Income

The following sources of income were distinguished: revenue from cash crop (cocoa in the forest zone and coffee in the savannah zone), wages (regular salary or pension), food crops, temporary jobs (e.g. carpentry, chain sawing, mechanics, etc.), petty trade, livestock, trees and remittances. Taking all villages together (Figure 12), traditional cash crops (cocoa and coffee) contributed proportionally the most to household income (33.4 %), followed food crops (20.4 %), temporary jobs (13.7 %) and wages (10.3 %). However, in the savannah zone, the major cash crop, which is coffee, only contributed 16.1 %, while in the forest zone, cocoa still counted for 39.9 % of household revenue. To compensate, households in the savannah zone relied more on temporary jobs (25.3 % of household income) and remittances (16.3 %). In general, male-headed households seemed to have more opportunities to do jobs than their female counterparts. Female-headed households relied more on remittances, in addition to doing petty trade.

In absolute terms, yearly household income averaged 847,355 FCFA (= 1294 €), but varied enormously from household to household [min: 0 FCFA, max: 5,280,000 FCFA]. Mean annual revenue from other trees (not including coffee and cocoa) was estimated at 47,562 FCFA (= 72 €), representing about 5.6 % of total household revenue. However, this was variable from village to village: households in Elig-Nkouma, Belo, Ting-Melen and Ngoumou seemed to derive a greater share (respectively 11.6, 8.0, 5.7 and 5.1 %) of their revenue from trees than in the other pilot villages. Overall, revenue derived from wages occupied an important place in rural household's income. In absolute terms, salaries and pension contributed annually for 238,937 FCFA (= 365 €), being 10.3 % of the household's total income.

Legend:

PEXPEDUC = expenditure for education

PEXHHNE = expenditure for daily household needs (soap, kerosene, salt, ...)

PEXPAGRI = expenditure for agricultural inputs (fertiliser, pesticides, farm tools, etc.)

PEXPHEAL = expenditure for health

PEXPHEAL = expenditure for health

PEXSOC = expenditure for social

Sites in forest zone

Sites in moist savannah zone

All sites

Figure 13: Share of different expenses in household expenditure (all sites together, forest and savannah zone of Cameroon, respectively)

Source: baseline study 2003

Expenditure

Household expenditure was divided up in expenses for daily household needs (soap, kerosene, salt, etc.), education, health, agricultural inputs, livestock inputs, transport, social events, leisure, clothes and building. As shown in Figure 13, households spent proportionally most money on daily household needs (35.0 %), followed by educational expenses (22.4 %), health care (11.8 %), agricultural inputs (6.7 %) and leisure (8.1 %). This expenditure pattern was not remarkably different in the forest compared to the savannah zone, even though households in the savannah zone appeared to spend more on education and social matters and slightly less on health and agricultural inputs. As opposed to income patterns, expenditure patterns of male and female-headed households were quite similar. In absolute terms, households spent on average 622,288 FCFA (= 950 €) per year, which is approximately three quarters of their income, though this varied much from household to household.

From the baseline study (2003), it was not clear whether interviewed households effectively had surplus and how they saved or invested this money, although literature (IFAD 2001a) shows that households around the world have always saved: as insurance against emergencies, to meet religious and social obligations and for investment and future consumption. The importance of savings in Cameroon is also demonstrated by the proliferation of local rotating savings and credit associations (*tontines* or *njangi*). On the other hand, Essomba (2004) asked farmers from the same study area what they would do in case their income doubled. Building or improving their house was first on the list (40 %), followed by paying better education for the children (21.1 %), investing in a small business (11.5 %) and buying land (7.7 %). Saving money was only mentioned by 5.8 % of the interviewed households. This indicates that less than 20 % of the households thought of making productive investments (small business, land purchase), although investment in education can also be seen as a productive investment in the long term, provided it leads to employment. This can be explained by the fact that the saving mechanisms currently at the disposal of poor people often fail to meet their needs in a convenient, cost-effective and secure way. There exists evidence that if a poor household is given a safe, accessible opportunity, its capacity to save and the amounts it manages to save are remarkable (IFAD 2001a), opening a window of opportunities to smoothen consumption and later acquire assets.

2.4 Transforming Structures and Processes

Transforming Structures and Processes (DFID 1999) within the livelihoods framework are the institutions, organisations, policies and legislation that shape livelihoods. They operate at all levels, from the household to the international arena, and in all spheres, from the most private to the most public. They effectively determine access to various types of capital; terms of exchange between different types of capital; and returns to any given livelihood strategy. Because culture is included in this area they also account for other 'unexplained' differences in the 'way things are done' in different societies.

Participation allows the poor to have a voice, and through transfer of responsibilities gives them the power to discover and determine ways to improve their lives. Empowering the poor is the foundation of rural poverty alleviation. IFAD (2001) suggests three institutional approaches to empowering the rural poor in their quest for poverty reduction:

- (1) a blend of devolution and collective action for natural resource management;
- (2) delivery of financial services to the poor to enable them to access and secure financial assets; and
- (3) developing linkages with NGOs and the private sector as partners for service delivery.

Devolution of Responsibilities

According to Oyono (2003), devolution or 'democratic decentralisation' implies that authorities or entities representing local populations are elected and - because of their easier access to local information and greater sensitivity to local needs - are more accountable to the local community. However, the claim that local institutions are accountable to the poor is controversial, as decentralised institutions may be controlled by powerful elites that reduce community programmes' efficiency.

Decentralisation efforts in Cameroon have to be viewed in the light of its double colonial heritage. At independence in 1960, a federal structure of government was adopted, but this had changed into a highly centralized, one-party state by 1972. These institutional developments did not allow sufficient participation by the poor, and consequently their energy was not catalysed enough to increase their opportunities for self-fulfilment. With the economic crisis, the tension and fragmentation - brought about by the previous institutional

development - degenerated into much social violence through the “dead cities” operations. This forced the government to accommodate the rising political opposition and the law instituted political pluralism in November 1990. This was still not enough, as was shown by the civil unrest that followed in 1991–92; violent protest against the political regime and its ‘governance practices’ including corruption, nepotism and social injustice. Further reforms were then put in place to allow more freedom and liberalization—for example, the 1990 law on association, the 1993 law on cooperatives, measures concerning the media, and so forth (Amin and Dubois 1999). By doing so, the government declared its interest in the strengthening of local governments. Yet, the central state continued to control them and worked towards their authoritarian deconstruction (Oyono 2003).

One example of decentralisation in Cameroon is the forestry code reform in 1994 that transfers powers to peripheral actors for the management of forestry fees in order to foster community development, Council Forests and Community Forests (Oyono 2003). The introduction of Community Forests was hailed by all local communities in Cameroon’s dense forest zone as the beginning of an era of equity in intra-generational access to natural resources. Unfortunately, the results are not as tangible as all that and local communities still seem vulnerable and captive. For example, Oyono (2003) views the slowness of the administration in treating applications for Community Forests as indicative of the central state’s wish to keep full control over the process or to even block it and maintain the status quo. Furthermore, senior civil servants and politicians, in their capacity of ‘local elites’, tend to hijack the management committees and hence contribute to the decline of the decentralisation process and the retention of powers at the centre.

Based on the above analysis of forest management decentralisation, two facts emerge (Oyono 2003). First, regional-level administrative authorities and national-level bureaucrats tend to withdraw powers and resources devolved to elected bodies and to other local actors. Second, the organisational infrastructure set up at village level to support devolutions seems immature, and incapable of promoting and controlling a collective effort like that required for local management. It certainly means that the way leading to democratic decentralisation in Cameroon needs effective change in policy and practice.

Delivering Financial Services

While it is increasingly recognised that microfinance alone is not a magic bullet for poverty reduction, finance for investment helps the poor if basic consumption can be assured and

technology (or market access) enables them to earn a decent return on assets (IFAD 2001). Yet, investment by the rural poor is often constrained because they cannot borrow.

As a whole, access to credit in Cameroon is very difficult, especially for those in the informal sector. The poor financial situation of the Cameroon banks accounts for the difficult credit conditions imposed on customers, and these conditions are generally not favourable to the poor, especially those in agriculture or the informal sector. These difficulties have pushed people, particularly women, to create solidarity funds with which they can start income-generating activities to satisfy monetary needs or solve financial problems. *Njangis* provide start-up capital for activities started by their members. The present role of a few non-governmental organizations in the fight to increase credit accessibility for the poor and the more vulnerable cannot be overlooked. To help solve this issue of credit inaccessibility in rural areas, the government, with the help of the World Bank, put in place a specific institution: *Fond d'Investissements pour les Micro-réalisations Agricoles et Communautaires* (FIMAC), to disburse investment funds for micro-projects. FIMAC provides financial assistance in the form of collective loans (Amin and Dubois 1999).

Developing Linkages with NGOs and Private Sector

With the law No 90/05 of December 19th, 1990, on the liberalization of associations in Cameroon, many community-based associations, *common initiative groups* (CIGs) and, more generally, NGOs came to life. Besides many other things, they help develop human capacities. As of 1998, about 7,000 CIGs had been registered and some 3,000 applications were still pending approval. Recent experiences in the poverty-reduction program show that these NGOs have a comparative advantage over other development partners (Amin and Dubois 1999). This advantage comes from their proximity, flexibility in approach, technical competence, and, often, international backing. Even though there is not enough evidence to show the extent of their aid to the poor, there is a general belief that their predominant location in rural areas brings them nearer to the poor. Oyono and Temple (2001), however, questioned the capacity of CIGs to play a role in agricultural development because of their diversity and the blurred motivation of their promoters (governmental and non-governmental organisations).

2.5 Livelihood Strategies

Livelihood Strategies (DFID 1999) is the overarching term used to denote the range and combination of activities and choices that people make/undertake in order to achieve their livelihood goals (including productive activities, investment strategies, reproductive choices, etc.).

In the light of the baseline study in ICRAF's pilot villages (2003) and based on previous work in the area, we identified livelihood categories that reflect the household's main sources of income in ICRAF's pilot villages.

1. *Cocoa/coffee dominant*. Households that generate their revenues mainly from "traditional" cash crops, i.e. cocoa in the forest zone (Abondo, Nkolfe, Nkom-Efoufoum, Elig-Nkouma, Ngoumou and Ting-Melen) and coffee in the savannah zone (Bandjoun and Belo).
2. *Cocoa/coffee + food crops*. Households that generate an important part of their revenues from cocoa or coffee, but complement this income with food crops.
3. *Cocoa/coffee + market gardening*. Households that generate an important part of their revenues from cocoa or coffee, but complement this income with market gardening (i.e. tomatoes, okra, green maize, green vegetables).
4. *Food crops dominant*: households that generate revenues mainly from food crops.
5. *Market gardening*. Households that generate revenues mainly from market gardening.
6. *Other perennials*. Households that generate their revenues mainly from perennial crops other than cocoa and coffee, these may include oil palm, fruit trees, etc.
7. *Non-agricultural*. Households that generate their revenues mainly from non-agricultural activities, such as petty trade, pension, casual labour, etc.

Taking the sites of the forest zone together (Figure 14), the most important livelihood strategy was the system that combines cocoa with food crops, which concerned 28 % of all households. The second most important category (24 %) was made up of households that generate the majority of their income from cocoa alone. Food cropping constituted the main income generating activity for 23 % of forest households overall, but is the main source of

income for 56 % of female-headed households. Thirteen percent of all households obtained their main income from non-agricultural activities. Except for Abondo (10 %) and Ngoumou (6 %), market gardening had not yet taken off in the forest pilot villages. Overall, only 1.5 % of households used this system to generate most of their income.

Figure 14: Livelihood strategies in humid forest and moist savannah zone of Cameroon, respectively Source: baseline study 2003

Coffee, which is the traditional cash crop of the savannah zone, has lost much of its importance as an income generator. Only 7 % of households in Bandjoun and Belo relied exclusively on coffee for income generation (Figure 14). On the other hand, almost one-third of the households (30 %) used a combination of coffee and food crops to make a living. Thirty-three percent generated the majority of their income from food crops alone. This proportion was even higher in Bandjoun where 59 % of households relied on food crops for their income. It must be noted that, in Bandjoun, 44 % of households were female-headed which might explain the dominance of food cropping in the household economy.

Looking at the contribution of different sources of income per livelihood strategy (Figure 15), we noticed that cash crops remained an important source of revenue in all strategies, ranging from 9.7 to 42.3 % of total revenue. Food crops contributed between 12.9 and 17.3 % to

household revenue, except for non-agricultural households. Wages, i.e. regular income in the form of a salary or pension, appeared to be a very important source of income for rural households, regardless their livelihood strategy. Temporary jobs, on the other hand, contributed differently to income, but seemed most important for non-agricultural households and for those combining cash crops and market gardening. Trees, overall, contributed to a lesser degree to farmers' income. This proportion was highest for households engaged in food cropping (10.8 %).

Figure 15: Contribution of different sources of income per livelihood strategy, humid forest and moist savannah zone of Cameroon Source: baseline study 2003

Livelihood strategies are expected to be determined by availability of land and labour, and might change with ageing of the household. Therefore, we looked at relationships between livelihood strategies and farm size, household size and age of the household head (Table 8). No clear relationship was found between livelihood strategy on the one hand and household size and age of the household head on the other hand. It was true that households engaged in market gardening had the youngest heads (average age = 45.3), but the difference with other livelihood strategies was not significant. While overall, households combining cash crops and food cropping had big families (average household size = 7.2), non-agriculture households had even more people (7.9). Households focusing on cash crops for income generation overall

had the smallest household size (4.5) and this was equally true for both forest and savannah zones. Nonetheless, differences in household size between different livelihood strategies were not significant. Land availability however seemed to affect livelihood strategy more. Overall, farm size was largest for households combining cash crops and food crops (9.3 ha) and smallest for non-agricultural households (2.8 ha). The impact of farm size was more explicit in the forest zone than in the savannah zone. In the latter, largest farm sizes were found with households combining coffee and market gardening.

Table 8: Relationship between livelihood strategy on the one hand and farm size, household size and age of the household head on the other hand, forest and savannah zone of Cameroon (Source: baseline study 2003)

Livelihood strategy	Farm size (ha)			Household size			Age of household head (years)		
	Overall	Forest	Savannah	Overall	Forest	Savannah	Overall	Forest	Savannah
Cash crop dominant	5.1	5.5	0.36	4.5	4.9	1.0	48.6	46.7	67.5
Cash crop + food crop	9.3	11.0	5.0	7.2	7.2	7.3	54.3	50.7	63.4
Cash crop + market gardening	5.8	5.2	7.9	6.3	6.5	5.7	45.3	43.7	50.7
Food crops dominant	5.5	7.4	1.8	5.9	5.2	7.1	52.6	54.0	49.9
Non-agriculture dominant	2.8	3.7	1.5	7.9	6.9	9.5	45.7	39.5	56.0
	N=112	N=82	N=30	N=112	N=82	N=30	N=112	N=82	N=30
	F=3.412	F=3.261	F=2.071	F=1.788	F=1.557	F=0.690	F=1.336	F=2.016	F=0.975
	p=0.012	p=0.016	p=0.115	p=0.137	p=0.194	p=0.606	p=0.261	p=0.100	p=0.439

2.6 Livelihood Outcomes

Livelihood Outcomes (DFID 1999) are the achievements or outputs of livelihood strategies and include the following categories: more income, increased well-being, reduced vulnerability, improved food security, and more sustainable use of the natural resource base.

In 2.5 we observed that the way in which households combine their assets to make a living differs, not only depending on the assets at their disposal, but it is also influenced by age, gender, market access, etc. However, the choices they make in designing their livelihood strategies determine the outcome. The perception of livelihood outcomes in itself may differ among people. As defined by DFID (1999), categories of livelihood outcomes include more income, increased well-being, reduced vulnerability, improved security and more sustainable use of the natural base. Box 1 gives a diverse collection of Cameroonian farmers' views on livelihood outcomes.

Box 1: Farmers' views on livelihood outcomes

"I want my children to pursue their education to a high level. I want to invest in farms for my children; I don't want to keep my money in the bank, I'd rather want to invest it well, for example by planting trees."

Emmanuel Kuh, Belo

"Poverty is when there is not enough food in the house. When my children have enough to eat every day, all year round, I am happy."

Eunice Tosi, Belo

"Poverty is a state in which your resources do not allow you to solve all your problems; it's when you can't fulfil all your obligations. It's like me now, I don't have enough money to send my children to college. My cocoa farm is not producing anything, because I lack money to pay fungicides. I am not happy because I cannot take care of my family."

Ferdinand Ohandja, Abondo

In our baseline study (2003), sample households were classified into well-being categories, using local indicators that reflect different perceptions of livelihood outcome (income, food security, well-being). Based on experience with participatory wealth-ranking exercises in our study zone (Schreckenber *et al.* 2002; Degrande *et al.* 2006), 5 categories were retained. Enumerators classified households into well-being categories using the criteria below. It is important to note that these categories are subjective and that comparison of households is only relevant within one village and not across villages.

1. *Very poor.* Households that lack land and generally do not own cocoa or coffee. Households headed by very young, very old, disabled persons or immigrants. Household that do not manage their money well (drink too much, lazy, ...). These households are not able to send their children to school or to ensure adequate healthcare. The state of their house also indicates the difficulties they must have to make ends meet.
2. *Poor/well-being below average.* Households that lack land and/or have a large family. They generally do not have cash crops.
3. *Average level of well-being.* Households that generate sufficient income from cocoa, market gardening and/or food cropping, but have a large family and a lot of expenses.
4. *Well-being above average.* Middle-aged households with well-managed cocoa plantations, few children or grown up children, or hard working young households doing market gardening. This category can meet the needs of their household and have no problems with sending their children to school.
5. *Rich or well-off.* Households that generate income from non-agricultural activities such as trade or wage labour, or that benefit from a pension. Households with large cocoa plantations and good management of their money. These households can be identified through their clothing, food, health care, some assets (vehicle, house, ...). These people often lend money to others.

In most villages, the well-being pattern followed a normal distribution curve with few people in the extreme categories of ‘*very poor*’ on one side or ‘*rich*’ on the other side, and close to half of households in the category of ‘*average well-being*’ (Figure 16). Nevertheless, some differences were found between villages. Abondo and Elig-Nkouma, for example, had a larger proportion of ‘*very poor*’ households, respectively 18 % and 15 %, while Ting-Melen and Nkolfep apparently had no households in the poorest category. The latter have good access to Yaoundé, which favours interactions with relatives working in town and offers job

opportunities. In Bandjoun, 37 % of households were classified as ‘*very poor*’ and 35 % as ‘*poor*’. In Ting-Melen 41 % of households were categorised as ‘*well-off*’, which was significantly higher than for the rest of the villages (17 % overall).

The sampling procedure used in the study did not allow us to determine whether there was a link between livelihood strategy and level of well-being (too small sample size). However, looking at sources of revenue per well-being category (Figure 17) may give us insights in strategies that permit households to move out of poverty. We noticed that the poorest categories had fewer sources of revenue than better-off categories. Households with average well-being disposed of the most diversified income portfolio with 6 different sources of revenue (only sources contributing more than 5 % were counted) against only 3 for the poorest categories and 4 for the richest categories. Generally, we noticed an increase in the proportion of revenue coming from wages (0 % in the poorest category and 62.3 % for the wealthiest category). At the same time, the contribution of food crops and jobs (temporary work) decreased respectively from 26.3 % to 7.4 % and from 25 % to 9 %. Interestingly, the share of trees in income generation was much larger for households in the average wealth category (15.3 %) than in any other category.

These results are in agreement with literature on rural livelihood diversity and agriculture. Ellis and Mdoe (2003) found that income from non-farm sources in Tanzania was higher for upper income groups than for the lowest income quartile. A study of 11 countries in Latin America (Reardon *et al.* 2001) indicated that non-farm income constituted approximately 40 % of rural incomes. Surprisingly, the highest levels were found in the zones where agriculture was successful, suggesting that rising farm productivity is a driver of the rural non-farm economy with linkages both from production (processing and agro-industries) and consumption (increased demand for manufactured products and inputs) (Chapman and Tripp 2004).

We also examined the balance between household revenue and household expenditure and tried to find relationships with livelihood strategies on the one hand and well-being categories on the other hand. Differences in yearly balance between livelihood strategies were not significant. Although there was a clear trend of increasing yearly balance as one moved from poorest category (40,285 FCFA), over average wealth category (74,924 FCFA) to richest (794,252 FCFA), the difference was only significant between the richest category and all other categories.

Figure 16: Distribution of households by well-being category and by village, forest and savannah zone (Bandjoun and Belo) of Cameroon *Source: Baseline study 2003*

Figure 17: Proportion of revenue coming from wages, food crops, jobs and trees per well-being category, forest and savannah zone of Cameroon *Source: Baseline study 2003*

Conclusion and Recommendations

In a context of vulnerability, households pursue a range of livelihood strategies based on assets (natural, financial, social, human and physical capital) they have to draw on and livelihood outcomes they wish to achieve.

Context

Despite its richness in natural resources, Cameroon still has many poor people. Its economy has been hard hit in the late 1980s - early 1990s due to drastic fall in export revenues and the consequences of structural adjustment programmes. Since 1995, Cameroon experiences a macro-economic improvement, but poverty is still high and inequality is increasing. Cameroon has one of the highest unemployment rates of the region. In the area of health care, despite reduced mortality rate and increased life expectancy, Cameroon's evolution in access to health care services in general is still discouraging. Decreasing public investments and escalating corruptive practices in all domains are reasons for concern.

Tree crop or forest-based farming systems in the forest and moist savannah zones were, until recently, highly dependent on industrial cash crops, namely cocoa and coffee. This made farmers extremely vulnerable to fluctuations in world market prices. However, alternatives for income generation were scarce, especially outside the agriculture sector. Therefore, farmers turned their attention to food cropping, thereby opening new forest land where possible, and intensifying cropping patterns elsewhere by reducing fallow periods. This inevitably led to physical degradation of soil, depletion of soil nutrients and increasing incidence of weeds, pests and diseases. In addition to problems with soil fertility, rural households still suffer from seasonality effects. Many households go through periods of food shortage prior to harvest. This shortage in food generally is accompanied by periods of financial distress when the household has no other sources of income than food crops. Moreover, many of the food crops fetch relatively low prices in the market because of their lack of added value. There is thus a need for alternative income-generating activities and, if possible, activities which build on and make effective use of existing assets.

Assets

- Improving human capital increases the skills and capabilities of people, enabling them to overcome various shocks in life and escape from poverty gaps. Education also speeds adoption of new rewarding technologies, eases access to new information, facilitates access to others with information (health professionals and extension agents) and improves ability to make sense of new information. In our study sites, households are comprised of 1 male and 1 female adult and 2-5 children, on average. Most heads of households have had primary education and have substantial experience in agriculture. Although we have no information on health status of households in our study sites, general data for Cameroon raise reasons for concern. Health care coverage as a whole has been poor, especially because a number of health care facilities are poorly equipped or absent. On average, the distance to the nearest health care facility is still long, and services are still poor because of lack of drugs and low motivation of personnel. Only 2 out of 8 study sites had a health centre and 3 had no potable water source at all.
- Strong social organization makes it possible for the poor to gain access to resources and knowledge within their communities and to develop links with external partners. In our study site, groups of all kinds (farming groups, cultural groups, mutual aid groups, savings and credit associations, church associations) occupy an important place in daily life. Credit and savings associations (*tontines* or *njangi*) are almost the only financial services accessible to rural households in Cameroon and often provide start-up capital for income generating activities or to buy agricultural inputs or tools. However, their capacity to finance investment for small-scale business is rather low, because of the small amounts involved. Common Initiative Groups (CIGs), because of their legal character, have most contact with NGOs, extension services and projects, but their contribution to development depends a lot on group objectives and cohesion, and dynamism of their leader. Our study revealed very little interaction and collaboration between groups within villages, neither did the households indicate groups as an important source of information about agricultural innovations. Remittances, gifts and transfers are also indications for social bounds. In our study sites, remittances constituted only a small proportion of household income. Overall, the contribution of remittances was higher for female-headed households. We therefore conclude that social capital in our study sites is potentially strong. To be able to become real motors of development however, groups will need training and assistance to mature.

- Natural capital is an extremely important asset for agricultural households. This is demonstrated by the fact that it is an important criterion in participatory wealth ranking. It is also the most important reason for conflicts in the village. Most land in the study sites is privately owned. The general rule is that property rights are passed from father to son. Women's access to land generally comes through men. Primary forests have disappeared in all study sites, although patches of secondary forests or old fallows exist. The latter are owned by families. This implies that, in most villages, open access to natural resources does no longer exist. The predominant farming type is mixed food cropping based on groundnut, cassava, maize and plantain in the forest zone and a combination of beans and maize in the moist savannah area. Perennial cropping systems are dominated by cocoa in the forest and coffee in the moist savannah zone. Most fruit trees are found in these perennial systems. A tree inventory in the study area (Degrande *et al.* 2006) identified *Dacryodes edulis*, *Mangifera indica*, *Persea americana*, *Citrus* spp. and *Psidium guajava* as most common fruit tree species. The results also confirmed that farmers do compensate for loss of access to trees in the wild by planting more trees on their farms. Their tree planting pattern also responds to market incentives.
- It is known that rural areas in developing countries often lack basic infrastructure, such as health centers, schools, markets, roads, electricity, etc., even though better access to this type of physical capital allows the poor to benefit more from innovations. In our study, only half of the sites had a primary school, 2 out of 8 disposed of a health centre and 5 had potable water. Household furniture and equipment was scanty and agricultural tools in most households were limited to hoes and machetes. Three out of the 8 sites were located near a tarred road, while access to the other villages is difficult in the rainy season. Bad roads make the gap between farm and market prices high. This problem is especially acute for roots and tubers, which are quite bulky and perishable. Households in remote places can therefore benefit less from improved incentives and liberalization. Also, apart from easier trips to schools, clinics, extension and so on, better transport facilities can relieve drudgery and save time.
- Financial assets comprise of savings and inflows of money. In our study sites, traditional cash crops (cocoa and coffee) contributed proportionally the most to household income (33.4 %), followed by food crops (20.4 %), temporary jobs (13.7 %) and wages (10.3 %). Household's average yearly income was 847,355 FCFA (1294 €) with big variations from household to household. Average annual revenue from trees was estimated at 47,562 FCFA per household, being 5.6 % of total

revenue. Nonetheless, this proportion was as much as 11.6 % in one of the sites. Irrespective of livelihood strategy or wealth category, temporary jobs contributed an important share to household revenue, being the first and third source of income in the savannah and forest zones respectively. The study also found that about three quarters of the income was spent, which represents an average yearly expenditure of 622,288 FCFA. Households spent proportionally most money on daily household needs (35.0 %), followed by educational expenses (22.4 %), health care (11.8 %), leisure (8.1 %) and agricultural inputs (6.7 %).

Transforming Structures and Processes

The study also looked at how policies and processes contribute to development at local level. Three approaches to empowering people in their quest to reduce poverty were highlighted.

- (1) Devolution and collective action for natural resource management. In Cameroon, reforms to strengthen participation of people at the community level, illustrated by decentralization of forest management, are at serious risk because administrative authorities and bureaucrats tend to take back powers and resources devolved to elected bodies and to other local actors. Another constraint is that the organisational infrastructure set up at village level to support these devolutions seems immature, and incapable of promoting and controlling a collective effort like that required for local management.
- (2) Delivery of financial services. In general, access to credit in Cameroon is difficult. This situation of poor financial services has led to formation of local rotative savings and credit associations that provide start-up capital for activities of their members, but they generally generate rather small amounts of money, lack flexibility and convenience.
- (3) Developing linkages with NGOs and private sector. After the 1992 law on liberalization of associations, there has been a boom of NGOs and CBOs that got actively involved in development and poverty reduction. Because of their proximity to the poor, they are expected to respond better to local needs. However, their diversity and lack of funds impedes many of them to contribute effectively to development of the poor.

Livelihood Strategies

Rural households in southern Cameroon undertake a combination of activities and make choices in order to achieve their livelihood goals. These livelihood strategies are categorised based on the household's main source of income. In the forest zone, 37 % of the households combine cocoa and food crops to earn a living, whereas 24 % rely on cocoa and 18 % on food crops alone for the majority of their income. Fifteen percent of the households obtain their main income from non-agricultural activities. In the moist savannah, coffee, which is the traditional cash crop, has lost much of its importance; only 2 % of the households still consider it as their main source of income. Almost half of all households combine coffee and food crops, while food crops alone constitute the biggest share of revenues for 35 % of households. A larger proportion of female-headed households generate their revenues mainly from food crops. The results confirm the diversification of farmers in southern Cameroon into food cropping as from the mid-1990s. Whereas cocoa and coffee remain important income generators, many households combine them with food crops to increase revenues.

From the study, it appears that land availability mostly affects livelihood strategies. Households that combine cash crops with food crops had largest farm sizes, while those with non-agricultural activities as main income generator were characterised by smaller farms. Age of the household head and family size - a proxy for labour availability - does not seem to affect livelihood strategies significantly, although younger household heads opted more for market gardening, big households were more into cash crops combined with food crops, whereas small households were more involved in cash crops alone.

Livelihood Outcomes

Using local indicators of well-being, sample households were categorised from very poor to well-off. The sample size was too small to permit us to determine a relationship between well-being and livelihood strategies, but looking at main sources of revenue we noticed that poorest categories had fewer sources of revenue than better-off categories. Households with average well-being disposed of most diversified income portfolios with 6 different sources of revenue. We also remarked a steady increase in proportion of revenue coming from wages as one moves from the poorest category to the wealthiest, while the contrary was true for the contribution of food crops and jobs. The share of trees in income was much larger for households in the average wealth category than in any other category.

Implications for Poverty Reduction Strategies

Poverty reduction strategies need to be situated in the context of the Central African region in general, and southern Cameroon in particular. These include: a weak human capital base; inappropriate or insufficiently pro-poor policies and institutions; low agricultural productivity combined with degradation of the natural resource base; insufficient and poorly maintained rural infrastructure; and the need to operate more effectively in the global market place.

First of all, the capacity of the rural poor and their organizations to develop adequate livelihood strategies needs to be strengthened. Although in Cameroon, social, human and physical capital are improving, respectively through more NGO networks and social links, better health and education policies and improvements in the banking sector, the rural poor need to have greater access to a variety of interdependent assets – human and social, natural, infrastructural and financial. Our study revealed that development policies and institutions, despite decentralization processes, have not been able to meet the needs of the poor. Therefore, emphasis must be put on building the technical, organizational, and administrative capacity of local governments, communities and civil-society organizations to take on roles previously held by central authorities in this domain.

Another priority for development is to raise agricultural and natural resource productivity and to improve access to technology. Intensification and diversification of agriculture call for the generation and dissemination of improved agricultural and natural resource technologies. These technologies should concentrate on areas where population pressure has increased incentives for intensification, and on promotion of community-based natural resource management activities. As IFAD (2001b) suggests, there should be a specific focus on technologies that: (i) use locally available inputs; (ii) build upon indigenous knowledge and practices; (iii) take into account existing systems and their gradual evolution, as well as present constraints in terms of labour, gender division of labour and decision-making, access to finance, access to support services, markets and policies; (iv) are sustainable and environmentally friendly with locally reproducible resources; and (v) can be disseminated through cost-effective client-driven institutions.

Diversification of income sources should address two constraints in particular: (1) current high dependence on few crops that are prone to price fluctuations on the world market, and (2) seasonal fluctuations in income and consumption. This can be achieved either through production and marketing of non-traditional crops or by more fully exploiting off-farm opportunities. Indeed, rural non-farm activities may provide steadier streams of cash income

than agriculture alone (which is highly seasonal) and are already part and parcel of rural livelihoods (Chapman and Tripp 2004). From our study it also appears that households with non-agricultural activities seem to be better off. However, among the most important rural non-farm activities are those directly linked to agricultural outputs (food processing and marketing) and inputs (blacksmith construction and repair of agricultural implements). Indeed, it is often overlooked that a dynamic smallholder agricultural economy forms the backbone of a vibrant rural non-farm sector. Due to multiplier effects, developing smallholder agriculture is more likely to stimulate off-farm employment than either large-scale agricultural development or industrial development.

Nevertheless, rural poor have special problems in exploiting non-farm employment opportunities, because of their limited human and social capital, insufficient access to markets, and lack of credit for working and investment capital. It appears that while the poorest diversify to supplement income and the poor to mitigate risk, only the rich are able to further increase income through diversification (Chapman and Tripp 2004). In the case of non-timber forest products (NTFPs) for example, Ruiz-Perez *et al.* (2004), based on 61 case studies from Asia, Africa and Latin America, demonstrate that NTFP-specialised households, i.e. cash-oriented households that rely on a forest product as their main source of income, tend to have higher household incomes than the local average. On the other hand, where NTFPs provide income to households that earn the bulk of their income from agriculture or off-farm sources, income equals the local average. Hence, income potential of commercial NTFP production is linked to the existence of infrastructure, access to skills and services, and other enabling conditions that are often lacking in rural Africa. Moreover, because of reasons of food supply, farmers often prefer a mix of activities including both agriculture and micro-enterprises. This was illustrated by Orr and Orr (2002) showing that amongst farmers in Malawi, faced with options to either further specialise in commercial agricultural niches or diversify into other micro-enterprises, a key factor was not to disrupt household food supply. Therefore, targeting the rural poor for diversification and micro-enterprise development requires specialized institutions.

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