CONSOLIDATED REPORT ON THE LIVELIHOOD ZONES OF THE DEMOCRATIC REPUBLIC OF CONGO

DECEMBER 2016
Contents

ACRONYMS AND ABBREVIATIONS ........................................................................... 5

ACKNOWLEDGEMENTS ......................................................................................... 6

1. INTRODUCTION ................................................................................................. 7
   1.1 Livelihoods zoning ......................................................................................... 7
   1.2 Implementation of the livelihood zoning ....................................................... 8

2. RURAL LIVELIHOODS IN DRC - AN OVERVIEW ........................................... 11
   2.1 The geographical context ............................................................................. 11
   2.2 The shared context of the livelihood zones .................................................. 14
   2.3 Food security questions ............................................................................... 16

3. SUMMARY DESCRIPTIONS OF THE LIVELIHOOD ZONES ................................ 18
   CD01 COPPERBELT AND MARGINAL AGRICULTURE .................................. 18
   CD02 SAVANNAH CASSAVA ............................................................................ 20
   CD03 SAVANNAH SURPLUS MAIZE ................................................................ 24
   CD04 KAMALONDO DEPRESSION .................................................................. 27
   CD05 SOUTHERN TANGANYIKA-MWERO FISHING ........................................ 30
   CD06 MANIEMA SAVANNAH AGRICULTURE .................................................. 33
   CD07 HIGH FOOD PRODUCTION AND MARKETING ..................................... 36
   CD08 NORTHERN TANGANYIKA MIDLAND AGRICULTURE ............................ 39
   CD09 MOUNTAIN AGROPASTORAL ................................................................ 41
   CD10 MIDLAND SAVANNAH AGRICULTURE .................................................... 44
CD10: Seasonal calendar ........................................................................................................ 45
CD10: Food access calendar for poor households ................................................................. 46
CD11 VIRUNGA VOLCANIC SOILS AGRICULTURE .............................................................. 47
CD11: Seasonal calendar ....................................................................................................... 49
CD11: Food access calendar for poor households ................................................................. 49
CD12 FOREST CULTIVATION AND PRODUCTS .................................................................... 50
CD12: Seasonal calendar ....................................................................................................... 52
CD12: Food access calendar for poor households ................................................................. 53
CD13 ARTISANAL MINING WITH AGRICULTURE ............................................................... 54
CD13: Seasonal calendar ....................................................................................................... 56
CD13: Food access calendar for poor households ................................................................. 57
CD14 NORTHEAST HIGHLANDS AGRICULTURE .............................................................. 58
CD14: Seasonal calendar ....................................................................................................... 60
CD14: Food access calendar for poor households ................................................................. 60
CD15 ORIENTALE FISHING WITH AGRICULTURE .......................................................... 61
CD15: Seasonal calendar ....................................................................................................... 63
CD15: Food access calendar for poor households ................................................................. 63
CD16 NORTHERN PLATEAU CASSAVA, MAIZE, GROUNDNUTS AND BEANS .................. 64
CD16: Seasonal calendar ....................................................................................................... 66
CD16: Food access calendar for poor households ................................................................. 66
CD17 BUMBA RICE AND TUBERS ....................................................................................... 67
CD17: Seasonal calendar ....................................................................................................... 68
CD17: Food access calendar for poor households ................................................................. 69
CD18 BOMONGO AND MAKANZA DISTRICTS INTENSIVE FISHING ................................. 70
CD18: Seasonal calendar ....................................................................................................... 71
CD18: Food access calendar for poor households ................................................................. 72
CD19: Seasonal calendar ....................................................................................................... 75
CD19: Food access calendar for poor households ................................................................. 75
CD20 CUVETTE CENTRALE STAPLE CROPS, FISHING AND CHARCOAL .......................... 77
CD20: Seasonal calendar ....................................................................................................... 78
CD20: Food access calendar for poor households ................................................................. 78
CD21 EQUATORIAL FOREST HUNTING, FISHING, STAPLE CROPS ................................. 80
CD21: Seasonal calendar ....................................................................................................... 81
CD21: Food access calendar for poor households ................................................................. 82
CD22 LIGHTER FOREST WITH RICE AND CASSAVA ......................................................... 83
CD22: Seasonal calendar ....................................................................................................... 84
CD22: Food access calendar for poor households ................................................................. 85
CD23 SAVANNAH WITH CASSAVA AND COWPEAS AND SMALL LIVESTOCK ..................... 86
CD24 INTENSIVE ARTISANAL DIAMOND EXPLOITATION WITH CROP CULTIVATION .......... 88
CD25 CLAY SOILS WITH HIGH PRODUCTION OF CASSAVA AND MAIZE, AND CATTLE .......... 90
CD26 HIGH FOOD CROP PRODUCTION AND TRADING .................................................. 92
CDs 23, 24, 25 and 26 together: Seasonal calendar .............................................................. 93
CD27 AGRO-PASTORAL – STAPLE CROPS, SMALL STOCK AND CATTLE WITH WILD FOODS ..........95
  CD27: Seasonal calendar ........................................................................................................96
  CD27: Food access calendar for poor households .................................................................96
CD28 AGRICULTURE WITH HIGH PRODUCTION AND MARKETING.................................97
  CD28: Seasonal calendar ........................................................................................................98
  CD28: Food access calendar for poor households .................................................................98
CD29 CASSAVA, MAIZE AND GROUNDNUTS .........................................................................99
  CD29: Seasonal calendar .........................................................................................................100
  CD29: Food access calendar for poor households ...............................................................100
CD30 MARKET GARDENING AND STAPLE CROPS ..............................................................101
  CD30: Seasonal calendar .........................................................................................................102
  CD30: Food access calendar for poor households ...............................................................102
CD31 RIVER FISHING AND STAPLE CROPS ......................................................................103
  CD31: Seasonal calendar .........................................................................................................104
  CD31: Food access calendar for poor households ...............................................................104
CD32 COASTAL FISHING AND KITCHEN GARDENING ......................................................105
  CD32: Seasonal calendar .........................................................................................................106
  CD32: Food access calendar for poor households ...............................................................106
CD33 FOREST – STAPLE CROPS, CASH CROPS AND MARKET GARDENING ...............1
  CD33: Seasonal calendar .........................................................................................................1
  CD33: Food access calendar for poor households ...............................................................1
CD34 KINSHASA PERI-URBAN ..............................................................................................2

Annex 1: Former and current provinces of DRC .................................................................3

Annex 2: Participants in the livelihood zoning workshops ..................................................4
  Célestin Kimanuka ..................................................................................................................6
  Provincial Director of INS North Kivu ..................................................................................6
ACRONYMS AND ABBREVIATIONS

DRC – Democratic Republic of Congo

HEA – Household Economy Analysis

FEWS NET – Famine Early Warning Systems Network

NGO – Non-Governmental Organization

RVAA - SADC Regional Vulnerability Assessment and Analysis Programme

SADC – Southern African Development Community

UN – United Nations

USAID – United States Agency for International Development

VAC – Vulnerability Assessment Committee
ACKNOWLEDGEMENTS

This overall exercise, executed in three phases in March and May 2015 and February 2016, was carried out in association with the DRC Vulnerability Assessment Committee. Its chair, M. Robert Ngonde Nsakala, Chief of Statistics at the Ministry of Agriculture, Fishing and Livestock, is to be thanked for his selection and mobilization of an appropriate number of high grade of participants from all the country’s provinces as well as from Kinshasa, and for organizing the two workshops held at Kisantu, near Kinshasa. FEWS NET organized four workshops held in Lubumbashi, Goma and Kisangani.

The western workshops were facilitated by Julius Holt and Nora Lecumberri, consultants of The Food Economy Group (FEG Consulting) under contract to CARDNO. The eastern workshops were facilitated by Jenny Coneff, livelihoods advisor to FEWS NET in Washington and by Julius Holt for FEWS NET. The three variously wrote the regional reports upon which the present consolidated report is based.

NB: All references to provinces in the present document refer to the country’s provinces before the re-division into new provinces in 2015; a map showing both is offered in Annex 1.
“The administrative map was dumb; now with the livelihood zones it speaks.”

Participant at the Orientale workshop

1. INTRODUCTION

1.1 Livelihoods zoning

Livelihoods zoning offers a particular view of economic geography associated with Household Economy Analysis (HEA), a widely-used methodology for the assessment of food security with reference to whole livelihoods in their various geographical contexts. A livelihood zone is defined as a geographical area where rural households rely on the same resources and means – ecology, production systems, access to markets - to meet their life and livelihood needs, particularly therefore their food and cash income. A livelihood zoning exercise creates both a map and summary descriptions of the zones identified – in effect a well-annotated livelihoods map. But the reason for undertaking the zoning – the use to which the result will be put – must underpin the exercise. In any country, let alone one the size of DRC, it would be possible to find a plethora of livelihood zones based on localized economic differences. In DRC, for NGOs working in specific territoires (districts) or smaller units such as the Health Areas (Aires de Santé) of the Ministry of Health, such micro-zoning can be of benefit in refining their local contextual understanding and offering a localized geographical frame for nutrition or other surveys. By contrast, the zoning of the whole country, region by region, was done with its utility for the national VAC in mind, that is, as a basis for seasonal or annual assessments of food security organized at provincial or national level. With its capacity in personnel and logistics, the VAC could not be expected to monitor changing conditions in a multitude of local zones: what was required was zoning at a sufficient level to reflect basic differences in potential effects on populations and to guide practical decisions about official/agency responses. This meant that tens rather than hundreds of zones needed to be distinguished over the country: zoning with a broad brush rather than a fine pencil. In this spirit 33 rural livelihood zones were identified across the country, while the peri-urban zone behind Kinshasa formed an additional, semi-rural livelihood zone.

The boundaries of different rural economies do not generally coincide precisely with administrative boundaries, but government and agency activities generally do. Therefore a livelihood zoning map is always seen with administrative units superimposed, so that populations can be identified both by livelihood zone and by their administrative location.

The overall livelihood zoning exercise was carried out under the aegis of the DRC national Vulnerability Assessment Committee (DRC VAC), whose primary mission is to provide prediction of the food effects of seasonal or other shocks and to guide the targeting of government and agency responses. The VAC currently uses household surveys and information from food price monitoring for such assessment, and now wishes to expand its approach by arming itself with HEA livelihood baselines and early warning
scenario analysis (Outcome Analysis) as used by the majority of the Member States of SADC. Livelihood zoning is the first step towards this goal.  

The SADC Regional Vulnerability Assessment and Analysis Programme (RVAA), with its Regional Vulnerability Assessment Committee, has long supported livelihood zoning in the region. In association with them and the CARDNO regional office in Gaborone, the DRC VAC implement a livelihood zoning exercise for Bas-Congo and Bandundu provinces, and later for Equateur, East Kasaï Occidentale and West Kasaï provinces. FEWS NET to complement this initiative by delivering livelihood zoning for Orientale, Maniema, North Kivu, South Kivu and Katanga provinces, i.e. roughly the eastern half of the country.

1.2 Implementation of the livelihood zoning

For a country the size of DRC there was no question of achieving the zoning with a single workshop: even if the logistics and cost had not been a sufficient barrier, the roughly 200 key informants involved could not have been effectively handled in a single event. Instead, workshops were carried either by single province or with two provinces considered together, according to the 11 provinces (including Kinshasa) before the re-division the country in 2015 into 26 provinces). Bas-Congo and Bandundu were zoned in a joint workshop in March 2015 at Kisantu, near Kinsaha; Katanga, Orientale and Maniema were zoned in separate workshops in May 2015, at Lubumbashi, Kisangani and Goma respectively, together with South Kivu and North Kivu in a joint workshop also at Goma in May 2015; finally, Equateur, and East Kasaï and West Kasaï together, were zoned in two workshops at Kisantu in February 2016. All the workshops were carried out using the same methodology and process, which were originally developed by the Food Economy Group and FEWS NET.

The participants were mainly government officers associated with the VAC, from the territoires as well as the regional capital of each province. To these were added representation from WFP, FAO and mainly local NGOs. The lists of participants are given in Annex 2.

The process for developing livelihood maps and descriptions was in the following steps:

1. Before the zoning workshops, the facilitating consultants and FEWS NET Washington HQ variously made a search for relevant background/secondary information, including demographic, rainfall, food production and nutrition data, and food security and other reports from government and partners. A review was made of these sources, and a number of maps were reproduced for reference in the workshops. In addition, a set of baseline maps for the

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1 For more information on livelihood zoning and the application of HEA, please visit the section on Livelihoods at [www.fews.net](http://www.fews.net); the document Application of the Livelihood Zone Maps and Profiles For Food Security Analysis and Early Warning can be downloaded.
workshops were developed and printed in large format, showing administrative units down to the *territoire* level, also showing villages as points on the map, and main towns, roads and rivers.

2. In developing countries the available statistical information from the different sectors usually offers only a restricted repertoire of elements and is virtually never at a level of disaggregation or consistency or quality, and above all of comparability, to allow in itself a computing of livelihood zones. A cardinal problem with much information is that it is based on administrative units rather than on economic geography, so that it very often mixes two or even more ecological or agro-economic areas together, and thus considerably blunts any differentiated view of livelihoods. The essential, first-line resource is therefore people with a very substantial knowledge of local geographical conditions and livelihoods, who can offer and compare their own knowledge and judgment and construct together a livelihoods map. Participants from the relevant provinces who had this level of knowledge were identified by the Chair of the national VAC and invited to the workshops.

3. Each workshop began with substantial introductory presentations and discussion of the HEA analytical framework and methodology, and of the methodology and outputs of livelihood zoning.

4. The participants in plenary were then invited to begin sketching out livelihood zones on the base-map, with commentary from fellow-participants and progressive additions and changes to the map.

5. Once initial maps were completed in this manner, the workshop divided into sub-provincial working groups to consider the local zones at length and refined their boundaries on the map. The available secondary information was used both to pose questions and to corroborate the arguments for distinguishing the different livelihood zones.

**Group work and presentation**

First and interim sketches of Maniema livelihood zones
6. The participants then came together again to present and discuss their results and to finalize the consolidated map, and to agree provisional names for the zones. In Goma and Kisantu, where two provincial workshops were held concurrently, the participants of the two workshops finally joined to consider their maps together and look at the livelihood zones that straddled their provincial borders, and so to agree on the exact boundaries of these zones. Once the drawn maps were finalized, participants were asked to fill in a livelihood zone description form for each zone, recording preliminary information on the geographical characteristics of each zone and the main sources of food and income, with some distinction between poorer and wealthier households; and finally making list of the most common food risks affecting each zone, and the common coping strategies used by poor households. The form also contained templates for seasonal calendars of production activities, and for separate food and income access calendars. The information in summary is given in the separate accounts below of the livelihood zones, together with the calendars.

7. Photographs were taken of the final workshop maps, which were then used by Cardno and FEWS NET to produce digitized regional maps. Finally, from the regional maps FEWS NET constructed the consolidated map of the livelihood zones of the whole country.

The exercise did not include verification on the ground with local government and services and agencies, which is intended to be carried out at the time of anticipated fieldwork to develop full HEA baselines. A priority is to resolve a small number of questions concerning zone boundaries—shown on the DRC national livelihood zones map in the next section, where four checkered lines indicate ‘Boundary needs verification’. The requirement to conduct workshops in separate locations meant that there could not always be certainty concerning the position of livelihood zone boundaries where the straddled provincial boundaries. All other things being equal, with further local guidance it will eventually be possible not only to resolve these issues but to refine the zone boundaries down
to the village level, something that was not feasible in the provincial workshops.

2. RURAL LIVELIHOODS IN DRC - AN OVERVIEW

2.1 The geographical context

The relief map below presents clearly certain features that shape fundamentally the different livelihoods in DRC. The most striking element is the lowland basin (green) that contains by far the biggest area of original tropical forest in Africa, at around 3.7mn square kilometers. Associated with this is the river system draining into the Congo River that finally issues into the Atlantic Ocean – one of Africa’s greatest watersheds. And then there are the higher elevations that form the upper parts of that watershed. The most prominent are the eastern highlands the mountains and hills skirting the lakes that form the country’s eastern frontier; but the more extensive drainage comes from the somewhat lower southern hills and plateau-plains, consisting mainly of vast areas of savannah.

Accordingly there are four general kinds of livelihood zone that can immediately be pointed out on the livelihoods map below: those of the forests (CDs 12, 16, 20, 21, 22, 33); those in the eastern high elevations (CDs 09, 11, 14); those of the savannah in the south (CDs 02, 03, 06, 10, 23, 27) and those of the riverine and lacustrine areas dominated by fishing (CDs 05, 15, 18, 19, 31) to which we may add the smallest of the livelihood zones, the coastal fishing zone CD32.

Of the zones not listed above, CD29 quite densely populated in major part and is a mixture of forest and bush highly cleared for farming. Three of the zones might be put in the riverine/lacustrine category, but CD04, comprising the Kamalondo/Upemba Depression has a peculiar lake and swamp environment, with
fertile soils prone to flooding and significant fishing resources; CD08 beside Lake Tanganyika is, due to the precipitous lakeside slopes, more an agricultural than a fishing zone; and CD17 in Equateur comprises the surroundings of Bumba town, an intermediate inland Congo river port between Kisangani and Kinshasa, where rice cultivation by flood recession is a specialty.

Further zones stand out for high food production and marketing: the two go together, and are critically encouraged not simply by relatively fertile soils but by the existence of roads connecting them to town markets: so few are the usable motor roads in the country that the local phenomenon attracts settlers, sometimes doubling the usually-expected population density. These zones are CD07 at the southern tip of the forest in Maniema and South Kivu with an intersection of three motor roads; CD25 with its clay soils and road link to the West Kasaï city of Tshikapa; CD 26 in East Kasaï with a functioning motor-road to important markets in Maniema; and the large zone CD28 in Bandundu Province surrounding the town of Kikwit but also with a motor road to Kinshasa, which at 535 km counts as relative proximity given the country’s size. But perhaps the zone most defined by a motor road is CD30 in Bas-Congo, with particularly intensive market gardening on this strip of land straddling the Matadi-Kinshasa highway which is the conduit to the huge demand of the capital. The densely-populated Kinshasa peri-urban zone CD34 is defined both by the daily employment of so many of its villagers in the city and by the profitability of produce from the small landholdings, especially vegetables and fruit, sold in the city.

Finally, two zones are distinguished by artisanal mining. DRC is known for its great resources in minerals: not only the copper and cobalt of the big industrial mining complex in Katanga, but elsewhere also gold, diamonds and other precious stones, tin-ore (cassiterite), tungsten ore ( wolframite) and coltan. Over many of the above livelihood zones, minerals are subject to artisanal mining at small sites worked by villagers seasonally as a sideline to agriculture, so that they form a part, but not a dominant part, of general livelihoods. However there are two zones where artisanal mining is concentrated and makes up a particularly substantial proportion of local rural incomes: CD01 in Katanga and CD13 in the northern forests (in Oriental, Maniema and the Kivus). But in Katanga it is as much the profitability of marketed agricultural produce that counts for villagers, benefiting from the good roads (and the railway lines) to feed the demand of the copperbelt cities of Kolwezi and Lubumbashi as well as other towns.

As a general rule in the countries of sub-Saharan Africa, highland areas show more differences in livelihoods than are found in lower lands, because local climatic and ecological factors produce substantially different pictures at different layers of altitude and in different locations. So also in eastern DRC there are more livelihood zones in the highland category than in any other. Their combined geographical area is only a fraction of that of covered by the forest or savannah zones; on the other hand their population densities, averaging around 180-200 people per square kilometer, are up to ten times greater than in the
other categories of zones. The map below shows this starkly, even more so across the border in Rwanda and Burundi.

**DRC Population Densities**

(Source: Bellmon Estimation, 2010)

In the forest areas population densities may fall below 5 per square kilometer, so that some groups of people are able to live by hunting and gathering alone – among the rare locations in Africa where this is still the case. The village settlement pattern in the forests is not even, as may be seen in the map below.

Settlements tend to follow roads more than waterways – but not only, or even mainly, the motor roads. The strings of villages seen here without road or waterway are in fact strung along tracks mostly only used by two-wheel transport if not on foot. A good number of these tracks were first cut through the forest during the colonial period. Where cars or trucks do use them, it is only in periods when the surfaces are dry enough for wheels to grip. Even many stretches of the ‘motor roads’ in red are very frequently impassable, and when passable a drive of fifty kilometers may take several hours.

The following schematic map is useful in showing the main transport axes in the country. The main road ‘network’ is so desultory that the vast majority of the rural population lives more than a day’s walk from any motor road, be it paved, graveled or simply earth-topped. What is also remarkable, therefore, is that the navigable waterways also shown are extremely important for transport, however slow, on barges and boats. We may say that ‘all waterways lead to Kinshasa’ where the effective market demand for everything from cassava to dried fish to forest hard-wood timber reaches deep into the country.

**National transport systems**

(Source: USAID, Cassava Value Chain in West DRC)
2.2 The shared context of the livelihood zones

The summary descriptions of each livelihood zone offered in Section 3 below show their different characteristics. As a preliminary, however, we may set these within the context of economic factors *shared* by the zones at large.

There is no rural zone in the country that does not have agriculture as the basis of livelihoods, even where the importance of fishing or mining differentiates a zone from its neighbors. And it would be hard to find anywhere where cassava is not the prime staple crop, however much the secondary staples may vie with each other for prominence, especially rain-fed rice, maize and banana plantains. As a rule of thumb maize is more grown in the savannah than in the forest, and also more consumed as a staple: in the forest it tends to be eaten from the field in its ‘green’ pre-harvest state, while the mature maize is milled and used to prepare local alcoholic beverages – produced also in savanna zones. The rice is grown in more quantity in the forest than in the savannah, and is overwhelmingly ‘rainfed’, that is, it is not irrigated or grown in flooded paddies but rather on fields where it is sown directly, without transplanting. Bananas are grown in both forest and savannah with different cultivars, and in volume some five times more plantains are produced than sweet (dessert) bananas.

As regards livestock, again it would be hard to find anywhere that some smallstock – goats, sheep, poultry - were not kept by most rural households; on the other hand in DRC cattle are a relative rarity in most of the livelihood zones. The prevalence of the tsetse fly undoubtedly forms part of the reason; but
decades of civil insecurity in the east must also have discouraged cattle ownership, if not to some extent sheep and goat ownership too, since these animals are valuable items vulnerable to theft or wholesale raiding by armed rebels or bandits, insofar as a distinction can be made between the two. The main exception is in the eastern highlands, where cattle raising is more of a feature, but, subject to confirmation by proper field study, it appears that the great majority of these cattle are in the hands of a small minority of better off households. On the other hand the concentrations of sheep and goats are more likely to indicate important assets for poorer people as well.

A feature very generally shared amongst the livelihood zones is the isolation of the great majority of the rural population from market centers. This reflects the paucity of motor roads emphasized in the previous section, and with it the paucity of substantial towns beyond the **territoire** centers that might harbor collection markets for onward trading of produce. Beyond the motor roads, the essential forms of transport are head-loads, back-loads, bicycles, and motor-cycles for wealthier households. This means that trading activity by most farmers is confined to a very localized sphere. The resulting lack of market dynamism is reflected in the fact that in forest areas especially, farmers quite commonly sell surplus cultivated produce, and dried fish, and dried game and other forest products, and perhaps excavated minerals too, to itinerant traders who come directly to villages, so that a village market or market for a few villages together may not even exist. The difficulty of trading food surpluses or cash crops inevitably means that there is a limited incentive to produce them. By the same token, around the main towns, and along main roads, and along the rivers navigable by barge, the incentive is there, and even defines livelihoods zones, as described in the previous section. There is no question that alongside peace and good governance and universal education, expanding trade is the key to adding value to rural people’s work and livelihoods, and the development of the country’s motor road network is a crucial priority.

To the extent that the market works, it is remarkable how far the effective demand of Kinshasa, the national capital in the far west of the country with its population of some 10mn (about one seventh of...
the national population), penetrates into the east of the country. Clearly the markets of the provinces nearer to the capital have an advantage, and we have noted that even 500 km is comparatively proximate. We do not know exactly in what volumes staple produce – cassava, maize and perhaps above all rice – are taken to Kinshasa from eastern DRC; but it is clear at least that produce with higher unit values in terms of weight or volume – beans, dried fish and game, palm oil – go to Kinshasa from far into Orientale and Maniema Provinces, even from North Kivu. Even fresh fish, the most perishable of items, finds Kinshasa customers willing to pay prices reflecting the transport costs, whether for frozen fish in refrigerated tanks on barges originating at Kisangani; there are even customers in Kinshasa for fresh fish air-freighted from Lake Albert at the extreme north-east frontier of the country. And then there are the gold and precious stones.

2.3 Food security questions
With its abundant and generally regular rainfall regime and its usually steady production of staples, dominated by cassava and with maize and rice as the substantial cereals, DRC is not the first country where one would look for periodic, acute food insecurity, at least not of the kind found in more arid ecologies with their frequent rain failures. It is true that in virtually any year, somewhere in this vast country there occur very localized production deficits occasioned by floods or severe local outbreaks of crop pest or crop disease, or even rainfall irregularities - but very rarely acute food insecurity on any scale. This is not to ignore the now chronic threats to cassava production in particular, including Viral Mozaic Disease in recent years, and bacterial blight that caused a food crisis in Bas Congo as long ago as the mid-1980s.

But if we accept that widespread, acute crop failure is a rarity, are there other causes of food insecurity? In eastern DRC in particular there have certainly been episodes of acute food insecurity resulting from conflict, and especially from the wholesale displacement of rural people or at least the serious disruption of their food production and/or access to food markets. Again, it is true that in many areas there are local land disputes and conflicts between people based on customary political or clan relations. These may cause some localized disruption of economic activities but not widespread food insecurity.

On the other hand, there is a generally accepted, but not always clearly defined, concept of a food insecurity that is not due to periodic or sudden events; therefore we must suppose it to be chronic food insecurity. This appears to turn on the inadequate nutritional quality of diets rather than necessarily on their adequacy in terms of basic energy intake (calories). And/or it turns on an irregularity or instability of access to food over the year’s cycle in which the ‘lean season’ (soudure) before the main harvest is usually the big feature (followed however by compensatory consumption after harvest: i.e. people do not get progressively thinner from year to year). These are symptoms and results of chronic poverty; but if this non-acute ‘food insecurity’ is taken as something apart, then it is certainly a phenomenon found right across a country where the majority of the rural population are poor by any standard. Whether it is more pronounced in one or other livelihood zone, and how it may contribute to the geography of malnutrition, are questions that only future field evidence might answer. ‘After all, food insecurity is not
necessarily related to the source of livelihood which the poor households are involved in. Further research by province is important to better understand the relationship between food insecurity and source of livelihood. (Democratic Republic of Congo Comprehensive Food Security and Vulnerability Analysis (CFSVA) WFP 2014). But at all events it is difficult to imagine how we might make any such assessment without substantial analysis of the household economy that defines people’s access to food. And towards this, livelihoods zoning is a first step.
3. SUMMARY DESCRIPTIONS OF THE LIVELIHOOD ZONES

CD01 COPPERBELT AND MARGINAL AGRICULTURE

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 ha of land</td>
<td></td>
<td>&gt;2 has of land</td>
</tr>
<tr>
<td>Manual farm equipment</td>
<td></td>
<td>Mechanization or paid labor</td>
</tr>
<tr>
<td>Small animals, poultry (limited)</td>
<td></td>
<td>Small and large animals</td>
</tr>
<tr>
<td>Family labor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main types and sources of food</th>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize (HP, MP)</td>
<td></td>
<td>Maize (HP, MP)</td>
</tr>
<tr>
<td>Cassava (HP)</td>
<td></td>
<td>Cassava (HP, MP)</td>
</tr>
<tr>
<td>Sweet potatoes (HP, MP)</td>
<td></td>
<td>Sweet potatoes (HP, MP)</td>
</tr>
<tr>
<td>Beans (MP, HP)</td>
<td></td>
<td>Beans (HP)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Main sources of income</th>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale of crops</td>
<td></td>
<td>Sale of crops</td>
</tr>
<tr>
<td>Rent (hotels, mechanized equipment, means of transport)</td>
<td></td>
<td>Skilled labor</td>
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<tr>
<td>Farm labor</td>
<td></td>
<td></td>
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<tr>
<td>Mining work</td>
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| Main markets | Lubumbashi, Zambia, Kolwezi/Kambove, Likasi/Lubudi, Salamia, Kipushi |

<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Brush fires</th>
<th>May-August, 1/3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erratic rainfall</td>
<td>November-March, 1/3 years</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Coping strategies of poor households</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>More recourse to unskilled labor (farm work, work in the mines)</td>
<td></td>
</tr>
<tr>
<td>More recourse to the sale of charcoal, petty trade, and bicycle transport services</td>
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</tbody>
</table>

This livelihood zone lies in the Copperbelt in the far southern reaches of the DRC along its border with Zambia. Other heavy metals such as a cobalt, gold, silver, zinc, and lead are also mined in this area. It is a moderately high-altitude area (at between 1,000 and 1,800 meters) with relatively infertile acidic ferralitic and sandy-clay soils containing very little organic matter and few nutrients. Average annual rainfall ranges from 1,200 to 1,500 mm. The area gets an average of somewhere between 150 and 180 days of rain per year, with less rainfall activity in the southern part of the area than in the north. Temperatures in the area are moderate, averaging between 26 and 28 degrees Centigrade in October/November and between 11 and 14 degrees Centigrade in June/July. These conditions also support savanna to dry open or, occasionally, dense forest vegetation. The area also has fish resources, including tilapia, catfish, and minnows, which are utilized by only a small minority of the population living close to lakes and rivers. The same goes for the area’s other forest resources such as wild game, caterpillars, mushrooms, and termites. Rural population density is low, at around 15 to 20 inhabitants/km².

There are good connections between this livelihood zone and Zambia via earthen tracks in rural areas and via the main highway and railway line in Lubumbashi. The railway line connects Zambia with Maniema province. There are also rather good connections between Lubumbashi and the city of Kolwesi and Angola via a road in mediocre condition and with Kasenga and Pweto by road or river. The area is also close to Tanzania. Thus, this livelihood zone has relatively good market access.
Even with its poor soils, the local population is dependent mainly on farming and, secondly, on artisanal ore mining activities. Area households engage in subsistence rainfed farming activities using manual family labor. However, with the area’s flat topography, the competition with the mining sector for unskilled labor, and effective demand for the purchasing or leasing of motorized equipment, the farming system is becoming increasingly mechanized. Moreover, households living in the DRC will oftentimes grow crops in fields across the border in Zambia, where better soil management and a large availability of fertilizer help produce better crop yields than in the DRC. Only the best-off households have access to chemical fertilizer, but all household groups generally purchase their seeds, even improved seeds. The large majority of poor households consume all their crops over the course of the year, without keeping even part of their crops for use as seeds.

This livelihood zone generally has crop production deficits and relies on Zambia (Kasenga) to supplement market supplies of locally grown staple food crops, particularly maize, groundnuts, sweet potatoes, and beans. The production deficits in this area, particularly the shortfalls in maize production, are attributable as much to excess demand (demand for maize rather than cassava, especially in fast-growing large urban areas) as they are to soil and climate-related factors. Prices peak between January and March and bottom out between June and August/September. Crop marketing activities are concentrated in large urban areas such as Lubumbashi, Kolwesi, Sakania, Likasi, and Kipushi.

Even poor households earn income from the sale of crops and are virtually self-sufficient as far as cassava production is concerned. The lean season occurs from February through March and marks a period when households have less access to food and income and greater expenses. Other important sources of income include unskilled employment in farming or small-scale mining operations and the sale of charcoal. Artisanal fishing activities (using small boats and nets) are another source of income but are engaged in by only a small minority of the poor population living less than a kilometer or two from area rivers (the Lualaba, Luapula, Lufira, Kafubu, and Muyendashi) and lakes (Tshangalele and Kando).

Accordingly, the main drivers of wealth in this predominantly farming area are the size of cropped fields, the amount of available funds for securing access to tractors or hiring laborers, and transportation facilities for the marketing of crops. Livestock are not an important source of income in this livelihood zone, regardless of the type and number of head of livestock owned by households in each wealth group. They are used mainly for savings purposes. The animals most commonly raised in this area are pigs and poultry.

In general, demand for unskilled labor for farming and mining activities outstrips supply, particularly in large urban areas. Day laborers are usually paid by the job, either in cash or in kind. Wage rates range from 2,000 to 3,000 CDF per are (1/100th of a hectare) or per day (1,500 CDF/are for planting; 2,500 CDF/are for plowing, weeding, and ridging; 3,000 CDF/are for the harvest).

Brush fires, which are cited as hazards, threaten harvests from time to time. However, it is important to understand the source of these fires, which are occasionally started by households hunting for game, grasshoppers, and rats to either eat or sell.
### CD01: Seasonal calendar

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<tr>
<th>Seasons</th>
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<tbody>
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</table>

### Crops

- **Maize**: May, June, July, August, September, October, November, December
- **Cassava**: March, April, May, June, July, August, September, October, November, December
- **Groundnuts, beans**: April, May, June, July, August, September, October
- **Sweet potato**: July, August, September, October, November, December
- **Mango, avocado, guava**: January, February, March, April, May, June
- **Wild food products**: August, September, October, November, December

### Hazards

- **Brush fires**: March, April, May, June, July, August, September, October, November, December
- **Poor rainfall distribution**: March, April, May, June, July, August, September, October, November, December

### Legend

- **Land preparation**: January, February, March, April, May, June, July, August, September, October, November, December
- **Sowing**: March, April, May, June, July, August, September, October, November, December
- **Weeding**: April, May, June, July, August, September, October, November, December
- **Harvest**: July, August, September, October, November, December

### CD01: Food access calendar for poor households

<table>
<thead>
<tr>
<th>Staple foods</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
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<th>Nov</th>
<th>Dec</th>
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</thead>
<tbody>
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</table>

### Income

- **Sale of crops**: March, April, May, June, July, August, September, October, November, December
- **Labor**: March, April, May, June, July, August, September, October, November, December
- **Mining work**: March, April, May, June, July, August, September, October, November, December
- **Sale of charcoal**: March, April, May, June, July, August, September, October, November, December
- **Sale of wild food products**: March, April, May, June, July, August, September, October, November, December

### Expenditures

- **Staple foods**: March, April, May, June, July, August, September, October, November, December
- **School fees**: March, April, May, June, July, August, September, October, November, December
- **Purchase of seeds**: March, April, May, June, July, August, September, October, November, December
- **Clothing, celebrations**: March, April, May, June, July, August, September, October, November, December

### Legend

- **Production**: March, April, May, June, July, August, September, October, November, December
- **Market purchase**: March, April, May, June, July, August, September, October, November, December
- **Production and purchase**: March, April, May, June, July, August, September, October, November, December

### CD02  SAVANNAH CASSAVA

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td><strong>~0.5 ha of land</strong></td>
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<tr>
<td><strong>Manual farming equipment</strong></td>
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<td><strong>Family labor</strong></td>
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<tr>
<td><strong>Cattle</strong></td>
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<tr>
<td><strong>Pigs, goats</strong></td>
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<tr>
<td><strong>Petty trade</strong></td>
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</table>
This highland area of grass and tree-covered savannas (at altitudes of from 800 to 1,200 meters) has sandy soils and gets between 1,200 and 1,500 mm of rain per year between the middle of September and the middle of May. Local temperatures range from 15 to 35 degrees Centigrade. The area is especially well suited for cassava production, but also produces maize, beans, groundnuts, rice, sweet potatoes, plantains, and pineapples. Its many rivers (the Luluia, Lubilashi, Mukweji, Kajileji, Kaungeji, etc.) provide artisanal fishing and bottomland farming opportunities for a minority group of households in riverine areas. Rural population density is relatively low, at around 15 to 20 inhabitants/km².

This is a predominantly rainfed manual farming area. Accordingly, wealth is measured primarily by the amount of land owned and available means of transport (bicycles or motorbikes). Poor households do not keep part of their crops for use as seeds, with the possible exception of cassava. Thus, they buy their seeds on the market.

The main sources of income for all households in this livelihood zone are the sale of crops, supplemented by unskilled (farm) labor in the case of poor households. Workers are normally paid by the job but, with the slight surplus of labor in this area, wage rates are lower than in other parts of Katanga (60,000 CDF/ha for land preparation, 30,000 CDF/ha for planting and weeding, and 15,000 CDF/ha for the harvest in 2014/15). Most wage payments are in the form of cash but may occasionally be made in-kind (in the form of palm oil, staple foods, household items, clothing, etc.), particularly in bad years.

Communal work arrangements in return for a mid-day meal are also oftentimes used for the performance of farm work. Poor households also earn income from the sale of charcoal and wild-growing and wild-caught products from hunting, gathering, and fishing activities (mangoes, mushrooms, flying ants, and fish) and through labor migration to Kolwesi to work in the mines.

All household groups have at least a few head of livestock (poultry, goats, or pigs) Better-off households also have a few head of cattle, since there is less of a risk of trypanosomiasis in this relatively high-altitude area than in other parts of Katanga. However, livestock-raising is primarily a source of savings for occasional expenses. It is not a regular source of food or income, nor are the animals used in farming activities.

<table>
<thead>
<tr>
<th>Pigs, goats, poultry</th>
<th>Motorbike</th>
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</table>

### Main types and sources of food

<table>
<thead>
<tr>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava (MP)</td>
<td>Cassava (HP)</td>
</tr>
<tr>
<td>Maize (MP, HP)</td>
<td>Maize (MP, HP)</td>
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<tr>
<td>Beans (MP, HP)</td>
<td>Beans (MP, HP)</td>
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<tr>
<td>Sweet potatoes (HP, MP)</td>
<td>Sweet potatoes (MP, HP)</td>
</tr>
</tbody>
</table>

### Main sources of income

<table>
<thead>
<tr>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Sale of crops</td>
<td>Sale of crops</td>
</tr>
<tr>
<td>Sale of charcoal</td>
<td>Petty trade in gold</td>
</tr>
<tr>
<td>Sale of wild-caught products (caterpillars, game, fish)</td>
<td>Sale of livestock Marketing</td>
</tr>
</tbody>
</table>

### Main hazards and periods

<table>
<thead>
<tr>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swine fever, swine erysipelas (diamond skin disease)</td>
<td>August, 1/10 years</td>
</tr>
<tr>
<td>Price slump</td>
<td>April-May, 1/3 years</td>
</tr>
<tr>
<td>Flooding</td>
<td>November-January, 1/10 years</td>
</tr>
</tbody>
</table>

### Coping strategies of poor households

- Expansion in livestock-raising activities and larger sales of poultry
- Expansion in market gardening activities in lowland areas
- Digging for gold

<table>
<thead>
<tr>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale of crops</td>
</tr>
<tr>
<td>Sale of charcoal</td>
</tr>
<tr>
<td>Sale of livestock</td>
</tr>
<tr>
<td>Petty trade in gold</td>
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<tr>
<td>Marketing</td>
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<table>
<thead>
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<th>Poor households</th>
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<table>
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<th>Better-off households</th>
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<td>Sale of crops</td>
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<tr>
<td>Sale of livestock</td>
</tr>
<tr>
<td>Petty trade in gold</td>
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<tr>
<td>Marketing</td>
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</tbody>
</table>
Practically all cassava cultivars in this livelihood zone are infected with the cassava mosaic virus. However, even with the potentially lower crop yields as a result of the virus, the area still produces a large surplus of cassava, particularly the *Mwat kasang* variety, which is highly regarded and has a high hydrocyanic acid content, which makes it comparatively more resistant to cassava mosaic disease. Locally grown cassava crops are sold in Angola, Kolwezi, and Mbuji Mayi.

The importance of farming makes this livelihood zone vulnerable to climatic hazards, particularly floods, which can have especially serious consequences for cassava production, though they generally only occur every ten years. Local households earn a large share of their income from the sale of their crops, which makes them especially vulnerable to price slumps in general and plunges in cassava prices in particular, primarily at the height of the harvest season in April/May. Epizootic diseases affecting pigs can have serious repercussions given the relatively high density of the area’s pig population and the importance of these animals as a savings mechanism for poor households.

**CD02: Seasonal calendar**

<table>
<thead>
<tr>
<th>Seasons</th>
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<td>Groundnuts, beans - Season B</td>
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<td>Swine fever, swine erysipelas</td>
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</table>

Dec Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec
### CD02: Food access calendar for poor households

<table>
<thead>
<tr>
<th>Staple foods</th>
<th>Jan</th>
<th>Feb</th>
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#### Legend

- **Production**: Cassava (dried)
- **Market purchase**: Maize
- **In-kind paymt**: Beans, Sweet potato
- **Gathering**: Income sources
This livelihood zone includes most river plain and savanna areas of Katanga. It has a tropical climate, with relatively moderate temperatures ranging from 21 to 33 degrees Centigrade year-round. It gets somewhere between 800 and 1,200 mm of rain per year, mainly between September and April. Area ferralsols (as defined by the FAO) occasionally have nitic properties and, in general, are moderately fertile soils.

Households living on the edges of open forests or along the banks of rivers (the Congo and its tributaries, the Lukuga, Nyemba, Lufira, Lovoi, Kabeya Mayi, Luizi, Luvudjo, Luuva, etc.) have the option of engaging in bottomland farming, artisanal line fishing, or, to a lesser extent, hunting activities. Certain parts of the area also have high concentrations of ores (cassiterite or coltan). This is a sparsely populated rural area with between 15 and 20 inhabitants/km².

This livelihood zone has relatively good connections to markets compared with other provinces in the eastern and central reaches of the country. There is the main highway between Zambia and the Kasai region (West and East Kasai) which passes through Lubumbashi, the railway line from Lubumbashi to Kindu in Maniema, as well as the road between Lubumbashi and Kalemie and boat connections to Tanzania. Thus, there is a relatively important volume of cross-border trade in this area. The main markets in the area are Kolwezi, Moba, Nyunzu, Kongolo, and Likasi, which are also connected to markets in Lubumbashi and the Kasai region.

The local climate and low population density are well suited for farming, particularly subsistence rainfed farming systems. In general, the average size of cropped areas is under a hectare, being as the farming system is primarily manual. Poor households in particular have the possibility of growing two maize crops per year. Middle-income and better-off households using tractors produce enough from the first growing season to enable them to devote themselves to more lucrative activities during the dry season (trade, palm oil processing, the mining and sale of ore, etc.) The area generally has a surplus of maize, which it ships to the Kasai region and
Lubumbashi. Though the area produces comparatively more maize than Katanga, the constant rain impedes the drying of maize crops from the first harvest in February/March. Thus, the main crop grown for household consumption is cassava, particularly in the case of poor households. Other important crops grown in this area include beans, legumes, and palm oil (which is grown throughout the area but, particularly, in the western reaches of the livelihood zone close to its boundary with the Kasai region). Better-off households grow rice, as do certain poor households in localized areas, particularly in moisture-retaining bottomland areas.

With this being a predominantly rainfed manual farming zone, the main measures of wealth are the amount of land owned and available means of transport (bicycles or motorbikes). The main sources of income for all households are the sale of crops and, for poor households, unskilled wage labor (in farming, transportation, or mining activities). Workers are normally paid by the job ($1,000 CDF/are in 2014/15). Most wage payments are in the form of cash but may occasionally be made in-kind (in the form of palm oil, staple foods, household items, clothing, etc.), particularly in bad years. Poor households also earn income from the sale of charcoal, hand-made goods (woven mats, pots and pans, mortars and pestles, gourds, etc.), and wild-growing and wild-caught products from hunting, gathering, and fishing activities (mangoes, mushrooms, flying ants, and fish).

All households own at least a few animals (goats or poultry). Though some households may have a few head of cattle, large ruminant production (and the use of these animals in farming activities) is limited by the prevalence of tsetse flies and trypanosomiasis. Thus, livestock-raising activities are primarily a source of savings for occasional expenses. They are not a regular source of either food or income. Animal waste may occasionally be used as organic fertilizer for market garden crops.

### CD03: Seasonal calendar

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<tr>
<th>Seasons</th>
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- Land preparation
- Sowing
- Weeding
- Harvest

- m/c
- crickets
- mangoes, mushrooms
- hazards (flood, cholera)
### CD03: Food access calendar for poor households

<table>
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<tr>
<th>Staple foods</th>
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### Income

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<tr>
<th>Sale of crops</th>
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<tbody>
<tr>
<td>Labor</td>
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<tr>
<td>Sale of charcoal</td>
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<tr>
<td>Sale of wild food products</td>
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</table>

### Expenditures

| Purchase of condiments, palm oil |     |
| School fees                       |     |
| Clothing, celebrations            |     |

### Legend

- **Production**: Green
- **Market purchase**: Light pink
- **In-kind payment**: Dark pink
- **Gathering**: Yellow
Also known as the Upemba Depression due to its location partially within Upemba National Park, this livelihood zone is a marshy depression composed of some fifty or so lakes formed by the Lualaba (the Congo River upstream from Kisangani), the two largest of which are Lake Upemba and Lake Kisale. The area gets an average of 800 to 1,200 mm of rain per year, primarily between mid-August and April, with a break in the rains or lighter rainfall activity in December/January. Temperatures in this depression area are higher than in other parts of Katanga. It has alluvial, clay, and calcareous (chalky) soils with average pH levels and, thus highly fertile. The vegetation consists mostly of grass-covered savanna, with misaaka trees similar to bamboo and special grasses used to make mats and mattresses.

With the area’s abundant lakes, there is trade in locally grown crops and other local products along their shores (between the east and west) and shipments of local products from Bukama to Kabalo/Kongolo. Bartering is a common practice in this area, particularly the trading of (smoked and salted) fish for dried cassava from surrounding farming areas. However, the main channel for trade and exports of dried fish and other local products is the road (a small dirt road) skirting the lakes and serving as a sort of boundary with the park in the southeast.

These environmental and commercial conditions have a number of implications. First, most of the population is concentrated in roadside and less flood-prone lakeshore areas to facilitate their market access. The lakes offer good fishing conditions (for artisanal fishing activities in small boats using nets, traps, or fishing lines), which is the main source of income for better-off households and an important source of income for poor households, either directly or indirectly, by creating demand for labor. The area’s extremely fertile soils and access to fishery resources are attractive features. Thus, rural population density in this area is higher than in other rural areas of Katanga, generally between 25 and 50 inhabitants/km², with larger concentrations in certain roadside villages, where population density can exceed 500 inhabitants/km². Lastly, with the
importance of bottomland crop production, the crop calendar in this livelihood zone is slightly ahead of harvests in neighboring areas, affording hedging opportunities, should the need arise.

The effort involved in working clay soils, the area’s high population density, and its high-fertility soils are all factors contributing to the smaller size of fields in this area than in other parts of the province (averaging 30 ares compared with one hectare elsewhere). Moreover, local households will farm several different plots to make use of different farming systems and minimize flooding risks. The most common systems are rainfed and bottomland farming systems, though there are also irrigated farming and flood-recession farming systems. In fact, it is possible to produce three harvests per year per plot. However, most households have only two harvests, which is more than enough for them to live on. Furthermore, the lack of road infrastructure and high cost of water transport (by barge, ferry, or boat) limits the profit-making potential of crop-producing activities due to the competition from neighboring farming areas, particularly when there is a high demand for fish in Kolwesi, Lubumbashi, and the Kasai region. Better-off households in this livelihood zone are engaged in fishing and, thus, depend on trade with poor or middle-income households at harvest time to build up food reserves. The main crops grown in this livelihood zone are (rainfed and bottomland) maize, (rainfed) cassava, (bottomland) rice, (bottomland) sweet potato, and (rainfed) bean crops.

There are practically no large ruminants in this area due to the lack of pastures and the high risk of trypanosomiasis. Livestock production is limited mainly to goats, pigs, ducks, and chickens raised for sale, particularly in the case of need, and, occasionally, for household consumption by better-off households.

The main sources of income in this livelihood zone are the sale of fish and crops, particularly fresh maize and rice. Other sources of income for better-off households are trade or transportation services for passengers and goods. Transport capacity for direct access to destination markets for the sale of local commodities is a driver of wealth. Poor households resort to gainful employment, primarily in land preparation and field clean-up work, to augment their incomes. Tourism is not a major economic trigger on account of the conflicts (the attacks by Mai-Mai militia groups in 2004) and poaching which has decimated zebra and elephant populations and completely wiped out lion and rhinoceros populations.

Not surprisingly, poor households in this livelihood zone are self-sufficient due to its highly fertile soils and their poor market access. There is a drop in income with the closure of the fishing season during the breeding period between December and February. However, this is not a true « lean season » on account of the high degree of complementary between local harvests and fishing activities. In fact, the closure of the fishing season coincides with harvests of rainfed maize and bottomland rice and sweet potato crops and, thus, has little impact on food access.

The main hazard is flooding, which causes damage to crops and can occasionally make it more difficult to fish. Cholera is endemic in this area, but its effects on household expenditures (on medicine) and income (lost work days) weigh differently on affected households. It does not appear to have a wide-ranging impact. In general, poor households cope with these problems by resorting to borrowing and the sale of livestock and ramping up the sale of charcoal.
### CD04: Seasonal calendar

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**Hazards**

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**Legend**

- Land preparation
- Sowing
- Weeding
- Harvest

### CD04: Food access calendar for poor households

<table>
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<tr>
<th>Staple foods</th>
<th>Jan</th>
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**Income**

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<tbody>
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<td>Sale of crops</td>
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**Expenditures**

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**Legend**

- Production
- Market purchase
- In-kind paymt
- Gathering
CD05  SOUTHERN TANGANYIKA-MWERO FISHING

The area on the southern shore of Lake Tanganyika in the DRC is very similar to the Mweru Bangweulu Tanganyika Fisheries zone (livelihood zone ZM21) in Zambia. Livelihood zone CD05 is a 10 to 20 kilometer-wide belt of land running along the lake shore.

The Mitumba mountain range beginning in South Kivu extends into this area, though with lower elevations and gentler slopes than in the Kivus. The area gets an average of 1,000 to 1,200 mm of rain per year between October and April, particularly in the north, with the southern part of the area getting slightly less rain between November and May. Temperatures are higher close to the lake and cooler in the hills, but only rarely do they exceed 33 degrees Centigrade on the lake during the rainy season and only occasionally drop below 14 degrees Centigrade in the hills during the dry season between May and September. The area has sandy-clay soils supporting savannas and gallery forests such as those in north Tanganyika. The area also has ore deposits, particularly gold and coltan, and different types of timber resources (mufula, eucalyptus, cypress, and kabamba (used to make charcoal).

However, unlike the north Tanganyika area in the Kivus, this livelihood zone has a low population density of less than 20 inhabitants/km², which explains the larger average size of the landholdings of local households compared with those in the north Tanganyika area. In addition to cassava (tubers and leaves), maize, and irrigated rice crops, local households also grow groundnuts and beans.

Nevertheless, with the lack of mechanization and the numerous artisanal fishing opportunities in this area, these small-scale fishing activities are generally a more important source of income than crop-farming activities, particularly for households living less than two kilometers from the lake or area rivers. The main driver of wealth in this livelihood zone is access to small motorized fishing boats and a means of transport for shipping goods to market. Poor households without access to these types of assets earn

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Small boat</td>
<td></td>
<td></td>
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<tr>
<td>Small nets (parallel nets, mesh nets, trawl nets)</td>
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<tr>
<td>Small plots</td>
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<tr>
<td>Small motor boat</td>
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<td>Large nets (parallel nets, raised nets)</td>
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<td>Flood light</td>
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<td>Refrigeration equipment</td>
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<td>Small plots</td>
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<table>
<thead>
<tr>
<th>Main types and sources of food</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Cassava (HP, MP)</td>
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<tr>
<td>Maize (HP, MP)</td>
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<td>Rice (MP)</td>
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<td>Fish (W)</td>
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<tr>
<td>Maize (HP)</td>
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<tr>
<td>Cassava (HP, MP)</td>
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<td>Rice (MP)</td>
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<tr>
<td>Fish (W, MP)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Main sources of income</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Fish</td>
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<td></td>
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<tr>
<td>Sale of crops</td>
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<tr>
<td>Sale of wood/charcoal</td>
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<td>Wage labor (fishing)</td>
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<td>Petty trade</td>
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<td>Wage labor (mining)</td>
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<td>Fish</td>
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<td>Transport</td>
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<table>
<thead>
<tr>
<th>Main markets</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Kalemie, Moba</td>
<td>Fish is shipped to Zambia, Bukavu/Goma, and Lubumbashi.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Heavy rain</td>
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<td>Strong winds (lakes)</td>
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<td>Lack of rain</td>
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<td>December-January, April</td>
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<td>July</td>
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<td>February-March</td>
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</table>

Coping strategies of poor households

Larger sales of charcoal
More recourse to unskilled employment
wage income as laborers in fishing, farming, and mining activities. Self-employment (the sale of charcoal) and petty trade are also important sources of income for poor households.

There are artisanal (using small non-motorized boats, fishing lines, small parallel nets, or mesh nets) as well as semi-industrial fishing activities (using motor boats, flood lights, raised nets, parallel nets, etc.) in this livelihood zone. There are alternating seasons for the two main types of fish found in this area, with year-round artisanal fishing activities, though the fishing season is closed to motor boats between December and February. The main catch between December and April is the *mikebuka* or sleek lates (*Lucio lates stappersii*), a type of perch. Since the fishing season for minnows is closed between October and April, most fishing for minnows (*Stio strasio tanganyikaye*) takes place during the dry season between June and August, when the lake can be somewhat rough. The season is closed to motor boats at Pweto on Lake Mweru between December and February.

Even with the poor condition of the main lakeshore road, the area still has relatively convenient access to markets in Zambia and the Kivus by motor boat, mainly for the sale of dried fish, which is also shipped overland from Kalemie to the Kasai region via Kongolo and to Lubumbashi from Pweto.

All households have a few small ruminants and poultry to sell, according to their means, which are sold only when necessary. The risk of trypanosomiasis precludes the raising of large animals.

The main hazards are those affecting fishing activities and, thus, indirectly, the incomes of poor households from gainful employment in the fishing sector. As a coping mechanism, poor households tend to ramp up their sales of charcoal.
### CD05: Seasonal calendar

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<th>Seasons</th>
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<td>Maize - Season B</td>
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### CD05: Food access calendar for poor households

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<tr>
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**Legend**

- Land prep
- Sowing
- Weeding
- Harvest
- Closure
- Production
- Market purchase
- Production and purchase
This zone, which corresponds to approximately the southern third of Maniema province, contrasts with the vast rainforest area. The northern border (which is actually made up of dozens of kilometers of transition area) is located roughly at the same latitude as Kindu, the provincial capital, which it surrounds. To the east, the zone connects with the upper reaches of the Luama River, and the border is at a slightly lower latitude than the city of Kasongo. Unlike the dense humid forest to the north, this zone is made up of Guinea savanna woodlands with relatively dense gallery forests and shrub vegetation and Sahelian savanna with many extensive gallery forests covering vast areas, sandy soils, and short grasslands. In addition to the contrast between the forest and the savanna, the difference can also be seen in terms of hydrography, with the contrast between the Congo River basin and the southern plateau, which forms the upper watershed of the river.

The savanna plain is characterized by natural shrub vegetation, tall grasses, and intermittent gallery forests. The soils are generally made up of more sand than clay and are only moderately fertile. However, the northernmost area (the southern part of Kailo territory and the northern part of Kibombo territory) is more productive than the rest of the zone, since it is a transitional region that benefits from transitional rainfall patterns. Average annual rainfall is approximately 1,500 mm, mainly from September through April, with a dry (or drier) season from May through August. With large areas being practically uninhabitable, the zone is sparsely populated, with an average density of approximately 20 inhabitants/km². At the same time, land holdings are relatively small, at generally less than one hectare for the poorest households and just over two hectares for the best-off households.

Most of the population lives far from the main drivable road, which starts in Kasongo in East Kasai, or at the road from Kasongo to Kindu, and is isolated from the main trading corridors. Agricultural trade is therefore less dynamic than in neighboring zone 5. On the whole, the zone is characterized by

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Farm land and equipment</td>
<td>Small animals (limited)</td>
<td>Small animals</td>
</tr>
<tr>
<td>Fish ponds</td>
<td>Fish ponds</td>
<td>Motorbike (for retail trade)</td>
</tr>
<tr>
<td>Line fishing</td>
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<table>
<thead>
<tr>
<th>Main types and sources of food</th>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava (HP)</td>
<td>Maize (HP)</td>
<td>Rice (HP, MP)</td>
</tr>
<tr>
<td>Maize (HP, MP)</td>
<td>Rice (HP, MP)</td>
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<tr>
<td>Wild-growing/wild-caught foods</td>
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<table>
<thead>
<tr>
<th>Main sources of income</th>
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<th>Better-off households</th>
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<td>Household production</td>
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<td>Small-scale livestock-raising</td>
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<td>Wild-growing/wild-caught foods and game</td>
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<td>Local labor, migration</td>
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<table>
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<tr>
<th>Main markets</th>
<th>Local markets, Katanga, East Kasai, Oriental</th>
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<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Erratic rainfall</th>
<th>September and April</th>
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<td>Epizootic diseases</td>
<td>April-May</td>
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<tr>
<th>Coping strategies of poor households</th>
<th>Search for more paid labor opportunities</th>
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<tbody>
<tr>
<td>Increased gathering of wild-growing/wild-caught foods</td>
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subsistence agriculture more than commercial production. That is true not only of cassava, the main staple food, but also of the zone's two main secondary crops: maize, which is an important crop, particularly in the savanna, and long-cycle rainfed rice (which is less widespread than maize), particularly in forest areas. There are also some millet producers in the savanna. Only a minority of farmers grow a second maize crop during the short rainy season (B). A short-cycle variety of rice is also grown in the bottomlands during the dry season, particularly in Kibombo territory. Other crops include plantains, groundnuts, and cowpeas. Palm oil production is limited. The raising of livestock – almost exclusively goats, sheep, and poultry – constitutes a modest source of income. Cattle holdings are rare, even among better-off households.

The poorest households must resort to purchasing food (other than cassava) on the market for several months out of the year. They have a variety of ways of earning income: sales of charcoal, mangos, and wild mushrooms gathered during the season, sales of wild game, and sales of fish caught in rivers and streams and farmed in fish ponds – which also constitute a major investment for the best-off farmers. Line and net fishing are more frequent along the Lualaba River (upstream of the Congo River), which crosses the northern part of the zone. There are also a few artisanal mines in the zone. However, the poorest households suffer from a shortage of paid day labor opportunities. While they are hired by better-off neighbors to work on special projects, clear new land, dig new fish ponds, or build houses, apart from that, the bulk of farm labor is usually done on a communal basis. For example, a farmer will recruit a group to work on his land in exchange for a meal and perhaps a locally made beer and will then join that same group when another farmer needs work done on his land. The poorest households, who need extra income, tend to look for temporary work in neighboring zones where there are more labor opportunities.
### CD06: Seasonal calendar

<table>
<thead>
<tr>
<th>Season</th>
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<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
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<th>Oct</th>
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**Legend**
- 🌧️: Land preparation
- 🌾️: Sowing
- 🌾️: Weeding
- 🌾️: Harvest
- 🐟: Mushrooms, mangoes

### CD06: Food access calendar for poor households

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<th>Staple foods</th>
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<th>Feb</th>
<th>Mar</th>
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<th>May</th>
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<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
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<th>Dec</th>
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<tr>
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**Legend**
- 🌾️: Production
- 🌾️: Market purchase
- 🌾️: Production and purchase
- 🍋: Production and purchase
- 🍎: Production and purchase
This zone mainly covers the central and western sections of Maniema province, the southern reaches of Pangi territory, the northern reaches of Kasongo territory, and the northern tip of Kabambare territory. It also stretches into the southernmost part of Shabunda territory, in South Kivu province. The zone constitutes the southwestern border of the country’s northeastern forest region. It could be considered a transitional area between the forest and the savanna. It is still essentially a low-altitude forest but is less dense than in the north, with some savanna vegetation in the high plains. The rainfall pattern, however, is similar to that in the savanna region, which extends from the southern part of Maniema province to Tanganyika district in Katanga province, and is characterized by a dry season that is much longer than in the rainforest, lasting from May through August. Nonetheless, this climate still allows for a second season (B) for short-cycle crops, particularly beans, which grow better with the less abundant rainfall from December through March.

The zone is characterized by relatively high crop production levels and significant trade, due to production surpluses. The relatively fertile sandy-clay soils result in higher crop yields. As in other parts of the country, access to drivable roads is essential for motivating households to produce food to sell on the market and has resulted in a higher population density (approximately 30 inhabitants/km²) than in the rainforest to the north or the savanna to the south. The zone forms a triangle that starts in Kasongo, at the approximate intersection of three roads: the northern road to Kindu, the capital of Maniema; the southwestern road to Kabinda, in East Kasai, which meets the railway in Samba that runs south of Kindu to Katanga; and the northeastern road to Bukavu in South Kivu. The zone stretches to the Lualaba River (upstream of the Congo River), east of Kasongo.

The zone’s main crop is cassava, which is reserved more for local consumption than trade. Even the poorest households set aside a large portion of their small plots of land (less than one hectare) for growing cassava and generally produce enough to meet their own needs. Cassava can be pulled up a
few months after it reaches maturity and is generally available year-round, as plantings are staggered throughout the year. Rainfed rice and maize production are also important, particularly for the best-off households, who farm approximately three hectares of land. These two crops are the main foods marketed and consumed in the zone. Proportionally, more maize is grown in this zone than in the large forest region to the north. Legumes (namely cowpeas) are a crucial complement to staple foods, though some are sold on the market. Groundnuts and palm oil are specifically produced as cash crops. Plantains are another perennial crop, reserved mainly for household consumption.

Some parts of the zone are known for raising a large number of goats and sheep, while cattle are rare. Fish are caught in small rivers and streams, but fish ponds are becoming more widespread and are profitable enough for their owners to hire workers to dig and maintain the ponds. There is also some seasonal hunting, and there are a few artisanal mines scattered throughout the zone. Despite the limited size of cropped land here, the poorest households – thanks to their productivity and supplemental activities – are less dependent on day labor than their counterparts living elsewhere, who must find paid farm work to earn income.
### CD07: Seasonal calendar

<table>
<thead>
<tr>
<th>Season</th>
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<tr>
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**Legend**
- Land preparation
- Sowing
- Weeding
- Harvest

### CD07: Food access calendar for poor households

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**Legend**
- Production
- Market purchase
- Production and purchase
Despite being located on the shores of Lake Tanganyika, the steep slopes of the banks and the depth of the lake limit fishing in this zone, where a minority of inhabitants engage in artisanal fishing in the lake and rivers. For that reason, the zone's economy is dominated by agriculture.

The zone has fertile, sandy-clay soils. Average annual rainfall varies from 800 to 1,200 mm from September through May, with a decrease in rainfall in February, and moderate temperatures range from 22 to 26 degrees Centigrade. The population density on the road running along the lake (more than 300 inhabitants/km²) is much higher than in the south and affects the vegetation, which is now mainly savanna vegetation with a few gallery forests near the lake shore.

In addition to the lake and rivers, which provide fish and water to irrigate farmland, the zone offers its inhabitants other unique opportunities. There is a large grazing area (of Congo grass) in the Ruzizi Plain that allows livestock from the southern part of the Mitumba Mountains to graze in July-August. The zone also has red wood, saltwater hot springs, and artisanal gold mining sites.

The N5 road, which runs along the lake, is both the heart of the zone and its main roadway. The population is concentrated along this road, which connects the zone to the markets in Uvira, Bukavu, and Bujumbura (Burundi). The zone is also connected to Tanzania by the lake. The products most important to the zone's food security are the most widespread staple crops: cassava, maize, and irrigated rice.

The demand for labor for farming, fishing, and especially the artisanal mining of gold, which can be easily sold in nearby markets, is high enough to support the zone's high number of inhabitants and even more. The price of labor here is therefore slightly higher than in neighboring zones, at 1,500-2,000 CDF/day (2015).

In addition to staple crops (cassava, maize, irrigated rice), market garden crops are also grown from June through August, and oil palms, citrus, and mango trees are frequently found in localized areas. The
fertility of the soil encourages people to engage in farming, but the high population density limits the size of fields (30 ares for poor households and 0.7 to 1 ha for better-off households). While the majority of the population practices traditional farming using manual equipment, the Ruzizi Plain and its ideal topography allow approximately 20 percent of households to practice mechanized farming. Some households, particularly medium and better-off households, use animal waste as an organic fertilizer for agricultural intensification, but they remain largely a minority. The main drivers of wealth in the zone are the ownership of land and the means to profit from it, through irrigation, fertilization, mechanization, and crop sales.

**CD08: Seasonal calendar**

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**Legend**

- Land preparation
- Sowing
- Weeding
- Harvest

**CD08: Food access calendar for poor households**

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**Legend**

- Production
- Market purchase
- In-kind paymt
- Gathering
The volcanic Virunga and Mitumba Mountains are the highest in the Albertine Rift, the western branch of the East African Rift. The soils are mainly clay and are often low in organic matter due to over-exploitation and erosion. The climate is tropical humid but cold, with average temperatures often below 20 degrees Centigrade. Average annual rainfall is high, at between 1,300 and 1,600 mm and more in certain areas. Vegetation is mainly composed of mountain forests, which cover areas ranging from 1,600 to 3,500 meters altitude. Bamboo and stunted spruce trees grow from 2,400 meters up. Heather and grasses dominate above 3,500 meters.

The intermediary forest, or the transition area between the bottomland and mountain forests, covers the area from 1,000 to 1,750 meters altitude, mainly along the western edge of the border with northeastern Congo’s bottomland forests. The zone has minerals (gold, coltan, cassiterite, tourmaline) and parks with wild game and wood (for charcoal).

Most people in this densely populated zone (more than 100 inhabitants/km² in rural areas) live between 1,500 and 2,000 meters altitude, particularly along the main road. The highest peaks are over 3,000 meters high.

People generally access markets via the main road, which is very poorly maintained. It runs from Lake Tanganyika to Beni and passes through Lake Kivu. Most products sold locally arrive at the market on the heads of porters, while most products coming from other markets or other zones arrive by tshukudu (wooden scooter). Assembly markets along the road supply the markets in Butembo (the largest market in the zone) and Beni and then Kisangani/Bunia to the north and east and Goma and Bukavu to the south.
The zone’s topography and population density limit the size of cropped land to approximately one ha for better-off households and 15-30 ares for poor households, or approximately half that of neighboring zones. The land is farmed manually, normally using a companion planting system (beans and maize, potatoes and maize). The main crops grown in the zone are potatoes, maize, beans, sorghum, bananas (in North Kivu), and sweet potatoes. Households grow produce in small market gardens around their homes (huts) or in the nearest bottomland areas.

Large ruminant-raising is a distinctive feature of this zone, as tsetse flies are not found at such high altitudes. Livestock-raising is becoming increasingly integrated into the farming system, particularly with the use of animal waste as organic material for the soil. Fields are generally used for grazing, especially for small ruminants after the harvest. The use of animal waste for fertilizer is so widespread that it is even sometimes sold on the market. In addition, all households in the zone consume a significant quantity of cow’s milk, though small ruminant milk is not consumed.

The zone’s population density and constraints limiting the size of cropped land also create a labor surplus, especially in the central and northern parts of the zone. Another distinctive feature of this zone is that demand for labor is higher during and after the harvest (for harvesting, threshing, winnowing, transport), while in other, more agricultural zones, demand for labor is highest before the harvest (for land preparation, planting, weeding).

While the zone is, on the whole, fairly homogeneous in terms of livelihoods and crops grown, there are still some differences in the production systems between the north and south, with the dividing line located around central South Kivu, between Mwenga and Shabunda. The crop production systems are essentially the same, but for cultural reasons and likely due to a better access to resources, households in the south tend to use more paid farm labor than in the north, where farming is generally done by families or through mutual assistance.

The main distinction between the northern and southern parts of the zone concerns their large ruminant raising systems. Cattle in the north are improved species, and pastures are organized and optimized. Livestock in the north are therefore more productive, but production costs are higher than in the south. Herd sizes in the north are smaller than in the south due to these additional costs and to looting, which is often conflict-related. Livestock-raising in the north is intensive and organized around herders’ homes. Households in the south raise traditional species of cattle that are less productive but do not require routine vaccination. Herd sizes are larger than in the north. Herds are transhumant, with cattle migrating to Lake Tanganyika in June/July for food. Sheep are also more commonly raised in the south than in the north. The main livestock markets in North Kivu are Muchata/Masisi and Kipese/Lubero.
Livelihoods in the zone are often disrupted by conflict, but it is not cited as a hazard to livelihoods because mutual assistance and hosting systems, emergency assistance, and self-help (for example, by selling labor or crops) are generally enough to meet the needs of displaced households until they can return to their homes. The most frequent hazards mainly affect crop production. Coping strategies include livestock sales (only when necessary) and the leasing of fields to better-off households.

**CD09: Seasonal calendar**

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**Legend**
- Land preparation
- Sowing
- Weeding
- Harvest

**CD09: Food access calendar for poor households**

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**Legend**
- Production
- Market purchase
- Production and purchase
This zone is made up of the midland hills and marshy plains (1,400 to 2,000 meters) between the Mitumba Mountains and Lake Kivu and Lake Tanganyika. The soil are mainly clay and are moderately fertile. The climate is humid equatorial, with annual precipitation ranging from 1,300 to 1,500 mm from September through May and moderate temperatures from 18 to 26 degrees Centigrade. There is wooded savanna vegetation in the east and mountain forest or transition vegetation to the west. The temperate climate and fertility of the soils have led to a high population density in rural areas, at more than 400 inhabitants/km².

The large cities of Bukavu and, to a lesser extent, Goma, dominate trade in the zone. All local markets supply or are supplied mainly by Bukavu. With few roads in the zone, goods are mainly transported on men's and women's heads and backs, by bicycle, or by tshukudu. Weak infrastructure generates high demand for labor to transport goods.

The economy is based mainly on rainfed, manual agriculture (family farming). Even poor households earn a significant portion of their annual income from selling 50 to 75 percent of their crops. Market garden crops are another source of income but are less widespread and are planted in the middle of June and harvested in August/September. These crops include cabbage, green leafy vegetables, potatoes, onions, and green onions. Land is therefore the main driver of wealth in the zone. Better-off households farm approximately two hectares of land, while poor households farm approximately 30 ares (0.3 ha). In addition, the asset most often sold by poor households is labor.

Bananas (especially plantains) and cassava are the main crops produced in the zone, with banana production less common among poor households. Despite the presence of banana bacterial wilt, salvage operations are helping to maintain banana crops in the zone. The zone also suffers from cassava mosaic disease. Two or three crops are frequently grown in the same field, especially in combination with
beans, and land is rarely laid fallow. Maize, market garden crops, soybeans, groundnuts, sorghum, sweet potatoes, and china bark are other common crops in the zone. Arabica coffee production is also high enough for coffee cherries to be sold directly from the field but also for the beans to be washed in washing stations by a few coffee cooperatives, which export them to Rwanda.

The raising of cattle by better-off households and small ruminants and poultry by poor households is mainly a source of savings. However, some households use animal waste as fertilizer for their fields.

While demand for farm labor is high, especially for land preparation, weeding, and the transport of crops and other goods, the labor supply sometimes exceeds the local demand. That is why the zone is known as a source of domestic labor – performed essentially by young people – for large cities (Goma, Bukavu) and even for Rwanda and Burundi. Wages are most often paid in cash at a rate slightly lower than that in neighboring zones (1,200 CDF/day compared to 1,500 CDF/day elsewhere), probably due to the zone’s high population density.

The greatest hazards in the zone are those that affect crops (disease, hail, flooding). Households cope by selling animals, looking for more local work on landowners' farms, or temporarily migrating to cities. Conflict is another significant factor in the zone, as it can cause prolonged displacements. Displaced households live mainly off small jobs, assistance from host families, and humanitarian assistance.

**CD10: Seasonal calendar**
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**Legend**
- Production
- Market purchase
- Production and purchase
This zone is located in the highlands between the Mitumba Mountains to the west and the Virunga Mountains, shared with Uganda and Rwanda, to the east. Lake Edward forms its northern border and Goma/Lake Kivu form the southern border. The western part of the zone is completely volcanic, made up of the ancient lava flows of Mounts Nyiragongo and Nyamuragira, volcanoes that still pose a threat today. The climate is humid, with a bimodal rainfall pattern composed of a short rainy season from March through May and a main rainy season from September through December. Temperatures are moderate, ranging from a minimum of 15 to 20 degrees Centigrade and a maximum of 22 to 27 degrees Centigrade. The soils are generally volcanic (ranging from new to ancient and decomposed). Significant agricultural pressure has changed the vegetation, which is now made up of a mosaic of farmland (herbaceous or shrubs) with a few occasional mountaintop vestiges of forests and bamboo that are home to mountain gorillas, which is why the mountains are part of the protected Virunga National Park.

While this eastern part of Rutshuru territory is almost entirely designated as a national park or protected area, the zone is densely populated, with approximately 200-250 inhabitants/km². However, easy access to the park, the zone's cross-border location, and the fertility of its volcanic soils makes it vulnerable to frequent conflicts. Since the park was created, conflict between the resident population and government institutions has been the main obstacle to the development of a dynamic tourism industry around gorillas and elephants. The search for oil resources constitutes another potential threat to tourism in the future.

The zone's environmental conditions are particularly conducive to rainfed agriculture, on which the local population depends. The main crops grown by all households include beans, maize, coffee, bananas, cassava, potatoes (especially near the Rwandan border), groundnuts, sorghum, fruit, and tea (in the Mweso Valley). Most fields use the companion planting system, with the main combinations of crops...
being beans and soybeans, beans and maize, and beans and groundnuts. Beans are also grown in combination with coffee, bananas, and cassava. The zone exports its surplus beans, maize, and bananas to Goma and from there to Bukavu. Surplus soybeans, bananas, and sorghum are also exported to Rwanda and Uganda.

Access to land is therefore the main driver of wealth in the zone. Access to one to two hectares of land allows better-off households to meet their food needs with their own crops while also investing in cash crops such as coffee, soybeans, and sugar cane. However, the land is so productive that even poor households can produce nearly enough maize, beans, and sorghum (and to a lesser extent, bananas) to meet their own needs. Crop sales are the main source of income for almost all households.

Labor supply and demand are more or less balanced, and wages are paid mainly in cash (approximately 1,500 CDF/day, or for a morning of work). Demand for labor is around twice as high before the harvest, for land preparation and weeding, than during or after the harvest.

Most households have a few animals (poultry and/or small ruminants), depending on how wealthy they are. Livestock-raising is generally used only as a source of savings.

Armed conflict is the greatest hazard in the zone. The coping strategy most often used is temporarily moving to cities (Rutshuru, Kiwanja, Goma) or abroad (Uganda). During their displacement, households change their livelihood strategies and depend much more on paid labor to earn income and on market purchases or food assistance to eat. For three to four months, households with access to host family or communal land can grow their own cassava or vegetable crops, which they can also sell.

In addition to conflict, the most frequent hazards are those that lead to crop losses (destruction of crops by domesticated or wild animals, hail, volcanic mud flows, etc.). A drop in prices during the harvest or an increase in prices when crops are purchased – particularly sorghum, maize, and beans in April/May and October/November – are other hazards for households. In addition to resorting to savings strategies (by consuming foods other than those that are usually consumed or preferred), poor households cope with these hazards by selling livestock and looking for more work opportunities, either locally or in cities (Rutshuru, Goma).
### CD11: Seasonal calendar

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**Legend**
- Land preparation
- Sowing
- Weeding
- Harvest

### CD11: Food access calendar for poor households

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<th>Staple foods</th>
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**Legend**
- Production
- Market purchase
- In-kind paymt
- Gathering
This zone is by far the largest livelihood zone in the country’s four northeastern provinces. In Orientale province, it is the zone of reference to which all other zones can be compared. It covers the western half of North Kivu, from north to south, the western half of South Kivu, except for the southwestern corner, and the northern half of Maniema, as well as a small section in the southwest. The zone is mainly dense rainforest, dominated by Gilbertiodendron and Cynometra trees in the north and semi-deciduous forest characteristics in the south, with African Teak (Milicia/Chlorophora), mahogany (Entandrophragma) and Fagara trees. On the whole, it has extensive, highly valuable red and brown hardwood resources. The forest is becoming slightly less dense near its southern border, where it meets the savanna, even though it is still a bottomland tropical rainforest without a long dry season. The gallery forest in Kabambare is called the maniema, for which the province is named. The zone is, for the most part, between 500 m and 1,000 m altitude and contains a large portion of the middle reaches of the enormous tributaries that constitute and feed into the Congo River. On the whole, the zone’s sandy-clay soils are reasonably fertile. Annual rainfall ranges from 1,000 mm to 2,000 mm, with an average total of approximately 1,600 mm. While there are some local irregularities in rainfall distribution affecting crop growth, rainfall shortages are not a serious threat.

In general, the forest provides the same livelihood resources everywhere, even though localized differences in conditions (for example, difficulties obtaining agricultural inputs) give rise to certain differences in production. Integrated soil fertility management techniques are generally not used due to a lack of technical support, which translates into low crop yields.

The production system is characterized by shifting cultivation and slash-and-burn agriculture, with fields being used for approximately five years, according to crop rotation practices. With a population density of approximately 20 inhabitants/km², land availability is not a problem. The difficulty lies more in clearing the land, then in fighting every year against encroaching weeds, trees, and shrubs. The
population density in some areas is actually much lower, sometimes even below five people/km², and in some localized areas, hunting and wild food gathering form the basis of certain specific ethnic groups' livelihoods. Wild game, whether hunted or purchased on the market, reduces to some extent the need to raise more goats, sheep, or pigs. Cattle-raising is rare, even among the best-off villagers.

The main staple food is cassava, followed by rainfed rice (which is not irrigated or transplanted) and plantains, which are a perennial plant. Less important annual crops include groundnuts, cowpeas, and other legumes, grown mainly in combination with cassava. Maize is widely grown, but it is mainly consumed in "green" form before the harvest to meet food gaps before the main rice harvest, which takes place before the cassava harvest. If it is not immediately consumed, ripe maize is used to make local beer. Wild and cultivated oil palms are widespread, but palm oil production is concentrated in just a few areas, sometimes as a result of past investment projects. In addition to the main growing season (A), which depends on rains beginning to fall in April after the dry season, which lasts from January to the middle of March, a second growing season (B) starts in September, with a short production cycle following a dry (or relatively dry) period from July through August. Crops grown during this season include groundnuts, legumes, and a non-traditional, short cycle variety of rice promoted by the government. It is also possible to plant a second cassava crop, which can be harvested up to one year later.

The poorest households often do not produce enough rice (or sometimes even cassava) to meet their needs year-round, even though they sell some of their crops to meet urgent needs. They must therefore buy or barter for the food they need from neighbors or on the local markets. To earn some money (or be paid directly in food), they can look for paid labor, mainly clearing land or working in plantations, for a daily or piecework wage. Plowing is done manually, without the use of draft animals.

On the whole, the zone could be described as being self-sufficient in staple foods, with a potential surplus. In reality, the poor network of drivable roads keeps villagers in this vast region so isolated that production for the markets is generally limited. However, production is greater near the few main drivable roads – where there is also a greater concentration of people and even an overexploitation of land. Products sold along these roads reach markets to the east in the Kivu provinces and those in the west, all the way to Kinshasa.

The forests and groundwater system offer villagers other resources, such as fish in rivers and streams, wild honey, other seasonal wild foods, wild-growing or wild-caught foods (including jungle yams, large snails, caterpillars, grasshoppers, and wild game), timber, bamboo, and tall grasses and raffia to make roofs and fences. Some households also earn income from the localized artisanal mining of gold, diamonds, cassiterite, and wolframite. In some regions, mineral production is widespread or concentrated and has such an impact on rural livelihoods that it justifies creating a separate livelihood
zone (Zone 13), but these and other smaller sites draw seasonal migrant workers, particularly young men, from villages in other forest areas.

**CD12: Seasonal calendar**

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### CD12: Food access calendar for poor households

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<th>Staple foods</th>
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### Income
- Peak in sales of household production
- Peak in livestock sales
- Peak in firewood/charcoal sales
- Peak in income from farm labor
- Peak in fish sales
- Sale of minerals
- Mining labor

### Expenditures
- Staple foods
- Seeds
- School fees
- Clothing, celebrations

### Legend
- Production
- Market purchase
- Production and purchase
This zone has deposits of gold, diamonds, cassiterite (tin ore), and wolframite (for tungsten) scattered throughout the forest area. This has given rise to a complex network of industrial and commercial operations, large, private mines run by business owners, and small mines run by a small number of local employers and independent villagers. The first two types draw prospectors and workers from other zones and provinces, and even from other countries, and have been at the heart of recurring conflicts and problems with banditry and even occasional "gold rushes." Smaller mines are more scattered and are usually managed by local villagers. Large sites are generally found along or near drivable roads or navigable stretches of river.

Most people living in the forest do not have the possibility of working in the mines, and when they do, it remains an occasional or seasonal activity that contributes less to their income than farming or other activities. Inhabitants of this zone are still rural villagers whose livelihoods depend in large part on artisanal mining, whether they be better-off villagers who own their own sites and equipment and hire workers or poorer villagers who do paid work in the mines or dig for themselves with their own modest equipment. This group includes a minority whose every effort is focused on mining and who earns all of their income from the activity, and a majority who engages in farming and exploiting forest resources but who still earns half or more of their income from mining. These people come from villages within or close to the main mining areas indicated on the map, in the Orientale and Maniema provinces.

Within the majority of households who also work the land, the primary able-bodied man dedicates all his time to mining, sometimes living away from the village, while the rest of the household members...
who work, particularly the women, focus on producing crops (namely cassava), even if they must hire
a worker to help them clear land or for other physically arduous work. In general, all households,
whether poor or better-off, tend to only farm half as much land as their counterparts living outside
the mining area. However, these crops make a considerable contribution to feeding the family,
including the miners, to whom food is brought. Families can also earn income from selling surplus
crops to local miners or migrants who either do not grow crops or are heavily market-dependent for
food. Farming activities are developing around mining areas to feed artisanal miners, including
permanent and seasonal migrants. The market is large, and food prices are high. The areas where
mining activities are concentrated have urban characteristics, with a population density of nearly
750 inhabitants/km². The actual demand also drives the trade of goods from far-away areas, including
rice and dried fish, the local production of which is often insufficient. But local villagers also have the
advantage of being able to sell perishable goods, such as vegetables, fresh fish and game, and local
beer made from maize and palm wine. High prices also apply to animals, whether poultry, goats, or
sheep sold alive on the market or cows (or pigs) sold to butchers. In exceptional cases, some better-
off households even raise a few cows, even in forest areas.
### Seasonal calendar

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### Legend
- Land preparation
- Sowing
- Weeding
- Harvest
## CD13: Food access calendar for poor households

<table>
<thead>
<tr>
<th>Staple foods</th>
<th>Jan</th>
<th>Feb</th>
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<tbody>
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<td>Cassava</td>
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### Income

- Peak in sales of household production
- Peak in livestock sales
- Peak in charcoal sales
- Peak in income from farm labor
- Peak in fish sales
- Sale of minerals
- Mining labor

### Expenditures

- Staple foods
- Seeds
- School fees
- Clothing, celebrations

### Legend

- Production
- Market purchase
- Production and purchase
This livelihood zone includes the easternmost reaches of Orientale province and extends into Beni territory in North Kivu province. The zone is relatively small in size, but it has one of the highest population densities of all the livelihood zones in the eastern DRC. The population density is generally between 180 and 200 inhabitants/km$^2$ and can reach 250 inhabitants or more in localized areas, particularly in the hills and high plains that rise up from Lake Albert and in the southeastern part of Beni territory. Much of the original mountain forest has been cleared, with the exception of the uncultivated mountainsides at around 3,000 m altitude. The vegetation is mainly made up of a type of wooded savanna that tends to turn into rainforest near the eastern edges of the zone.

Farmland is located at an average of 1,500 m altitude and benefits from a relatively temperate climate and moderately fertile soils made up of a combination of clay, sand, and laterite. In the southernmost reaches of the Beni area, in the Semliki River valley, the soils are alluvial. The average size of land holdings varies depending on the altitude and local conditions, while population densities are similar everywhere. In general, land holdings at higher altitudes are smaller and calculated in ares (100 square-meter units, or $1/100$ of a hectare), while at lower altitudes, land is measured in hectares or portions of hectares. On the whole, land holdings are much smaller than in the neighboring forest regions.

Crop production is therefore relatively intensive and offers few possibilities for letting land lie fallow, and even fewer for shifting cultivation, like in the forest. Rain falls almost year-round, with only two considerably drier months, between January and February and July and August. Average annual rainfall varies depending on altitude, but it is generally lower than in the rainforests, at approximately 1,000 mm.

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Farm land and equipment</td>
<td>Farm land and equipment</td>
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<tr>
<td>Small animals</td>
<td>Small and large animals</td>
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<td>Motorbike</td>
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<table>
<thead>
<tr>
<th>Main types and sources of food</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Cassava (HP, IP)</td>
<td>Cassava (HP)</td>
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<tr>
<td>Beans (HP, MP)</td>
<td>Beans (HP)</td>
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<tr>
<td>Maize (HP, MP)</td>
<td>Maize (HP)</td>
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<tr>
<td>Sweet potatoes (HP)</td>
<td>Sweet potatoes (HP)</td>
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<td>Rice (HP, MP)</td>
<td>Rice (HP, MP)</td>
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<td>Plantains (HP, MP)</td>
<td>Plantains (HP, MP)</td>
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<table>
<thead>
<tr>
<th>Main sources of income</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Farm labor</td>
<td>Sale of crops</td>
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<tr>
<td>Sale of charcoal</td>
<td>Sale of livestock</td>
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<tr>
<td>Bicycle transport, gold mining, sale of fish, petty trade</td>
<td>Trade</td>
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<tr>
<td>Sale of crops</td>
<td>Motorbike taxi</td>
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<table>
<thead>
<tr>
<th>Main markets</th>
<th>Bunia, Kisangani, Mongbwalu, Watsa/Aru, Mahagi, Djugu, Ame, Beni, Kasindi, Uganda</th>
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</thead>
<tbody>
<tr>
<td>Main livestock markets in North Kivu: Muchata, Kipese</td>
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<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Storms (banana trees)</th>
<th>April-May</th>
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<tbody>
<tr>
<td>Locusts, grasshoppers</td>
<td>April-May</td>
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<tr>
<td>Elephants or wild pigs</td>
<td>January, May, July, November</td>
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<tr>
<td>Hail</td>
<td>September, 1/3 years</td>
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<td>Armed conflict</td>
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<thead>
<tr>
<th>Coping strategies of poor households</th>
<th>Increase sale of paid labor</th>
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<tr>
<td>Grow crops in damp, low-lying areas of land</td>
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</table>
Different types of crops are generally grown together in the same field or garden. Cassava is the main staple food, as it is nearly everywhere in the country, but sweet potatoes are also particularly important. These two crops can grow under bean plants, garden maize, groundnuts, and plantains, in combination with a small vegetable garden and even one or two coffee or cacao trees at lower altitudes. Growing crops together at different heights also protects lower plants from occasional hailstorms. Some separate plots of land are dedicated to banana trees. The best-off households, who own more land, can also grow rainfed rice, beans and fava beans, and additional maize separately in small fields.

This zone also has the highest concentration of livestock in the eastern DRC, including not only goats and sheep but also a significant number of cattle, particularly in the eastern part of the zone. However, livestock is mainly owned by better-off households, who own all the cattle and often have large herds of goats and sheep and a few pigs. Some households also have a small poultry production business with up to 100 hens. Some poor households raise a small number of goats, a dozen hens, and a few rabbits.

With limited land and crop production levels, the poorest households must purchase much of their food to meet their needs and complement the cassava that they grow and eat for most of the year. To earn income to purchase food and other basic necessities, they sometimes do agricultural work for other farmers and are most often paid in cash, though sometimes they are paid in-kind with processed cassava (fufu). Apart from that, and depending on the season, they generally earn income from sales of charcoal, edible, wild-caught or wild-grown foods (particularly caterpillars), fish caught on a line or in a net, and one or two small animals. They can also earn income from transporting goods on wooden scooters known as tshukudus, or by transporting people by renting a motorbike. Another common way of earning income consists of digging or panning for gold during the dry season. Despite their food production deficit, they sell a small portion of their crops during the main harvest, a period coinciding with year-end holidays, which create an urgent need for cash.
### CD14: Seasonal calendar

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<td>Short cycle rice - Season B</td>
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### CD14: Food access calendar for poor households

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**Legend:**
- **p**: Land preparation
- **s**: Sowing
- **w**: Weeding
- **h**: Harvest
- **mp**: Market purchase
- **pm**: Production and purchase
This livelihood zone is contained within Orientale province, mainly along large rivers – the Congo River itself and its main tributaries, the Uélé River and the Rubi-Tinda-Itimbiri River, which flow into its middle reaches. The zone's inhabitants live in villages scattered along or near the riverbanks (usually less than 500 m away), below the gallery forests. But with 1,500 km of river, the zone's population is not small. The fishermen in this zone differ from other people who fish in smaller river systems in other provinces, because while they grow a few crops, they are professional, artisanal fishermen, some coming from ethnic groups with a long fishing tradition. In addition to the river fishing economy, there are also fishing villages along the shores of Lake Albert, on the eastern border of Orientale province, where the savanna quickly gives way to the hills and mountains. The lake has some of the richest fishing resources of all the lakes on the country's eastern border (even though the industrial fishing infrastructure in Lake Albert was destroyed during times of conflict).

Villagers along the rivers have traditional rights (sometimes legal) over fishing in their stretch of waterway, and the intrusion of fishermen coming from other areas – particularly when the concentration of fish is high – can give rise to conflicts. Fishing is done artisanally using lines, nets, and traps and canoes of different sizes, and even small boats or larger, motorized canoes. In some stretches of river, overfishing – the result of the use of tight mesh nets and even poison – has considerably reduced fish stocks, while the use of trawling nets is destroying reproduction areas and threatening livelihoods.

In addition to their nutritional value for fishermen's families, the market value of fish is rising due to growing demand on the markets, particularly in booming cities. Most fish are not sold fresh, as it is too perishable to travel. Fish is most often bartered locally rather than being sold on the market. Most fish that is sold is preserved, salted, dried, and sometimes smoked, and travels long distances, either by the
river or the road. Downstream of the Kisangani rapids, some of the barges on the Congo River transport frozen fish in refrigerated containers to Kinshasa, where there is also high demand on the market for salted fish from Orientale province, as in other cities in the neighboring Équateur and North Kivu provinces. Places where the main roads bypass or cross the large rivers, such as Liguga and Bondo on the Uélé River and Aketi on the Tinda River, are the site of particularly extensive trade activities. There is also more organized commercial fishing, particularly on Lake Albert, where the fishing season is officially closed during the main reproduction period from October through December.

Poor households farm small plots of land – approximately 0.5 hectares – and dedicate more time to fishing, while also looking for farm work with wages paid in cash or food (and sometimes by other means, such as a goat in exchange for clearing a hectare of land). Better-off households usually farm nearly three hectares of land, for which they hire workers who they also call on to work on their fishing boats and help smoke fish and make and repair fishing nets. Many households have small ruminants and poultry, but the best-off households on the edges of Lake Albert also tend to raise a few dairy cows. The main crops are cassava, rice, maize, beans, and plantains. Many households also have vegetable gardens. Cassava, rice, and beans that are not consumed locally can be sold as far away as Kinshasa. Maize grown in the Haut-Uélé district is traded as far away as South Sudan.
**CD15: Seasonal calendar**

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<th>Season</th>
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<td>Gathering (leaves, tubers, firewood), mining labor</td>
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<td>Wild food products: f = fungi, x = termites, y = caterpillars, z = grasshoppers</td>
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**CD15: Food access calendar for poor households**

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The Northern plateau cassava, maize, groundnuts and beans zone is the dominant livelihood zone in northern Equateur province, covering the northern half of Mongala district as well as Sud-Ubangi and Nord-Ubangi districts (now ex-districts and new provinces). The density of the Congo Basin's forest cover diminishes considerably in northern Equateur, making agriculture a more viable livelihood option. Tropical forests give way to expanses of savannah where cultivation is concentrated. As a result, agricultural output levels and yields are considerably higher in this zone that south of the Congo river. Market access and demand is also higher, due to the existence of middle-sized towns (Gemena, Gbadolite, Zongo, Bosobolo, Lisala, Bumba, Yakoma, Businga) and numerous cross-border markets linking the zone to CAR and more distant markets in Cameroon, Chad or South Soudan.

The main crops grown are cassava, maize, groundnuts, black-eyed peas and rain fed rice. Most crops are intercropped, except peas - a more delicate crop with better yields in the second agricultural season (harvested in November/December). The size of agricultural plots is small, varying from 0.5 to 2 ha, depending on the household's labor and economic power and access to tools and inputs – difficult to come-by without government support. Poor households work for wealthier households and are paid in cash or in kind for their services (a more convenient way of acquiring manufactured goods). Many wealthier households are involved in cross-border trade, exporting local agricultural produce in exchange for basic processed foods and other manufactured items.

Besides agriculture, local livelihoods are supplemented by an assortment of secondary activities, the most important being artisanal palm oil production – a remnant of the industrial production before independence. The collection and sale of forest products (game, insects, mushrooms, wild plants, etc.) is also important.
Intensification of normal income generating activities
Expanded periods of labor migration
Informal loans

firewood) and the sale of handicrafts (traditional fishing baskets, fiber mats and pottery) are common.

Labor migration towards neighboring countries is also a source of income for local households and is most evident during the lean seasons, especially before the start of the first harvests in June/July.

This livelihood zone has been the most affected by the arrival of CAR refugees since the overthrow of president Bozizé in March 2013. Currently over 50,000 refugees have been hosted in four camps and in many villages along the north-western border. The major impact of the new arrivals has been an increase in the price of basic commodities leading to instances of food insecurity and a heightened situation regarding access to agricultural areas and an increase of the pressure on the already limited public services (especially medical services).

The north-eastern corner of the zone - the area lying between Yakoma, Businga and Bumba towns - is the most remote area in the livelihood zone, highly vulnerable to food shortages due to the very poor market access compounded by the general lack of public services.

There is a pocket of intensive kidney bean production around the town of Bosobolo and three small pockets of artisanal mining, in Mobinda, Wapinda and Kotakoli – attracting young men from inside and outside the zone. Here the availability of a different economic activity will define different local livelihoods.

The dry seasons in the north of Equateur province are more distinct that in the wetter, southern half of the province. It is at this time of the year that the most labor intensive agricultural tasks are carried out, land clearing and preparation, most commonly completed by hand. Maize and groundnuts are grown during the two seasons although the June/July harvest season is somewhat more important. The main harvest for beans is towards the end of the year and the June/July harvest is mostly reserved for sowing in the next season. Cassava is planted at the same time as maize and sometimes accompanied by rice. Cassava leaves and tubers are harvested as necessary during the year. The collection and transformation of oil nuts, either wild varieties or grown in partly restored colonial plantations, takes place during the wet seasons. The same is true for the collection of forest products and game.
### CD16: Seasonal calendar

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<th>Seasons</th>
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**Key livelihood activities**

- Cassava (harvest year-round)
- Maize
- Groundnuts
- Black-eyed peas

**Other livelihood activities**

- Palm oil production & sale
- Wild food sales
- Wild meat sales
- Migratory labour

**Shocks and hazards**

- Early arrival of rain during land prep.
- Rainfall delays after sowing
- Bush fires

**Legend**

- Land preparation
- Sowing
- Weeding
- Harvest

### CD16: Food access calendar for poor households

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<th>Staple foods</th>
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**Income**

- Crop sales
- Local agricultural labour
- Palm oil production & sale
- Wild meat & wild food sales
- Handicraft sales
- Migratory labour

**Expenses**

- School expenses (peak)
- Festivals

**Legend**

- Own production
- Market purchase
- In-kind
- Gathering
The smallest zone in Equateur province, the *Bumba rice and tubers zone* covers the rice producing areas around Bumba town, in Bumba and Lisala districts. The climate in this zone is slightly drier, allowing for two distinct agricultural seasons. Cultivation is a mixture of rain-fed rice and flood recession cropping close to the Congo riverbanks. Besides rice, cassava, maize and plantains are intercropped and grown for own consumption and sale, while yams, groundnuts and pumpkins are grown as single crops and are reserved especially for sale. The June/July harvests are larger than the harvest in December/January, although yams and groundnuts are harvested only once, at the end of the year.

Poor households cultivate approximately 0.5 ha aided by family labor alone, while better off households can operate on up to 3 ha and hire agricultural labor at the peak of the agricultural seasons, have access to better quality inputs including improved seeds and more frequently replaced agricultural tools.

Population density is higher than average (32 people/km²). Forest cover provides access to wild foods (snails, fungus, caterpillars, wild leaves) and wild animals (monkeys, antelopes, gazelles, wild boars, tortoises or hedgehogs), which are sold and consumed. The production of palm oil, traditional liquor (maize, cassava or sugar cane based) and small-scale fishing in ponds and swamps (commonly a female activity) provide additional ways to make an income.

Bumba is an intermediary fluvial port between Kisangani and Kinshasa. Local produce and imported manufactured goods flow in both directions. However, poor access routes from villages to wholesale markets and the lack of substantial transport capabilities push farm-gate prices down. Local rice must also compete with cheaper imported rice varieties and is often purchased by

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Agricultural land</td>
<td>Agricultural land</td>
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<tr>
<td>Basic agricultural tools</td>
<td>Hired labor</td>
<td>Agricultural tools</td>
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<tr>
<td>Labor power</td>
<td>Access to motorized transport to markets</td>
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<tr>
<td>Small livestock</td>
<td>Small livestock</td>
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<table>
<thead>
<tr>
<th>Main foods and sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Cassava (own prod or gifts)</td>
<td>Cassava (own prod)</td>
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<tr>
<td>Rice (own prod/purchase)</td>
<td>Rice (own production)</td>
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<tr>
<td>Yams &amp; plantains (own prod)</td>
<td>Yams &amp; plantains (own prod)</td>
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<table>
<thead>
<tr>
<th>Main income sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Crop sales</td>
<td>Crop sales</td>
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<tr>
<td>Local ag labor</td>
<td>Petty trade</td>
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<tr>
<td>Wild food sales</td>
<td>Livestock sales</td>
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<tr>
<td>Livestock sales</td>
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</table>

| Main markets | Bumba central market, Bokata (Imbiri), Mombesa, Yandongi, Agene & boats travelling through the area. |

<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Birds (rice fields)</th>
<th>Sowing season (April &amp; Sept)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Crop diseases (rice)</td>
<td>Before harvest (June &amp; Oct)</td>
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<tr>
<td></td>
<td>Localized flooding</td>
<td>Nov &amp; Dec</td>
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<tr>
<td></td>
<td>Uncontrolled bush fires</td>
<td>Jan/Feb &amp; June/July</td>
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<tr>
<td></td>
<td>Unseasonal rains/dry spells</td>
<td>End/start of each season</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Coping strategies for poor households</th>
<th>Increase normal income activities</th>
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<tbody>
<tr>
<td></td>
<td>Wild food and wild meat sales</td>
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<tr>
<td></td>
<td>Informal loans</td>
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<td>Urban labor in Bumba town</td>
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</table>
brewing companies instead. The most common hazard in rice producing areas is the arrival of colonies of birds during the rice-sowing season, which requires the guarding of fields virtually full time to minimize the loss of seeds. Bacterial and fungal diseases also affect rice periodically, especially when land clearing and preparation is inadequate. Flooding can occur when rainfall levels peak in November and December, while uncontrolled bush fires are most common during the land preparation phases during the dry seasons.

CD17: Seasonal calendar

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<th>Seasons</th>
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<td>Cassava (harvest yearround)</td>
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<td>Yams and pumpkins</td>
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<td>Wild food sale (snails and caterpillars)</td>
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<td>Rice parasites &amp; birds</td>
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</table>
There are no major differences between this zone’s seasonal calendar and that for zone CD16 which surrounds it, except the additional varieties of crops common to this zone: the specialization in rice production, the growing of plantains in humid plots close to the river and the addition of yams and pumpkins. Farming is more intensive in this rice-producing zone and as a result, agriculture takes a more prominent role in local livelihoods. More time is dedicated to crop production, on family farms or for others, and to the search for clients, leaving less time (and necessity) for other activities. Like in zone CD16, rice, maize and groundnuts are grown over two seasons, while yams and pumpkins are only harvested once, at the end of the year. Plantains and cassava are harvested year-round. Wild food consumption and sales increase during the lean season and at the key harvest periods for each species (for example, wild mushrooms during the wettest months and snails and caterpillars between June and August).
This fishing based livelihood zone covers the triangular area created by the rivers Congo and Ubangi in the districts of Bomongo and Makanza (western Equateur province), an area of flooded forests and swamps where firm land for growing crops is difficult to come by. The zone continues along the Congo riverbanks upstream towards Bumba town and includes all the fishing villages located at a maximum of 1 or 2 km from the riverbanks. Population density is low, distributed in villages and permanent fishing camps closer to the water.

The local communities are traditional river people; their main activity is fishing and fish trade and the dugout canoe is their most fundamental tool. Fishermen and women use a wide range of traditional techniques: fixed lines, fixed nets and mobile nets set by canoe. Their equipment is simple and only better-off households have outboard motors and better quality fishing tools. Fishing also takes place inland, in ponds and swamps. Fishing concessions can be purchased to secure these inland fishing grounds. Fish is sold fresh for local consumption, as well as dried, salted or smoked. The area is well known for the high quality of its smoked fish.

Fluvial links to Kinshasa are very good and much of the fish is transported downstream in boats (in canoes, pirogues, balenières and larger barges). Fish is also sold in Mbandaka (the largest town in the region) and in Congo-Brazzaville (at Makotipoko cross-border market).

Fishing takes place year round, peaking in January-February and June-July, months when the intensity of the rain decreases (even if these months cannot be characterized as “dry seasons”), water levels fall and fishing becomes easier. It is at this time that some cultivation takes place: vegetables and taro are planted for own consumption and sale.

Harvesting wild oil nuts for the production of palm oil is an important secondary activity in this zone; transformed using traditional methods and sold to traders from Mbandaka and Kinshasa. The

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Dugout canoe/pirogue</td>
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<tr>
<td>Fishing equipment:</td>
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<tr>
<td>fish traps, mosquito nets, rods, hooks, etc.</td>
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<tr>
<td>Dugout mortar</td>
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<tr>
<td>(palm oil production)</td>
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<tr>
<td>Agricultural land</td>
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<table>
<thead>
<tr>
<th>Main foods and sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Cassava/chicuanga</td>
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<tr>
<td>(purchase)</td>
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<tr>
<td>Plantain (purchase)</td>
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<tr>
<td>Taro (own crops/purchase)</td>
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<table>
<thead>
<tr>
<th>Main income sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Fish sales</td>
<td></td>
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<tr>
<td>Palm oil sales</td>
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<tr>
<td>Crop sales (vegetables)</td>
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<tr>
<td>Renting out canoes/river transport services</td>
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<table>
<thead>
<tr>
<th>Main markets</th>
<th>Mbandaka (largest), Mankanza, Lobengo, Bobanga, Mobenzeno, Maïya, Lilanga, Bomongo &amp; Buburu (both cross-border markets) and Makotipoko (in Congo-Brazza)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Localized flooding</th>
<th>End Oct-Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food price hikes</td>
<td>Year round</td>
<td></td>
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<tr>
<td>Rough waters &amp; wind (risk of capsizing)</td>
<td>Rainy season (peak March/April and Nov/Dec)</td>
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</table>

| Coping strategies for poor households | Intensification of normal income generating activities, including fishing outside the livelihood zone |

| Main hazards and periods | | |
|--------------------------| | |
| | | |
| | | |
Straw sales (for thatched roofs)
Wild food sales
Poultry sales
Family loans
Very little outmigration

The population in this livelihood is dependent on market trade for their main staple foods (cassava and plantains) of which they produce virtually none. Wild foods (snails, caterpillars, leaves, etc.), wild meat, small livestock (goats and pigs) and poultry provide additional sources of food and income in times of need. The changing climate is threatening livelihoods in the Congo basin. Certain species of fish are disappearing, due to the changing rainfall patterns causing water levels to recede. Strong winds roaring up the Congo river are also a common hazard, which can limit the number of fishing days.

CD18: Seasonal calendar

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<tr>
<th>Seasons</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
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Legend

Land preparation
Sowing
Weeding
Harvest
Small variations in the amount of rainfall, the volume of water in the rivers and the strength of the currents govern the fishing calendar and determine the seasonal calendar in zone CD18. While fishing is possible year-round, the peak fishing seasons are in January and February, before the intensification of the rains and the arrival of particularly fierce winds which regularly occur in the month of March. There is a second peak fishing season in July-August. Palm oil production commonly occupies the months when fishing becomes more sporadic. Wild food consumption and sales are more prominent in the second half of the year and as the lean season approaches; the time of the year when fishing income is at its lowest yet households continue to depend on the market to source the bulk of their food.
This zone lies along rivers in Bandundu, Equateur and East and West Kasai all of whose waters eventually flow into the River Congo and finally into the Atlantic Ocean. A dense network of rivers, tributaries, lakes and lagoons provides year-round fishing for the population living in close proximity to the water. The limits of the zone are defined by the location of the villages, generally between 1 and 2 km from either of the rivers’ banks. In Equateur the zone falls within the boundaries of the Cuvette Centrale, an area of tropical forests and wetlands at the center of the Congo basin. The parts of the zone that are in Eastern and Western Kasai provinces consist of the upper reaches of the rivers that flow west into Bandundu and north into Equateur. From north to south the zone includes the rivers: Ubangi, Giri, Mongala, Lulonga, Tshuapa, Busira, Lukenie, Sankuru and Kasaï and Lomela, as well as their main tributaries, and two lakes: Lake Lombé and Lake Mai-Nombe.

Local livelihoods are dominated by fishing, alternated with agriculture and complemented with a mixture of activities: charcoal and firewood sales, small-scale trade of manufactured goods, small-scale animal farming (pigs, goats and poultry) and hunting and gathering, according to the seasons. By far the chief cash income comes from the sale of dried and smoked fish, and the main market demand for this comes from the distant but huge city of Kinshasa. There are some 30 river ports in the livelihood zone and market access is generally much better than in the other livelihood zones in the interior – which indeed also depend partially on river transport for produce destined for Kinshasa.

The fishing season peaks during the dry seasons (Jan/Feb and June/July). With the pause in the rains and rough waters, access for traders from urban centers becomes easier. They travel along the rivers bringing manufactured goods for sale (processed...
Informal loans (food items and basic goods) and to buy fish and other local products (dried meat, charcoal, vegetables, sugarcane and surplus cassava). Most traders arrive from Kinshasa and the major provincial towns. They bring their own inputs for fish preservation and, as a result, at this time of the year there are many paid work opportunities preparing fish (drying, salting and smoking) for the urban traders. Rainfall levels in the zone average 1500/2000 mm/year. In November and December the water levels rise again with the start of the heavy rains. This is the time for eel fishing, caught in swampy areas with nets and creels.

The importance of agriculture is lower than in the surrounding areas, as fishing provides a more immediate and valued source of income. Fishermen know the best seasons for particular species; they fish for selected months and focus on other activities the rest of the time. Agricultural plots are small - on average less than 1 ha and sometimes merely gardens; they are tended by family labor when they are not out fishing. Households grow the ubiquitous cassava, small quantities of maize and rice (inter-cropped), as well as vegetables and sugar cane in irrigated plots close to the rivers. Plantains are commonly grown around the houses. Most of the crops are reserved for household consumption.

Hunting is also less important than in the nearby deep-forested livelihood zones, which have more abundant and diverse fauna. The return of the rains (April/May and Sept/Oct), however, is still a good time to go hunting when animal movement increases and they become easier to spot. The neighboring forests also provide wild foods for collection, including mushrooms, wild yams and caterpillars.

It is rare to find a household who does not own a dugout canoe - even if motorized canoes are equally rare. River transport is much more efficient than transport over land, in an area with no tarmac roads. Access to markets situated along fluvial routes is good, only hindered sporadically by a reduction in the volume of water along shallow sections of the rivers, especially during the drier months.

The main hazards affecting the zone are localized flooding during the months with the heaviest rainfall (November and December) and changes in the expected levels of rainfall at key moments during the agricultural calendar. Difficult access to inputs and a general lack of public infrastructure limit development in the zone. The main long-term hazard in this area is the depletion of fishing resources due to the use of trawling nets, which destroy reproduction grounds.
The seasonal calendar for this lengthy livelihood zone is dominated by the fishing season, which peaks during the dry seasons, following the same logic as in zone CD18, that is, the pause in the heavy rains allows for a reduction in the volume of water in the rivers which become easier to navigate for fishermen and river traders alike. Peak agricultural seasons compete with the peak months for fishing.
Land clearing, land preparation and the harvesting the previous agricultural season’s crops all take place during the dry seasons, making these the busiest times of the year in this livelihood zone. Complementary activities such as hunting and foraging increase during the rainy seasons, although there are particular seasons for specific types of bush products and wild animals.
This livelihood zone occupies the low-lying lands to the south of the Congo river, before the forest cover becomes almost impenetrable, edging the Salonga natural reserve. The ecology of the area presents a mixture of flooded forests, swamps, rivers, and pockets of savannah grassland (concentrated in Bikoro territory). Rainfall is almost constant year round, peaking in November-December and dwindling in January/February and June/July. Clearing the forest to give way to agricultural land is an arduous task and requires more labor power than in the forested savannah areas to the north of the Congo river. However, households rely on subsistence agriculture, growing cassava, maize, plantains and black-eyed peas. Fields vary between 0.5 and 2 ha in size. Poorer households with little land find labor opportunities working for wealthier local landowners. Villages closer to Mbandaka town intensify agricultural activities to profit from the urban demand for vegetables and staple foods. Most households keep a small number of animals, mainly pigs, sheep and poultry, which are sold in times of need. Forest products are also an important source of food and income: wild foods (fungus, caterpillars, wild honey), wild animals (gazelles, monkeys, crocodiles, snakes, scaly anteaters or ‘pangolins’), firewood and charcoal. Fishing is possible in the numerous ponds and marshes, however the local population has not specialized in fishing particularly.

Two main market routes determine the inflow of manufactured goods and the outflow of agricultural produce and forest products from the zone: 1) towards Kinshasa via Mbandaka (via the largest markets inside the zone: Bikoro, Ingende and Bolomba) and 2) towards Liranga (in the Rep. of Congo) via Mbandaka and Mobenzene. Overall, market access is difficult due to the lack of roads and the poor condition of the dirt tracks and bridges. Waterways provide a good alternative, but access routes from the villages to the rivers are not guaranteed.

The main cities of Mbandaka and Bouende attract young men from this livelihood zone in search of work. Migration to the neighbouring Republic of Congo has been curtailed recently due to successive waves of deportations of DRC nationals.
Besides the general lack of infrastructure and inputs, unseasonal variations in weather patterns are the most common hazard, causing crop losses and deteriorating access routes.

**CD20: Seasonal calendar**

<table>
<thead>
<tr>
<th>Seasons</th>
<th>Jan</th>
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**Key livelihood activities**

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<tr>
<th>Activity</th>
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<tbody>
<tr>
<td>Cassava</td>
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<td>Black-eye peas</td>
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**Other livelihood activities**

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<tr>
<th>Activity</th>
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**Shocks and hazards**

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<tbody>
<tr>
<td>Early arrival of rain during land prep.</td>
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<td>Rainfall delays after sowing</td>
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</table>

**Legend**

- Land preparation
- Sowing
- Weeding
- Harvest

**CD20: Food access calendar for poor households**

<table>
<thead>
<tr>
<th>Staple foods</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
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<tbody>
<tr>
<td>Cassava</td>
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**Income**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Jan</th>
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<th>Mar</th>
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<th>May</th>
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<th>July</th>
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<th>Sept</th>
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<tbody>
<tr>
<td>Crop sales</td>
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<td>Agricultural labour</td>
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<td>Wild food sales</td>
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<td>Charcoal/charcoal sales</td>
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<td>Fish sales</td>
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</table>

**Expenses**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
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<th>Sept</th>
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</thead>
<tbody>
<tr>
<td>School expenses (peak)</td>
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<td>Festivals</td>
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</table>

**Legend**

- Own production
- Market purchase
- In-kind
- Gathering

The variation in seasonality in this zone that lies on the Equator is almost negligible. The rainy season last over 10 months and only the months of January and February count as a relatively certain dry season, a certainty that is now being eroded by the destabilizing effects of climate change. Nevertheless, two agricultural seasons are possible in this zone, the main one being the season starting in January and
ready for harvest in June/July. Fishing takes place mostly during the drier months, when fishing peaks along riverine areas and after the land preparation tasks have been completed. Trade activities do not follow a particular seasonality, although market access improves during the drier months of the year, when over-land routes become easier to transit.
### Main productive assets

<table>
<thead>
<tr>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional animal traps</td>
<td>Fire arm &amp; ammunition &amp; modern animal traps</td>
</tr>
<tr>
<td>Bows &amp; arrows</td>
<td>Land (agricultural &amp; forest)</td>
</tr>
<tr>
<td>Land &amp; agricultural tools</td>
<td>Motorized dugout canoe</td>
</tr>
<tr>
<td>Own/hired dugout canoe</td>
<td>Chainsaw</td>
</tr>
</tbody>
</table>

### Main foods and sources

<table>
<thead>
<tr>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava/chicuanga (own production)</td>
<td>Cassava/chicuanga (own production)</td>
</tr>
<tr>
<td>Plantain (own production)</td>
<td>Plantain (own production)</td>
</tr>
<tr>
<td>Rice (own production/purchase)</td>
<td>Rice (own production/purchase)</td>
</tr>
</tbody>
</table>

### Main income sources

<table>
<thead>
<tr>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild meat sales</td>
<td>Wild meat sales &amp; trade</td>
</tr>
<tr>
<td>Crop sales (maize/rice)</td>
<td>Crop sales (maize/rice)</td>
</tr>
<tr>
<td>Fishing/hunting labor</td>
<td>Fish sales</td>
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<tr>
<td>Fish sales</td>
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<tr>
<td>Wild food sales</td>
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</tbody>
</table>

### Main markets

- **Bandundu**: Bandudu ville, Kiri, Mimia/Lokoloma, Oshwe, Kutu, Nioki, Mushie, Kikwit
- **Equateur**: Boende, Befale, Mokoto, Lingunda, Djolu, Ikela, Bokungu
- **Kasai Occidental & Oriental**: Lomela, Kole, Katak via Lodja and Dekese to Kinshasa

### Main hazards and periods

<table>
<thead>
<tr>
<th>Hunting accidents</th>
<th>Rainy season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough waters &amp; risk of capsizing</td>
<td>Rainy season (peak April and November)</td>
</tr>
<tr>
<td>Malaria</td>
<td>Rainy season</td>
</tr>
<tr>
<td>Restrictions to natural reserves</td>
<td>Year round</td>
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</tbody>
</table>

The *Equatorial forest hunting, fishing, crop cultivation* livelihood zone covers four provinces: the north-eastern corner of Bandundu province, the south of Equateur province and the north of the two Kasais. This vast area is covered in dense Atlantic equatorial and tropical forests, which provide plentiful natural resources. The zone includes the Salonga National Park and the Sankuru nature reserve.

Three major activities, fishing and hunting, and subsistence agriculture form the basis of livelihoods in this zone. These activities alternate with the seasons: during the rainy season (August to May) households cultivate cassava, plantain bananas and rice and venture into the forests to hunt monkeys, antelopes, gazelles, hares, wild boar and other species. During this time the population is based in their villages; men go out hunting (sometimes spending a number of days away from the home following animal trails), while women look after the crops, and the goats and pigs and poultry, and the household. Fishing with lines, nets and traps is carried out by villagers in the myriad streams and small rivers throughout the zone, with the best catches in the drier period between May and August when river levels drop. They also engage in collecting wild foods according to their varied seasonal appearance, including mushrooms, wild yams, *m'fumbua* (*Gnetum africanum*), as well as caterpillars, termites and snails.

During the 'dry' season in northern Bandundu (May to August) the volume and frequency of rain showers reduces and water volumes fall in Lake Mai-Ndombe, making it the most appropriate season to go fishing. During this time, families based in this particular area leave their villages in the forest and establish themselves along the lakeshore in temporary camps. The school season is over so children and mothers follow the male members of the family. Men go out fishing in canoes, alone or in groups. It is only the better off who have motorized boats and better quality fishing equipment. The bulk...
Coping strategies for poor households

<table>
<thead>
<tr>
<th>Intensification of normal income generating activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very little outmigration</td>
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<tr>
<td>Informal loans</td>
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</tbody>
</table>

of the seasons’ catch is dried and sold to the Kinshasa market. Kinshasa is also the main destination of dried game products and live poultry. Each household’s labor force determines the amount of land cultivated per season.

Land preparation requires more intensive labor than elsewhere in the region, starting with the felling of large tropical trees in forested areas. On average, households cultivate about 0.5 ha. Richer households who own chainsaws are able to expand their farms. Despite the damage to crops frequently done by wild animals, households are self-sufficient in staple foods (cassava, plantains and rice, some yams), as well as in game meat, fish and collected wild foods. The only foods that must be purchased are manufactured foods and basic goods – but these are scarce. There is little paid work offered to poorer people on wealthier farmers’ fields, and most people are too far from urban centers to engage in occasional daily employment there; seasonal migration for work is unusual.

Market access is very low; there are no tarmac roads and bridges, mostly made out of wood, are in bad condition. Rivers provide a limited alternative transport route but also hinder transport routes over land. The sparseness of the population and their general remoteness from basic medical services promotes childhood malnutrition through untreated illnesses. The environment favors disease attacks on adults as well (e.g. trypanosomiasis, onchocerciasis or outbreaks of monkey pox and ebola).

Attempts to regulate the protected natural reserves (without providing adequate recompense for the local population) have limited the sale of wild foods and meat - already affected by recent ebola infections. This has had a negative impact on households’ economies. Additionally, the presence of poachers and park guards has increased insecurity, while the existence of anti-personnel mines in Ikela territory also limits local livelihood options in this remote livelihood zone.

CD21: Seasonal calendar

<table>
<thead>
<tr>
<th>Seasons</th>
<th>Jan</th>
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<td>Hunting</td>
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- **Land preparation**
- **Sowing**
- **Weeding**
- **Harvest**
Like in neighboring zone CD19, the rainy season spans over 10 months of the year, with only a noticeable reduction in the level of rainfall during the months of January and February and again in June to August. Rains are heavier in the northern half of the zone (southern Equateur province) and the dry months are somewhat more accentuated in northern Bandundu and the two Kasaïs. In terms of crops, maize and beans are cultivated over two seasons, while rice is commonly only cultivated in the second agricultural season. There are distinct seasons for different types of forest products (wild plants, bush meat and fish). The importance of these products, as a source of income and cash, increases during the lean seasons when food reserves are finished. The changes in access during the wettest months also influence the volumes of produce gathered.
This zone sits mainly between the northern denser forest zone (CD21) and the savannah zone (CD23), containing therefore transitional belts north and south. There is also a south-western strip bordering the savannah to the east and probably stretching some way into Bandundu province to the west until it meets the Agriculture with high production and marketing zone (CD30).

Given the forest environment, the livelihood resources echo zone CD21 more than zone CD23. The difference with zone CD21 is that agriculture comes first while hunting, collecting and fishing are secondary activities, although important (especially the wild foods collection) – more important than in zone CD23. Other exploited resources are diamonds obtained through artisanal mining and timber. However the distance of most of the zone from main Kasaï trade centers (Mbuji Mayi, Kananga etc.), indeed even from more local market centers given the very few and poor-quality motor roads, robs the zone of the economic dynamism that better trading opportunities would bring. Only the Lusambo area in the far south-east of the zone has an advantage in its relative proximity to Mbuji Mayi. Otherwise, apart from the railway line running south of the zone through Mweka, the navigable stretches of the Lukenie and Sankuru rivers that run east-west through the zone provide some opportunity for the movement of goods for a part of the population, with especially rice and game products passing through Lodja and Ilebo as far as Kinshasa. But river transport can hardly begin to substitute for a functioning road network.

The main crops are cassava, maize and rainfed rice, with secondary production chiefly of cowpeas and groundnuts. Maize and pulses have two production cycles and harvests in the year, rice only one. Even poorer households tend to be nearly self-sufficient in basic food, especially in cassava, and the need to purchase maize or rice is limited. People who perform paid work on others’ fields are often remunerated directly in volumes of maize. But on the whole such income opportunities are quite limited, as the market isolation discourages the

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<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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<td>Agricultural land</td>
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<td>Hand tools for cultivation</td>
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<td>Fishing equipment</td>
<td>Fishing equipment and canoes</td>
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<td>Bicycles</td>
<td>Bicycles and motor cycles</td>
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<thead>
<tr>
<th>Main foods and sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Own cassava</td>
<td>Own cassava</td>
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<td>Own and purchased maize</td>
<td>Own and occasionally purchased maize</td>
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<td>Own and purchased rice</td>
<td>Own and occasionally purchased rice</td>
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<th>Main income sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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<td>Sale of fish</td>
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<td>Sale of wild foods and game</td>
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<td>Sale of small livestock</td>
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<td>Petty trade and salaries as village level teachers, nurses</td>
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<thead>
<tr>
<th>Main markets</th>
<th>Very localized village and small town marketing</th>
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<tbody>
<tr>
<td>More distant road and river market routes for rice, cassava, game products, caterpillars:</td>
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<tr>
<td>Lusambo-Mbuji Mayi; Benadibele-Lusambo-Mbuji Mayi; Tshiumbe-Lodja-Kinshasa; Katako–Lodja–Kinshasa; Ilebo-Kinshasa</td>
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<thead>
<tr>
<th>Main hazards and periods</th>
<th>Yearly, rainy season standing crops</th>
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<tr>
<td>Crop and animal disease</td>
<td>Local occurrence throughout the year</td>
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<tr>
<td>Irregularities in rainfall</td>
<td>Some years: start and end of rainy seasons; break in showers at critical crop-maturing periods</td>
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</tbody>
</table>

| Coping strategies for poor households | Mutual support between kin |
Increased reliance on collected wild foods  
Traps for wild animals coming into fields  
wealthier farmers who might hire labor from investing in substantial surpluses. At the same time villagers are generally very far from towns that might offer them occasional employment.

Livestock kept are principally goats and sheep; pigs and poultry; cattle are rare. Among the collected wild foods for consumption and sale are mushrooms, caterpillars, m’fumbua leaves (*Gnetum africanum*) and wild yams. A range of smaller and larger mammals are hunted: monkeys, antelopes, gazelles, hares, wild boar, squirrels. The hunters living closer to the savannah zone reap an advantage in the dry season months when savannah fields are burnt for clearing and preparation and small mammals flee into the neighboring forest. Small-scale line and net or trap fishing is carried out in the many streams and small rivers throughout the zone. Fish are dried or smoked for sale. There is minor artisanal exploitation of diamonds at sites on streams and small rivers.

**CD22: Seasonal calendar**

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There are two drier seasons, but since there are still showers during these months they cannot perhaps be called ‘dry’ seasons: indeed, a second crop of maize is sown during the early year drier period, and there are also two cowpea crops in the year. However there is only one rice cycle per year. Insofar as there are ‘lean’ months (*soudure*) these are at times when harvest stocks have run out; but if poorer people even have no cassava left, and little money for food purchase, there is still some relief from the ‘green’ or not finally matured maize as well as collected wild forest foods. In general there is potential cash income in nearly every month, between crop sales and fish, game and collected wild foods sales and perhaps a few diamonds; the problem is more that the profit from items is constrained by the relative isolation of populations from market centers.

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CD23  SAVANNAH WITH CASSAVA AND COWPEAS AND SMALL LIVESTOCK

This is the ‘default’ zone of the southern half of the Kasai provinces, as the lighter forest zone gives way to sandy soils and more open natural vegetation at somewhat higher elevations. On this general ecology are then superimposed, so to speak, the other savannah livelihood zones defined by higher mining activity because of the greater presence of surface diamonds (Zone CD25), or by higher fertility through clay mixes (Zone CD26), or by higher marketed crop production encouraged by the proximity of main motor transport axes (Zone CD24).

In this zone with its moderately fertile soils and rainfall averaging 1400-1600mm per annum, cassava is by far the main crop, accompanied by cowpeas and other pulses by relatively modest amounts of maize as well as rainfed ‘mountain’ rice, and banana plantains. Localized diamond digging along stream and minor river courses rivals the keeping of mainly small livestock (goats and sheep, poultry, pigs) as the main secondary source of income. Goats from this zone are known for their high quality of meat, but their numbers have in recent years been severely reduced by disease, entailing the near disappearance of the former trading of goats Kinshasa, so that the provincial capitals Mbuji-Mayi and Kananga are today the biggest markets.

In addition, although this zone is more densely populated than the forest zones, there are still vast areas of territory with natural bush and tree cover that harbor substantial resources for seasonal wild food collection, including caterpillars, termites, wild mushrooms, wild yams. The collected leaves of the wild vine *Gnetum africanum*, called m’fumbua or fumbua locally, are not much consumed in the Kasaïs but find a ready market in Kinshasa and other western centers. Finally there is fishing with lines, nets and cages in the ubiquitous streams and small rivers, as well as a certain amount of seasonal hunting, notably of hares, castor rats, and ‘rats de Gambie’ (*Cricetomys gambianus*).

As with so much of the country, economic dynamism in this zone is much discouraged by the lack of motor roads that could promote more effective and

<table>
<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural land</td>
<td>Agricultural land</td>
<td></td>
</tr>
<tr>
<td>Basic agricultural tools</td>
<td>Hired labor</td>
<td></td>
</tr>
<tr>
<td>Family labor power</td>
<td>Agricultural tools</td>
<td></td>
</tr>
<tr>
<td>Small livestock</td>
<td>(a few ploughs)</td>
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<tr>
<td></td>
<td>Small and limited large livestock</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Main foods and sources</th>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava: own product and purchased</td>
<td>Cassava: own product</td>
<td></td>
</tr>
<tr>
<td>Maize: own and purchased (minor crop)</td>
<td>Maize: own and purchased (minor crop)</td>
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</tr>
<tr>
<td>Purchased rice</td>
<td>Rice; localized production, purchase</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Main income sources</th>
<th>Poor households</th>
<th>Better-off households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale of crops</td>
<td>Sale of crops</td>
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<tr>
<td>Sale of minerals</td>
<td>Sale of minerals</td>
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</tr>
<tr>
<td>Sale of collected wild foods and game</td>
<td>Sale of livestock</td>
<td></td>
</tr>
<tr>
<td>Local agricultural labor</td>
<td>Remittances</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Main markets</th>
<th>Mbuji Mayi, Kananga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kifusu, Miabi, Lubeuf, Lusambo, Bilomba, Kambundi, Kongolo Monji, Kaluebo, Kazebe-Tshimbulu, Kalumba Mande, Demba Cité, Mweka</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Rainfall irregularities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sometimes in any year:</td>
<td>sometime in any year: hesant start or early end to rainy seasons; unusually heavy rains on standing crops</td>
</tr>
</tbody>
</table>

| Major crop disease: mosaic virus on cassava | Follows whitefly attack on young leaves from 2-3 weeks after planting |
| Animal disease, especially for goats | Endemic, any time of year |
| Conflicts over land | Main dry season, localized every year |

| Coping strategies for poor households | Failed start to season: re-seeding/planting and/or switching crop-type |

![Table](data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAAEAAABAQAMAAAJx1froAAAABGdBTUEAALGPC/xhBQCQAAAAQCyW塌Looking.xhtml?format=png&height=500&width=800)
Crop treatments (but little affordable for poorer people)  
Sales of small livestock  
Paid work transporting goods locally by head load/bicycle/motorcycle  
Seasonal migration to find paid work elsewhere  

Distant trading of agricultural produce than that allowed by the localized reach of headloads or bicycles or even village-to-village traders on motorcycles. It is true that the zone is bisected in the west by the railway line that runs from Lubumbashi in Katanga through Mwene Ditu and Kananga to Ilebo on the Kasaï river; but the limited capacity and frequency and reliability of goods trains on often dilapidated rails can hardly provide the same boost to trade that motorable roads would give. Nevertheless it does provide for the trade in two commodities from the zone into Katanga: plantains, and palm oil collected mainly from wild trees. But the general lack of motor transport continues to favor the one product that has such a high value-for-weight: diamonds.
### CD24 INTENSIVE ARTISANAL DIAMOND EXPLOITATION WITH CROP CULTIVATION

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<thead>
<tr>
<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Hand tools for mining</td>
<td></td>
<td></td>
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<tr>
<td>Agricultural land</td>
<td></td>
<td></td>
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<tr>
<td>Hand tools for cultivation</td>
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<tr>
<td>Small livestock</td>
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<tr>
<td>Mining equipment: for draining (often shared between operators), for digging / crushing Agricultural land Ploughs Small livestock and cattle</td>
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</tbody>
</table>

This zone is made up of two separate areas: that which forms the south-western corner of Western Kasaï and that formed by a substantial area that is the hinterland of the Eastern Kasai capital city of Mbuji Mayi. The western part contains the major town of Tshikapa (and a motor road link with the Western Kasai capital of Kananga that suffers from the very poor condition of the road). It is no coincidence that the zone has these urban connections: it is the combination of high diamond resources with access to main trade centers that most defines this zone. We have put diamond exploitation at the head of the title because, while local crop production is at the base of food availability, in terms of food security it is above all the proceeds of diamond sales that assures the purchase of food (and of other necessities) needed especially by the poor in normal times as well as any extra purchase needed in times when there are local food production problems.

The diamond market is dominated by expatriate traders linked to the international diamond trade centers of Bombay in India and Antwerp in Belgium, so much so that there is a major pause in the trade around the time of the Diwali and Christmas festivals respectively. The source of the diamonds is mainly in remote hills where the streams and small rivers uncover or dislodge diamond-bearing deposits that are then dug into for the gemstones: it is outside the main rainy periods, when water-flow reduces, that the most intensive diamond exploitation occurs.

There is a kind of symbiosis, however unequal, between wealthier and poorer villagers in this industry. While poorer workers can work on their own account to find surface diamonds, many also cooperate with wealthier people who have the capital for the equipment needed for more intensive exploitation. Wealthier operators club together to finance motorized draining. Then a main pattern is that these operators lend digging and breaking/crushing equipment to poorer workers and receive a share of the diamond sales income. They also directly employ labor. There is a move by the government to formalize the diamond working sites

<table>
<thead>
<tr>
<th>Main foods and sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Own and purchased cassava</td>
<td></td>
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<tr>
<td>Own and purchased maize</td>
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<td></td>
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<tr>
<td>Collected wild foods</td>
<td></td>
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<tr>
<td>Own production with occasional purchase of cassava and maize Localized own rice (Lubefu)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Main income sources</th>
<th>Poor households</th>
<th>Better-off households</th>
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</thead>
<tbody>
<tr>
<td>Diamond sales/crop sales (varies by household preference and luck in diamond exploitation)</td>
<td></td>
<td></td>
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<tr>
<td>Paid mining and agricultural labor</td>
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<tr>
<td>Sale of wild foods and game</td>
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</tr>
<tr>
<td>Diamond sales</td>
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<tr>
<td>Crop sales</td>
<td></td>
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<tr>
<td>Remittances</td>
<td></td>
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<tr>
<td>Livestock sales (minor)</td>
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</tbody>
</table>

| Main markets                                 | Mbuji Mayi, Tshikapa, cross-border into Angola; Luamela, Bakua Shimuni, Bakamba, Bampende |

<table>
<thead>
<tr>
<th>Main hazards and periods</th>
<th>Fall in diamond prices</th>
<th>End of year when main traders are on holiday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disputes between prospectors when a diamond find straddles two worksites</td>
<td>Any time of year</td>
<td></td>
</tr>
<tr>
<td>Rainfall irregularities</td>
<td>At beginning and end of rainy seasons</td>
<td></td>
</tr>
<tr>
<td>Crop diseases</td>
<td>Especially cassava mosaic disease</td>
<td></td>
</tr>
</tbody>
</table>
Coping strategies for poor households

| Re-seeding/planting and switching of crop-types when rainy season starts poorly |
| Increased work migration to towns |
| Paid goods transport by head-load, bicycle or motorcycle |
| Sale of livestock |

and to form cooperatives that will protect poorer workers in terms of pay rates or the conditions of work. This zone encompasses a mixed ecology. Most is in the general savannah otherwise covered by zone CD23. But in the western area, there is a southern part that lies on the clay soils otherwise covered by zone CD6, and a far western part that is in the lighter forest area otherwise covered by zone CD22. The majority pattern of agricultural production is based on cassava and maize, with some pulses, with market vegetable gardening where clay soils particularly retain moisture. There is a particular production of rainfed ‘mountain’ rice in Lubefu (eastern Kasai). There is general but minor production of goats, sheep, pigs and poultry, and some cattle amongst wealthier farmers. Cultivation suffers from the absence of young men who principally work on diamonds; but insofar as farmers achieve surpluses, for sales they have the advantage of the access to trade centers that, as said at the beginning, partly define the locations of this zone. A proportion of the maize harvest is devoted to the production of maize alcohol that is in high demand at the diamond sites.
This zone shares the savannah ecology with zones CD23, CD24 and CD25, but it has the particular feature of high clay mixes in the otherwise sand-based soil. This makes for both greater general fertility and in particular for higher maize production, although cassava remains the main staple. Greater retention of moisture in particularly high-clay soils creates small swamp areas that allow the gardening of vegetables running into the main dry season, helped by small-scale irrigation and hand-watering, a profitable activity for those within reach of town markets for these perishable items. There is also some plantation here of pineapples. Other significant rainfed crops are groundnuts, cowpeas, rice, and plantains, and there are scattered stands of oil-palms.

The availability of pastures and crop residues together with the profits of farming and other activities encourages comparatively more of the better-off households here to invest in cattle than in other zones, alongside the pigs and goats and sheep, and rabbits and guinea pigs kept by the other households. Ox-drawn ploughing is practiced by wealthier farmers, but they also commonly hire tractors. The success of the cattle production is signaled by the fact that people come from Angola to buy heifers to regenerate their herds. Another sign of wealth is that the better-off households tend strongly to engage hired labor on their farms, using very little family labor.

Although much of the commodity marketing is internal to the zone, trade is enhanced by the limited motorable roads, linking the main local city of Tshikapa with the Western Kasai capital Kananga to the north-east and with the Angola to the south. However, without all-weather hard-top dressing these roads cannot take much truck traffic without serious degrading; this is true of the stretches in Eastern Kasai where the big city of Mbuji Mayi north
of this zone provides the main trade demand. There is a more favorable trade prospect with the current construction of a highway between Kananga and Angola. But even today the Angola connection has economic significance beyond the immediate border area, as trade answering the Angolan demand penetrates farther into the zone. This involves all the main food crops; and apart from cattle and goats and sheep, cross-border livestock trade to Angola includes guinea-fowl and turkeys. In the immediate border area there is an industry of maize-based alcohol traded to Angola, and there is some smuggling of cannabis. The rail link to Katanga does not appear to have more than a localized effect on trade.

Denser areas of tree-cover than exist in the sandy-soil savannah to the north offer forest wild foods for collection but also some larger mammals for game-hunting: antelopes, gazelles, wild boar, monkeys; and hippopotamus are sometimes killed in the bigger rivers. Small-scale fishing is ubiquitous in streams and rivers, but a localized specialty in Western Kasaï is freshwater eels that are smoked or dried and sent as far as Kinshasa. Finally, as nearly everywhere in the Kasaïs, digging for diamonds in the streams and rivers provides a sometimes important secondary income for villagers.
This zone borders mainly with Katanga province, but it is its proximity to Maniema that is much more important: the zone is mainly defined by the effect of the relatively well-kept motor road running into that province. That effect is to allow the food-crop demand from Maniema to be responded to, so that surplus production for trade is highly boosted. More specifically, the main demand comes from two gold mining areas, Bikenge in the Moulou secteur and Salamabila in the Kabambare territoire, where there are concentrations of people working in the mines who do not cultivate land and who are indeed often migrants into the areas, so that this creates an urban-like demand for food provisions, including also meat (for which Zone CD24 provides mainly goats). Further demand comes from Samba town on the main road and Kibombo town on the navigable Lualaba river. In the other direction, within Eastern Kasai a secondary market demand, limited by the mainly very poor state of the motor road, comes from Kabinda town and the more distant provincial capital Mbuji Mayi whose population exceeds 1 million. These markets and the local main town of Lubao demand both crops and livestock, including the goats, sheep, pigs and poultry kept by the villagers. (Cattle are rare in the zone.) Palm oil is particularly exported into Katanga, with the main market at Kongolo and Kabalo on the Lualaba river, from where it is traded on south-west by road as far as Kabongo.

It is true that apart from this critical market access, the zone also has the advantage of relatively fertile soils, although the clay mixes in the sand-based soils are not as substantial as in Zone CD26. The farmers concentrate mainly on five crops: rice, cassava, maize groundnuts and cowpeas, with the farmers using selected seeds while the poorer can only afford seeds from the general stock. Rice appears to be the highest marketed item. High output of
production requires extra labor, and so the better-off farmers depend heavily on hiring labor from amongst their poorer neighbors – which, in turn, provides the second most income to these latter after the sale of their own crops.

Otherwise the villagers’ secondary economic activities are the same as in the Zone CD23 savannah in terms of wild foods gathered, animals hunted - and fishing that brings a significant income to both poorer and wealthier households; and similarly there is diamond digging in the many streams and small rivers.

A study by PAM-INS placed the local Lubao territoire alongside Ngandajima territoire in Zone CD26 as the two most food secure areas of Eastern Kasai, with fewer than 10% households threatened by food insecurity.

<table>
<thead>
<tr>
<th>CDs 23, 24, 25 and 26 together: Seasonal calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seasons</strong></td>
</tr>
<tr>
<td>Rainy season</td>
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<tr>
<td>Dry season</td>
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<tr>
<td>Lean season</td>
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<tr>
<td><strong>Key livelihood activities</strong></td>
</tr>
<tr>
<td>Cassava (harvested year-round)</td>
</tr>
<tr>
<td>Cassava - second planting</td>
</tr>
<tr>
<td>Niëbé (cowpeas)</td>
</tr>
<tr>
<td>Maïs</td>
</tr>
<tr>
<td>Rice</td>
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<tr>
<td>Plantains</td>
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<tr>
<td><strong>Other livelihood activities</strong></td>
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<tr>
<td>Small livestock</td>
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<tr>
<td>Artisan diamond extraction</td>
</tr>
<tr>
<td>Wild food sales - caterpillars</td>
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<tr>
<td>Wild food sales - mushrooms</td>
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<tr>
<td>Wild food sales - termites</td>
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<tr>
<td>Fishing</td>
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<tr>
<td>Labour migration</td>
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<tr>
<td><strong>Shocks and hazards</strong></td>
</tr>
<tr>
<td>Uncontrolled bush fires</td>
</tr>
<tr>
<td>Crop diseases</td>
</tr>
<tr>
<td>Wild animals invading fields</td>
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<tr>
<td>Livestock diseases</td>
</tr>
<tr>
<td>Conflict over access to land</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Legend</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land preparation</td>
</tr>
<tr>
<td>Sowing</td>
</tr>
<tr>
<td>Weeding</td>
</tr>
<tr>
<td>Harvest</td>
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</tbody>
</table>
The basis of food security is above all cassava, which is produced in a 12-18 month cycle. The calendar shows a typical progression, but the planting can vary in rainy months and therefore the harvesting can be staggered, the more so because mature cassava can be conserved in the ground for four to six months, depending on the humidity of the soil: it is prone finally to rot with excessive moisture. The position of the lean season between September and November relates in good measure to the finishing of the stocks of the other crops: maize, cowpeas, rice, and so the need for poorer people to buy food. Poorer people with little cultivated land may also run out of cassava if they have not been able to plant sufficient and/or staggered crops or if remaining mature tubers begin to rot in the ground during the main rains.

The savannah has a longer and more marked mid-year dry season than the forest areas. This is amongst other things the time when the streams and rivers are at minimum flow levels and therefore when it is most easy to prospect for diamonds. It is also the main time for land preparation, and it is thus the time when latent conflicts over land ownership tend to come to the boil as fields are cleared and prepared for planting and sowing as soon as the new rains begin.
The southern half of Bandundu provinces is characterized by tall grass savannah crisscrossed by gallery forests. The topography of the zone is higher than in northern Bandundu as this area merges into the Planalto (Angola’s highlands). This livelihood zone is well suited to livestock rearing, however it is mainly small stock that is kept by the majority of households, with only a few wealthier households owning small herds of cattle, especially in Feshi and Gungu districts. Cattle are kept in fenced enclosures which are pivoted when the section's pasture has been consumed. Smaller animals roam free close to the villages feeding on grasses, crop residues and scraps of food. Livestock is not reared to meet market demand as such, but as an additional source of income in times of need.

The composition of the local soil is sandy, influenced by the Kalahari basin, and agricultural productivity is somewhat lower. Animal traction is not common for lack of equipment, yet the zone has a high potential. Cattle rearing for animal traction was introduced in Feshi and Gungu districts (the most adequate areas ecologically) by Catholic missions but replication has not taken off.

The main crops cultivated in this zone are cassava, yams/taro, beans and bambara nuts and groundnuts. Fufu, prepared with cassava flour is the main component of the local diet. The pockets of tropical forest provide fertile ground for wild foods including crickets, caterpillars, mushrooms, cola nuts, wild leaves (fumbwa), game and honey. Honey is collected wild and also harvested in traditional beehives made out of wood and bark. While agriculture (crops sales and agricultural labor) is the basis of the zone’s economy, the sale of wild foods and traditional brews (e.g. maize based traditional beer) provide additional income for poor households.

While the neighboring zone in Angola shares many agro-ecological characteristics, the differences in purchasing power allow for profitable trade opportunities. Lunda Norte province (north-east Angola) also provides employment opportunities for young men in the agriculture and diamond extraction sectors.
### CD27: Seasonal calendar

<table>
<thead>
<tr>
<th>Seasons</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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</thead>
<tbody>
<tr>
<td>Rainy season</td>
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<tr>
<td>Dry season</td>
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<td>Lean season</td>
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<tr>
<td><strong>Key livelihood activities</strong></td>
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<tr>
<td>Cassava (harvest year-round)</td>
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<td>Season B</td>
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<td><strong>Other livelihood activities</strong></td>
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<td>Cattle sales</td>
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<tr>
<td>Small livestock sales</td>
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<td>Agricultural labour</td>
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<tr>
<td>Charcoal/firewood sales</td>
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<tr>
<td>Caterpillar sales</td>
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<tr>
<td>Mushroom sales</td>
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<tr>
<td>Honey extraction</td>
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### CD27: Food access calendar for poor households

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Legend:
- Land preparation
- Sowing
- Weeding
- Harvest
- Own production
- Market purchase
- In-kind
- Gathering
This zone, which surrounds the urban centers of Kikwit and Idiofa, is the most densely populated livelihood zone in Bandundu province. The population is largely dependent on subsistence agriculture. During the colonial era, palm oil was produced by European companies in the natural palm groves and plantations, attracting many agricultural workers to this area. Nowadays the industrial production no longer exists, but an artisanal system of palm oil extraction in villages has replaced it. Palm oil, together with cassava, maize and groundnuts are the main crops produced in this zone. Land cultivation is somewhat more extensive than in other zones and larger surpluses are sold to the urban markets. Poor households supplement their income year-round with the sale of palm wine (*malafu/nsamba*), tapped from various species of palm trees (*palmyra*, date palms and coconut palms) and fermented in jerry cans and calabashes. They also sell charcoal and firewood to urban households.

Rainfall levels range between 1500 and 1700 mm/year and the topography of the zone gently starts to rise from the lowlands of the Cuvette Centrale towards the south of the province. Soil fertility in this area is lower, however, than in the northern half of Bandundu. Soils are particularly degraded around Kikwit as a result of human intervention: deforestation and traditional agricultural practices including seasonal bush fires, as well as the unplanned expansion of housing construction in Kikwit and Idiofa. For the most part, soils are clay based, ferralitic and sandy.

Livestock ownership represents a form of savings; most households own a small number of goats and/or sheep, pigs and chickens. Wealthier households participate in livestock trade, purchasing live animals from Feshi, Gungu and Idiofa districts and selling them in the main cities. Market access is good thanks to the tarmac road linking Kikwit to...
Kinshasa (535 km). There is also a functioning airport in Kikwit and an aerodrome in Idiofa. The bulk of the agricultural produced is sold to the local urban population and to the Kinshasa market; smaller volumes of agricultural produce flow east towards Ilebo and Tschicapa in Kasai Occidental.

### CD28: Seasonal calendar

<table>
<thead>
<tr>
<th>Seasons</th>
<th>Jan</th>
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</tbody>
</table>

**Key livelihood activities**

- Cassava (harvest year-round)
- Maize/groundnuts A
- Maize/groundnuts B

**Other livelihood activities**

- Agricultural labour
- Palm oil/palm wine sales
- Charcoal/firewood sales

**Shocks and hazards**

- Crop pests (esp. mosaic)
- Animal pests
- Delays in start of rains

**Legend**

- Land preparation
- Sowing
- Weeding
- Harvest

### CD28: Food access calendar for poor households

<table>
<thead>
<tr>
<th>Staple foods</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
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<th>Jun</th>
<th>July</th>
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</table>

**Income**

- Crop sales (peaks)
- Agricultural labour
- Palm oil/wine sales & charcoal sales

**Legend**

- Own production
- Market purchase
- In-kind
- Gathering
The Cassava, maize and groundnuts livelihood zone stretches across both provinces and most probably continues further into Kasai Occidental. It is a “default” agricultural zone, the largest zones in each province, where households exploit available resources but where there are no valuable additional natural resources to warrant a specialization or diversification of livelihoods. Land fertility is adequate for subsistence agriculture (sandy-clay soils). The most fertile lands are found in the pockets of this zone which fall between the main rivers in zone 2. Rainfall levels vary between 800 and 1700 mm/year depending on location, and are generally greater towards the east of this wide zone. The dry season tends to shorten eastwards too, it last an average of 5 months in Bas-Congo (mid-May to end-September) but only 3 months in Bandundu (mid-May to mid-August).

The main crops sold (in approximate order of importance) are: cassava, maize, rice, groundnuts and bambara nuts (vandzou), beans, bananas tubers and sesame, all of which are rain-fed crops. Cassava is the main staple food (sometimes mixed with maize flour) and alternated with rice, bananas or yams a few times per week. Cassava leaves (pondu), marrow, caterpillars, mushrooms, palm oil and small quantities of fish are harvested as condiments, while all manufactured foods are purchased. Cultivated land sizes depend entirely on family and/or hired labor force, as animal traction is rare – it is most noticeable in Luozi district due to government programs to this effect in place since the 1960s.

Poor households supplement the income derived from crop sales with local agricultural labor (available almost year-round) and the sale of charcoal and firewood to wealthy rural households and to the urban markets. Livestock represents a form of savings and provide the necessary liquidity in times of need, for example when school fees are due, for medical treatments, funerals and other ceremonies.

Market access in this zone is average to low. Villages located close to the Matadi-Kinshasa or Kinshasa-Kikwit asphalt roads are better communicated. Villages located in the north of Bandundu
have access to the fluvial network. However, outside of these main axes, road networks are made up of dirt roads and tracks. Market access reduces considerably at the peak of the rainy season (November and March/April).

**CD29: Seasonal calendar**

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**Legend**

- Land preparation
- Sowing
- Weeding
- Harvest

**CD29: Food access calendar for poor households**

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<th>Staple foods</th>
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**Legend**

- Own production
- Market purchase
- In-kind
- Gathering
This undulating zone straddles the main Kinshasa – Matadi highway for much of its length, through the territoires of Lukaya, Mbanza-Ngungu and Songololo. It is this strategic marketing position that gives this zone its particular emphasis on market gardening, with its perishable products, as well as sales of charcoal by poorer households. The relatively fertile sandy-clay soils that it shares with the surrounding Zone 4 are an advantage that is enhanced by wealthier farmers by the use of manure from their livestock. Annual rainfall is generally 1000-1500 mm depending on location. This environment supports the production of every type of vegetable: leaves as well as bulbs – onions and garlic; and fruits are also sold.

Wealthier households gain sufficient income from vegetable sales supplemented by occasional sales of livestock and trading/business activities that include offering motor-bike taxi rides. But vegetable sales do not cover the cash-needs of the poor anything like as well, and paid local farm work is either not in sufficient demand or comparatively lowly-paid, so men from some poorer households take advantage of their strategic location to go for paid work to the big cities of Kinshasa and Matadi at different times throughout the year, even in the land-preparation and seeding months of February and March.

Poorer people have to try to further diversify their sources of income just to get by. They collect and sell the seasonal wild mushrooms. They collect and sell the seasonal wild mushrooms; they make money from palm-oil extraction; and their petty trade includes the retailing on-foot of seasonal fruits, including the mangustans and rambutans particularly produced around Inkisi.

<table>
<thead>
<tr>
<th>Main productive assets</th>
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<tbody>
<tr>
<td>Poor households</td>
<td>Better-off households</td>
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<tr>
<td>Land</td>
<td>Land</td>
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<tr>
<td>Agricultural tools</td>
<td>Goats, sheep, pigs</td>
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<tr>
<td>Poultry</td>
<td>Motor-bikes as taxis</td>
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<table>
<thead>
<tr>
<th>Main foods and sources</th>
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</thead>
<tbody>
<tr>
<td>Poor households</td>
<td>Better-off households</td>
</tr>
<tr>
<td>Cassava and vegetables (own production)</td>
<td>Cassava and vegetables (own production)</td>
</tr>
<tr>
<td>Maize and pulses (market purchases)</td>
<td>Maize, rice, fish &amp; other (market purchases)</td>
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<td>Collected foods</td>
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<table>
<thead>
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<th>Main income sources</th>
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<tr>
<td>Sale of vegetables</td>
<td>Sale of vegetables</td>
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<tr>
<td>Paid daily labor</td>
<td>Sale of livestock</td>
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<tr>
<td>Sale of firewood /charcoal</td>
<td>Petty trade</td>
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<td>Remittances</td>
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<table>
<thead>
<tr>
<th>Main markets</th>
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<tbody>
<tr>
<td>Vegetables: Kimpese</td>
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<tr>
<td>Mbanza-Ngungu --&gt; Kinshasa</td>
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<td>Kisantu</td>
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<tr>
<td>Cassava: Mbanza-Ngungu --&gt; Kinshasa</td>
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<table>
<thead>
<tr>
<th>Main hazards and periods</th>
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</thead>
<tbody>
<tr>
<td>Localized flooding</td>
<td>every year</td>
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<tr>
<td>Vegetable diseases</td>
<td>every year</td>
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<tr>
<td>Rainfall irregularities</td>
<td>every 2 years: season A</td>
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<table>
<thead>
<tr>
<th>Coping strategies for poor households</th>
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<tbody>
<tr>
<td>Increased paid work</td>
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<tr>
<td>Collecting more wild foods</td>
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<tr>
<td>Requesting remittances</td>
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</table>
CD30: Seasonal calendar

<table>
<thead>
<tr>
<th>Seasons</th>
<th>Jan</th>
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**Key livelihood activities**

- Market gardening leaf vegetables
- Market gardening onions
- Fruit sales
- Cassava (harvested all months)

**Other livelihood activities**

- Firewood and charcoal sales
- Peak livestock sales
- Wild foods collection
- Work migration

**Shocks and hazards**

- Floods
- Vegetable diseases

**Legend**

- Land preparation
- Sowing
- Weeding
- Harvest

CD30: Food access calendar for poor households

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<th>Staple foods</th>
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<td>Maize, rice and beans</td>
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**Income**

- Vegetable sales peak months
- Daily paid work peak months
- Sale of firewood/charcoal

**Legend**

- Own production
- Market purchase
- In-kind
- Gathering
This is a zone of mixed forest and savannah characterized by fishing, on two stretches of the Congo river, interrupted by a long series of non-navigable (therefore non-fishable) rapids and smaller tributary rivers and streams. But the first thing to say is that it is the wealthier households who appear to live more directly by selling fish than the poorer households. This difference bears verification, but must turn on the relative possession of boats (canoes) and equipment and perhaps the opportunity cost for the poor of earning cash by working for others, whether as fishing hands or as field laborers. Insofar as they are paid as fishing hands or receive a proportion of the catch, poorer people are still an important part of the fishing economy. Subsistence cultivation of especially cassava, beans and some rice is also an important element especially for the poorer households, who are generally self-sufficient in cassava, while wealthier people depend more on the market even for staples. Given their distance from the main markets along the main Matadi-Kinshasa highway to the south, wealthier people no doubt purchase such local surplus cassava and pulses as are available, and like the poorer households they grow vegetables for domestic consumption. Otherwise, distance from the main town markets, and the considerable problem of a network of only earth roads, poorly maintained and often impassable in the rains, must raise the prices of food brought in by traders. But by the same token the prices received for fish taken away by traders must be reduced, or the cost of travel increased for those fishermen who travel to sell catches. Thus a valuable commodity is devalued at source by the lack of infrastructure.
### CD31: Seasonal calendar

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### CD31: Food access calendar for poor households

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This is by far the smallest livelihood zone in the country, consisting of the country’s 30 km coastal stretch in the *territoire* of Moanda, from the small port-town of Banana to the Kumbi beach bordering Cabinda province (Angola). Apart from the Atlantic Ocean itself, the main ecological feature is mangrove forests, and villages are situated behind these inland. The coastal waters are highly affected by the outflow from the great Congo estuary. Although some fish are caught all year round, the months for the main fishing catches are those when the outflow from the estuary is least and the coastal waters are at their lowest, thus particularly the dry season from May to September. Effects of the cold Benguela Current from the south of the continent, with its plankton-rich upwellings, reach this coast.

The only occupation of villagers here is near-coast – i.e. shallow water – fishing, by line and net from canoes or small boats. Even better-off people with motors to their boats do not venture into the deep water for fishing. Fish is sold to traders at the intermediary markets of Yema (Iema) and Nsiamfumu or taken directly to the town markets of Muanda and Boma. It is through this market chain too, in reverse, that everyone purchases nearly all the food they eat, except for the fish itself and vegetables grown on small plots of the sandy soil for home consumption. No livestock is generally kept except poultry.

Wealthier fishermen employ poorer men as fishing hands on their boats for cash payment and/or a share of the catch. Otherwise, poorer people earn extra cash from petty trade and sales of firewood: mangrove wood is highly combustible. They also collect and sell wild coconuts.

During the rainy months when fish catches are low, some poorer men go to find work in the towns.
### CD32: Seasonal calendar

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<thead>
<tr>
<th>Seasons</th>
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#### Legend
- Land preparation
- Sowing
- Weeding
- Harvest

### CD32: Food access calendar for poor households

<table>
<thead>
<tr>
<th>Staple foods</th>
<th>Jan</th>
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<td>Paid labour (fishing)</td>
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#### Legend
- Own production
- Market purchase
- In-kind
- Gathering
CD33  FOREST – STAPLE CROPS, CASH CROPS AND MARKET GARDENING

Covering most of the territories of Tshela, Lukula and Seke-Banza, this zone is a mixture of hills reaching above 800 metres and undulating plains. Although known for the Mayumbe forest, the zone’s pure forest has increasingly been cleared by human activity and is estimated to have reduced by some four-fifths since the middle of the last century.

Despite some remaining vestiges amongst a few farmers of former commercial investments in coffee and cocoa production, this is in essence a food-producing area with some surpluses to put on the market each year. It is an environment that, with relatively fertile clay-based soils, favors a wide variety of crops, from cassava, maize, groundnuts and rice to taro, yams and plantains. Also the forest resources offer a variety of wild products, including oil palms, mushrooms, and special grasses and leaves including those of the climber *Gnetum africanum* that form the dish *mfumbwa/koko*.

Although wealthier people possess a few cattle as well as small ruminants, animal traction is rare.

The zone, with a border with Cabinda (Angola), is characterized by comparative isolation from the main commercial centers of Matadi and Boma in the south of the Province as well as from the main highway to Kinshasa. In addition the roads are poor, earth-based and prone to be impracticable in the main rainy months. These factors must limit the trade of surplus products, notably market gardening produce, or at least limit the prices obtained; and it must limit the profitability too of petty trade, although that is a secondary occupation of poor and wealthy alike. It also means a longer and more expensive journey for those who engage in migrant work, going mainly to the province’s southern cities in the dry season before the preparation of the fields for the new crops.

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<th>Main productive assets</th>
<th>Poor households</th>
<th>Better-off households</th>
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<tbody>
<tr>
<td>Land</td>
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<td>Small and big ruminants</td>
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<td>Agricultural tools</td>
<td>Farming tools</td>
<td>Motor-bikes (-taxis)</td>
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<td>Poultry</td>
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<tr>
<td>Harvested staples</td>
<td>Harvested staples</td>
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<td>Purchased foods (incl. cassava, rice, beans)</td>
<td>Purchased foods (incl. rice, palm oil, fish)</td>
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<tr>
<td>Collected foods</td>
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<tr>
<td>Paid daily labor</td>
<td>Sale of livestock</td>
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<tr>
<td>Sale of firewood/charcoal</td>
<td>Petty trade</td>
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<tr>
<td>Petty trade</td>
<td>Remittances</td>
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<tr>
<td>&amp; palm oil:</td>
<td>Kakongo --&gt; Lukula --&gt; (Boma) --&gt; Kinshasa</td>
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<td>Livestock:</td>
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<td>Lukula --&gt; Boma</td>
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<th>Main hazards and periods</th>
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<tr>
<td>Localized reduced rain</td>
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<tr>
<td>Crop diseases</td>
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<tr>
<td>Conflict-destruction or thefts of produce</td>
<td>every year</td>
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<th>Coping strategies for poor households</th>
<th>Poor households</th>
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<tr>
<td>Increased collection of wild foods</td>
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<tr>
<td>Increased daily paid work</td>
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### CD33: Seasonal calendar

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<tr>
<th>Seasons</th>
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<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
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<td>0</td>
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</tr>
<tr>
<td>Lean season</td>
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#### Key livelihood activities
- **Cassava (harvested all months)**
- **Groundnuts**

#### Other livelihood activities
- Sale of crops (peak)
- Daily paid labour (peak)
- Sale of firewood/charcoal

#### Shocks and hazards
- Lack of expected showers
- Crop diseases

#### Legend
- **Land preparation**
- **Sowing**
- **Weeding**
- **Harvest**

### CD33: Food access calendar for poor households

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<tr>
<th>Staple foods</th>
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<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
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<tr>
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<td>0</td>
<td>0</td>
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<tr>
<td>Income</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paid labour (peak months)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sale of firewood/charcoal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</table>

#### Legend
- **Own production**
- **Market purchase**
- **In-kind**
- **Gathering**
This zone consists of a band beyond the sprawling suburbs of Kinshasa city. As such it is a rural area, and so the possession of cultivable land, or at least access to it, is a distinguishing feature from the city population proper. However, the population consists to a great extent of families who have come into the Kinshasa orbit from elsewhere in the country, near and far. Cultivable land is at a premium because of the high value of any produce at the very gate of the great city market, and there are a number of commercial farms. Both poorer and wealthier households obtain the use of plots from the indigenous landholders not only for their dwelling, if it is not rented, but also for small-scale cultivation. The arrangements are in various forms from direct renting to other payment for usufruct, including sharecropping.

A glance at the left-hand boxes will show how mixed a rural/urban economy this is. In fact the ranking of income sources for both poorer and wealthier is hardly possible, so varied are the opportunities and individual circumstances. Nevertheless, producing from the land – some cassava and beans for home consumption, vegetables principally for sale, is a prime activity, at least for the poorer; and the environment is ‘rural’ enough to provide the wood resources for firewood and charcoal sales, a major economic activity across the board, including retailing in the case of some of the wealthier people. However, as in areas much farther afield, the ever-increasing demand from Kinshasa exceeds the capacity of nature to replace the wood resource, so that deforestation is a growing problem, bringing erosion and the openness of cultivated land to floods.

Many if not most households depend on a member working periodically in the city, or indeed staying in the city during the week and returning at weekends, bringing or sending regular remittances to the main household. A minority of households will have a member who has a salaried job. People with some capital may set up small businesses, from roadside restaurants to cell phone kiosks.
Annex 1: Former and current provinces of DRC
Annex 2: Participants in the livelihood zoning workshops

March 2015 workshop at Kisantu for Kongo Central and Bandundu provinces

<table>
<thead>
<tr>
<th>Province</th>
<th>Name</th>
<th>Organisation</th>
<th>Email address</th>
</tr>
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<tbody>
<tr>
<td>Bandundu</td>
<td>KAHULA MAYUNGULA</td>
<td>IPAPEL</td>
<td><a href="mailto:billykahula@gmail.com">billykahula@gmail.com</a></td>
</tr>
<tr>
<td></td>
<td>KUSANIKA TENDO Ditend</td>
<td>SNSA</td>
<td><a href="mailto:jeankusanika@gmail.com">jeankusanika@gmail.com</a></td>
</tr>
<tr>
<td></td>
<td>KIBALA MATEBE Georges</td>
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<tr>
<td></td>
<td>KOTHO TAKIZALA Michel</td>
<td>PRONANUT</td>
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<tr>
<td></td>
<td>MUSUMBULU NDA Paul</td>
<td>PROSADEF (ONG)</td>
<td><a href="mailto:musumbulupaul@gmail.com">musumbulupaul@gmail.com</a></td>
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<tr>
<td></td>
<td>MULEM SANTEME Vincent</td>
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<tr>
<td></td>
<td>KAKOLE MITHELEZI Valentin</td>
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<tr>
<td></td>
<td>KINGONZI MWATHA Godefroy</td>
<td>IPAPEL (Gungu)</td>
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<td>KAZADI KALONJI Jean Marcel</td>
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<td></td>
</tr>
<tr>
<td>Equateur</td>
<td>LIBANDA Fabien</td>
<td>IPAPEL</td>
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<tr>
<td></td>
<td>MONGU YENGE Céléstin</td>
<td>L.N.S</td>
<td><a href="mailto:mongucel@yahoo.fr">mongucel@yahoo.fr</a></td>
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<tr>
<td>Kasai-Occidental</td>
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<tr>
<td></td>
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<tr>
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### May 2015 workshop at Lubumbashi for Katanga Province

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<th>Institution</th>
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<tr>
<td>Paul Busambo</td>
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<tr>
<td>Mutombo Mwena</td>
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<tr>
<td>Alex Bukasa Nkashama</td>
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<tr>
<td>Bertin Kalombo</td>
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<td>Innocent Tshizubu</td>
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<tr>
<td>Etienne Mulolo</td>
<td>IGC</td>
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<tr>
<td>John Kalumbu Tshomba</td>
<td>Faculty of Agricultural Sciences, Department of Agricultural Economics, University of Lubumbashi</td>
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<tr>
<td>Mukalayi Nsenga</td>
<td>FEC Katanga</td>
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<td>Françoise Kanam</td>
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<td>John Kyobela</td>
<td>CAMI</td>
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<tr>
<td>Alain Mubalamba</td>
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<td>Arnold Kanku</td>
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<td>Desire Mulemaza</td>
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<td>Nelly Kangola</td>
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<tr>
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<tr>
<td>Miji Tshinkeji</td>
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<tr>
<td>Beya Mbayo</td>
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<tr>
<td>Mukaz Makal</td>
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<tr>
<td>Mpoyo Kanonge</td>
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<tr>
<td>Ilunga Mutabala</td>
<td>Inspector, Ministry of Agriculture, Kolwezi</td>
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## May 2015 workshops at Goma

### North Kivu and South Kivu Provinces

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<th>Institution</th>
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<tr>
<td>Léopold Kahavi</td>
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</tr>
<tr>
<td>Valère Vulambo</td>
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<td>Guillaume Kahomboshi</td>
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<td>Francesca Reinhardt</td>
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<td>Honorine Nyolo</td>
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<td>SNSA South Kivu</td>
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<tr>
<td>Innocent Kapedere</td>
<td>INS South Kivu</td>
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<tr>
<td>Célestin Kimanuka</td>
<td>Provincial Director of INS North Kivu</td>
</tr>
<tr>
<td>Espoir Bisimwa</td>
<td>University of Bukavu, South Kivu</td>
</tr>
<tr>
<td>Moïse Muhindo</td>
<td>FAO, South Kivu</td>
</tr>
<tr>
<td>Kikezi</td>
<td>Ministry of Agriculture, Shabunda, South Kivu</td>
</tr>
<tr>
<td>M’UNDABATU KASUKULU Dalton</td>
<td>Ministry of Agriculture, Fizi, South Kivu</td>
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### Maniema Province

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<td>Mankunku Philémon Mwania</td>
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### March 2016 Workshops at Kisantu for Equateur, Kasai Occidental and Kasai Oriental provinces

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