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Rapid Reconnaissance Survey of the 102 Project Area  
Area Food and Market Development  
Project No. 660-0102  
Work Order #12  
February, 1985

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The views expressed herein are the views of the Contractor and are not  
necessarily the views of A.I.D.

**FINAL REPORT**

**RAPID RECONNAISSANCE SURVEY  
OF THE 102 PROJECT AREA  
KWILU SUB-REGION, BANDUNDU REGION**

**Collectives of  
Kilunda, Kwilu-Kimbata, and Kapia**

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**February 1986**

## TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION .....	1
1. Terms of Reference .....	1
2. Project 102 .....	1
3. Survey Methodology .....	2
II. RECOMMENDATIONS .....	6
1. Agronomy .....	6
a. Diversification .....	6
b. Manioc .....	6
c. Sedentary Systems .....	6
d. Localized Testing .....	6
e. Research Linkage .....	7
f. Livestock .....	7
2. Extension .....	7
a. Government System .....	7
b. Agent Training .....	8
c. Farmer and Cooperative Training .....	8
d. NGO Training: Agronomic Techniques .....	8
e. NGO Training: Extension Techniques .....	8
f. CDR Interventions .....	8
g. Cooperative Support .....	8
h. Establishing Credibility .....	9
i. Village Women Extensionists .....	9
3. Marketing .....	9
a. Roads .....	9
b. Bridges .....	9
c. Price Information .....	9
d. Management Training .....	9
e. Farmers' Associations .....	9
f. Women's Associations .....	10
4. Appropriate Technology .....	10
a. Flour Mills .....	10
b. Manioc Transformation .....	10
c. Shellers and Dehullers .....	10
d. Palm Oil Presses .....	10
e. NGO Processing .....	10
f. Transportation .....	10
g. Water Supply .....	11
h. Storage .....	11
i. Collective Silos .....	11
j. Technology and Training .....	11

	<u>Page</u>
III. AREA DESCRIPTION .....	12
1. Ecology .....	12
2. Demography .....	13
a. Settlement Patterns .....	13
b. Families .....	13
c. Work Patterns .....	14
d. Migration .....	14
3. Health and Nutrition .....	15
4. Farming Systems .....	15
a. Crops .....	15
b. Cultural Techniques .....	19
c. Livestock and Fisheries .....	20
d. Natural Resource Exploitation .....	22
e. Transformation and Storage .....	22
5. Local Economy .....	24
a. Balance Among Agriculture, Local Manufacturing and Trade .....	24
b. Food/Cash Balance .....	25
c. Crop Profitability .....	25
d. Government Policies .....	26
6. Marketing and Transportation .....	27
a. Infrastructure .....	27
b. Markets and Alternatives .....	28
7. Social Organization .....	29
a. Village Structure .....	29
b. Conflict .....	30
c. Land Tenure .....	30
d. Associations .....	31
e. Ethnic/Religious Identity .....	32
8. Extension .....	32
a. Acceptance of New Technology .....	32
b. Existing Service Institutions .....	33

Appendices: Maps and Village Reports (in French)

- A. Kilunda
- B. Kwilu-Kimbata
- C. Kapia

## I. INTRODUCTION

### 1. Terms of Reference

The South-East Consortium for International Development (SECID) was contracted by USAID/Kinshasa/ARD to carry out a rapid reconnaissance (RR) of the farming systems in three collectives of the Kwilu Sub-Region of Bandundu, part of the area to be covered by the future Area Food and Marketing Project (102). The plan of work was to include: (1) participation in an on-farm research training workshop held by IITA for RAV personnel, to introduce the concepts and methods of rapid reconnaissance; (2) use of the workshop participants to carry out the RR; and (3) preparation of a final report describing farming systems in the 102 area.

The rapid reconnaissance is a survey tool merging inter-disciplinarity and intense short-term on-site evaluation in order to identify potential agronomic interventions for on-farm testing and later dissemination. The 102 survey was broader than a traditional reconnaissance survey as the objectives also include gathering information on marketing, transport, nutrition, and extension infrastructure. RR practitioners are also commonly members of on-going research teams in the region being studied, and thus equipped to put their recommendations directly into practice. Although 102 is still in the planning stage, the team included 6 agents from existing local agencies, and 3 AID personnel charged with the planning and eventual implementation of 102.

### 2. Project 102

The precise goals of 102 are still being defined. As it was presented to the team in January by Cit. Nkoy Baumbu, future 102 project coordinator, the project is to cover 14 collectivities in 4 zones, with major emphasis on the zones of Bulungu and the north of Idiofa. The objectives are to increase agricultural production and develop marketing by reinforcing the existing physical and institutional infrastructure (the former in connection with the roads and river project) and by using existing non-governmental organizations and private firms intermediaries to reach the small farmers.

The 102 staff itself will consist of 5 administrators, 10 extension-agronomists, 2 marketing experts, 1 appropriate technology (processing) expert, 1 non-formal education expert, and 2 evaluators.

The project at this time needed information on soils, quantities and kinds of agricultural products marketed and consumed, how marketed, goods brought by the producers, local processing, and local agricultural systems. 102 already had several studies on area marketing (starting at a level above the producers) and a small farm survey with quantitative information on distribution of land farmed, crops planted, organizations found, etc., across the region. These unfortunately were not accessible to the team beforehand.

Cherryl McCarthy, USAID/ARD, specified also the need to know more about constraints to production related to water, labor, land access and erosion; about whether the produce marketed is surplus or taken out of basic food needs; and about the limitations to marketing imposed by the present transport system.

The three collectivities (Kilunda and Kwilu-Kimbata in Bulungu, Kapia in Idiofa) are not totally representative of the project area. They do represent a range of conditions from densely populated to sparsely populated<sup>1/</sup> although there are less populated and more remote areas especially in the zone of Kutu. USAID chose to concentrate on those collectivities with enough road access to be included in the first stages of the project. Other than this, the study sites cover the majority of the 14 ethnic groups found in the area, a wide variety of marketing conditions, and the two predominant agro-ecological zones, forest and savanna.

### 3. Survey Methodology

In December 1985, Susan Almy, accompanied by soil scientist Olu Osiname (IITA/Ibadan), visited the 102 area in order to select sites in the three collectivities and plan logistics. An aerial survey was made, noting down on topographic maps the principal changes in land form, crops, settlements, erosion, vegetation and water. From this information six agro-ecozones were identified per collectivity, and narrowed down to three by merging similar areas, eliminating peri-urban, low-access, and low-density ones, and assuring a geographic distribution around each collectivity (see first report by Almy).

In January, a team of 14 people was assembled from the December workshop and new recruits brought in to increase the number of Bandundu and female participants. The survey team included eight Zairians, six Americans; eight men, six women; seven Kikongo speakers, three Lingala speakers, and four with only French capability; five masters/license or doctoral training in the agronomic sciences, five in the social sciences, and four bachelors or vocational training (one in economics, three in agriculture). Three persons work in the project area as agricultural researchers and extensionists. (See figure 1.)

The team members spent two days in Kikwit (figure 2) getting to know the project and each other, and designing the Grandes Lignes (figure 3), a topic outline of information to be collected. We then divided into 3 sub-teams, balanced according to sex, citizenship, language and discipline. Each team spent 4-5 days in a village of the collectivity of Kilunda. Two of the teams slept in the village itself, which allowed continuous interaction with the village population, and one in a neighboring school. Information was collected through

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1/ Kilunda 60 persons/sq. km; Kwilu-Kimbata 40; Kapia 50, but outside the two port cities probably under 20.

observations and discussion in fields and in the village with both women and men, and from individual and group interviews with the chief and his council, farmers and representatives of local associations, market-goers and traders. Village teams routinely split up into groups of two or three, usually mixed discipline and sex, to carry out these enquiries. Once or twice during the visit the team met to compare notes on each point in the Grandes Lignes, and returned to check inconsistencies and fill in gaps. Once a team felt comfortable with what it knew about the core village, it usually visited other villages in the same area to determine if there is much variation in agricultural activities from one village to another.

Before or just after leaving the village, the team wrote the village report together. The village teams then spent a day reporting to each other, fielding questions, and annotating the reports. Three different teams were then formed and sent out to Kwilu-Kimbata, where the process was repeated, and finally to Kapia, with programmed rest and travel days for the more difficult transport situation.

Receptivity in the villages varied greatly. In most villages it took at least a full day of explanation and acquaintanceship to convince people to take the teams into the fields. Once in the field there was little reticence and it was easy to verify the information provided by field observation. In one village (Kintshwa-Nseke), we felt that the village as a whole had collaborated to hide some things from us.

The season chosen for the survey was not optimal. The short dry season was picked for ease of transport. With more time programmed we could have gotten into all of the areas surveyed during the rains, and in November/December we would have been able to observe peanut and maize problems in the field. The fact that people are busier during that season would have actually been an advantage, as it would have been harder for them to keep us from visiting the fields.

Figure 1: Participants in the Rapid Reconnaissance:

<u>Name</u>	<u>Discipline</u>	<u>Degree</u>	<u>Institution</u>
Susan Almy	Anthropologist	Ph.D.	SECID/inde.
David Attebury	Rural Development	MS	AID/Kinshasa
Cameron Burn	Agronomist	BS	RAV/Kiyaka
Martha Gaudreau	Soil Scientist	Ph.D.	SECID/UMinn.
Ifulu Mitwana Marie Jose	Letters	License	CODAIK/Kikwit
Kasele Idumbo	Agronomist	MS/Agr. Eng.	RAV/Kiyaka
Kassongo Kazumba Sungila	Sociologist	License	RAV/M'vuazi
Kusonika Mafuta Vicky	Rural Development	Graduee	CODAIK/Feshi
Mbulu Nzau	Sociologist	License	AID/Kinshasa
Mark Metzner	Economist	BA	AID/Lubumbashi
Jeana Myers	Agronomist	BS	PCV/Lusekele
Nkiere Moo Wassa	Agro-economist	Agr. Eng.	AID/Kinshasa
Nkoy Baumbu	Agronomist	Agr. Eng.	AID/Kikwit
Pangu Songi Songi	Agronomist	Agr. Eng.	CODAIK/Kikwit

Figure 2: Work Plan for January-February 1986:

18.01	Travel to Kikwit
19-20.01	Preparation Kikwit
21.01	Leave by noon to go to sites Kilunda for early evening meetings in villages
22-24.01	Farm visits Kilunda
25.01	Fill in gaps with villagers or on farms
26.01	Come together in Vanga to report, write
27.01	To Kwilu-Kimbata villages early afternoon
28-30.01	As to Kilunda days I/4-7
31.01	Return to Kikwit
1.02	Report and write
2.01	Travel to Idiofa
3.02	Travel to sites Kapia
4-6.02	As in Kwilu-Kimbata week II
7.02	Travel to Idiofa and Kikwit (2 groups)
8.02	Travel to Kikwit 3rd group
9-10.02	Write and report Kikwit
11.02	Departure to Kinshasa

Figure 3: Grandes Lignes:

Facteurs humains:

éthnie (magie, conflits, religion, croyances, tabous)  
composition familiale (main d'oeuvre, age, sexe, rôle)  
exode rural et urbain, santé et régime alimentaire  
rapports extérieures de la famille, associations  
villageoises

Régime Foncier:

répartition de terres, disponibilités et types de  
terre, conflits, détermination de la durée de jachère

Systèmes de production:

climat (perceptions), management du sol et érosion,  
calendrier culturel pour les différents types de  
champs, nombre, type et taille de champs, techniques  
culturales, utilisation/accès de/à intrants agricoles  
(semences, fert., outils, herbicides etc.), situation  
phytosanitaire et moyen de lutte, niveaux d'encadre-  
ment public/privé, estimation de rendiments des  
recettes et utilisation vendre/consommer/semences,  
réaction à introductions locales de nouvelles cultures  
et de techniques culturelles

Élevage:

types, espèces, leurs objectifs, situation zosan-  
itaire, conflits avec l'agriculture (localisation,  
kraals)

Exploitation forestière:

utilisation des ressources (chasse, pêche, bois,  
cultures, cueillette des aliments et médicaments),  
conservation

Transformation et stockage:

description des transformations et stockage par produit  
(temps, main d'oeuvre (type), opérations, qualité  
du produit), raisons de ne pas vendre immédiatement,  
quantités de stockage, individuel ou collectif et pour-  
quoi, pertes éventuelles des deux, réaction aux inno-  
vations dans le secteur

Commercialisation:

marchés (organis., fréquence, distance, participants,  
mode et moyen de transport, spéculations avec l'objet  
de vente ou échange, provenance d'acheteurs, prix et  
mode de fixation et époques de fluctuation, produits  
achetés par les agriculteurs et mode de paiement;

système de vendre aux champs, maisons et coopératives,  
marchés et leur concurrence; perceptions de tous les  
commerçants par les producteurs, problèmes du commerçant  
privé/autre, magasins villageois et besoins de produits  
manufacturés

## II. RECOMMENDATIONS

### 1. Agronomy

a. Diversification into higher-value (cash) crops and new food crops is strongly urged: improvements on traditional crops (new varieties of peanuts for oil and consumption, seed gourds, rice and maize), new introductions like beans and potatoes, and the cultivation of wild plants now occasionally harvested for sale (punga and urena fibers, gloriosa and other medicinal plants).

b. There should be continued efforts toward improvement of manioc production in both savanna and forest. Criteria for villager acceptance may differ from one ecological zone to another and they should be identified and used in the varietal selection process. Additional work on optimum length of planting materials, appropriate densities for intercropping, and varietal trials using villager agricultural practices may provide short-term increases in agricultural production that would facilitate more extensive innovations later.

c. Research should be conducted to develop long-term management systems for sedentary agriculture in both savanna and forest. DPP/Mbeo has made a start on mixed agro-pastoral systems. Savanna and forest management systems should emphasize increased productivity while maintaining or improving soil fertility. Possible interventions for the savanna that need additional study include: use of fire-free zones; animal traction; rotation between pastures and cropped fields; enclosed or herded cattle and small ruminants; use of appropriate leguminous species (both woody and herbaceous) for forage and green manure; and cultivation of alternative crops (oil, fiber, medicinal). Interventions for forest management that would require additional study include: intercropping of food or forage crops beneath perennial tree crops (coffee, palms); purposive sowing of leguminous species at the end of the planting cycle to improve soil fertility and reduce the fallow period; development of dry season vegetable gardening (with Lusekele) in the marshes and valley bottoms; establishment of nurseries for coffee and palm plantations in the humid valley bottoms; establishment of sustainable fish ponds (with PPF).

d. Kiyaka should initiate early on-farm testing of varieties to establish appropriate local criteria for selection, adaptation, and adoption in the different agro-ecological zones. Farmers can do part of the testing, where their land type, farming methods and goals resemble those of the villagers. Links to the Bulungu seed multiplication project will be critical. The farmers should also be encouraged to get into the seed multiplication business.

e. The most effective route for agronomic introductions under 102 is seen to be:

- 1) new varieties and techniques sent from the national RAV stations to Kiyaka;
- 2) adaptation and selection trials by RAV/Kiyaka both on-station and on-farm;
- 3) Kiyaka training and distribution to DPP and Lusekele; and
- 4) NGO training, distribution and supervision of the monagris for localized trials and multiplication.

RAV cannot afford to put out one of its own extension agents to supervise each new crop or enterprise introduced. There is also a problem in that some appropriate technology introductions, and high-value crops (medicinal, fiber and oil plants) and seed gourds are outside the mandate of RAV. The 102 staff may be able to supply to the NGO's technologies for local trials and testing that are outside the activities of RAV. These could be channeled through the NGO's to the monagris. The 102 staff would need to monitor these interventions more closely.

f. All the livestock, but especially the cattle and goats, cause serious problems to agriculture because of the lack of local traditions of herding. The livestock emphasis of 102 should be on effective grazing and confinement systems, rather than on any expansion of numbers and quality. An exception might be made for the vaccination of poultry against Newcastle disease.

#### g. Extension

a. The group recommends strongly that 102 work through the official system of agricultural and veterinary monitors (monagris and monivets) of the Department of Agriculture. No NGO in the area is capable of expanding its staff sufficiently, even with 102 support, to provide adequate extension services to the project area. Religious NGO agents also often experience a conflict between their agricultural and evangelical duties. It is estimated that about half the existing monagris and collectivity agronomists are making a serious effort to improve agriculture in their work areas, while the others are neutral or negative influences. Even many of these latter could become positive agents of change if given the technical and management training that would allow them to see the possibility of achieving something real. With time and good results, the Department of Agriculture might even be convinced to reduce the monagris' official monitoring duties in favor of extension. In the meantime, 102 and the NGO's in question could operate through a cooperative agreement with the Department of Agriculture similar to that of CODAIK, which allows it to work with and reward those monagris and collectivity agronomists that are capable.

b. Training and immediate supervision of the monagris would be most efficiently undertaken by the localized NGO's, at Lusekele and DPP's Mbeo and Laba centers. These would provide recycling courses either in the collectivities themselves or at the area centers, and would follow up with supervision and provision of planting materials and other inputs for extension and localized trials. They would also provide feedback on local success and acceptance of new varieties and practices to the 102 staff and Kiyaka. Lusekele has already begun to consider extending its agent program to work with the monagris.

c. Courses on agricultural techniques and farm management should be held by Lusekele and DPP for representatives of the active farmers' groups and co-operatives/pre-cooperatives in the region. These in turn would share their new knowledge with their members and to a lesser extent, with neighboring villages.

d. Lusekele and DPP staff are not adequately trained in the techniques of field trials to be able to train others. The RAV Centre de Formation at Kiyaka should be utilized for NGO staff training. As much of the RAV training as possible should be held at the NGO centers, under local agro-ecological conditions, rather than in the very different ecology of Kiyaka.

e. There should be an analysis of DPP's and Lusekele's extension methods. Information to be gathered would include: policies on status and sex of the villagers with whom they work; distribution of inputs by sale, share-cropping or gift; group extension methods; personnel management; accounting; and cooperative formation and assistance. Based on this information a program of staff training could be developed that would be supported by 102.

f. CDR is not now interested in continuing its earlier extension work, but may be willing to accept management training for its Zairian staff and support for its bridge building and commercial activities.

g. A cooperative support system should be developed. Possible interventions may include:

- 1) provision of a specialist in cooperative and business management who could train cooperative workers in accounting, stocking, diversification, and Zairian cooperative law and regulation;
- 2) regular auditing or bookkeeping of the local coops by a neutral accountant based at NGO headquarters, to assure members that the coop leaders are not robbing the till; and
- 3) extension of special benefits to coop members to stimulate membership, such as higher access to technical training, credit, transport, storage or other facilities.

The cooperatives should be encouraged to write or re-write their statutes in such a way as to enable the admission of more members from the villages. Today, most or all pre-coops, associations, and the one cooperative require that new members bring in a quantity of cattle, to which few people have access.

h. The group considers that since the introduction of a new savanna manioc variety is so well received to date, 102 will gain credibility at the local level from helping to complete its diffusion. Support of the PPF's fishpond project is another example of an intervention that would enhance 102's stature in the project area. This base of good will can be used later when the project wants to expand into more innovative interventions such as new crops that have greater nutritional and/or market potential. CEPLANUT should be invited to provide nutrition education, especially in Kilunda.

i. Women extension agents, particularly a network of women villagers supported and trained by the NGO's and monagris, would make a valuable contribution to transmission of new techniques, and to the understanding of local criteria for their selection. In developing such a system, a study should be made of the effects of DPP's women agents and foyers sociaux and of Louise Fresco's 1979-80 experiment using village women monitrices south of Kikwit. Further study is also needed of the women's contribution clubs for group extension and purchase of appropriate technology and agronomic inputs.

### 3. Marketing

a. Roads should be upgraded and a permanent repair system worked out for northern Kwilu-Kimbata and for Kapia.

b. The possibility of a bridge or government control of the ferries across the Kwilu to Kwilu-Kimbata should be explored.

c. 102 should promote an information system, perhaps through the monagris, to inform villagers of the prices paid recently at markets and by trucker-traders in their zone.

d. Both the trading companies (private and NGO) and the petty traders (by foot and bike) need training courses and follow-up in management and marketing techniques. Kapia's CODAPAL, some of the farmers' associations and some pre-cooperatives have a potential to alleviate the marketing situation locally and provide competition to the companies, but they need special training sessions in management, specifically aimed to the problems of a cooperative.

e. The use of farmers' associations as vehicles for seed multiplication and distribution and truck loans should be considered.

f. The use of the women's contribution clubs, or bi-sexual clubs modelled on them, should be considered for individual and group purchase of appropriate technology introductions, seed and other inputs.

g. The project should study ways of effectively providing credit to traders (company and petty), farmers' associations, cooperatives and individual villagers.

#### 4. Appropriate Technology

a. Mills to grind manioc and maize flour would substantially reduce women's domestic work and give them more field time. A simple mill adapted to the use of one or a few families, such as a hand mill, may provide an attractive alternative to the traditional methods of flour preparation.

b. Transformation of manioc is a time-consuming process. Interventions at various stages of the process would reduce women's work load. For example, in Brazil extraction of the cyanide is accomplished using a press rather than soaking. The use of solar driers would reduce drying time and help eliminate bottlenecks during the rainy season.

c. Simple machines for performing tasks currently done by hand would reduce women's work load. A machine to break apart palm nuts would be attractive to women in Kilunda and parts of Kwilu-Kimbata. The women sell the palm kernels, which are used for oil extraction. Since returns from their sale are low, a machine would have to be cheap to justify the purchase. Also, women remove maize kernels from the cob by hand prior to selling it or preparing flour. A good maize dehuller would facilitate the task.

d. Palm oil presses at the village level should be regularized and expanded in north-central Kwilu-Kimbata, Kapia, and Kilunda. The areas directly dependent on the functioning palm factories for piece-work choose explicitly to avoid the trade in order not to antagonize their employer. In some areas the palm factories are no longer functional and oil palms are an under-exploited resource.

e. The NGO traders DPP and CDR process coffee, rice and maize, and would benefit from technical advice on their machinery and methods. Presumably reduced processing costs would be fed back to village profits.

f. Cattle-drawn carts could be a viable option to head-portage for bringing farm produce to market, and even from some fields. (Most fields, down steep slopes, would require wider paths and switch-backs for animal traction). Alternatively or additionally, human-powered push-carts could be used over distances of 3-5 km.

- g. A major drag on women's time and energy is the portage of water up the hills to the houses, often a round-trip of an hour. The intermediate technology expert should explore the local acceptability and costs of wells within the villages, pump-driven water towers, and rain-water catchment and storage systems. The latter seem most plausible a priori.
- h. Storage systems for maize, peanuts, seed gourds and manioc need to be studied. Alternative methods drawing upon technologies developed by IITA and FAO could be tested and evaluated at the village level. Traditional and new methods for reducing post-harvest loss due to insect and pest damage need to be explored.
- i. The idea of a collective storage, for example, a village silo, should be considered. The knowledge that a full shipment was waiting in one place would encourage more traders to enter the villages, and the silos would probably reduce post-harvest losses. They present substantial management problems, however. If the owner is a trader, he will gain a local monopoly and prices will suffer. If the village owns the structure, who will take out the loan for silo construction, or will the village be willing to tax (cotiser) itself for this before the idea is proven? Who will control the storage and removal of produce, and will people trust him not to cheat? Will villagers be willing to put their produce into a collective silo when they won't get paid for it until the trader arrives? Additional studies might be able to respond to some of these questions.
- j. Technology which can be taken up by local blacksmiths, caners, wood workers, and potters should be preferred to that which must be manufactured outside the area. Local training in these technologies and credit where necessary for new machinery should be instituted.

### III. AREA DESCRIPTION

#### 1. Ecology

The three collectivities surveyed are ecologically similar. The climate is humid tropical, with an average monthly temperature year-round of 25°C. Daily temperatures can range between 20° and 35° depending on season and cloud cover. Rain occurs in all months but rarely from June to August, the long dry season. The rainiest months are October, November, and April. There is a relatively dry period occurring in late January and February dividing the year into two rainy seasons, one long from mid-August through December, one short or less predictable from March to May, and two dry seasons, from June to August and January-February.

The land forms observed in all three collectivities are hilly, highly dissected plateaux with grasses and little scrub, slopes varying in length and gradient either entirely forested or with pockets of forest cutting into the savanna, and large expanses of forest covering some hills and the banks of the streams.

The soils on the plateaux are sandy to 2m or more, and clayey or sandy clay on the base and slopes of the valleys. The soil underlying the Kapia forests is more clayey and humic than on the grassy plateaux but not, according to soil scientist Olu Osiname, sufficiently so to protect them from rapid conversion if short fallow periods are utilized.

A large number of secondary rivers feeds the region, and all the villages studied were surrounded by 2-10 streams or rivers. Many of these are suitable for fish culture and dry-season vegetable gardening. Altitudes are 400-500m.

Vegetation is Hypparhenia grass on the plateaux and most hilltops, with light to heavy bush composed mostly of *Hymenocardia acida* and *Dialium anglerianum*. *Pari-narri*, a vine-nut plant that multiplies by rhizome and is used for nut-butter and fruit, winds through the grass and is difficult to uproot in land-clearing. The forest is mostly gallery, including wild palm, hardwoods, leguminous trees such as acacia, and many other species. In southern Kwilu-Kimbata the forest has been totally replaced (except for a reserve established by each village) by cultivated palms planted by the PLZ company. The central area was found to be the same in 1960 by Henri Nicolai, but when PLZ's power and finances waned during the rebellion the villages recaptured their land and reduced the number of palms to make planting easier. To date, it is illegal to cut the palms down, even when they are very dense or unproductive. The existing forest in Kilunda and parts of Kwilu-Kimbata and south Kapia (wherever population densities are high) is considerably degraded by the shortening of fallow from the traditional 7-10 to 3-5 years.

## 2. Demography

a. Settlement Patterns. Villages are built on the highest points around, a heritage from the Belgians that protects the villages from malaria and tsetse but makes the portage of water and produce much more difficult. In Kilunda villages' populations range from 800 to 900, and they are found wherever there is enough forest nearby to plant. In Kwilu-Kimbata, they vary from 200 to 1500 and concentrate near the trading outlets, palm company and best forests. In Kapia they vary from isolated extended-family hamlets of a few houses to Bankumuna with its 2000 people and the huge port-towns of Mangai and Dibaya-Lubwe; all the larger villages are positioned on or near the few main roads, and people walk long distances to fields. Villages in Kapia and some elsewhere have a history of schism: certain clans or sub-clans will be forced to leave a village after repeated conflicts and accusations of sorcery. A new village will be established nearby, with cordial relations eventually being renewed.

b. Families. It proved to be very difficult to collect population statistics on the local level. In Lemfu, Kilunda, 57 percent of the adult population was reported to be female, and 45 percent of the total population under 15 years of age. In Mayoko-Lutundu, Kwilu-Kimbata, 60 percent of the adults were said to be female and a full 55 percent of the total population "children". The sex ratios are higher than those reported for collectivity populations as a whole in the 1982 census but fit with what we saw in the villages.

Family size is estimated in most villages to be between 7-9 individuals. Families are usually monogamous, with more polygamy in Kilunda and among village leaders and farmers who have extra labor needs. Households are composed of nuclear families, or sub-families where a spouse has died or is polygamous.

Children help in the field and in sex-appropriate domestic and gathering tasks from the age of 6 or 7. Girls may be given their own fields by the age of 12-14. Some girls marry as early as this, but most wait till their late teens, and boys longer.

Labor is provided by the nuclear family with occasional exchange among families, usually restricted to the same clan or to co-wives. Young people in some places exchange labor on a more regular basis, and in areas with heavy forest the men may form work groups for land clearing. Men also cooperate in communal hunts both in the forest and in the savanna. A few farmers pay occasional wage labor, and widows and women whose husbands have heavy external demands on their time may also pay for help in land clearing.

c. Work Patterns. The work week varies from 3 days in Ndunga, Kilunda (plus one for collectivity work (salongo)) to 6 days near the palm company in Kwilu-Kimbata. There is a four-day traditional week in parts of Kapia, but on "rest" days, the women prepare chikwangu, wash clothes, fix walls, gather firewood, haul water, etc., and the final result is 2-3 hours of leisure at most. In most villages work loads lighten in February.

Men's traditional roles in farming are limited to forest clearing and burning. They are substantially under-employed everywhere except near the PLZ company. They help the women in non-manioc sowing and harvesting (but not weeding) in at least half the villages studied, but whether their help is significant or not could not be determined without a major study. Men's contribution is not necessarily greater where they have few other tasks, but may be related to how hard pressed the women are. Men's own tasks include palm nut cutting, extracting palm wine, harvesting other trees, hunting, fishing, maintaining fish ponds, and constructing houses. They share trading and marketing with the women.

d. Migration. Emigration to other farming areas or even nearby villages, except for marriage purposes, does not occur. Women usually go to their husband's village (or clan within the same village) and the male children return to their mother's brother's village when the father dies. In cases of land shortage, a man may go to his wife's village or the children may stay with their father's clan, as tolerated visitors ("stranger" clans) with no firm rights to land.

Major rural emigration by young people of both sexes is common in both Kilunda and Kwilu-Kimbata, less so in Kapia. Kilunda's youth will not return unless major economic changes take place within the collectivity. Kwilu-Kimbata's young people are beginning to come back to engage in farming where it is profitable. Kapia's emigrant youth often engage in trading between village and port or city, and the young people in the villages are abandoning traditional agricultural pursuits to go into trade or coffee farming.

Emigrants return for rare visits and bring or send occasional consumer goods or cash; in case of major emergencies like heavy fines or deaths of important people they will be asked to contribute along with the rest of the clan, and many do so. Emigrants from a few villages act as intermediaries, exchanging village produce for consumer goods when village men bring it to town via rented truck. Real investment or maintenance of rural families by urbanites is insignificant.

### 3. Health and Nutrition

The health status of the sub-region is tied to the nutritional status, which depends closely on agricultural production. Other diseases are of course present but not remarkable. Malnutrition was most noticeable in Kilunda, where most children looked borderline. But, extrapolating from Vanga health team figures in the Moliambo area, only about 5-10 percent at most are clinically malnourished. Again according to the Vanga team, malnutrition levels have soared the last year as a result of the poor peanut harvest. In Kwilu-Kimbata the children are thin, but no signs of real malnutrition were observed except in the north. In Kapia, children were healthy and even on the plump side.

These observations relate both to preferred diet and to the availability of protein "condiments". The basic diet in both Kilunda and Kwilu-Kimbata is a sticky mass of manioc flour mixed with maize flour (luku or fufu). Some northern Kwilu-Kimbata families and the western Kapia villages leave out the maize flour, eliminating the protein content. Most Kapia families use chikwangu, a semi-fermented manioc product, as their main staple. To the staple (about 80 percent of the meal) are added "condiments": usually boiled manioc leaves and palm oil, sometimes with a little fish, gourd seeds, peanuts, mushrooms, leafy vegetables, meat, or caterpillars. In Kilunda manioc leaves are the only proteinic condiment many families eat during the month, although in the months of January-March many are able to snack on fresh Bambara nuts (voandzou). Voandzou is never stored. In Kwilu-Kimbata peanut harvests are better and people have more access to a bit of meat or fish. In Kapia, even the poorest village has more access to meat, both wild and domestic. It is our impression that except possibly in the most forested parts of Kapia, meat is rarely consumed. Local receptivity for more fish and peanuts in the diet is great.

The general health other than the nutritional status of the villagers in the surveyed collectivities is good. Two factors have contributed to this:

- 1) widespread education by medical teams on the use and construction of latrines has reduced the incidence of parasites.
- 2) each village visited has 2 or more sources of potable water, many of them improved with a protective enclosure or pipe outlet and maintained by the village. These sources are uniformly at the base of the hills, requiring substantial time and effort to bring the water to the homes.

### 4. The Farming System

a. Crops. The principal crops and cropping patterns are similar across the three collectivities. The major division is by ecological zone: the forest and the savanna.

In the forested areas, the principal crops in order of importance are manioc, maize, seed gourds (mantete) and peanuts. These are planted in

association with other secondary crops scattered throughout the field: amaranth, eggplant, hot pepper, sweet potatoes, yams, tobacco, and pine-apples. As each crop is harvested, it is replaced by manioc and occasionally a second season crop (maize or upland rice). In Kapia rice is grown in association with maize and manioc; it is a new crop introduced by DPP. In southern Kwilu-Kimbata, because of the influence of PLZ, food crops are grown in association with oil palms.

In Kwilu-Kimbata and Kapia there are two types of forest fields made possible by greater land availability. The first is a maize-manioc field that is planted on newly opened land or on land in fallow for 7-10 years. The second field type is smaller and devoted principally to peanuts with some associated maize and seed gourds followed by manioc. Women prefer a much reduced fallow period (1-3 years) for peanut fields as they must clear the land while the men are busy on the larger fields. Fallows in the southern parts of both collectivities are reduced to 4-5 years in the maize-manioc fields.

Since most of the forest fields are cultivated on steep slopes, one would expect to find serious erosion problems on the sandy topsoils. In fact, there is little evidence of erosion in the maize-manioc fields because of the presence of large stumps, tree trunks, and debris which protects the soil. The peanut fields are kept cleaner, and more signs of erosion are observable; there is often significant gully formation on the paths to the valley bottoms.

Where the valleys are broader, they are often planted in the same crops as are found on the slopes. On the wetter areas, bananas, vegetables, and an occasional nursery for coffee are found. This land is also the location for dry season vegetable production, an activity which seems to be relatively unimportant to the villagers.

A typical agricultural calendar for the forest area would be as follows:

<u>Maize-Manioc Field</u>		<u>Peanut-Gourd-Manioc Field</u>	
Apr-May	Clear underbrush	May-June	Clear land
June-July	Tree cutting	Aug-Sept	Burn
Aug-Sept	Burn	Sept-Oct	Plant peanuts and gourds
	Plant maize 2 weeks later	Nov	Weed
Sept-Oct	Plant manioc once maize established	Dec	Harvest peanuts
Oct-Nov	Weed	Jan	Harvest gourds - 2nd weeding
Nov	Harvest first manioc leaves	Jan-Mar	Plant manioc
Dec	Harvest green maize for direct consumption	May	Harvest peanut regrowth from incomplete first harvest
Jan-Feb	Harvest maize 2nd weeding		
Feb-Mar	Plant manioc to replace corn		
June	Early manioc harvest (Kilunda)		
Sept-Oct	Manioc harvest begins		

In areas with significant vegetative regrowth or where new forest is being opened up, clearing underbrush can begin as early as March for the following year's fields. In Kilunda and Kwilu-Kimbata, planting and harvesting seemed to be two to three weeks ahead of Kapia. This corresponds to a slight shift in the rains going east from Kilunda to Kapia. It should be noted that the harvest of manioc begins after only 8-10 months in Kilunda. Individual tubers are selected from each plant and harvested rather than pulling up the whole plant. Soils is then mounded around the plants to prevent lodging.

In Kwilu-Kimbata and Kapia, harvest of manioc begins after twelve months. Harvest usually continues not longer than the 24th month, but in some parts of Kilunda and Kwilu-Kimbata, villagers reported harvest of manioc continuing over a period of three years, with no weeding after the first year. In Kwilu-Kimbata as in Kilunda, individual tubers are selected while in Kapia, whole plants are harvested.

Perennial crops such as coffee and oil palm are becoming more important in the forested areas on "concessions" or "farms". With permission of the "chef de groupement" and the "chef de collectivité", a man can claim perma-

ment ownership to between 15 and 60 ha of land as a "farm". He can put part of this into perennial crops as well as the usual food crops and livestock and fish ponds.

Other crops that contribute to the cash flow of families include punga (Triumfetta cordifolia) and Urena lobata, fiber plants that are found in the secondary forests and fallow areas, and Rauwolfia, important as a medicine. These plants are not cultivated but are collected as time and need for cash exist, particularly in Kwilu-Kimbata and Kapia. Gloriosa, a savanna medicinal plant, is collected similarly in Kilunda.

In the savanna, the principal crops in order of importance are manioc, peanuts, gourds, and Bambara groundnuts (voandzou).

A typical agricultural calendar for savanna fields is as follows:

July-Aug	Land clearing and preparation
Aug	Burning
Aug-Sept	Plant peanuts, groundnuts, gourds
Oct	Weeding
Dec-Jan	Harvest gourds, peanuts, groundnuts
Jan	Land clearing and preparation for second season
Feb	Burning
Feb-Mar	Plant crops (peanuts and gourds after pure peanuts, or gourds and manioc after peanuts-groundnuts, or millet in Kapia)
Mar-Apr	Weeding
May	Harvest gourds
July	Harvest millet
Sept	Begin harvest manioc (Kilunda)

Although the species cultivated in the savanna fields are similar throughout the three collectivities, there is great variety in whether or not the crops are grown in association and/or rotation. The savanna soils are inherently less fertile and more land must go into cultivation to assure adequate harvests.

Through the three collectivities, most villagers have at least two new principal fields a year -- one to two in the forest and zero to one in the savanna. The forest fields are preferred and where forest land is adequate, people do not cultivate the savanna (most of Kapia and Kwila-Kimbata). When strangers come to the area and have no ancestral claim to land, they are given savanna land. Some women do not consider their peanut fields to be large enough to be considered a field and therefore will underestimate the number of fields they work. Field size can vary from 15 ares to 2 hectares depending on the strength and ambition of the person clearing the land, and land availability.

Most of the planting materials used in the fields are traditional varieties. There are at least eleven varieties of manioc recognized by the village women. In parts of Kilunda, the PRONAM variety F-100 is being planted in savanna and the villagers are happy with its yields. In the Djuma area of Kwilu-Kimbata, several varieties rejected by PRONAM in a varietal trial in the area are being cultivated in the village forest fields. When asked about the performance of these varieties, the villagers responded favorably.

There are three maize varieties planted in the survey area -- a white variety that is linked to Kasai I, a yellow variety, and a red Chinese variety. Usually only two of the three are found in any one field.

There are three main varieties of seed gourds that are distinguished by the ease with which the seeds can be separated from the seed coat -- two varieties require pressure (cracking the seed coat between the teeth), and one can be shelled by hand.

The peanut variety currently planted was introduced by the Belgians in the fifties. According to one group of villagers, they appreciate the "new" variety because it is easier to harvest. When the plants are pulled, fewer fruits stay in the soil and there is less hoeing necessary to remove the remaining fruits. Another group of villagers appreciates the "new" variety because it makes better peanut butter. Some villagers still plant the traditional late variety as well.

b. Cultural Techniques. Manioc, maize and peanuts are planted on flat seedbeds that are essentially not tilled except to loosen the soil where the planting material will go. In Kilunda and Kwilu-Kimbata, two manioc stems are placed horizontally with 1-1.5 meter spacing between plants. In Kapia one stem is placed randomly with no regard for position of the nodes. The stems vary in length from 25-80 centimeters, and there is no consideration given to optimum diameter or freedom from disease.

The maize is planted with from 3-7 seeds per hole and spaced one meter apart. There is little attempt to remove extra plants and one can find three or four stalks of maize in one location.

The peanuts are planted two seeds per hole in a 30 cm x 30 cm spacing. Because there are usually fruits not recovered during the first harvest, there can be fairly large stands of peanuts with almost the original spacing in the second season.

In the savanna, tillage operations occur at the time of land clearing. The soil may be worked at this time to a depth of 10 cm. After burning there is no additional hoeing. Plant spacings are those observed in the forest fields.

Weeding is done in both savanna and forest about a month after planting peanuts and maize. A second weeding is accomplished after the harvest of peanuts and maize and occasionally a third weeding of just the manioc is performed. This is relatively uncommon.

Villagers use hoes and machetes to perform their field operations. Many of the tools are made and bought locally. The local tools are lighter and less expensive than those from the factory and are much preferred by the villagers although they are not as durable.

No fertilizers or any other chemicals such as pesticides are used on the fields. The village gardens receive household wastes but this practice of composting is not used in the fields.

The villagers did not perceive that disease of manioc might be limiting their production. Mosaic, anthracnose, bacterial blight and green spider mites were observed in the fields. There was some indication that rosette was causing a problem in the peanuts and some streak was observed in the second season maize. Insect damage was observed in the maize both in the field and in storage. Mice also were cited by villagers as pests that attacked their stored produce.

c. Livestock and Fisheries. The animals most commonly observed throughout the three collectivities are goats, sheep, pigs, poultry (chicken, guinea hens), ducks, pigeons, cattle, and guinea pigs. The management system tends to be extensive with the animals roaming freely throughout the villages and fields.

In Kilunda, there had been a problem with widespread destruction of village fields and resulting famine. The collectivity agricultural agents banned free roaming animals in the villages, a ruling readily accepted by the villagers. If they want to keep animals, they must keep them on clan lands far from the homes and fields. Occasionally one can see a home and land fenced off within the village where there will be several goats and maybe some sheep. These individuals had kept their animals enclosed prior to the ruling and are allowed to keep their animals enclosed on their land now. As a result of this ruling, there are much more extensive gardens around the

village houses than one sees in Kwilu-Kimbata or Kapia. The same crops are grown in the gardens and in the fields -- manioc, maize, peanuts -- as well as vegetables and some medicinal plants. The only animals that roam freely in Kilunda are ducks and chickens. In Kwilu-Kimbata and in some parts of Kapia, scavenging animals still cause significant damage to agricultural crops resulting in conflicts between villagers.

Cattle raising is not very common in the surveyed collectivities. Herds tend to be small and they belong to village chiefs, notables, and a few farmers. The animals usually roam untended although some richer individuals can afford to have young boys act as herders. Several of the farmers use corrals for the livestock at night. No use is made of the manure which accumulates in these areas.

The cattle as well as other animals are kept primarily as a bank account and for ritual activities -- dowries, celebrations. They do not represent a significant source of family protein or cash income on a regular basis. Meat is seldom consumed more than once a week but can be found more in Kapia and much less in Kilunda.

Pig production is even more limited throughout the area. The general feeling of the villagers is that pigs are more destructive than either sheep or goats. At one point in time, pairs of pigs were given to young men who completed training courses at DPP. The extent of pork production in the area because of this intervention is unknown. In some villages, pigs are banned because of the spread of diseases.

In Kapia, poultry production is better managed than in Kwilu-Kimbata and Kilunda. Each family has constructed a special house elevated on sticks where the birds can roost for the night. These dwellings are constructed of bamboo and many have ladders to facilitate the entry of the birds. There are similar houses constructed for the pigeons. Besides scavenging the poultry is occasionally fed manioc and corn. In Kwilu-Kimbata and Kilunda some individuals collect the poultry at night and keep them in crude structures attached to the kitchen, granary, or house.

In Kwilu-Kimbata and Kilunda fish ponds are better developed as a result of previous Peace Corps intervention. The number of ponds owned per individual ranges from 1-8. There are two types of ponds -- one for fish production that is the domain of men, and one that is used by women to wash their manioc and secondarily for fish production. The former are emptied twice a year and the latter are emptied to change the water every two weeks. The ponds were originally stocked with fish brought in from rivers such as the Gobari or from the Peace Corps or DPP pisciculture projects. Generally speaking the ponds are not well managed. People do not have the habit of feeding the fish but rather let them eat whatever is present in the pond. The stock has degenerated and it is uncertain that optimal production could be obtained with improved management techniques without introduction of better breeding stock.

The fish ponds represent both a source of protein in the family diet and a source of cash for villagers. The fish can be sold for human consumption or sold to individuals who are starting their own fish ponds.

Most villagers have had little to no regular contact with veterinary services. In southern Kwilu-Kimbata agents of Lusekele provide vaccination programs for the animals and other veterinary supplies, but elsewhere these services hardly exist. Periodic Newcastle epidemics affect the chickens and the larger animals suffer from abscesses and bouts of diarrhea.

d. Natural Resource Exploitation. Hunting and gathering are important activities in the forest and savanna areas of the surveyed collectivities. In the forest, wild fruits, yams, leafy vegetables, caterpillars, mushrooms and medicinal plants are collected by both men and women. Community hunts as well as individual hunting provide protein to the diet of villagers, particularly in Kapia. Certain of the forest areas are set aside as reserves for hunting and gathering. In these areas men hunt with bows and arrows, guns, and set traps.

In the savanna, traps are also set and the grasslands are regularly burned to facilitate hunting of antelope and other small game. Game is not as plentiful in these areas as in the forest reserves. Mushrooms and other wild plants, insects and caterpillars are also collected in the savanna.

In the forested areas of Kwilu-Kimbata and Kapia, there are groups of lumberjacks who harvest trees and make planks that are sold locally for 150 Zaires apiece. There are some carpenters who produce furniture and tool handles. Caners plant their own raffia for use in crude furniture and household tools.

e. Transformation and Storage of Agricultural Products. Most mornings the village women spend several hours in some activity associated with the transformation of manioc. After the tubers are harvested, they are soaked in a stream for two to three days depending on whether they are destined for consumption or market and whether they have had the outer bark removed or not. If not before, the bark is removed after soaking, and the tubers are washed and put out to dry on racks over a fire in the forest (Kapia) or on racks in the sun in the village (Kilunda, Kwilu-Kimbata). Drying racks in Kwilu-Kimbata and Kapia are higher off the ground to protect the produce from scavenging animals. After drying, the manioc can be stored for up to two months until it is sold or used within the family.

In Kapia, the manioc that is dried over a fire must undergo two additional steps: the brown coating from the fire is removed, and the manioc is dried in the sun briefly before storage.

Throughout the area, manioc is consumed either as a dough prepared from manioc flour (luku) or in a boiled, pounded form called chikwangué. Pounding the dried roots for luku takes an hour a day of the women's time. Chikwangué is prepared two times a week (5-6 hours/week) since it can be stored over relatively long periods of time depending on the process used in its preparation. The tubers are used immediately after being washed or after only a brief period of drying in the sun. They are steamed in a vat, pounded and rolled in leaves. In some areas, the chikwangué is cooked and pounded a second time, in others it is consumed directly (see individual village reports for more details).

According to women, one of the most burdensome tasks they have is the transportation of the tubers from field to stream to drying site to village to market. All transport is by head carrying. Often the fields are some distance from the streams and there are steep slopes to be maneuvered. The time involved in the processing does not seem to be as important to the women as the transport. In some cases the women used a more time consuming method of chikwangué preparation because they preferred the taste of the finished product. At certain times of the year drying becomes a problem (during the heavy rains) and there can be a lack of manioc available for family consumption.

Most manioc storage is in the kitchen. The smoke and heat provide additional drying and fumigation against insect pests. In Kapia, special bins are constructed in the kitchen for manioc storage. In other areas, the manioc is stored in baskets or sacks in the kitchen.

Maize is generally field dried for at least a month after maturity. In Kapia, the maize is left in the field until it can be sold in April. The stalk is left upright and the irregular wetting and drying probably reduces germination potential and grain quality, and enhances the insect damage. In some parts of Kapia, special storage structures for maize have been constructed. These look like small houses. The granaries do not contain maize during the growing season indicating that the surplus is not large enough to allow for family consumption up to the next harvest.

In Kwilu-Kimbata and Kilunda, when the maize is brought into the village, it is dried in the sun and stored in its husk on racks in the kitchen. The kitchen fire provides additional drying and the smoke is a fumigant against insect pests. Before the sale of maize, the kernels are removed by hand and put into sacks. In some villages, maize is consumed roasted, boiled, or pounded into flour and mixed with the manioc in the luku. In all areas most of the maize production is for sale.

After harvest of the seed gourds, they are left in the fields to rot. This makes it easier to extract the seeds. The fruit is pierced with the blunt edge of a machete and left to rot either covered by palm fronds (Kilunda, Kwilu-Kimbata) or open to the air (Kapia). After a week, the seeds are removed, placed in a basket, and taken to the stream and washed. The seeds are then spread out to dry in the sun. When they are dried, they are stored in gourds or baskets in the kitchen. In the afternoons when women are feeding children or visiting with neighbors, one can often see them cracking the seed coats with their teeth and extracting the seeds. In parts of Kapia some seed is sold to traders.

Peanuts are stored in their shells after being dried in the sun. They can be stored in sacks covered with leaves on the drying racks, stored in special containers in the kitchen, or in specially constructed exterior granaries. Peanuts are consumed raw, roasted, or crushed in a sauce. Most peanut production is for sale and only a small quantity is kept for home consumption and as a seed source for the following year.

5. Local Economy

a. Economic Balance among Agriculture, Local Manufacture and Commerce. Kilunda's cash economy depends entirely on the sale of palm oil and palm kernels, and on the markets as a source of manufactured goods. Kwilu-Kimbata varies by area: the north is totally dependent on CDR (Djuma) to market its produce and to bring in manufactured goods; the south on the PLZ palm company for money (palm cutters' piece rates) and scantily provided manufactured items; and the center partially on the PLZ, though it has developed two locally based small truckers. Both collectivities show no signs of any change in the future on these points, unless 102 intervenes.

Kapia, however, has active local industries to fill local needs, as well as a high level of imports from Kinshasa brought back by local traders carrying produce to the capital. Local manufactures include raffia cloth, rustic raffia-wood and high-quality hardwood furniture, baskets and mats, and pots. Even without 102 the collectivity is likely to see an increase of food exports as well as imports of non-local goods and local manufacturing.

Non-local goods in greatest demand throughout the region are simple ones: soap, salt, lanterns and oil to put in them, matches, cloth and used western-style clothing, low-cost dishes, cups and casseroles for cooking. In Kilunda and especially Kwilu-Kimbata these items are very poorly supplied. Medicines are also very difficult to get in most places, even where there are dispensaries.

Blacksmiths in the region work with light-weight metal and cheap tools. In Bulungu Zone they tend to be Hungana or Mbala, and are found within their own villages, one or less to a groupement. In Idiofa Zone there is a group of Pende and Bambunda smiths who work out of Idiofa and sell to village traders, and isolated Dinga blacksmiths working in some villages. They make the lighter hoes that are often preferred by the women, arrowheads, and little else. Local smiths' prices are lower than the comparable industrial goods and their products much easier to obtain.

b. Food/Cash Crop Balance within Agriculture. Kilunda's agriculture is subsistence, with little perspective for significant marketing until major research and extension investments have been made. The south of Kwilu-Kimbata is similar but could increase its sales from present-day production if traders would come to buy. Kwilu-Kimbata's center and north have the potential for major produce sales, although today they still eat more of what they produce than they sell. Kapia already sells more than it eats, eats very well, and promises to sell still more in the future.

Manioc is a poor commercial crop for the area. Only during certain months (especially September to December) does the price in Kinshasa rise high enough to make it attractive for traders to buy in the Kwilu area for export. These months are ones in which local fields are nearly fully harvested in most places and heavy rain prevents large-scale drying of the root for sale.

Present-day cash crops in Kilunda are palm oil and kernels; in Kwilu-Kimbata, palm regimes in the south and manioc in the center-north, followed by coffee, maize, peanuts, punga fiber, and Rauwolfia bark; in Kapia, maize and manioc share equal place, followed by peanuts, seed gourds (courge), raffia wine, coffee, punga, and Rauwolfia. These latter two products interest the villagers primarily as a means to attract the traders. Truckers will come for these products, pay too little for them to justify the labor input, then fill up their trucks with the villagers' manioc. Urena fiber, a semi-domesticated plant found more rarely in the same areas as punga, brings a higher value.

c. Crop Profitability

Kilunda has little choice of profitable crops. Locally processed palm oil is very profitable where the presses (malaxeur) are permitted. The collectivity chief seems to enforce the ban on presses variably throughout the collectivity. Some villages have many presses and pay an annual 2.500Z fine per machine, other with a few machines fear confiscation, and in other villages the collectivity is said to have confiscated them all. Palm oil pays 100 percent more to the villager than the sale of the regime would, and his wife is left with the palm nuts to break open for the kernels, which sell

for 22 per kilo in the market. Palm oil is sold by local men who transport it to Kinshasa on rented trucks and return with manufactured goods for local sale. Some is also sold locally to villages which don't have their own oil presses.

Another option for Kilunda is the development of the Gloriosa flower as a cultivated crop. It is sought by buyers for processing in Kinshasa for medicinal uses.

In Kwilu-Kimbata, existing production is sufficient to permit higher levels of sales of manioc, maize, gourd seeds and coffee than already exist. With better varieties and cultural methods both Kwilu-Kimbata and Kapia could extend their sales and profits still further. In Kapia, project help in training or commercial promotion of raffia cloth for export might make a valuable sideline.

In all three collectivities, there is a strong local demand and export potential for fish if training can be provided to upgrade the local fishponds. Demand for beans would be similar if they could be locally adapted, as would potatoes in some areas.

d. Effects of Government Policy. Despite the national government's liberalization of agricultural price controls, the majority of groupement or village chiefs continue to fix produce prices, and their citizens strongly approve. In some areas the villagers insist that the "collectivity chief has set the price" at a level higher than regional norms (thus driving traders away when the villagers insist on abiding by it), in others, where transport costs are no higher, villagers cheerfully report "collectivity" prices lower than elsewhere in the region. In both situations, villagers are hurt by their lack of pricing information.

The team divided over the question of the effects of the policy of "imposed fields". Supporters of the policy of enforcing a 0,5 ha field per adult cite the greater ease of statistical data collection on agricultural production, the need to force certain lazy villagers to grow their own food rather than steal it, and the ability to force a village to give land access to some people who might not have traditional land rights. Others note that some monagris use the system to extract punitively high fines for minor offences, and that the time spent in monitoring fields limits the amount of time available for true extension work of the kind envisaged by 102.

The policy of creating a "farmer" class, with individual property rights and tax obligations, has had variable results. Most of Kilunda's farmers and some in Kapia are inactive. The forest land they occupy is used primarily to raise a few cattle and keep some traditional fishponds, and their tree plantations are neglected and unproductive. Land conflicts have erupted in some villages where the forest land is scarce.

In Kwilu-Kimbata and parts of Kapia, farmers are extremely active in several crops and types of livestock production. They try new crops and techniques, sell a lot of produce (at least locally), and have formed associations to try to advance their interests. They could be one channel for developing local trucking, seed multiplication and on-farm trials.

In general, the tendency in customary land tenure is toward individual holdings, and the farmers in the future may look little different from other villagers. The provision of individual property rights is probably necessary to the continued expansion of coffee and other perennial crops in the area.

## 6. Marketing and Transportation

a. Infrastructure. Roads and/or bridges are a major constraint everywhere except in Kilunda. In Kilunda and southern Kwilu-Kimbata, the palm companies maintain the roads at reasonable standards; but the latter collectivity (and those to the north and northeast of it) are effectively cut off from private traders by the lack of bridges across the Kwilu. Whether traders shun the existing ferries for their long delays (sometimes up to an hour) or for the bribes they may have to pay to cross, has not been determined; but the traders that go frequently to Kilunda and its south-western neighbors rarely if ever appear in Kwilu-Kimbata to buy produce at the same prices. CDR tries to maintain the road system in northern Kwilu-Kimbata but needs help.

In Kapia, roads formerly maintained by the trading companies have badly degenerated since the demonetization severely reduced trader capital. The companies charged with maintenance are supposed to receive a regular stipend from the government but little of it is said to arrive. Kapia roads are at their worst on the approach routes to the port city of Mangai and on those to major villages 10-20 km off the truck routes.

Trucks rarely visit the villages away from the port towns in Kapia, except during the formal marketing campaign from April to June. Villages near the truck routes from the Kasai to Idiofa can often flag down semi-empty trucks returning to Kinshasa, and rent space to carry produce. This is also an option for villages along the Bandundu-Kinshasa route in Kilunda. From Kapia, a truck ride to Kinshasa currently costs 600Z for the passenger and 30Z for each sack of produce, which makes manioc just barely profitable for a village-level trader at the low point of the price cycle, if he also buys consumer goods in Kinshasa to resell at home.

River traffic is heavy on the Kasai, and Kapia contains two of the major river ports in Bandundu, Mangai and Dibaya-Lubue. Traders at Mangai report that they use private barges rather than ONATRA, due to theft problems on the latter. There is also a loading site near Djuma on the Kwilu, but it has been very little used since the demonetization because local traders who provided the transport to it have disappeared.

Communication among villages and with the government administration in the collectivity headquarters is almost exclusively by foot. Messages may be sent with passing trucks and occasionally a government person may get a ride with a mission car or commandeer one of the companies' trucks to do a tour.

b. Markets and Alternatives. Markets are held once every two weeks in large villages (usually a groupement center). The principal attraction is the presence of one or more truckers who have come to buy maize and peanuts (during the campaign), palm kernels, manioc, and the pharmaceutical roots and flowers collected by a few villagers. The markets also attract large numbers of petty traders who walk or bike to the towns to buy cheap consumer items to resell. The petty traders go to from 4-12 markets during the two-week cycle, depending on whether they have saved enough to buy a bike. They pay an annual trader tax (70%) to the collectivity but nothing to the groupement chief that runs the market. Local women move their cook-pots to the market to sell prepared foods, and women walk in from surrounding villages up to 15 km away with a basket of manioc or palm kernels to sell. Traders are all men and produce sellers/shoppers are almost all women. A few traders also set up small pharmacies with penicillin, tetracycline, aspirin, analgesics; the customer decides what he needs and buys it.

Village shops (boutiques) are usually tiny affairs, with a sub-sampling of the consumer goods found at the market and varying stock levels. They often buy local manioc or palm oil to sell in bulk in Kinshasa and purchase manufactured goods to restock their shelves. They suffer from management and cash flow problems. Stores (magasins) are larger versions of the same found in towns like Mangai and Bulungu, usually connected to a company with several trucks that buy in the villages. Kapia companies used to keep shops open in the larger villages, but closed them because their agents would often abscond with the till or the stock.

Markets are strong in Kilunda (where the collectivity has forbidden truckers to buy in the villages in order to inventory produce sold) and its neighbors to the south and west. The groupements studied have access to 2-4 markets and 1-2 local shops each. In Kwilu-Kimbata there is only one market in the central area and one near Djuma. The only shops are at Djuma and in the PLZ worker camps, where the workers buy up most of the stock. Kapia has no markets because distances between villages are so large, and shops (except for tiny outlets run by local youths) are only found at the four sub-collectivity Bureaux Auxiliaires.

Visits to the villages cost more to the trucker, and are prohibitive where quantities are smaller, as in Kilunda. Sales through markets, on the other hand, severely limit the produce that can be brought to sell and are prohibitive to the villager where the average distance between neighboring settlements exceeds 5-10 km, as in Kapia. Payment is almost always in cash

everywhere. Credit is practically non-existent but is supplied by local boutiques in parts of Kapia to known clientele.

Produce prices fluctuate with the national ones (Kinshasa), being highest for manioc in the wettest months (September - December) when transport and root drying are hardest, and for maize and peanuts in June to August, when the first scramble to buy after the April campaign opening is over. Traders in Kapia said they do not compete on price, but on quantity: each tries to buy up as much maize and peanuts as possible before their rivals can get to the villages. In South Kapia some villagers expressed a fear that, if they hold back produce hoping for a higher price, trucks will not return later to buy it. Villagers nearer the port towns have no such problem and try to hold some/all back until August or even later. Renting space in a truck to ship your own maize is not an option, because most of the maize goes east to the Kasai. Returning trucks are already fully laden.

The trading companies that come into the region are located in the following towns:

to Kilunda/Luniungu: Bulungu; Masi; Belmiese, Bwalayul/Mokamo, Zaba, Mosango;

to Kwilu-Kimbata (primarily during the campaign):  
South: 1 local trader, 2 Bulungu, none still coming;  
Center: Bulungu, 2 local traders, Kikwit, Kinshasa;  
North: Djuma; Bandundu, Bulungu, Kikwit, Kinshasa;

to Kapia (primarily during the campaign):  
Mangai, Dibaya-Lubue; Buluem, Idiofa, Ilebo, Tshikapa.

The traders in Bulungu and Mangai cite their problems as: lack of credit (since the demonetization), peasants' suspicion (refusal to sell when they decide the price is too low, inclusion of debris in produce), bad roads, stealing by their own agents and on ONATRA barges, and occasional localized monopolies by one trader native to the area. When peasants refuse to sell or a local trader takes the cream of the produce offered, the other trucks which come may have to return nearly empty, and eventually stop coming.

## 7. Social Organization

Understanding of the social organization in the region is basic to development of useful intermediary organization strategies. An overview follows:

a. Village Structure. Local political hierarchies extend from collectivity chief through groupement chief (head of the original settler clan in the area), village chief (ditto), clan chiefs, extended family heads, to nuclear family heads. Occasionally one or another of these is female, and frequently

they are young, having been named by their respective clan as the most appropriate replacement for a dead uncle. The party hierarchy is usually con-founded with the traditional one in practice. Chiefs are sometimes seconded by a capita, others by a dirigeant, and advised and/or watched by a council of clan chiefs, sometimes with 1 to 5 notables named for their understanding of village interests. Some villages appoint a condition feminine representative, a woman party official responsible for village hospitality and representation of women's concerns. When women take chiefly roles, they are viewed as representing everyone, not only women.

b. Conflict. We found villages with from 2 to 22 clans. Some or all clans in a village have come in as first settlers; others are the result of first-settler schisms; and occasionally one finds a stranger or "slave" clan that arrived too late to lay claim to land and has to make arrangements through in-laws to gain access.

Clan splits are alternatives or preludes to village splits. Splits are often the result of quarrels over financial issues: fines or major loss to some clan member for which other members are asked to contribute cash. Especially common is a growing rift as some part of the clan becomes wealthier and the others expect larger contributions from it. Rather than continue, the richer part forms a new clan. Splits within clans and villages are also caused by personal rivalries leading to fighting and accusations of sorcery. Damage to crops by straying animals has grown as a cause of conflict since cattle were introduced in the 1960's. Generational conflicts between old and young are also often mentioned. Strangely enough, despite the deteriorating land:human ratio, conflict over land is firmly denied in all the villages except for one former instance in Kilunda.

Sorcery is a major vehicle both of conflict and problem-resolution. Sorcerers steal others' crops, or protect their own by killing the thief, or by killing others who they feel have caused them injury. Sorcerers usually work for the benefit of their clan, may work against that of others, and may get swelled heads and turn against their own. Sorcery is considered to be behind any decline in crop yields, or any unreasonable increase in them (such as PRONAM's better yields with different cultural techniques). Introduction of new techniques can be considerably retarded in the presence of such beliefs.

c. Land Tenure. Land is held in common by the clan, but there is a growing tendency toward individual property rights in all the collectivities. Legally and traditionally the land belongs to the state, to the groupement, to the village, to the clan, and finally (in most places) to an extended family within the clan. Customarily individuals have a right to return to their own fallowed land, especially in the forest. Forest is becoming scarce enough in most places that the loose rights of an extended family to a specific part of the forest have consolidated, and individual nuclear families have an established right to specific sub-sets of that land. Except in parts of Kapia

there is no "new" forest for over-populated families or new immigrants to expand into.

Savanna (grassland) is another category. In all villages individuals can plant in the grasslands wherever they want, with the tacit or explicit approval of the village or clan chief. In Kilunda, land is scarce enough that the right to return to the farmer's previous fallow is being extended to the savanna as well. "Stranger" clans in some places are allowed to cultivate only in the savanna, and where straying goats and cattle make that impossible strangers such as school-teachers must buy all their food. The monagri, in consultation with the clan/village chief, selects savanna land for the imposed fields, although in Kwilu-Kimbata and Kapia he allows those who have planted a sufficiently large field in forest (almost everyone) to forgo the requirement.

Permanent crops, including farms, must be approved by the groupement and clan chiefs, and in Kapia, by a local assembly if the claimant is a stranger. In part of Kilunda conflict has arisen over the appropriation of forest land by inactive farmers.

d. Associations. There are no associations in the villages beyond the traditional/party hierarchy. The only groups found with any structure at all are (1) a number of young women's contribution clubs within the clans of Lundu, Kwilu-Kimbata: members tax themselves at irregular intervals to pay for presents to a newly wed, a new mother, or in cases of sickness; and (2) a variety of farmers' clubs, some having sociability as their prime concern and others farm work and study groups.

The traditional hierarchy occasionally takes village-wide decisions: the banning of livestock from cropping areas, fines on owners of marauding cattle and small ruminants, establishment of forest reserves, and establishment of a four-village health society to build a maternity.

There are two cooperatives in the region: a savings and loan cooperative at the Djuma mission to which a few farmers and villagers belong, and CODAPAL at Kasangunda, Kapia. The latter is the only formal cooperative registered in Idiofa Zone. It works in cattle, crops, and lumbering, and hopes to get into commerce. Its agricultural activities began this year and it aspires to use modern agricultural techniques without the aid of a trained agronomist who can teach them how. They also suffer from ignorance of basic accounting, but seem genuinely interested in the development of their region. There are also a large number of pre-cooperatives of varying degrees of seriousness and stability; some share only in herding or financing of beer parties. None in the villages we visited could be considered as potential cooperatives within the near future. DPP's attempts at cattle cooperatives over a twenty-year period have been mostly failures, and they are now trying general agricultural marketing crops. They are apparently not providing the follow-up management advice needed to get off the ground once the idea of a cooperative has

been accepted. Cooperatives in the area also face the problem of a long history of village/clan schisms over money issues.

e. Ethnic/Religious Identity. Ethnicity and religion have no noticeable effect on the agricultural system or anything connected with them, except that in one site the team felt that the Lusekele agent was ignoring the non-Protestant villagers in his extension work. The missions, whether Catholic or Protestant, carry out their health and most of their educational and agricultural work without respect to creed. Most villages have significant minorities of another creed: we worked in 5 Protestant, 3 Catholic, and one mixed village. There are a few Kimbanguists in some of the villages and an unidentifiable number of "pagans".

We worked in two Mbala groupements, one Yansi, one Songo, and Dinga; one groupement with separate Dinga, Shilele and Babunda villages, one with separate Hungana and Mbala villages, one in which Yansi, Mbala and Hungana share villages, and a final one in which these three plus Ngongo share villages. In no one of the mixed groupements or villages is there a difference in farming methods, except that in Kilunda the recently arrived Mbala and Hungana are not allowed access to the forest. Elsewhere the co-habitation goes back to the beginning of the century or earlier, and the tribes have occasionally intermarried and understand each other's dialects. Shared identity revolves around the clan, village, and groupement, not the tribe.

## 8. Extension and Research Systems

a. Local Acceptance of New Technology. The Kwilu Sub-region is practically virgin with respect to agricultural introductions. Since very little new has been tried, very few villages have negative experiences to make them wary of future innovations. We encountered only the specific cases in two villages of a phobia about chemical fertilizer (based on migrant farmwork near Kinshasa) and disappointment after planting irrigated rice seed distributed without cultivation instructions by a company in Mangai. Many people were theoretically interested in trying out new crops like beans or potatoes, improving their traditional fishponds, getting better seed for local crops.

F-100 manioc has made a big impression everywhere it has been distributed in the savanna. Its planting material has been rapidly and widely diffused in the villages that have had multiplication plots. The recommended planting practices that have gone with it (that, in the opinion of Kiyaka, have more yield-raising potential than the variety itself) have been very little accepted. There are several sources of resistance. The new methods - turning under the weeds, selecting healthy stems and ensuring they lie right side up - require more work and a change in long-standing habits of hoeing. Villages, groupements or local areas define themselves partly by the "way they plant". Rather than admit that another cultural method is better, people can attribute unusual yields to the use of sorcery. Only convincing several families in each village to try out the comparison themselves on small plots is likely to change these prejudices.

b. Existing Service Institutions. Government agricultural services are restricted in most cases to the delimitation of fields and the pre-campaign inventory of maize and peanut harvests. Two of the three villages in Kilunda and one in Kwilu-Kimbata reported being frequently fined by the collectivity agricultural assistants (monagris). In two Kilunda villages the monagri intervened to ban livestock from the village to protect fields. The veterinary assistants (monivets) are rare; the only one mentioned was rated "ineffective", as was FOMETRO's attempt to eliminate bovine trypanosomiasis in part of Kwilu-Kimbata. The monagris do not have enough manpower to do the work they are assigned (delimitation and monitoring), except in Kilunda. There the collectivity has hired additional ones and, apparently, urged them to collect fines to pay their salaries. PRONAM's manioc multiplication is the only government service doing extension which is widely well regarded. PPF (PCV fish culture) has only briefly reached a few villages in Kilunda and Kwilu-Kimbata; afterwards the fish species rapidly deteriorated.

The religious organizations doing extension or marketing in the area are Lusekele (Protestant) in Mikwi just north of Kilunda, CDR (Catholic) in Kwilu-Kimbata, and DPP (Catholic) in Idiofa.

Lusekele is most apparent in the villages we visited. In Kilunda, the agent near one village was judged useless, another sold some inputs (primarily tools) without instruction on use, and the third provided some technical assistance with the vegetable seeds he sold. In Kwilu-Kimbata, there are two agents near Tango (and none near Djuma or Mayoko); one does the agricultural work, putting out demonstrations for the new seeds and selling seeds and tools; the other, the veterinary, vaccinates the poultry annually, cares for livestock and sells veterinary products. They are both well regarded. Lusekele does not put enough time into following up and evaluating agents, and seems to judge them more on their evangelical qualities than on their extension or technical skills.

CDR is run by a Belgian priest who centralizes all operations in his own hands, and considers extension of new agricultural ideas or inputs as a waste of time; he will only work in marketing, though some of his junior Zairian staff are more interested in extension. They did some extension work in the past, including varietal testing for PRONAM that resulted in several varieties "escaping" into the area that are locally preferred over F-100 for forest conditions.

DPP has a very broad, indeed overextended operation throughout the Idiofa Diocese, which includes Idiofa Zone and part of Kasai. It tries to work in marketing, community organization, technical agricultural training, extension, and processing. It works through four subcenters, none in Kapia itself.

Several people in the villages have been influenced by its programs at Laba Training Center to improve fishponds and produce coffee. The upland rice growing in the area was introduced by DPP, which in the past was the major marketing outlet for that crop. The CODAPAL cooperative had been started with DPP encouragement and a cattle loan fourteen years before it became a real cooperative. It has received no useful help, technical or material, since.

Because DPP is so overextended and its technicians poorly trained, there is little follow-up to its interventions. They do not do sufficient training in cooperative management or in fish culture, and their marketing activities have become increasingly limited because of capital constraints.

**APPENDIX A:**  
Village Reports, Kilunda

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### Collectivité de Kilunda.

- ~ Fleuve --- limite
- x- route et village
- P paroisse
- c chef-lieu
- M mission

