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PADDY AND RICE  
MARKETING  
IN  
ZAIRE

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Pragma Consultant  
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## PREFACE

This study was completed under an agreement between the Pragma Corporation and the author for the 070 Ag Sector studies project funded under a grant by the United States Agency for International Development. Its preparation involved both the review of existing literature and the development of a specific methodology to collect field data. In addition, a large number of individuals both in the private and public sectors were interviewed including small, medium and large farmers, traders, mill owners, and government officials. Special attention was paid to tracing the commodity from the production to the marketing and consumption phases in order to collect and analyse reliable data, and provide recommendations for improvements.

The following institutions were contacted during the course of this study:

- |          |                        |              |
|----------|------------------------|--------------|
| - ONATRA | - ECONOMIE NATIONALE   | - ANEZA      |
| - SNCZ   | - CECOPANE             | - PNR        |
| - ONPV   | - DEPT. OF AGRICULTURE | - FAO        |
| - OFIDA  | - DEPT. OF FINANCE     | - WORLD BANK |

The private sector entities contacted were:

- |            |               |                       |
|------------|---------------|-----------------------|
| - COMAGRIN | - ISSIA FRERE | - GRISA               |
| - SAICOM   | - SOTEXCO     | - Other small traders |

The full cooperation received from the above public and private sector entities is hereby acknowledged and appreciated.

## INTRODUCTION

1. Scope of study. Marketing can be defined as the performance of business activities that direct the flow of goods and services from producer to consumer or user (MATHIEWS, 1969).

Actually, marketing activities imply physical structures and operational mechanisms sometimes not clearly defined. Essentially, marketing deals with agricultural products that involve considerable number of agents such as producers, middlemen, consumers.

Moreover, there is not a clear-cut delineation between those economic agents. The purpose of this study is to make a diagnosis of the real situation of rice marketing in Zaire, to identify various economic agents who operate between the producer and the consumer in order to analyze the mechanism which supports the present structure.

As a result of this study, an appropriate strategy can be set up for breaking the bottlenecks or constraints that will ensure an efficient pricing policy and system on a medium and long term basis.

2. Methodology. The work started in Washington D.C. and continued in Kinshasa (Zaire) by a survey of the literature and documentation related to this subject matter. Moreover, a field survey in the regions of Equateur, Haut-Zaire, and Kivu was taken in order to have direct contact with the marketing chain and develop a reliable data base from the rice farmers, merchants, owners of rice mills and the transporters of the grain. A questionnaire was drafted with the participation of Citoyen KAHINDO, who translated it into the local dialects. This questionnaire which deals with the scope of work to be done enabled the following accomplishments:

1. Analysis of the existing marketing structure in Zaire, with emphasis on the main production and consumption areas
2. Analysis of marketing process, distribution and margins, supply costs, price mechanisms and demand.

The data collected was processed, tabulated and is presented in this

### 3. SUMMARY

Zaire with a vast area of 2,200,000 square kilometers and a population of 28 million had not reached food self-sufficiency in 1981. High population growth, combined with accelerating urbanization after independence, raised the demand for food products at a rate which local production could not meet.

This deficit was particularly pronounced with regard to rice, which has become a specifically urban food product. As indicators of this deficit, we observed that rice imports increased from 10,000 tons in 1975 to 15,000 tons in 1979, and decreased to 10,000 tons in 1980. Retail prices in Kinshasa during October, 1981 were Z7-Z8 a kilo for local rice and Z33 a kilo for imported rice.

What are the causes of this imbalance, a weak supply confronted by a strong demand? Can we pin it on low production? Is it due to post-harvest losses in transport, storage or leakages across the borders? Or is it the marketing system which is not moving out the crop from production areas.

The answer is certainly a combination of these different factors. The regions of Equateur, Haut-Zaire and Kivu supply 72% of the total production of rice, which is estimated at 144,000 tons in 1980, according to GOZ agricultural statistics. Production has been rising slowly since 1974: 3% in 1975, 5% in 1976, 13% in 1977, and 5% in 1978. This is due largely to a similar slow expansion in rice acreage. Rice production is largely in the hands of small farmers working small fields. Those cultivating less than one hectare amount to more than 97% in Haut-Zaire, 90% in Kivu, and 68% in Equateur.

Agricultural practices are traditional: shifting cultivation with low-grade seed and few tools other than hoes and machetes. Very little acreage is under irrigation or using some improved technology. These elements explain the low average yields: 800 kg. per hectare in Equateur and Haut-Zaire and 900kg. in Kivu. Moreover, the extension network is far too insufficient.

Bad roads and too few trucks explain the high cost of transport, reaching 40% of the millers' price of rice. Equally serious is the excess of obsolete milling equipment, often non-operable, either for lack of spare parts or for lack of credit. The inconsistency and basic lack of a national price policy and the impossibility of availing credit to small farmers has exacerbated the supply problem.

Home consumption varies by region : 30% in Equateur and Haut-Zaire, 40-60% in Kivu. Roughly 20% of the paddy is held for seed. About 50% is marketed in the main cities, particularly Kinshasa. Overall potential demand was estimated in 1980 by the millers and FAO at 230,000 tons. Post-harvest losses are unknown but probably amount to 10-15% due to poor transport and storage.

Improving the road network in the main production zones can cut the cost of transport in half, recuperating an estimated 20 K a kilo, some Z28 million on the 140,000 tons marketed. Modern milling equipment can improve yields 25% and overcome the deficit of 160,000 tons. Tissakin can produce and distribute enough sacks, perhaps in the long run from locally produced kenaf and jute.

The Departments of National Economy and Agriculture should set a national policy on marketing food crops.

#### 4. RECOMMENDATIONS

Zaire, which once exported rice, now has an annual deficit of 160,000 tons. That is the problem this paper addressed.

First priority goes to logistical requirements. Decent roads are needed to bring out some 200,000 tons of paddy. At least 10% is lost a year because of poor roads. Passable routes are needed to deliver the improved seeds and equipment, and to provide access for extension. Equally essential is the processing equipment which can provide a higher yield of rice from paddy, to reduce the deficit. Spare parts are essential; the entire production of a zone may not get out if the rice mill is out of operation.

It is essential to get the major marketing companies involved in the elaboration and execution of the tasks laid out in the following recommendations.

##### A) Improve Logistics

###### 1. Roads

Transport costs now amount to 40% of the final sale prices of a kilo of rice while paddy cost is only 1 Zaire per kg in Haut-Zaire or in Equateur. Improving the road network could reduce transportation costs by 20% of the final sales price, with the following savings:

- a) longer amortization, 7 years instead of the present 3 years;
- b) less fuel per ton/kilometer, and less spent on repair and maintenance, less broken parts and fewer worn-out tires.

To illustrate, a special charge of, say, 20 makuta, per kilo of rice marketed could provide a fund of 228 million, enough to maintain 18,000 km. of roads (1.500Z/km). This road maintenance, moreover, is an essential precondition for any increase in rice production.

The 10% of the rice presently left behind because of bad roads will contribute some 14,000 tons, at least, to the reduction of the deficit.

Further on, the net savings can be used to subsidize production inputs, before passing it on directly as an increase in the farmgate price.

###### 2. Rice Processing Equipment

The rice mills need modern, high-yielding equipment, like the equipment installed at the Ruzizi Project. The equipment generally in operation now has a low yield of rice from paddy, around 50%. This equipment, moreover, is so obsolete that it is practically impossible to get spare parts on the international market, which means that production which cannot be milled does not move onto the market.

Modern equipment gives a yield of 67% rice from paddy, an improvement of 25%. This can mean 35,000 tons increased rice on the market from the present paddy production volume, which in turn lowers the deficit to 110,000 tons, with the increased marketing resulting from improved roads.

Bank financing for this equipment should be provided for credit-worthy millers who have demonstrated their basic solvency and management capacity.

B) Increased Yields : from 800 kgs, average to 1300 kg/ha.

An increase of 500 kg/ha can be achieved with improved seeds, for which the farmer will pay 2Z a kilo or 100Z a hectare, and an extension ratio of one agent per 500 farms. This is a profitable investment : 100Z a hectare produces an increased net income of 400Z. Such an increase on present hectarage can more than cover the balance of the current deficit.

## I. AGRICULTURE IN ZAIRE

### RECENT TRENDS.

Zaire covers 2.2 million square km inhabited by about 28 million. The traditional agricultural sector and the modern sector represent 70 - 75% of the total population. In 1977 - 1979 this agricultural sector represented 25% of the gross national product. The modern sector has undergone a period of stagnation and even decline. Actually, it comprises two main categories or groups of producers:

1. Large commercial corporate farms using a high level of technology (about 800 at the present time) with an average size of 2,300 ha/farm and an average labor force of 300 employees.
2. Small units of production engaged in family type farming.

The modern sector grows palm oil, sugarcane, hevea, tobacco, coffee, cocoa and raises cattle.

The traditional sector, which involves 3 to 4 million small farms (1,5 ha average), has an average of 6 persons per family farm. The crop patterns differ among and within the regions, influenced by local traditions and habits.

Women play a key role in the agricultural labor force to such an extent that a positive correlation is formed between the amount of land cultivated and the female population available. Also of importance are demographic pressure together with shifting cultivation, which result in erosions and soil sterility in spite of a system of natural fallow.

Recent Trends: The agricultural sector has not met the objective of feeding the population; consequently food imports become an urgent and necessary need. While the country was an exporter in earlier years, Zaire has now become an importer of corn, sugar, wheat and beef. A number of social changes (employment, education, sanitation, urbanization)



## II. RICE PRODUCTION IN ZAIRE

### PRODUCTION OF PADDY IN ZAIRE.

Incentive for rice producer. The availability of irrigation or climatic conditions enabling the use of rainfall are not the only factors which stimulate farmers to produce rice. Other causes may also motivate them and drive them to grow a certain variety of rice adaptable to their land. Other motivations may be rooted in ancestral traditions. The field survey showed that paddy production is considered a cash crop in the areas under study.

Production areas. Rice is grown in the areas covered by the field survey including : Haut-Zaire, Equateur and Kivu, including swamps, located in other areas as shown on the map attached. For instance, Bas-Zaire (Cataractes), Bandundu (Kwilu), Kasai-Occidental (Dekese), Kasai-Oriental (Sankuru), Haut-Zaire (F.A.O., 1980).

Varieties grown. Local varieties adapted and grown in each Zone have been registered during the survey. Their relative importance of the varieties grown by region is shown in the table below:

Table II.

RICE VARIETIES GROWN IN ZAIRE BY REGION AND PERCENTAGE.

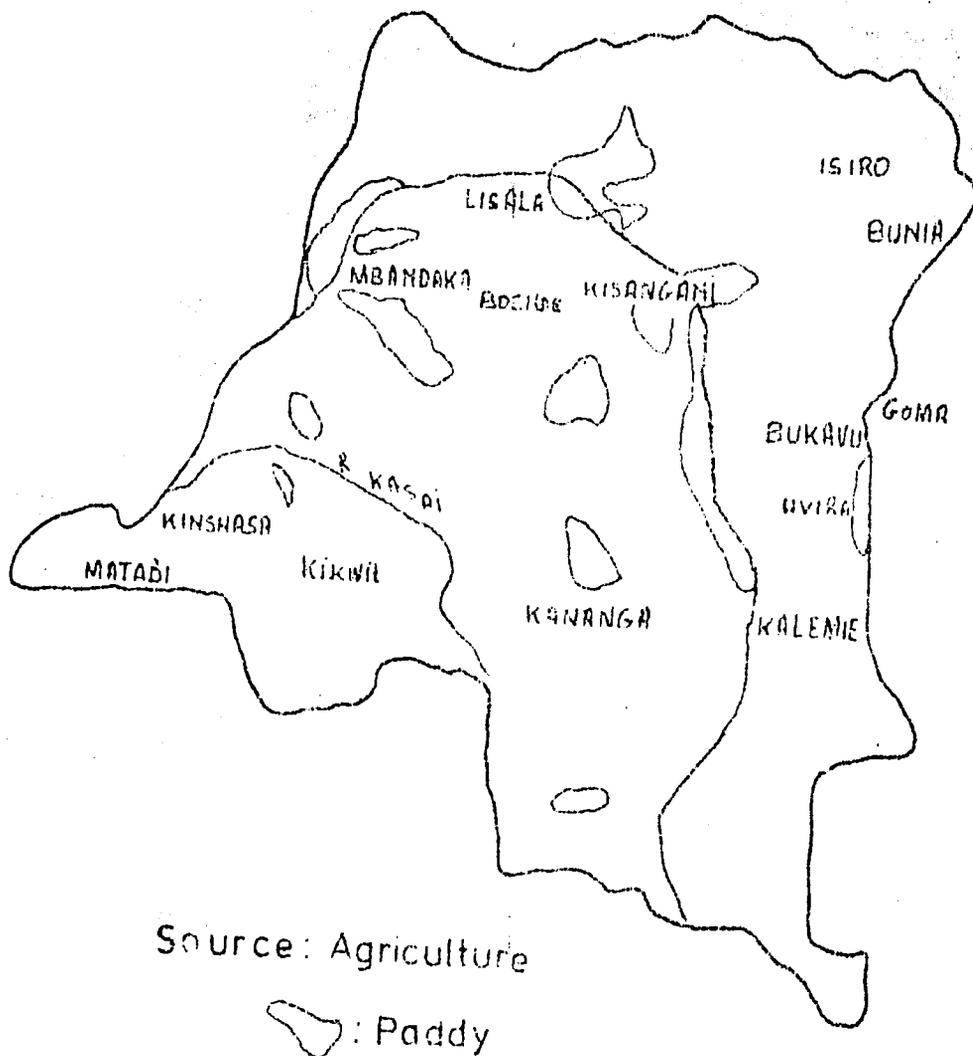
Regions	R 66	L 78	L7	KINJIN	IR20	IR5	CHIA 242
Haut-Zaire	78%						
Equateur	71%						
Kivu	2%	4%	67%	7%	83%		

Source: Field survey by George CONDE, September - October, 1981.

<sup>7</sup>  
Mountains and rice is grown in some forest regions, mainly in the Zone flooded by the Itimbiro (Haut-Zaire), in Bumba (Equateur), Basoko, Bongawisa, Lodja and in subregions such as Maniema (Kivu) and Tshuapa (Equateur). The rainfall in these areas is estimated to be 1,600 mm.

LA PRODUCTION DU PADDY AU ZAIRE

Paddy Production in Zaire



Source: Agriculture

: Paddy

Irrigated rice as well as upland rice production areas are located in the Center of the Chinese Agricultural Mission ( MAC ) in Ndjili, N'sele (Kinshasa), Mawunzi (Bas-Zaire), Lodja (Kasai Oriental), Kikwit, Inongo, Gungu (Bandundu), Ruzizi (Kivu), Yangambi (Haut-Zaire). (F.A.O., 1976).

#### Transportation of paddy.

The access to the paddy production areas is done by deteriorated secondary roads, by river boats, by railroad or by plane. Evacuation of paddy and other agricultural products is extremely difficult because of the insufficiency of the physical infrastructure and unavailability of trucks to do the work at the time allocated.

Rice from Maniema in Kivu goes to West Shaba by the railroad: Kindu - Kamina - Lubumbashi. From the Ueles (Haut-Zaire), rice is shipped by the Banga - Watsa and Bunia, Wamba - Isiro roads. Kananga, Mbuji-Mayi, Tshikapa and their hinterland receive rice from Sankuru (Kasai-Oriental). (F.A.O., 1976).

Annex G.III presents an analysis of the transportation cost from Bumba, Bukavu, Kisangani to Kinshasa, to have a better understanding of the cost components of rice in urban markets. A number of agricultural export companies are now making an effort to improve the means of transportation, road maintenance, boat building, etc.

#### Production Conditions.

**Farm Size.** As mentioned earlier there are two types of farm size. One is small farms with 0,40 and 0.50 ha/farm with traditional agricultural practices, direct seeding and rainfed rice associated with other food crops especially in the mountains. On these farms, the primary objectives are home consumption and marketing of the surplus.

Irrigated rice farms with high yields have larger land areas (40 - 200 has) and use improved seeds, fertilizer and small agricultural machines (F.A.O. 1976). However, during our survey in Ruzizi, Kivu we noticed the existence of under irrigation.

**Cropping patterns.** Paddy production in Equateur, Haut-Zaire, Kivu, is equivalent to 72% of the total production in Zaire. We noted an annual increase in the acreage put down to rice with different yields by region for rainfed paddy. For irrigated paddy rice, we also noticed an increase in acreage and a variation of the yield from 1.5 to 6 T/ha (Annexe G.I., G.II). Rice production in Zaire is equivalent to the 30% of the grain produced in the country. The cropping pattern (seeding, harvesting) is quite different in the three areas as we observe the survey results.

#### Impact of rice production on employment.

Equateur, Haut-Zaire and Kivu have a population of about 9 million inhabitants, about 32% of the Zairean whole population. The rural population is 91% for Equateur with 84% in agriculture; in Haut-Zaire rural population is about 86% and the agricultural active population is about 79%. In Kivu, we have a distribution similar to Equateur: rural population is 91% and agricultural population is 84%.

It is not easy to measure and evaluate the impact of rice production on employment in each of these three regions. We noticed during our survey that most of the farmers we interviewed depend on family labor force. The marketing chain includes tradesmen, whole-salers, retailers, and owners of trucks and boats. In the Kivu region, the information collected from the mill owners is very instructive: each rice mill uses an average of 50 full time workers and 40 seasonal workers in each campaign where:

Men	45 mill owners x 90	= 4,050
Women		= 3,890
Children		=18,400 (KYANGALILWA WA NYENGO, 1980).

A rough evaluation of productivity can be done by noting the correlation between the number employed and the land area used.

Production Constraints. These constraints are at different levels: Extension applied research, improved seed production, transportation and communications, agriculture technology, and an appropriate logistic network.

Applied research, leads to an improvement of local and new seeds. An extension of irrigated lands with the right technological package (seeds, fertilizers, pesticides) and good extension service can improve the supply and decrease rice imports.

The assistance and cooperation of cotton export companies in providing extension services and the use of their trucks to evacuate the paddy should be taken in to consideration. It seems that the trucks are available during four months in the year after the cotton harvest. Those companies can also assist in the maintenance of roads with light road material. They can also use some farm labor during some certain months of the year to improve the roads and generate employment in the rural sector.

Solutions to constraints. The spread of improved seed should be carried out within the context of the operations of an agricultural development project, with special plots reserved for improvement and multiplication of existing varieties. Rice growers buying these seeds at Z 2 a kilo can raise their yields from the present level of 800 kg/ha to 1300 kg/ha and make an estimated net profit of Z 400.

An extension network of one moniteur per 500 farmers is essential to support the spread and use of improved seeds. Well-trained extension agents are needed to advise and assist farmers on proper land preparation, seeding density and spacing, on-time weeding, and use of subsidised sprays to fight off insect attacks. Each agent needs a bicycle. Each agent should keep a record on each farmer he serves.

The road network can be improved with the help of some of the big marketing companies, PLZ and Sotexco. In particular, priority should be given to the secondary roads leading into the production zones. The monthly reports of zonal agriculture officers (agronome du Zone) frequently note that sections of the roads are so bad that the crop cannot get out.

#### Production and Consumption Balance Sheet.

Overall supply. An evaluation of the overall paddy production can be done considering the land area devoted to rice and the yield. This is not a complete estimate of the supply on Zairean markets since it does not consider the volume bought by the brewers, the losses during transportation, storage and probably the volume going across the frontiers.

The real supply is less than that published in annual production reports. Only a much more detailed survey such as those that can be taken by satellite and aerial photography can give a good estimate of the paddy production. Certainly the supply is weak and not in balance with the demand.

Demand for rice. There exists a large demand for rice in Zaire which can be explained in demographic terms. However, the geographic distribution of rice consumption gives this product a specific urban characteristic. Other socio-economic factors contribute to the formation of demand for rice need to be identified.

Apparent causes. Taste characteristics of rice varieties are important components of rice consumption patterns. Rice is a tasty food grain and is a substitute for other starches on the market. Another aspect of rice consumption is the presence and influence of minorities in Zaire such as Senegalese and Pakistanese who consider rice a staple in their diet. This influence leads to changes in the consumption patterns of rice among the local population. The large companies (KILG-MOTO, PLZ) which produce or buy rice for feeding the workers create a demand and provoke a shortage of rice for towns.

Real causes. The process of urbanisation is a major contributor to changes in demand for rice. People migrate to towns in search of employment and also to achieve a higher standard of living. In town, they are obliged to change their diets because they have a higher purchasing power and increased opportunity for employment, education and improved health care. People interviewed indicated that rice is easy to prepare and does not need to be eaten like cassava, with meat or other ingredients. Most of the people interviewed believe that rice aids in satisfying hunger before consumption of the main course. Generally in April, May, and June rice is a substitute to cassava. Rice is also considered a more prestigious food item compared, for example, with cassava.

Potential demand. It is very difficult to have a complete estimate of demand for rice without a more detailed survey and the indepth analysis of some key elements. In the short run, we can have a good forecast using the method of moving averages but we don't have sufficient data to do so. For rice, it would be better to use the elasticity method, but the lack of data prevents the use of this methodology as well.

The intermediaries involved in rice marketing were asked to give an evaluation of the demand for rice from their point of view since they have a better knowledge of the market and the customers than the producers and consumers. COMAGRIN, GRISA believe that a volume of 230,000 tons of rice could be sold easily. According to F.A.O. in 1980, demand was estimated at 220,000 tons including 60,000 tons for subsistence and 160,000 tons available for sale.

Supply costs analysis. It is relatively easy to estimate the different supply costs. However, the essential point would be to identify the number and function of various middlemen in the channels. A direct intervention of mill owners in the market has not been possible due to the weakness of supply and also due to the high investment required for logistic and infrastructure are too high (ISSIA FRERES, COMAGRIN, GRISA, 1981).

The relative costs are:

- production cost for paddy
- milling cost
- milling margin
- wholesaler cost (amortization, transportation, handling), and margin.
- retailer margins.

These costs and margins were observed in each one of the primary production areas.

## ANNEX G.I.

PRODUCTION AND LAND AREA DEVOTED TO RICE IN THREE REGIONS  
OF ZAIRE, 1974-1978.

		<u>1974</u>	<u>1975</u>	<u>1976<sup>a</sup></u>	<u>1977</u>	<u>1978</u>
Equateur	H	41.80	43.9	45.2	46.8	47.3
	P	33.4	34.4	38.0	37.4	35.9
	I	0.82	0.78	0.84	0.80	0.76
Haut-Zaire	H	84.7	84.0	84.6	85.2	86.0
	P	60.1	59.5	59.5	67.7	62.4
	I	0.71	0.71	0.73	0.71	0.73
Kivu	H	62.4	63.9	64.4	65.3	67.2
	P	51.7	55.6	56.0	59.4	58.7
	I	0.83	0.87	0.87	0.97	0.87

H = land area (1,000 ha)

P = production (1,000 T)

I = yield (t/ha)

Source: Annuaire des Statistiques Agricoles (1977 - 1978)  
Department of Agriculture.

## ANNEX G.II.

## BADDY PRODUCTION FOR THREE REGIONS AS A PERCENTAGE OF TOTAL NATIONAL PRODUCTION, 1974 - 1978.

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Equateur	16	16	15.6	17	17
Haut-Zaire	32	31	31	31	31
Kivu	<u>23</u>	<u>23</u>	<u>23.3</u>	<u>23</u>	<u>24</u>
	<u>71%</u>	<u>70%</u>	<u>71.3%</u>	<u>71%</u>	<u>72%</u>

Source: Annuaire des Statistiques Agricoles (1977 - 1978).  
Department of Agriculture.

## ANNEX G. III.

COMPARATIVE TRANSPORT COST FOR PASSENGERS AND RICE BETWEEN SELECTED  
LOCATIONS IN ZAIRE, 1981

Cost for passenger 1<sup>st</sup> class of ticket purchase and tons of rice.

Transport cost in regions (tickets and tons of rice).

DUMBA - KINSHASA		(A = departure ; R = return)
<u>Ticket</u>		<u>Tons of rice</u>
2d class	3rd class	Z.
278.07 (A)	200.75 (A)	145.04
248.07 (R)	170.75 (R)	
KINSHASA - KISANGANI		
2d class	3rd class	
349.25 (A)	254.19 (A)	155.39
319.25 (R)	224.39 (R)	
Bukavu - Lubumbashi		
2d class	3rd class	
437.66 (A-R)	182.98 (A-R)	449.32*
		485.48**
BUKAVU - KISANGANI		
RAIL		482.06
Dukavu - Kindu		429.21
Kindu - Kisangani		100.85
Kindu - Lubumbashi		198.19
Lubumbashi - Kinshasa		321.70
Dasoko - Kinshasa		***30.00 Z/60 kg bag (boat)=0,5Z/k
Dasoko - Kisangani		9.00 Z/60kg bag (boat)=0,15Z/k
Luberizi - Bukavu		10.00 Z/100 kg bag =0,1Z/k

\*Source ONATRA

\*\*Source SNCZ

\*\*\*Source ISSIA FRERES.

## MEASURES UNITS IN USE IN MARKETING

100 KG BAG

60 KG BAG

50 KG BAG

45 KG BAG

GLASS OF 250 GR.

1 KG BOWL

5 KG BOWL

6 KG BOWL

250 GR PLATE

### III. RICE MARKETING IN EQUATEUR, HAUT-ZAIRE AND KIVU: 3 REGION OF ZAIRE.

The rice involved in this study is milled and bleached rice generally called local rice (riz tout venant). However, the presence in markets of low grade rice processed at the farm level with traditional technology should be mentioned because it is also available and bought at market places.

Methodology. A total of 100 questionnaires relative to the scope of work were prepared and filled out by surveyers who visited the farmers. The first house visited was chosen at random followed by every third house. Mill owners, tradesmen, truck and boat owners were among those interviewed, also.

Survey period. Our survey began in the Haut-Zaire region on September 8, 1981, followed by Kivu and ending in Equateur on October 21, 1981. We covered characteristics of villages, crops, agricultural households, population, ecological parameters, and rice acreage.

Data processing and analysis. The analysis of the data collected is discussed in the text of this report and clearly displayed in the annex of each chapter in various tables and tabulations

Marketing system. It is difficult to precisely define a marketing system, but every marketing system involves:

1. Commercial institutions (private or public) individuals and firms engaged in the performance of marketing functions;
2. legal, historical and customary relationships among these institutions and/or individuals
3. consumers (intermediate and final users)
4. transformation, packaging, distribution, in brief, the logistical support.

All these 4 elements constitute a system because they are interrelated and combine to achieve a common set of goals. (Matthews, and AL. 1964).

We see then the difference between selling and marketing: "selling is generally concerned with the plans and tactics to get the consumer to exchange what he has (money) for what you have (goods and/or services). Marketing is primarily concerned with the much more sophisticated strategy of trying to have what the consumer will want. Selling is preoccupied with the seller's need and marketing with the needs of the buyer." (Mathews, 1964).

The diagram gives an idea of how the marketing system operates. With it one can find all the information from the survey and the interviews with rice farmers, trademen, middlemen, and boat and truck owners.

Diagram explanation ;

- the flux (physical movement) of paddy and/or rice from producers to users of consumers is indicated by arrows. In the opposite direction, implicitly, there is a flux of money.
- marketing places (villages, towns, markets, or mills).
- marketing agents: they are the primordial components in the system with their function. Certain kinds of agents are not indicated for example, the banking credit agents who also play a role in the marketing system.

The marketing channels diagram was designed to identify and quantify the flow of rice from producer to final consumer including direction and margins.

There are two phases in the rice marketing system:

The first phase is paddy marketing in the villages after harvesting, consumption at the farm level, and storage. The paddy is bought by:

a) big mill owners with a milling capacity of 6,000 to 9,000 kg/day, with one or two trucks;

b) small mill owners with a milling capacity of 1,000 to 5,000 kg/day with one truck. Some mill owners do not buy paddy, but receive only a fee of 30 - 40 K/kg to mill paddy;

c) tradesmen with or without a licence (Annex C, I.) to purchase paddy and use a mill owners' service.

The second phase consists of rice marketed by mill owners, middlemen in larger towns and very often by the producers around towns who during some months of the year become active tradesmen. It is difficult for producers to undertake direct marketing of their crops in markets except in Uvira (Kivu) as it will be seen below. The marketing channel can be long or short, very often in Zaire, we have a juxtaposition of the two or the short extends into the long version.

**Short system:** The rice is sold directly to the household consumer by the mill owner or by the producers (local rice at farm level). For example, in Dumba, the mill owners sell directly to consumers. In case of paddy, they sell directly to brewers. In Basoko (Haut-Zaire) ISSIA FRERES or SAICOM in Kisangani sell directly to consumers.

**Long system:** There are a large number of middlemen between the producers and the consumers. For example, the mill owners sell to brokers who sell in turn to wholesalers and in turn to retailers who sell to consumers. The system profile is very complexe and the cost is very high due to a margin at each level; especially when the rice reaches the Kinshasa markets.

We found the two kinds of system channels everywhere we visited in Equateur, Haut-Zaire and Kivu, particularly in Maniema (Kivu).

Morphological analysis of the system. The information collected from the survey and from the interviews gave two organizational aspects of marketing channels: a formal one (ONACER -Mill owners) and an informal one with middlemen at various levels who are generally unknown and often illegal. It is impossible under those conditions to understand the price mechanism; it is also impossible to know the specific terms of purchase and sale (measure, unit,). Usually, supply and demand determine a myriad of different kinds of transactions using different measures of weight and volume as well as prices.

Economic agents. In Bumba, Uvira in the formal and legal channel, we find the mill owners and tradesmen operating under a subregional licence. Those tradesmen have their legal, permanent address in the region or subregion and manage their business throughout the year according to legal or traditional rules in the area. These intermediaries express a certain solidarity, protecting their interests even though they are competitors, and cooperate with local authorities to solve paddy reserve problems. Though in Bumba for example, mill owners generally organize the purchasing of paddy in each campaign. In South Kivu, through ANEZA (Association des Entreprises Zairois) the mill owners in the month of September 1980, proposed that the paddy price be fixed by subregion. (They often meet with the local authorities.) The wholesalers and retailers are the components of the distribution link to the consumers. In Zaire, the middlemen especially women are very active and perform an important service even though they contribute to higher consumer prices. Below the wholesalers, the channel becomes informal with all the different kinds of retailers in the markets, stores and stands.

Legal and financial aspects of marketing.

Terms of purchase and sale - price and commodities information.

Within the formal marketing channels of paddy and rice, every element is in principle well defined. The marketing commodity is the local rice called "Riz Tout Venant" (R.T.V.) of good quality and bought in large sacks and according to the price list from an official arrêté of the Commissaire Sous-Régional. For instance, in Bumba COMAGRIN and GRISA (mill owners) sell rice by 5 kg package to the individual consumer. In Basoko, ISSIA FRERES sell bags of 60 kg everyday, but only 20 bags per day. Often, the official minimum price is not given to the producer and the former has no information on the price as we have been told by some producers in the subregion of Tshopo. It is also difficult in a period of shortages and after the price is over to know the real terms of purchase or sale even in the formal channels but differently from the

and after the campaign is over to know with precision the terms of purchase or sale even in the formal channels but differently from the informal channel, the rice is not passed through excessively numerous middlemen.

Paddy milling. According to information provided by F.A.O. (1980), WORLD BANK (1981), in all paddy production areas there were 81 mills. In the Kivu 50% were out of work in 1976, hence a 68% fall in rice production between 1973 and 1976 (F.A.O., 1976). The mills are old-fashioned and millers find themselves unable to find and buy the spare parts on the international market. In Haut-Zaire, the situation is dramatic and a lot of peasants have abandoned paddy cultivation .

In Equateur, only small paddy mills stopped their activities relative to larger ones which are in operation. This lack of mills has certainly a negative impact on local production (ANNEX, H.Z., K., E.). The mill ratio is 55 - 60%, about 55 - 60 kg of rice for 100 kg of paddy. In the Ruzizi Project, they have a mill with American equipment with a 67% ratio. At the farm level, home milling of rice is by mortar and pestle, broken rice is high and the ratio very weak. In the Ruzizi Plateau however, the similar process gives a good rice with fine appearance and taste.

Logistic: Rice distribution. The arrows in the diagram, according to the survey results, indicate the locations in which marketing takes place. The mill owners buy the paddy in the villages and generally sell it at their store or send it around the country, particularly to the large urban centers such as Kinshasa, Kisangani. In Zaire, the main limiting factor for improvements in production and marketing of rice is the lack of a functioning communication system, roads are not maintained and trucks are not in sufficient quantities. Even short hauls take long hours. Truck prices are very high and it is calculated to amortize it within three years after 75,000 km or an annual average of 25,000 km. Transportation cost is relatively high

and at times prohibitive. The producer cannot feasibly purchase or rent a truck or bus to go to town to sell his produce. Even the mill owners have problems transporting the paddy from the villages to their mills; in Kindu (Maniema) 600 tons of paddy were not evacuated during the last fifteen days of August. During our survey we learned of many similar incidents. In 1976, in the Tshopo subregion, in Dafwasende, agricultural technicians tried to motivate the population to raise the production and in fact, they achieved better production, but it was impossible to evacuate the produce on account of the bad roads. Other solutions exist, for example: a boat (baleinière) was being built by Coton Zaire to send the paddy from Businga to Mongala subregion.

Unfortunately, transportation is poorly developed on the river which could ordinarily provide easy evacuation of agricultural produce to the market places. Zairians have never developed animal traction to help in their agricultural needs which creates a greater dependence on a very weak and undependable truck route. In Opionge, a producer sold 200 bags of paddy, but the miller could not evacuate the paddy for lack of a passable route.

The most interesting example of communication impact on development in general is about the Kinshasa - Kikwit road (Bandundu). Before 1978 - 1979, passengers traveling in trucks spent two weeks to reach Kinshasa from Kikwit. The construction of that road has facilitated the distribution of food (cassava), adding the elimination of starvation in the Bas Zaire region which suffered a long drought period. (LETHA, September 1981).

The cassava from Bandundu is also sent to Drassaville (CONGO), to Kasai Oriental and Kasai-Occidental. Aside from creating easy transport of food produce to various regions, the road has also facilitated internal migration to Kinshasa.

In addition to communication and a

In addition to collection and distribution problems, there is a problem in the supply of sacks. This means both the lack of sufficient sacks on a temporary basis; and also their availability at reasonable prices. The cost to the millers is Z 10-20 a sack, depending on how they buy them. The raw material used in the manufacture of these bags, jute, kenap, cotton, polypropylene or any mixture of these, contributes to the high pricing. It seems that Tissakin cannot keep up with the demand. The company needs heavy investments to meet the demand. In the long run, it should be using domestic raw materials such as jute.

SUMMARY OF COMPARATIVE COSTS AND MARGINS IN THREE AREAS OF ZAIRE, OCTOBER 1981.

	HAUT-ZAIRE		KINSHASA		NEU KIVU			EQUATEUR		KINSHASA	
	Basoko %	Kisangani%	Kin. %		Ruzizi%	Kirin% gue	SOUTH% Kivu	Bukavu%	Bumba %	Kin.%	
Production cost	0.64	0.64			1.62	1.62	0.66		0.60		
Paddy farmgate price	0.70	0.70			2.0	2.0	1.00		0.70		
Producer margin	0.06	0.06			0.38	0.35	0.34		0.10		
Miller cost(rice)	3.10				4.0	3.12	3.15		2.19		
Miller net margin	0.53 20%	20%			0.80 20%	0.78 20%	0.79 20%		0.54 20%		
Miller sale price	3.63	3.78			4.80	3.9	3.94		2.7-3.15		
Wholesaler cost	3.68	4.16	4.18		4.81	3.92	3.95	4.08	2.85	2.92	
Wholesaler gross margin	0.48 11%	0.38 8%	0.20 5%		0.19 4%	1.08 21%	0.21 22%	0.92 18%	1.31 31%	2.08 42%	
Wholesaler sale price	4.16	4.54	4.38		5.0	5.0	4.16	5.0	4.16	5.0	
Retailer cost *	3.68	4.57	4.40		5.03	5.03	4.12	5.03	4.19	5.03	
Retailer gross margin	0.48 13%	0.43 9%	0.60-1.98 13.32%		0.97 17%	0.97 17%	1.81 30%	0.97-1.81 17.22%	2.1-2.1 30%	1.3 20%	
Retailer Sale Price	4.16	5.0	5-6.38		6.0	6.0	6.0	1.4 6-6.4	6-6.3	6-6.3	

\* In Basoko, millers sell rice only at retail prices.

Total transportation cost in the  
1.40 Z which is 70% of the paddy  
farmgate rice equivalent price

$$\frac{1.40}{7.20} \times 100 = .70$$

$$\frac{1.40}{7.20} \times 100 = .195$$

$$\frac{520}{720} \times 100 = .72$$

Transportation cost is 19.5% of the final price while intermediate margins without transportation cost is 72% of final price. Margins and transportation costs absorb the whole of the marketing chain is 91.6%

$$\begin{array}{r} 520 \text{ margin} \\ 140 \text{ transportation cost} \\ \hline 6.60 \text{ total} \\ 720 \end{array} = 91.6\%$$

Marketing spatial organization - Credit. The marketing structure is simple to visualize because we can observe in the diagram a hierarchization in spite of the logistics weakness.

The paddy and milled rice flows from villages to towns.

Villages: production and collecting of paddy, auto-consumption - storage -milling - selling in local markets.

Regional towns: wholesale and retail trade - agro-industry.

Large towns and cities: wholesalers, distribution of rice, retailers, distribution in local markets and stores, etc...

The diversity in marketing channels together with transport difficulties result in high prices to the consumer. The communication problem is connected to the problem of credit in Zaire. There are some banks which provide limited amounts of credit but only commercial banks, they see too high a risk in agricultural projects, being especially in a country where management is not well organised.

Some credit is available to a number of mill owners (very short term credit: 4 months) just for buying 4% of the market harvest.

There is also a local tax to improve agriculture which can be used. It is timely and essential to have a development bank to finance agriculture and agro-industry.

With the cooperation of the big companies an agricultural credit organisation can improve the supply of food crops and we believe can manage a system of supervised credit for farmers. Generally, the survey found out, a pervasive attitude on the farmers part that funds borrowed from the state is essentially a gift.

State control. The state exercises minimal control in the marketing of rice. The licence given by the Commissaire Sous-Régional and the planning of the buying campaign are elements of that control.

The creation of ONACER - ONPV with the purpose of a better distribution of products to consumers is the third element of that control. However, there are too many constraints at logistic levels to get the best results. The priority now is to raise crop production and improve working conditions.

Conclusions on marketing. The marketing system for crops in Zaire is a model inherited from the colonial period with an infrastructure which served the tasks and objectives of that period. There was obviously less demographic pressure and migration to the cities. The system of rural supply through "cantines" worked to the satisfaction of the governments' administration.

Now, with the transfer of economic and political power to the capital, means of communication become the limiting factor in the supply of the rural sector. The difficulty of moving out paddy due to the deterioration of the roads, lack of trucks and barges, obsolete and overaged milling equipment, unavailability of milling spare parts - all these factors block the growth of production.

Transport costs as demonstrated below are a contributing factor to the high price of rice. An emphasis on improving the roads, which would lower the cost of transporting paddy some 20% or about 20 K/kg. should be stressed. On the 140,000 tons of paddy currently marketed, a charge of 20 K/kg for road maintenance can raise 28,000,000 Z, enough to maintain 18,000 kms. of roads, more than enough to maintain the road network of the rice-growing areas. Decent roads, which can assure on-time marketing of all paddy produced, are an essential pre-condition to increased production.

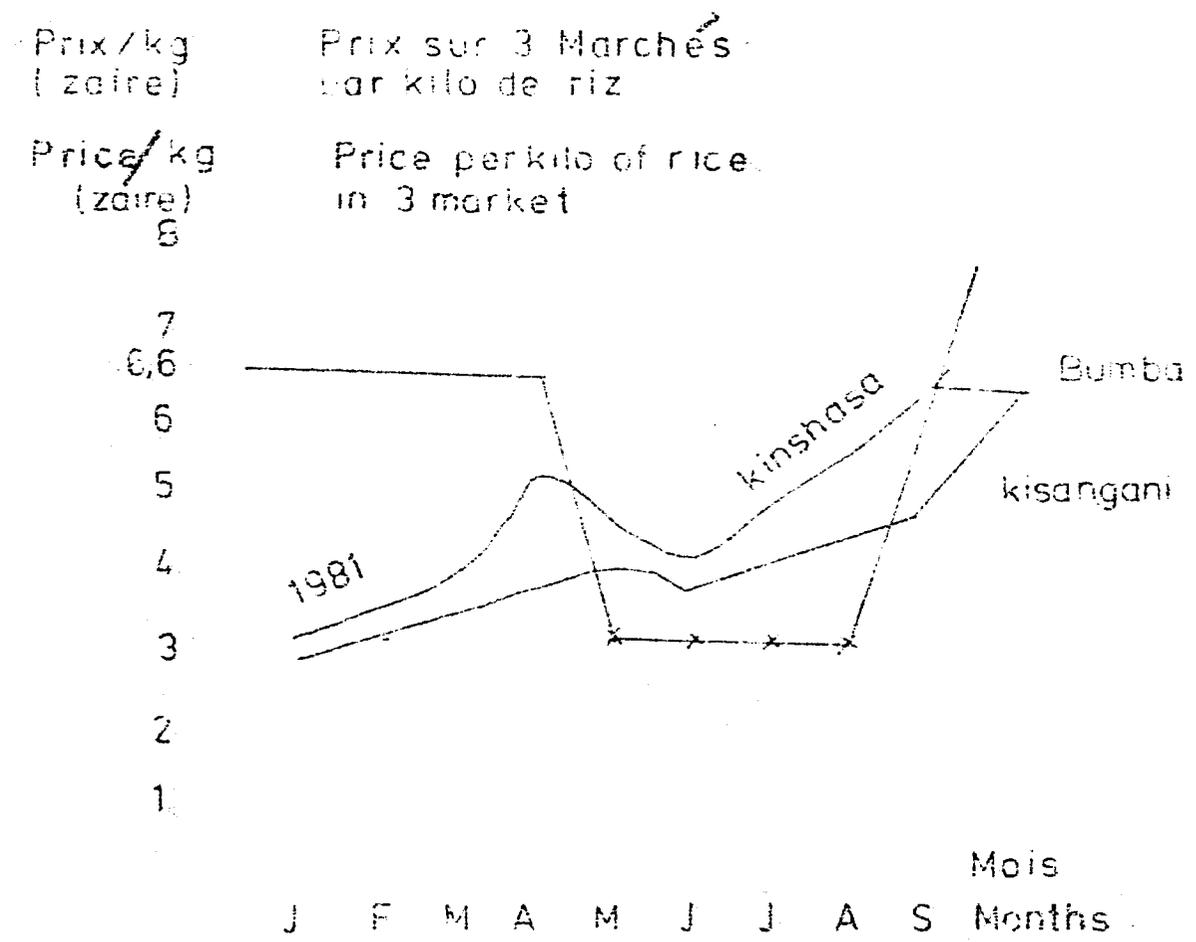
The next priority is replacing overaged milling equipment with up-to-date equipment, which can increase the yield of rice from paddy by 25%.

A reconstruction of cost-margin-price of paddy and rice in selected areas of Zaire based on a survey done in October-November 1981.

PADDY FARMGATE PRICE (FP) 1kg	= Z 1
RICE EQUIVALENT OF PADDY FP 1kg	= Z 2
TRANSPORTATION COST FG TO MILL	= Z .80
MILLERS TRANS. COST + PROFIT	= Z 2.20
MILLERS PRICE	= Z 4.00
FIRST WHOLESALER TRANS. COST	= Z .20
F.W. MARGIN AND PRICE	= Z 1.00
F.W. PRICE	= Z 5.20
SECOND WHS. TRANS. COST	= Z .20
SECOND WHS. MARGIN AND PRICE	= Z 1.00
SECOND WHS PRICE	= Z 6.20
RETAILER TRANSPORTATION	= Z .20
RETAILER MARGIN AND PRICE	= Z 1.00
<u>CONSUMER PRICE ESTIMATE</u>	<u>= Z 7.20</u>

(The above assumes two wholesalers in the chain between miller and retailer).



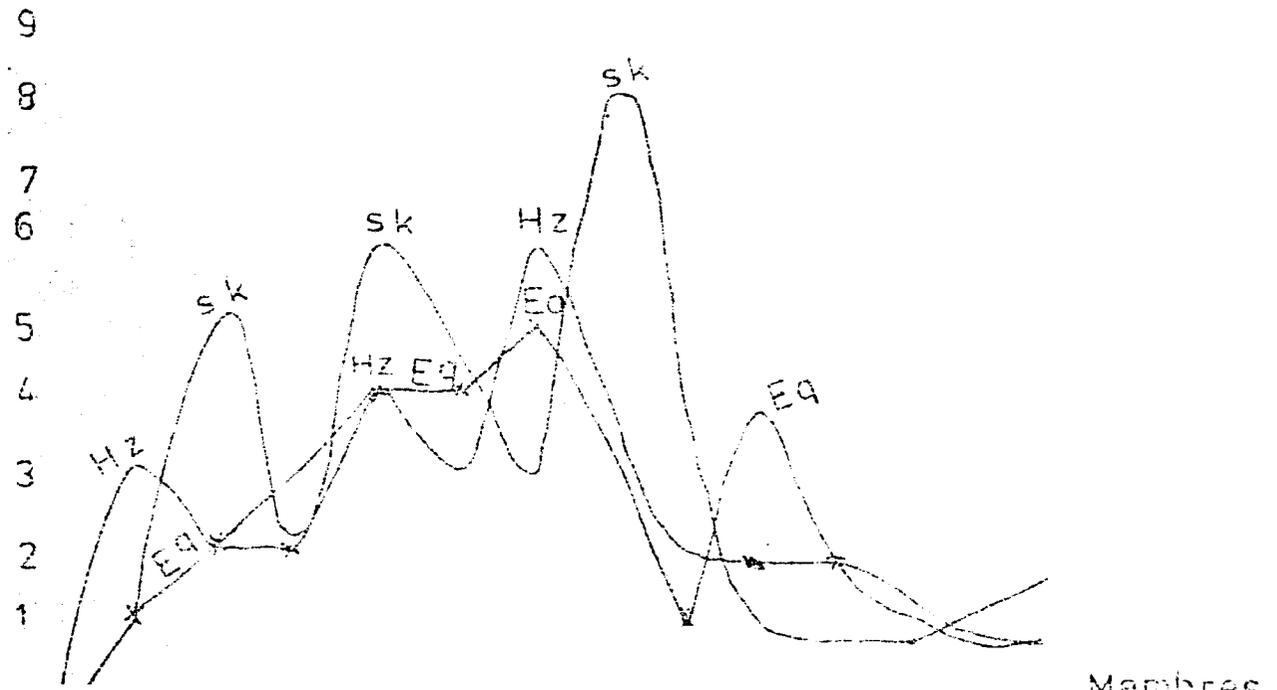


Source: CECOPANE  
 Agriculture: Bumba

31-6

Exploitation  
Farm

Histogramme; Membres ; , Exploitations  
Histogram; Family members per farm



1 2 3 4 5 6 7 8 9 10 11 12 13

Membres  
Members  
14 15

16

— Haut zaire    Haut zaire    —  
— South Kivu    Sud kivu    —  
— Equateur    Equate ur    —

### MILL OWNERS OBLIGATIONS

1. The millowner must obtain approval from the commissaire Sous-Regional to be a paddy tradesman. He must mention where he intends to purchase the paddy as well as where he had bought paddy in the past. He is also required to report the volume bought in the past, the processing capacity of the mill and his means of transportation.
2. The millowner may buy paddy only during the months of the purchasing campaign and only in the areas allocated to him.
3. The Commissaire Sous-Regional is the only official who can authorize purchasing of paddy by issuing licences.
4. The millowner is obliged to provide seed to rice farmers in his allocated area during the (planting months) sowing period. He must provide the producers with bags for the paddy.
5. An agent is assigned to monitor the weighing and pricing of the paddy when marketed. This agent is appointed by the Commissaire Sous-Regional from the Department of Agriculture.
6. The millowner must submit to the Commissaire a weekly accounting sheet clearly stating the names of village markets visited, volume of paddy purchased, etc.
7. At the close of the marketing campaign for paddy, purchasing is opened to any of the "riziers" however, a millowner may continue buying paddy in his allocated area by authorization from the Commissaire.
8. The millowner is responsible for various taxes to be paid for paddy and rice.
9. Every three years, the millowner is required to improve paddy volume in his areas.
10. The Commissaire can not authorize a tradesman to purchase paddy if he can not provide material for processing, transportation, etc.

Source: AFFAIRES ECONOMIQUES DUMDA.

32-19

APPENDIX I

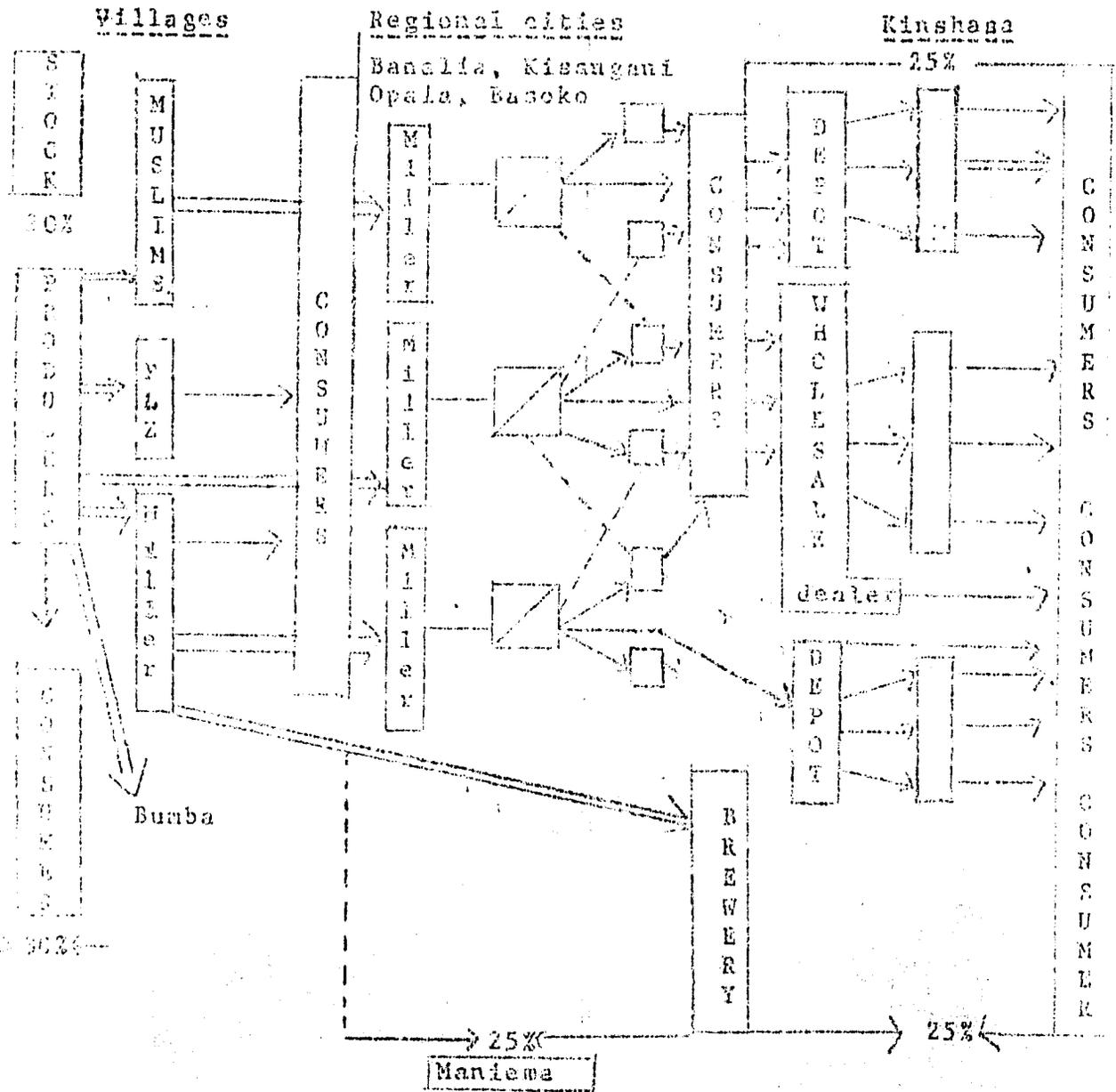
## PADDY AND RICE MARKETING IN HAUT-ZAIRE

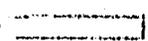
As previously mentioned, Haut-Zaire is one of the most important regions for paddy cultivation and in major towns such as Kisangani, Opala and Banalia, the rate of consumption is about 25% of the total regional production of the Tshopo subregion. The consumption pattern make the towns important centers for rice marketing. (AGRICULTURE, 1981).

The survey area was the Tshopo subregion, but the sampling area was the central town of Yangambi and two villages in the countryside, Isangi and Yanonge, 10 and 22 km from Yangambi. The population for the Tshopo subregion which covers 197,896 km<sup>2</sup> is about 353,300 inhabitants, or 5/km<sup>2</sup>. The Tshopo subregion is situated at 2° of latitude North and South. The annual average temperature is 25° C, with extremes of 15 and 35°C (AGRICULTURE, 1980). The rainfall is excellent for rice production: 1725 mm/yr is an average for 10 years (1969-1979); 1974 was the best year with 2228.9 mm; 1970 received less with 1457 mm of rain. Yangambi is relatively high in altitude (427 m) in the center of the equatorial forest. There are large rubber plantations adjacent to forests and fruit orchards. The population of Yangambi is about 27,671 inhabitants with 4,612 agricultural households. They grow paddy, cassava, corn, plantain, etc. on about 14,412 ha (AGRICULTURE, KISANGANI, 1981).

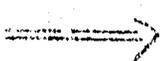
Yangambi is 97 km from Kisangani, a trip of 4 - 5 hours in a light-weight truck. The road to Yangambi is in a deteriorated condition, covered with potholes and the entire road -bed in a damaged state. There are 8 bridges with shattered aprons on the Zaire River tributaries. During the rainy seasons, the situation gets worse. The trucks (6 tons) used for grain transport on that road are very scarce; the vans used are not covered and passengers, animals, (goats,pigs) and agriculture commodities compete for space.

### MARKETING CIRCUIT IN HAUT ZAIRE



wholesale dealer   
 retailer 

possible price circuit 

paddy circuit 

A trip also depends on the driver's mood, involving long bargaining sessions on transportation fees with the passengers. The trucks physical condition also determines the success of a trip.

We chose Yangambi as the sampling area for 30 interviews for three reasons:

- a) long term tradition in rice production, the area devoted to rice is about 26% of the total area put down to rice production in the Tshopo subregion, making Yangambi the leader in the region.
- b) Existence of a cooperative which has been out of operation since 1978 used to provide agricultural tools and basic consumer goods. They used to own a rice mill which is also now abandoned. The cooperative was a real inducement to rice production.
- c) Existence of an agricultural center for research during the Belgian settlement. They worked on breeding and seed improvement of selected varieties. Now INERA (Institute National de Recherche Agronomique) continues this research activity.

The survey began on Tuesday, September 7, 1981 and ended on Thursday September 10, 1981 in Yangambi and there after in Kisangani until September 13, 1981.

#### Marketing systems for paddy.

##### Marketing agents.      Among the agents in

the rice sector , the first one is the paddy producer. Variety R 66 is familiar in the region. Farmers grow rice for consumption (30% of production) and for cash to cover expenses (school fees, clothes, etc.). In the past, they sold the paddy through The Turumbu Cooperative. Since 1978, other middlemen, legal and illegal trademen (wholesalers - retailers), millowners, have taken the place of the now defunct cooperative.

The mill owners and/or trademen, according to their economic power, try to buy most of the volume, to amortize investment capital and also to get the highest profits. Some companies like PLZ buy paddy . . . milled rice to feed their field and administrative personnel. Breweries use paddy instead of barley as raw material for beer due to the high cost and inavailability of barley.

Legal and financial structure of marketing organization.

The planning of the paddy marketing campaign is done by the subregional officials of the Department of Agriculture. They generally have an inventory of all mills with information on their capacity and they submit a report to the Commissaire Sous-Régional, who licences mill owners.

The campaign is scheduled for 5 months, from November to April. Every mill owner can buy paddy in his allocated area. Generally, the millowners go to the villages with their trucks and scales. Bags of 50, 60, 80, and 100 kg are distributed at harvest time and filled up by the peasants. Millowners in the presence of the "Directeur du marché" (Agriculture Service Agent) and a village representative to check weights, pay the producers and bring the paddy to their mills. Officials of the Tshopo subregion are trying to improve the planning of the buying campaign and expect to introduce modifications in the near future. In future campaigns, every area will be allocated to a licenced miller for only two months. In the last three months every miller will buy where he wishes. The reason given was that some millers tend to run out of money and are unable to evacuate the total marketable supply in a given area. Lack of credit is an important marketing bottleneck. Lack of credit is an important marketing bottleneck. Lack of funds to buy paddy and to get new mills and spare parts for existing mills hamper milling operations. The commercial banks are not interested in providing credit to millers. There are many risks which were mentioned by the bankers interviewed such as paddy prices. It seems that very often especially at the beginning of the buying campaign, the mill owners pay under the official price for paddy. Hence, the Commissaire Sous-Régional is obliged to enforce the minimum price to be offered and paid by millers to producers. (AGRICULTURE, 1981).

Generally 70 K/kg of paddy was paid to the producer. Our survey confirmed that: 80% of the farmers interviewed confirmed this price.

The price paid per kilo by illegal tradesmen is unknown. For example the Muslims trading from Ubundu, buy paddy in some isolated villages where there are no mills. These traders go to Kisangani to sell the paddy or have it processed.

It is difficult to know the volume of paddy bought in that condition because the units of measure (bags or containers of 20kg) have no definite norm. However, it seems that the volume channeled illegally is important since a miller in Kisangani recognized that more than 350tons have been processed in his mill in 1981. He added that he is not the only such miller to do it.

In the village markets (wenze) there are different measures of weight and volume. The price of paddy is higher than official prices at the end of harvest or at planting time especially in Yanonge, Mambassa, Irumu, where the prices collected were respectively 150 K, 266,66 K, 250 K per kilo. Even with a production cost per kilo of 63 K and a high transportation cost, the middleman gets a gross margin of about 300%.

Naturally, it would be interesting to find out the volume of paddy which is transacted at these high prices ranging from 150 to 250 k/kg. However, the survey and interviews implied that only a few traders sell at these prices.

Rice marketing systems. There are different levels of distribution from the villages to the main and secondary towns. In the villages, especially in the neighborhood of the INERA Stations, the paddy in storage (see diagram) is processed by local threshing (pilonnage) and sold in the village markets (wenze). INERA distributes seeds and at harvest receives twice the volume. It was impossible to determine the volume of threshed rice sold, although the prices were 2 to 4 Z/kg (or 50 K or 100 K the glass which is the unit of measure used in the region). in 1981.

In some urban centers, Basoko, Kisangani the rice is sold at retail by millers agents. IESIA FRERES for example, sells a daily quota of 20 60kg bags. Tradesmen buy milled rice in small quantity from those agents, along with consumers, for sale in larger towns. A number of tradesmen convert it into small volumes of rice and bag it for sale in Kinshasa. SAICOM sells rice by the bag and by the glass in Kisangani. Other millers sell by contract to some wholesalers who, in turn, sell to retailers and to consumers. Some middlemen especially women, try hard to purchase rice from wholesalers in order to send to Kinshasa, where price differentiations allow high profits. National and regional price information is not available (in the country) and consumers are informed of current prices in their area only at the time of purchase. They are also unable to monitor existing prices in the rest of the country.

The primary marketing centers for rice are Kisangani, Opala, and Banalia which consume an estimated volume of 25% of production. Moreover, about 450 tons were purchased by KIL0-MOTO for their mine workers in Bunia and by PLZ for their agricultural workers. PLZ alone bought 417.5 T in 1978, 179.04 T in 1979 and 385.8 T in 1980. The main center for rice marketing is Kinshasa and its suburbs. The demand is very high and the supply is consistently low resulting in high prices clearing the market. 25% of the marketed production of rice goes to Kinshasa (AGRICULTURE, 1981). In Kinshasa, the distribution in markets is done through wholesalers and retailers, particularly women .

Both wholesale and retail rice prices in Zaire are extremely location specific and vary over a wide range. Prices are influenced not only by costs and margins at each level of the marketing chain but also by the lack of equilibrium of supply and demand conditions. Unfortunately, it is difficult to have an objective idea of the seasonal and annual variations of average prices in regional and subregional markets. There is no systematic collection of prices. Also, there are too many units of measure in the markets.

The price is set at the level of the millers in Basoko, Kisangani and other small towns. In the month of February 1981, PLZ sold rice to its employees at the price of 108 Z for a 60 kg bag. In January and February 1981, ISSIA FRERES sold to a wholesaler in Kisangani at 100 Z/bag about 67% higher than PLZ; certainly the amortization and management costs were less for PLZ than ISSIA FRERES, whose only business is rice. For other millers from January till April, the sale price was 180 Z for a bag. In the month of June 1981, with the economic crises and the rise of fuel price, there was a 20% raise in prices from 180 - 200 Z the 60 kg bag to 210 - 215 Z. ISSIA FRERES in Basoko and GRISA\* IN Dumba sold rice at these prices in mid-1981. In Kisangani, SAICEM sells at 200 Z/60kg bag. This difference in price among mill owners can be explained by different management costs and level of efficiency.

At the level of middlemen, especially retailers the price reaches 230 - 240 Z per 60 kg bag in Kisangani about a 7 - 11% increase. The transportation cost by boat from Basoko and other costs reaches a price of about 227 Z and an intermediary gross margin of 5 - 15 Z/bag.

Those who sell rice at 250 Z get a 32 Z profit or 10 - 20% of the estimated price. It is possible that this margin is shared by more than one middleman. The price in Basoko in August 1981, was 250 Z the 60 kg bag. During the second week of September 1981, the price in Kisangani markets was 300 Z, exactly the same price as in the Kinshasa market. Transportation costs for Kisangani - Kinshasa and Basoko - Kinshasa are respectively 9 and 30 Z/per 60 kg bag. Handling and transportation costs in Kinshasa from the boat to town center, are 1,5 Z/60 kg bag. For those who buy in Basoko and resell at 300 Z, the margin is about 50 Z/bag.

\* GRISA and other millers in Bumba have raised the price (Oct., 20, 1981) to 235.70 Z a 60 kg bag to wholesalers and 264 Z to retailers.

For the next campaign in 1982 producers expect a farmgate price increase from 70 K/kg in 1980-1981 to 85 K/kg in 1981 - 1982. The expected paddy price per kilo is 85 K\*. It would be extremely useful and interesting to monitor the monthly price variations of paddy and milled rice in various regional and subregional markets to determine trends and the degree to which rice is substituted by other grains in different times of the year.

Estimated monthly consumer prices for rice in Kinshasa and Kisangani are given below:

TOWNS	MONTHS	J	F	MM	A	M	MJ	J	AS	A	S	...D
Kinshasa		3.23	3.62	3.32	5.27	4.68	4.39	5.07				
Kisangani		3.0	3.12	3.44	3.92	4.12	3.92	4.38				

A correlation test gives a coefficient of 0.80

Interviewed about their proposals to improve marketing systems, the farmer in Yangambi emphasizes these factors:

- Market organization logistics (30%)
- Price improvement (30%)
- Credit to farmers (24%)
- Transportation (6%)
- Mills in operation (6%)

These elements are interrelated and need a global approach.

The local rice milled by threshing at the farm level which includes a much higher percentage of broken rice still sells at the same price which milled rice sells due to the high demand for the grain.

\* At final press time of this report in March 1982, the price of paddy at farmgate had risen to 1 Z/kg.

SUMMARY OF COMPARATIVE PRODUCTION COSTS AND MARKETING MARGINS IN THE  
HAUT-ZAIRE REGION IN Z/kg IN OCTOBER 1981.

	<u>Basoko</u> %	<u>Kisangani</u> %	<u>Kinshasa</u> %
Production cost paddy	0.64		
Farmgate paddy price	0.70		
Produce Margin	0.06		
Miller cost (rice)	3.10		
Miller net margin	0.53 20%		
Miller sale price	3.63	3.78	
Wholesaler cost	3.68	4.16	4.18
Wholesaler gross margin	0.48 11%	0.38 8%	0.20 5%
Wholesaler sale price	4.16	4.54	4.38
Retailer cost	3.68	4.57	4.40
Retailer gross margin	.48-.53 13%	0.43 9%	0.60-1.98 13.32%
Retailer sale price	4.16	5.0	5-6.38

\* Transport BASOKO - KISANGANI : 12 Z/60kg bag = 0,2 Z/kg.

BASOKO - KINSHASA : 30 Z/60 kg bag = 0,5 Z/kg.

Source: ISSIA FRERES.



## ANNEX H - Z -II.

CORRELATION ANALYSIS BETWEEN LAND AREA IN HA (R) AND YIELDS  
(kg/ha) FOR HAUT-ZAIRE

Size 100 100 80 50 100 40 100 100 50 60 100 80 60 100  
(are)  
( $X_1$ )

Yield 1020 1570 420 380 600 480 680 1200 600 1290 700 900 300 210  
(kg)  
( $X_2$ )

$$n = 14 \quad \bar{X}_1 = 81.3 \quad \bar{X}_2 = 720.6 \quad X_1^2 = 6,393.86 \quad X_2^2 = 470,225.4$$

$$\sum X_1 X_2 = 35,950.48$$

$$r = \frac{\sum X_1 X_2}{\sqrt{(\sum X_1^2)(\sum X_2^2)}} = 0.30$$

r is positive.

Weak correlation: the yield is not proportional to farm size.

A sample of 14 farmers were selected from a universe of 28 farmers in the Yangambi area. The common analysis indicated that yields do not increase as land area increases assuming all other factors having no influence

HAUT-VAIRE SURVEY DATA ANALYSIS1. Frequency distribution of farm family size:

<u>Household</u>	<u>Members</u>
3	1
2	2
3	3
4	4
3	5
6	6
4	7
3	8
2	10
<u>N = 30</u>	<u>159</u>

Average of 6 members (see histogram).

2. Frequency distribution by age of farm family members:

<u>Age</u>	<u>Members</u>	<u>%</u>
0 - 9	22	14
10 - 19	70	44
20 - 29	19	12
30 - 39	17	11
40 - 49	15	9
50 - 59	5	3
60 and over	11	7
	<u>159</u>	<u>100</u>

70% of members are less than 30 years old.

3. Frequency distribution by land area in rice cultivation:

<u>Hectarage</u>	<u>Farms</u>	<u>%</u>
0 - 0,99	11	37
1 - 1,99	18	60
2 - 2,99	1	3
3 - 3,99		
		<u>100%</u>

4. Frequency distribution by varieties:

<u>Varieties</u>	<u>Farms</u>	<u>%</u>
R 66	23	72
CHIDOLA	4	13
MANZANO	1	3
KINURE	1	3
SELE SELE	1	3
	<u>30</u>	<u>100</u>

5. Frequency distribution of quantity of seed used for hectare:

<u>Volume/ha</u>	<u>Size</u>	<u>Farmers</u>	<u>%</u>
50	1 ha	6	22
50	0.5	1	3
40	1 ha	3	10
10	2 ha 30	1	3
	1 ha 40	1	3
	1 ha	1	3
	0,50	3	10
20	0,80	1	3
15	0,50	1	33
no answer			40
		<u>30</u>	<u>100</u>

6. Frequency distribution of month at which planting starts:

<u>Months</u>	<u>Farmers</u>	<u>%</u>
March	5	17
April	9	30
May	22	73
July	1	3
August	8	27
September	1	3
no answer	4	13
	<u>30</u>	<u>166</u>

Multiple answers add to more than 100%.

7. Frequency distribution of agricultural tools used:

<u>Instruments</u>	<u>Farmers</u>	<u>%</u>
Machete	30	100
ax	25	83
hoe	11	37
File	15	50
coupe-coupe	13	45
P... ..	4	13
spade	3	10
Rake	5	17
Datonnet trouaison	1	3
		<u>356</u>

Multiple answers over 100%

8. Frequency distribution relative to reasons for growing rice:

		<u>%</u>
- money cash crop	23	77
- self consumption	24	80
- self consumption and need of money	3	10

Multiple answers total over 100%.

9. Frequency distribution of family labor force:

<u>Farmers</u>	<u>Members of labor force</u>
4	2
1	3
4	4
1	6
5	7
3	15
11	no answer

10. Frequency distribution of substance consumption of production:

<u>Rate</u>	<u>Household</u>
0 - 9	10
10 - 19	4
20 - 29	7
30 - 39	3
40 - 49	1
	<u>30%</u>

70% of household consume the 30% of harvesting rice.

11. Frequency distribution of problems relative to production:

	<u>Responses</u>	<u>%</u>
1. Drought	2	7
2. Birds	7	23
3. Transportation	3	10
4. Bad seeds	3	10
5. Credit	3	28
6. Marketing organization	3	10
7. No answer	4	14
	<u>30</u>	<u>102</u>

12. Frequency distribution of most profitable crops:

<u>Cultures</u>	<u>Farmers</u>	<u>%</u>
Rice	22	71
Cassava	4	13
Corn	2	7
Plantain	-	-
No answer	2	7
	<u>30</u>	<u>100%</u>

MARKETING.1. Frequency distribution relative to selling to different agents:

	<u>Farmers</u>	<u>%</u>
Villagers	2	7
Village retailers	2	7
Cooperatives	26	87
Tradesmen in Kisangani	1	3
	<u>30</u>	<u>104</u>

2. Frequency distribution relative to the location of sale:

Village markets	30	100%
Houses in village		
Other market		
	<u>30</u>	<u>100</u>

3. Frequency distribution relative to the timing of sale:

Before the harvest		
At the harvest	11	37
After harvesting	<u>19</u>	<u>63</u>
	30	100

4. Frequency distribution relative to measurements in use:

50 kg bags	-	-
60 kg bags	21	70
70 kg bags	5	17
80 kg bags	4	14
20 kg basin	9	<u>43</u>
		144

Multiple answers over 100%.

5. Frequency distribution relative to prices received for paddy:

0.40 Z/kg	1	3
0.50 Z/kg	2	7
0.70 Z/kg	24	80
1.50 Z/kg	3	1
1.30 Z/kg	1	3
1.00 Z/KG	1	3
no answer	<u>3</u>	<u>10</u>
	30	107

6. Frequency distribution relative to selling of the threshed rice

	<u>Farmers</u>	<u>%</u>
Sell	17	57
Don't sell	<u>13</u>	<u>43</u>
	30	100

7. Frequency distribution relative to measures used in selling paddy:

Glass (250g) or kg	18	60
No answer	12	<u>40</u>
		100%

N.B. test question to preceding: 43% don't sell; 60% used the measure.

8. Frequency distribution relative to retail price paid in local markets:

0.50 Z/GLASS	10	33
4.00 Z/KG	8	27
1.25 Z/KG	2	7
45 Z BASSIN	1	3
no answer	<u>9</u>	<u>30</u>
	30	100%

9. Frequency distribution relative to to the price expected for paddy:

1 - 1.50 Z/kg	10	33
0.80 Z/kg	4	14
4.00 Z/kg	3	10
no answer	<u>13</u>	<u>43</u>
	30	100

10. Frequency distribution relative to the appraised price for paddy:

Good price	16	53
Price not good	12	40
no answer	<u>2</u>	<u>7</u>
	30	100

11. Frequency distribution relative to the reasons for low farmgate price:

Production cost high	10	33
Manufactured product high	7	24
No answer	<u>13</u>	<u>43</u>
	30	100%

This is a control test for the tenth question.

12. Frequency distribution relative to means for improving marketing:

Market organization	10	30
Price raising	10	30
Mill to put on operating	2	6
Credit to farmers	8	24
Transportation	2	6
No answer	<u>1</u>	<u>4</u>
	30	100

13. Frequency distribution relative to transportation means:

	<u>farmers</u>	<u>%</u>
Porters	22	73
Tracteur - trucks	7	23
Boats - canoes	1	<u>4</u>
		100

14. Frequency distribution relative to the most favorable time to sell:

December - January	10	33
April - June	6	20
July - August - Sept.	<u>10</u>	<u>33</u>
	33	109

APPENDIX II.

## PADDY AND RICE MARKETING IN KIVU.

Our second survey was in South Kivu, from September 18 to September 23, 1981. Kivu is in third position for rice growing in Zaire and supplies Shaba, Haut-Zaire, and part of Kasai. Level rice home-consumption is about 40% of the production for South Kivu and 60% for Manicma subregion (PROMOTTEUR ZAIROIS, N° 10, 1980).

The survey took place in Uvira Zone particularly in Ruzizi Projet area. We chose this Zone for:

- practice of rice culture under irrigation and the use of tractor power for plowing
- attempts to use animal power for plowing which was not successful
- existence of mechanism to irrigate cultivation
- high paddy prices, three fold higher than elsewhere.
- it is the only zone where first grade rice is milled (no broken) with good appearance and taste.

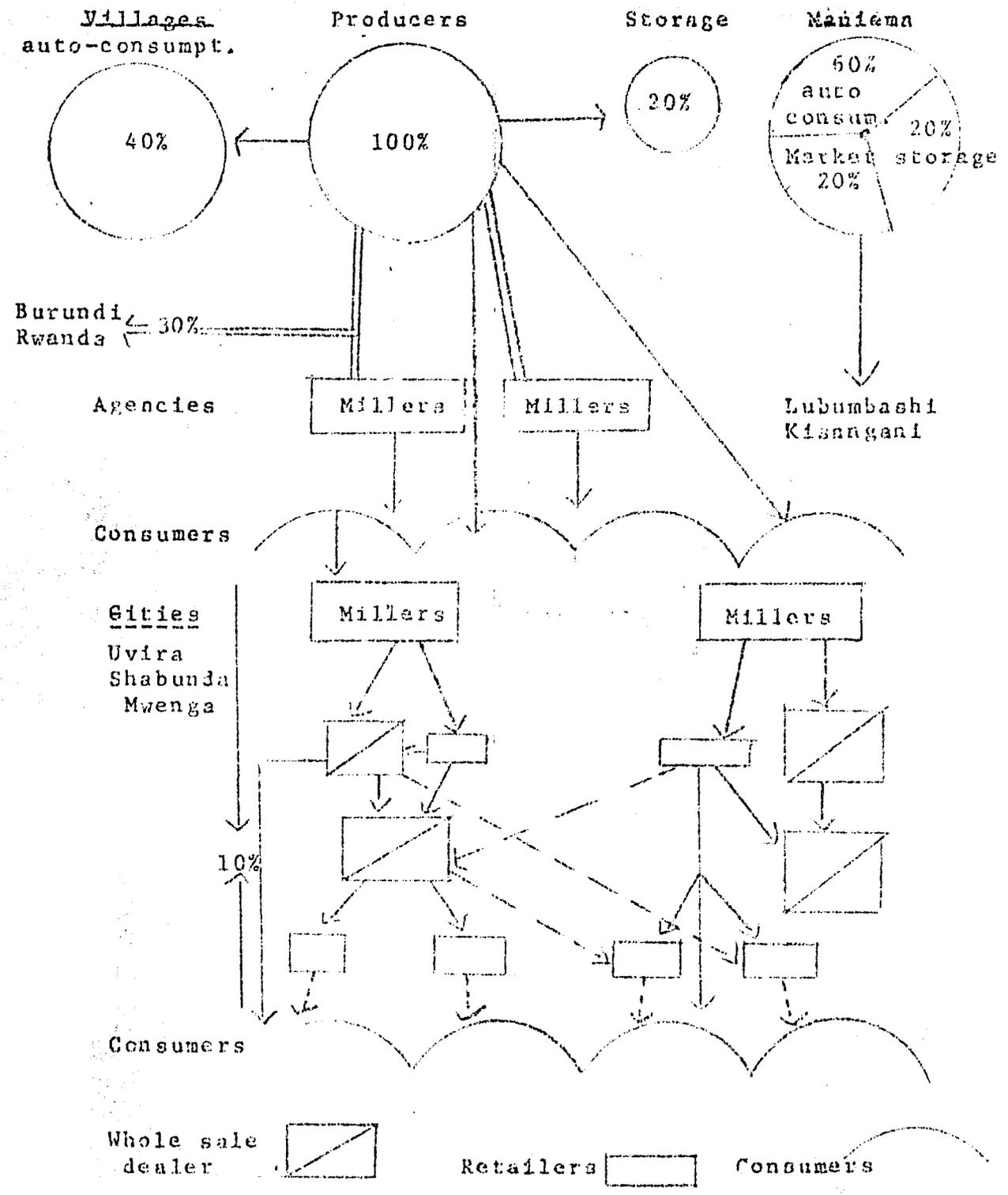
The South Kivu subregion has a population of 1,542,600 inhabitants for a 62,000 km<sup>2</sup> area. The subregion is located at 2° 59' S.

The geologic relief is uneven and erosion is the main problem. On Ruzizi Plateau, during our visit, it was very hot and the reflection off the sandy soil was high. The annual average temperature is 30°C with a high of 34°C and a low of 28°C. From May - June to September is the dry season and during that period, all vegetation burns and livestock growers are obliged to transmigrate the cattle elsewhere. The rainfall in Ruzizi Plateau is 1,400 mm. Evapotranspiration is very high and with the lack of water, farmers can grow rice only once a year.

In Uvira zone, 7,850 farmers grow paddy on 3,677 ha, about 14% of the paddy hectareage in South Kivu. It is in third position for paddy production after Shabunda (65%) Mwenga (18%) for the last year 1980 (AGRICULTURE DUKAVU, 1981). The Ruzizi Plateau is 70km from Dukavu and 30 km from Uvira town and the roads which give access are pretty good.

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### MARKETING CIRCUIT IN SOUTH KIVU



possible rice circuit: ----->

Luberizi village gave the impression of a high degree of economic activity with a large number of women threshing, cleaning and selling rice.

The presence of the Kiringe Cooperative in this area and the Ruzizi Project (Former Mission Agricole Chinoise till 1978) may be two factors contributing to this activity. The main food crop staple is cassava; paddy is grown more for cash than for home consumption.

As to paddy and rice marketing there is apparently no difference between the Haut-Zaire marketing system and what is found in Kivu, as far as morphology is concerned. We found the two systems have long and short channels, formal and informal organizations. However, we notice some differences among marketing agents from a legal and financial point of view and logistics.

Paddy marketing. Apparently, the marketing agents are similar to those mentioned earlier.

Paddy producers, especially those involved in paddy under irrigation are very active, courageous, and aggressive in their demands for high prices. They want to earn a high return to maintain their investment as well as their purchasing power. As already mentioned, they practice flood irrigation and mechanized agriculture. There was no success with animal power traction because the peasants like their cattle and try to avoid working them.

Paddy production is sold to:

- a) Cooperative du Kiringe: milling capacity of 8 T/daily, managed by the Mission Catholique. The purpose is not profit but to help the farmers to process their paddy and market their rice. Also, they provide farmers with inputs and other goods like iron, roofing, etc. The milling fee is 40 K/kg.
- b) Ruzizi Project : at the present not operating due to lack of funds. There is a delay for plowing. No tractors are in operation, fuel and parts are not available. The milling potential capacity is 1 -2 T/daily but they mill only ½ ton/daily with a 67% rice ratio. The milling fee is 35 K/kg.
- c) MOAFRICA : is a miller from Uvira. He purchased paddy only twice in 1931 from the Ruzizi Plateau because he ran onto trouble. Producers sold him a mixture of paddy and sand in the bags. Also, the high paddy price in this zone (2.80 Z/kg) caused him to go and buy paddy in the Baraka zone near Tanganika Lake where the price is lower, to the tune of 1 - 1.50 Z per kilo.

The other mill owners buy in the following areas:

<u>Zones</u>	<u>Mills</u>	<u>Capacities</u>
Shabunda	17	92 T/daily
Mwenga	4	16 T/daily

Source: PROMOTEUR ZAIROIS; n° 10

The "image de marque" of those millers is their joint community spirit and their desire to solve community problems. As a group they provide reasonable prices to producers without taxing to cheat them.

- d) SUCRERIE (Sugar factory) KILIRA with its own paddy field, they help others by plowing.
- e) BRALIMA (Brewery) generally buys paddy from millers of Mwenga (2,600 tons).

In the Manicoma subregion, famous for its paddy production (43,000 tons in 1980), there are a number of millers, some of which are:

- Ets Chiani
- ANTRIACO (ex-EGYPTO)
- Ets TSHIMDALANGA

#### Legal and financial aspects of paddy marketing.

In this region differently from Haut-Zaire and Equateur, the market is completely free and open to every miller with a licence received from the subregional Commissaire. For example, Kiringe Cooperative can buy in the same village market and at the same time <sup>AS</sup> Ruzizi Project agents or MOAFRICA. A second difference: the purchasing campaign is from

April to December. The terms of purchase (weight and price) are:

- purchase by weight in 50 and/or 100 kg bags for 2.80 Z per kilo;
- the Ruzizi Project buys at the price of 2 Z because they help farmers and also they process a rice of first grade.
- Kiringe Cooperative pays its members 1.50 Z per Kilo when they buy, keeps 40 K as a fee membership and 30 K are given subsequently.

At the end of the buying campaign, the producers generally refuse the official price and the millers are obliged to close operations reluctantly. The transportation is generally done by truck, on foot or in small boats as will be shown below. As in Haut-Zaire, there is also a lack of milling equipment.

Rice marketing in south Kivu and Maniema.

As shown in the diagram, in South Kivu like in Haut-Zaire or Equateur, there is a juxtaposition of the short and long channels. After milling, the primary distribution by the millers reaches the wholesalers, the half wholesalers, retailers and the household consumers.

MORPHOLOGICAL ANALYSIS OF THE MARKETING SYSTEMS.

Marketing organisation. The most active link in the marketing chain is the producer who is assisted by his wife in the marketing of the crop. The paddy is processed by thrashing and then sold beyond the frontier.

Ruzizi Project: due to lack of funds, this entity does not buy paddy anymore. According to the administrative manager, from May to July 1980, the Project had processed 95,163 kg of rice. The very low volume of rice which is produced by the Project at the present is sold to a few customers.

Hospitals, schools in Bukavu and Uvira.

These entities used to purchase large quantities at wholesale prices.

Wholesalers and retailers. The Ruzizi Project used to sell rice to wholesalers for cash and on a previous order basis in loads of 10 - 20 tons. To the retailers, they sold 1 - 5 bags daily. Rice of first grade was not processed after a period because although first grade rice was valued in the market the tradesmen mixed it with local current rice (Riz tout venant) and sold it as first grade rice.

Cooperative of Kiringe. Profit is not the main objective of this entity and the rice is sold according to the grades. The cooperative refuses to sell to tradesmen like KOTECHA'S who get large profits estimated at 60% on purchasing price from selling to hospitals or schools as granted. Other millers protested against this situation. The millers sell to PROVIMIL which is the Zairean army service corps. They buy the rice in Uvira zone and bring it to Goma. The KUSAIDIA Action (branch of the army in charge of refugees) also purchased rice from this cooperative.

Kiliba sugar factory. At the request of government officials, this society grows paddy in order to feed its personnel. On our arrival in Luberizi, 6 tons of paddy had been processed by the Project mill.

The channel to Burundi and Rwanda. This marketing channel is short and simple. After milling the paddy, the rice is brought to the frontier where the same tribes (Burundi and Banyarwanda) with the same language are on both sides. The rate of exchange is unfavorable to Zaire and despite price increases in Ruzizi, the flow continues through the frontiers. Twice a week, very early in the morning at 5 A.M. the women leave together and reach the Ruzizi river, 4 km far from their village. They cross the river by small boat continuing walking 1 km inside the neighbouring country and arrive at a Rwanda village market at 7 A.M. to sell rice.

It was fascinating to get information on the benefit/cost ratio of this "adventure". According to a farmer interviewed whose wife is doing this type of trading, they pay 7 Z per capita and 5 Z per 50 kg bag to customs officials in Zairean territory; they also pay the equivalent of 4 Z on the other side once they cross the frontier. The price received is twice or three times the Zairean price. A woman receives 12 Z/kg; subtracting the duties and taxes paid to cross the river and the frontier, she goes back home with about 584 Z or about 9.73 Zaires per kilo.

A second channel for paddy and rice is through the Kamanyola market on the Zairean frontier, also with Rwanda, held once a week on Sundays. The light trucks and buses from Burundi and Rwanda bring traders to buy paddy and rice. They also buy rice along the roads to Bukavu and Uvira in small bowls (unit measure) of 1, 2, or 4 kg.

South Kivu miller. Sabunda, Mwenga millers supply the urban local markets (wenzé) through different middlemen. About 49,200 tons of rice have been marketed by these millers.

Maniema Millers. In Maniema, there are three large companies who own and operate mills. (DOUANES, 1981). Those mills are about 5 years old and equipped with machinery from Germany.

Ets Tchiani: In 1980 this company sold rice in the Shaba area to the army and to Gecamines and others, a total volume of 4,880 tons, the equivalent of 122 railcar-loads of 40 tons each.

ANTRIACO: This company used to be called EGYPTO previously. In 1980 it sold milled rice to customers in Shaba and Kasai.

Société TSHIMBALANGA: This company supplied customers in Haut-Zaire, about 2,000 tons delivered in Kisangani.

In addition to these 3 modern mills, there are a dozen or more small traditional millers in this area. The 3 modern milling companies have indicated their expansion plans for the near future by procuring new equipment. CHANI plans to add an additional capacity to process 240 T/ per week, ANTRIACO 200 T/week and TSHIMBALANGA 125 T/week.

Logistics.

Communications. In Kivu as elsewhere in Zaire, the millers are anxious to improve the supply. According to Citoyen KYALANGALILWA (PROMOTEUR ZAIROIS n° 10 - 12, 14, 1980), the main problems are first a lack of sufficient milling units and second a large number of mills which have ceased operations. For example, observation by the survey team in this southern part of South-Kivu has indicated a shortage of milling capacity. In Shabunda existing milling capacity is estimated at 92 T/day. However, present use is substantially under this capacity. The millers in this zone indicated that they could easily process an additional 750 T/year without needing any additional equipment. In Mwenga the present capacity of all the millers was estimated to reach 16 T/day. These millers have indicated they could go up to 47 T/day if existing but non-functioning mills were repaired and put to work. In Uvira present capacity was estimated at 13 T/day and the potential at 80 T/day given the repair of mills which were not working.

Another logistic weakness of the marketing system is the insufficient supply of bags. In Kivu the price of a bag was 15 Z in October 1981, compared to Kinshasa and Kisangani where it was 8 - 10 Z/bag. There was also a lack of means of transportation such as trucks. The millers indicated they were obliged to buy fuel on the black market. According to the ANEZA Director in Bukavu, the millers in Kivu did not receive help from the banks. The interest rate was high, about 18%/year. If they did get credit, it was only short term (3 months) except at the Banque du Peuple where loans were made for up to 6 months. The millers in South Kivu have expressed a serious shortage of working capital exacerbated by the lack of credit. This situation has led to a milling capacity of only 10% of the total paddy production in the area. This capacity refers to mills equipped with modern equipment, since most of the production is milled with simpler tools or by hand at the village level. While the commercial and modern millers estimated their existing capacity at 10% of total production the DOA

Regional officials of Bukavu estimated the modern millers capacity at 20% of total Production.

Costs and margins. Data on market prices, as in Haut-Zaire, is very difficult to find systematically collected to determine seasonal and annual variations. However, information given by The Affaires Economiques Service in Bukavu are as follows:

- |                    | <u>margins</u> |
|--------------------|----------------|
| - mill owners      | : 20%          |
| - wholesalers      | : 10%          |
| - semi-wholesalers | : 12%          |

Despite the margins mentioned above we observed that the supply/demand interplay at the market place usually provided for much higher margins resulting in higher profits for millers and intermediaries than expected. The increase in fuel prices taken into consideration, the price of rice in the Kiringe Coop in October of 1981 was:

- |                |             |
|----------------|-------------|
| - first grade* | : 4.25 Z/kg |
| - second grade | : 3.90 Z/kg |
| - third grade  | : 3.20 Z/kg |

As mentioned above, Ruzizi Project had only broken rice and the price was 4 Z/kg. Despite the fact that the above may be considered retail prices, the reality of consumer demand forces a large number of intermediaries of different sizes in terms of working capital to purchase rice at the above price for resale in other towns. Thus the question is raised as to the evolution of prices to consumers away from production areas.

At Kotecha's agency, the price per kg was found to be 6 Z, about 41% higher than the purchase price of the first grade mentioned above. Considering transportation, handling, amortization and other costs totaled to 25 K/kg they received a 33% net margin, which was the source of South Kivu millers complaints to the Kiringe Cooperative administrators. During our stay in Bukavu (18 - 23 September 1981), the retail price to the consumer in the local markets was 6,3 Z/kg.

\* The first grade rice is a rice milled, bleached, often polished, sifted to minimize breakage (VASCONCELOS, 1981).

In the Ruzizi Plateau small producers who thrashed their own production and sold rice on road side stands and in local markets received a retail price of 6.25 Z/kg. In this case the net margin of a producer was estimated at about 200%. However, compared to the Ruzizi Projects' retail price of 4.80 Z/kg, the producers price was 30% higher than the price charged by the project. The price in Burundi and in Rwanda are two or three times higher than the Ruzizi Project ~~retail~~ price.

SUMMARY OF COMPARATIVE PRODUCTION COSTS AND MARKETING MARGINS  
IN 4 AREAS OF KIVU (Z/kg) OCTOBER 1981.

	RUZIZI			
	PROJECT %	KIRINGE %	KIVU %	DUKAVU %
Production cost(paddy)	1.62	1.62	0.66	
Farmgate price(paddy)	2.0	2.0	1.0	
Producer margin	0.38	0.38	0.34	
Millers' cost(rice)	4.0	3.12	3.15	
Millers' net margin	0.80 20%	0.78 20%	0.79 20%	
Millers' sale price	4.80	3.9	3.94	
Wholesaler cost	4.81	3.92	3.95	4.00
WHS gross margin	0.19 4%	1.08 21%	0.21 22%	0.02 18%
WHS sale price	5.0	5.0	4.16	5.0
Retailer cost	5.03	5.03	4.19	5.03
Retailer gross margin	0.97 17%	0.97 17%	1.01 30%	0.97 17-22%
Retailer sale price	6.0	6.0	6.0	6-6.4
Retailer sale price in Rwanda and Burundi	12.			
Gross margin	8.76 73%			

In the month of December, the retail price of rice in South Kivu was 8 Z/kg and the margin was estimated to be 103.4%.

Transportation price and handling price:

- Luberizi-Bukavu : 0,12 Z/kg
- Passenger's ticket : 20 - 25 Z.

The evolution of prices described above proves first that as the productivity of transforming paddy to rice increases millers margins improve substantially. Furthermore, those producers that could develop a farm level milling capability and sell at retail, absorbing intermediary margins can realize very substantial profits especially if they sell in Rwanda - Burundi.

ANNEX K.V. I.

PRODUCTION COSTS

Location: Luberizi (South-Kivu)	Variety : IR 5
Culture : paddy	Seed use : 80 kg/ha
Period of cultivation : 4 months	Seed cost : 2.42/kg
Fertilizer : 14-14-14	
" cost : 1.92 Z/kg	
" use : 200 K/ha	

Costs per ha in Z.

1. Production value : 2.500 kg x 2 = 5.000 Z.  
 Inputs: - seeds : 80 kg x 2.40 = 196 Z.  
 - fertilizer : 200 kg x 1.92 + = 384  
 - irrigation -

Input cost/ha = 436 Z.

2. Value added . . . . . : 4.564 Z.

3. Gross margin . . . . . 2,607.8 Z.

4. - soil preparation : 435.2Z  
 - planting : 16  
 - application of fertilizer : 5  
 - irrigation : 1200  
 - weeding (6 h/d) : 300  
 1956.2

4. Direct margin . . . . . 1,663.78

- harvest - threshing  
 - transport - winnowing 100 h/d  
 - weeding - wreshing birds 80 h/d  
 - inflation 20% 650.44  
 - interest 0% 105.34

Paddy cost per kg :  $\frac{4055.98}{2.500} = 1.62$  1,663.78

Producer margin : 2 - 1.62 = 0.38

Source data : Ruzizi Project statistics.

ANNEX K.V. II.

PRODUCTION COSTS (1ha)

Location : South Kivu (Shabunda)  
 Culture : paddy seed cost : 1 Z/kg  
 Variety : IR 5 seed use : 50 K/ha  
 Period of cultivation / 4 months

COSTS PER HA IN Z.

1. Production value : 1.500 x 1 =	1.500 Z
Inputs : 50 kg x 1 =	50 Z/
Inputs costs/ha	50Z
2. Value added . . . . .	. 1.450 Z.
3. Gross margin : soil preparation : 60 H/J	
sowing : 33 H/J	
weeding : 150 H/J	
4. Direct margin . . . . .	507.63
harvest	
transport	
drying	
threshing	
winnowing : 100 H/J	= 300Z
Interset : 3%	= 21.50
Inflation : 20%	= 161.8
	<u>483.37</u>

Paddy cost per kg :  $\frac{992.37}{1.500} = 0.66$

Producer margins : 1 - 0.66 = 0.34 Z  
 or 2 - 0.66 = 1.34 Z. (Luberizi).

## ANNEX K.V. IV.

CORRELATION ANALYSIS BETWEEN LAND AREA  
IN HECTARES (R) AND YIELDS (kg/ha)  
FOR RUZIZI, KIVU

Hectarage	30	40	25	80	30	25	40	30	35	25
(x)										
(are)										
Yield	800	2050	500	1630	1030	467	1500	500	360	300

$$n = 10 \quad X_1 = 35.5 \quad X_2 = 913.7$$

$$X_2^1 = 2522.2 \quad X_2^2 = 2,418,247.13$$

$$X_1 X_2 = \frac{81,111.50}{10} = 1$$

$r$  is positive and equal to 1.  $X_2^1$   $X_2^1$

A sample of 10 farmers were selected from a universe of 30 farmers in the Ruzizi area. The correlation analysis indicated that yields increases as land area increases assuming all other factors having minimal or no influences.

## SOUTH KIVU SURVEY DATA ANALYSIS

## UVIRA SUBREGION.

## 1. Frequency distribution of farm family size:

<u>Farm</u>	<u>Members</u>
1	1
5	2
21	3
6	4
5	5
3	6
8	7
4	8
2	9
2	10
1	11
1	12
<u>2</u>	<u>13</u>
42	155

7 members/farm

## 2. Frequency distribution by age of farm family members:

<u>Class of age</u>	<u>Members</u>	<u>% of total farmer responded</u>
0 - 10	113	44
10 - 19	55	22
20 - 29	42	16
30 - 39	26	10
40 - 49	12	5
50 - 59	7	3
60 and over	-	-
	<u>255</u>	<u>100</u>

82% of members had less than 30 years old.

## 3. Frequency distribution by land area in rice cultivation:

<u>Hectarage</u>	<u>Number</u>	<u>% of total farmers responded</u>
0 - 0.99	30	90
1 - 1.99	3	7
2 - 2.99	1	3

The farms average is 0.42

## 4. Farmers frequency distribution by varieties cultivated:

<u>Varieties</u>	<u>Farmers</u>	<u>%</u>
R 66	1	2
IR 5	35	83
L 7	28	67
KIN GIN	3	7
COCHENIG	3	1
L 70	2	4
		<u>165</u>

Multiple answers over 100%.

## 5. Farms frequency distribution relative to the rate of seeding:

<u>Quantities</u>	<u>Number</u>	<u>%</u>
40 - 51 kg/ha	20	48
40 kg/ha	3	7
80 - 100 kg/ha	15	36
60 kg/ha	1	2
no answer	3	7

## 6. Farmers frequency distribution of month at which planting starts:

<u>Month</u>	<u>Farmers</u>	<u>%</u>
January	6	14
February	1	2
August	11	26
November	15	36
December	9	22
	<u>72</u>	<u>100</u>

## 7. Frequency distribution to agricultural tools:

<u>Tools</u>	<u>Farmers</u>	<u>% of total farmers responded</u>
Dinette	16	36
Hoe	41	97
Machette	26	62
Trident	6	14
Sickle	13	31
Tractor	4	9
Cultivation harness	1	2
Small sickle	1	2
Rake	12	28
		<u>231</u>

Multiple answers over 100%.

## 8. Frequency distribution relative to reason for growing rice :

Cash	41	97
Consumption	26	62
No answer	1	2
		<u>161</u>

## 9. Frequency distribution of family labor force:

<u>Farmers</u>	<u>Labor force</u>
4	2
1	3
4	4
1	6
5	7
3	13
1	15
23	no answer

## 10. Frequency distribution relative of subsistence consumption of production:

<u>% of home consumption</u>	<u>Number of household</u>	<u>% of total</u>
10 - 19	9	21
20 - 29	13	31
30 - 39	4	10
40 - 49	5	12
50 - 59	1	2
	1	2

## 11. Frequency distribution of problems of production:

<u>Problems</u>	<u>Farmers</u>	<u>% of total farmers responded</u>
Lack of labor force	30	71
Lack of water for irrigation	15	36
Lack of seeds	10	24
Lack of credit	2	5
		<u>136</u>

Optional question: answer higher than 100%.

## 12. Frequency distribution of most profitable crops:

<u>Crops</u>	<u>Farmers</u>	<u>%</u>
Rice	36	86
Cassava	6	14
Maize		
Dananas		
	<u>100%</u>	<u>100%</u>

## 13. Frequency distribution relative to the volume stocked:

0 - 9%	17	4
10 - 19	10	2
20 - 29	4	10
30 - 39	2	5
50 - 69	1	2
80 and over	1	2
	<u>7</u>	<u>16</u>
	42	100

## MARKETING

## 1. Frequency by selling to different agents:

<u>Agents</u>	<u>Farmers</u>	<u>%</u>
Tradesmen retailers of village	12	28
Wholesalers tradesmen	9	21
Tradesmen of next village	7	17
Tradesmen of towns	6	14
Village coops	22	52
Ruzizi Project	14	27
Rwanda	1	2
Villagers	2	4
no answer	2	4
		<u>169</u>

## 2. Frequency distribution relative to locations

Village markets	37	88
Houses in village		
Other market	<u>5</u>	<u>12</u>
	42	100

## 3. Frequency distribution relative to the timing of sale:

Before the harvest		
At the harvest	9	21
After the harvest	40	<u>95</u>
		116

Multiple answer over 100%

## 4. Frequency distribution relative to the measure units in use:

<u>Measures</u>	<u>Farmers</u>	<u>%</u>
basket (panier)	3	7
kilo	11	26
bowl	25	59
100 kg bag	1	2
80 kg bag	5	<u>10</u>
50 kg bag		104%

## 5. Frequency distribution relative to price reasons for paddy

<u>Price</u>	<u>Farmers</u>	<u>%</u>
2 Z/kg (Ruzizi Project)	20	48
1 Z/kg	1	2
1,40 Z/kg (coop)	7	17
1.20 Z/kg	4	9
2.60 Z/kg	1	2
no answer	<u>3</u>	<u>22</u>
	42	100%

## 6. Frequency distribution relative to the selling of thrashed rice:

Sell	11	26
Don't sell	21	50
no answer	<u>10</u>	<u>24</u>
	42	100

## 7. Farmers frequency distribution relative to measures used in selling rice:

100 kg bag	3	7
80 kg bag	2	5
50 kg bag	1	2
basket	1	2
no answer	<u>32</u>	<u>77</u>
	42	100

## 8. Farmers frequency distribution relative to expected rice price 1982:

<u>Price</u>		
7 Z/kg	1	2
6	1	2
5	7	17
4	2	5
3	2	5
3	<u>7</u>	<u>17</u>
	42	100

## 9. Farmers frequency distribution relative to their opinion on paddy price:

good price	23	55
price not good	3	7
no answer	<u>16</u>	<u>38</u>
	42	100

This a control test for the eighth question.

10. Farmers frequency distribution relative to the reasons for a low farmgate price:

<u>Reasons</u>	<u>Farmer</u>	<u>% of total farmer responded</u>
Expenses	6	14
Inflation rate	13	31
Good salary	3	7
no answer	<u>20</u>	<u>48</u>
	42	100

11. Farmers frequency distribution relative to measures for improving marketing:

Market organization	10	24
Higher price	22	52
creation of coop	3	7
Price control	5 (tradesmen: 3)	10
Higher production	11 (with technicians)	26
no answer	2 (and machines)	<u>5</u>
		124

12. Farmers frequency distribution relative to the month for most favorable price:

<u>Months</u>	<u>Farmer price</u>	<u>%</u>
September	3	7
October	17	40
November	6	14
December	13	31
June	2	4
no answer	<u>7</u>	<u>113</u>
	42	

Multiple answers over 100%

68-A

APPENDIX III.

## PRODUCTION AND MARKETING IN THE REGION OF EQUATEUR.

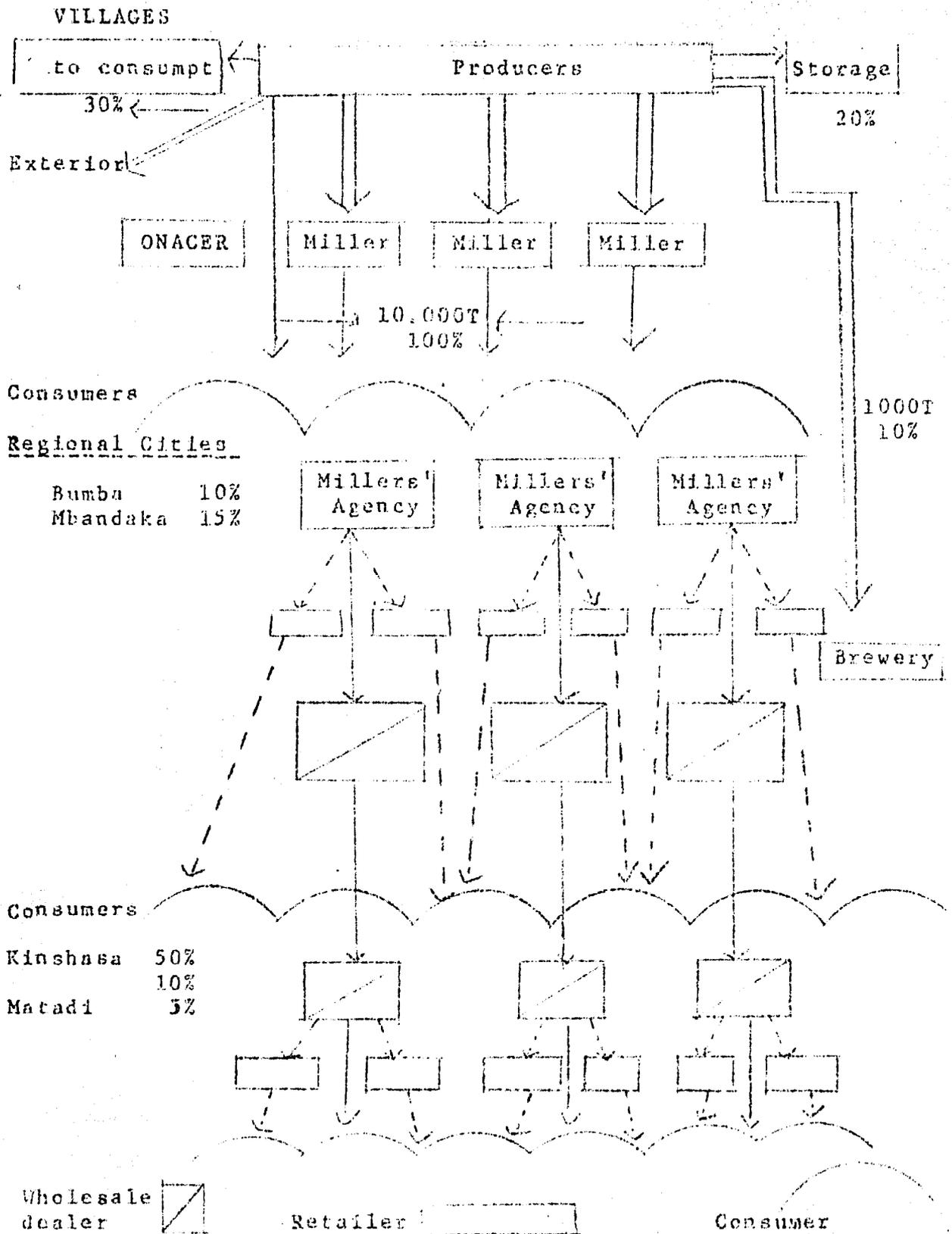
The third phase of the survey took place in the region of Equateur, at Bumba, which neighbors Basoko and Yangambi, in the subregion of Tshopo where the first survey was held.

Bumba is a part of Mongala subregion which includes two zones; Bongandanga and Lisala. The Mongala subregion covers an area of 58,141 km<sup>2</sup> (INSTITUT GEOGRAPHIQUE DU ZAIRE, 1979) with Lisala as headquarters. The zone of Bumba involves an area of 15,498 km<sup>2</sup> and has a population of 318,000 people. In addition to rice there are about 25,960 ha in other crops such as cassava (21,952 ha) maize (29,231), yam (321 ha), peanuts (3,250 ha), plantain (9,770 ha). During 1975 - 1978, the Chinese Agricultural Mission (MAC) project cultivated both irrigated and upland rice. It was impossible to determine the land area and the yields since no reports were left behind after the project ended in 1978. Both types of cultivation have degressed substantially and fields have gone down due to lack of funds, equipment, spare parts, fuel and adequate management personnel.

At the present time the survey team observes that Zairean agronomists are performing efficiently in selecting, multiplying and distributing a degenerated version of R 66 variety. Other varieties such as IRAT are being introduced after a period of observation prior to multiplication and distribution. The improvement of rice is done by F.N.R. sponsored by the Department of Rural Development. The lack of funds to purchase necessary equipment has hampered the progress and made extension operations difficult.

Actually, two tractors to plow the land and two trucks to carry seeds for distribution are needed. In general experimental plots are clean and seem likely to produce good results.

MARKETING CIRCUIT IN EQUATEUR (BUMBA)



Marketing of paddy rice and mill rice.

Bumba is located 100 km from Basoko and provides similar marketing conditions to Basoko. In fact, mill owners at Dumba, particularly Bemba of SCIDE ZAIRE, are supplied from Basoko where the firm bought a total of 850 tons of paddy in 1981 (AGRICULTURE, YANGAMBI, 1981). Usually, the yearly agricultural campaign and marketing calendars are alike in Dumba, Equateur and Haut-Zaire. The marketing campaign takes place from November through April. Prices are also similar (70 k) per kilo and presently increasing to 85 K/kg.

Buying procedures and conditions as well as logistic problems are similar in Equateur and Haut-Zaire (Pattinson, 1977). The two differences observed were the characteristics of the marketing agents and evolution of prices.

Agents. The majority of the Dumba area rice growers sell their paddy to established, well organized mill owners in the city of Bumba. They are engaged in a variety of other commercial activities taking advantage of vertical integration of their operations. Their organization is similar to the company store (canteen) system which existed before independence, where they provided a large number of goods and services to the producers in exchange for his crops. (Ryelandt, 1965). The management of these firms is considered to be efficient and productive which has led to their receiving credits from local banks. These mill owners work under the following company names:

- NOGUEIRA
- SCIDE ZAIRE
- COMAGRIN
- GRISA

They control the rice market since they bag 80% of the total commercial output of the zone. The small mill owners handle 10% and the remaining output is purchased by large millers for the breweries.

Millers sell part of their processed rice in small bags of 5 kg. The great bulk of total annual sales is broken down as follows:

- price of paddy : 20%
- price of fuels : 48%
- price of wrapping: 4%

The price of milled rice which is 164 Z per/60 kg bag for the wholesalers and 189 Z for the retailers reached a peak of 235.70 Z and 264.Z. for both categories of middlemen (see Annex III. price structure).

The market price in Bumba varies monthly. They have increased from January to May and also in October. Numerous middlemen, mostly women, travel throughout the area in search of rice to supply Kinshasa. Most of the women traders interviewed claimed to have sold a 60 kg bag at 420 and 480 Z which they had bought for 189 - 200 Z at Bumba marketplaces. Costs were estimated to be: transportation cost of about 7 - 10 Z/per bag, handling fees of 1.50 Z per bag in Bumba, and accomodation costs in Kinshasa, Mbandaka and Kisangani. The women traders generally bring along fabrics, toilet products, alcohol and manufactured products which they sell in Bumba or Kisangani. They then buy rice to take back to their own areas to sell in local rural markets.

SUMMARY OF COMPARATIVE PRODUCTION COSTS AND MARKETING MARGINS PER KG IN THE REGION OF EQUATEUR AND IN KINSHASA IN OCTOBER 1981.

	<u>DUMBA</u>	<u>%</u>	<u>KINSHASA</u>	<u>%</u>
Production cost(paddy)	0.60			
Paddy farmgate price	0.70			
Producer margin	0.10			
Millers' cost(rice)	2.19			
Miller net margin	0.54	20%		
Miller sale price	2.7-3.15			
Wholesaler cost*	2.85		2.92	42%
WHS gross margin	1.31	31%	2.08	
WHS sale price	4.16		5.0	
Retailer cost	4.19		5.03	
Retailer gross margin**	1.8-2.1	30-33%	0.97-1.3	20%
Retailer sale price	6-6.3		6-6.3	

\* The wholesaler according to rizier's (millers) definition is the tradesmen who buys above 200 bags.

\*\* This amount is a gross margin from which we subtracted some variable fees particularly an interest fee during storage before selling.

Transportation cost: Dumba - Kinshasa : 7 - 10 Z/60kg bag = 0,12-0,16 Z/kg  
 Handling Dumba : 1.5 Z - 3.00 Z/60 kg bag = 0,025-0,05/kg  
 Handling Kinshasa : 1.5 Z - 3.00 Z/60 kg bag = 0,025-0,05/kg



## ANNEX III.

STATION P.N.R. DUMBA

1. Delineation of area to be cultivated:
  - ( daily job : 6 tons O. for 600 m )
  - need of manual labor for 1 blok of 1 ha = 1 T.O/M/D/ha
  - cost of the manual labor :  $1 \times 1 \times 2.50 = 2.50$
  
2. Tree cutting:
  - \* daily task : 10/50 m faby T.O.
  - need of manual labor for 1 h : 20 T.O.
  - cost of the manual labor :  $20 \times 2.50 = 50.00 \text{ Z}$
  
3. Felling:
  - need of manual labor : 30 M/D/ha
  - cost of the manual labor :  $30 \times 2.50 = 75.00 \text{ Z}$ .
  
4. Clearing of stumps:
  - need of manual labor : 20 M/D/ha
  - cost of the manual labor :  $20 \times 2.50 = 50.00 \text{ Z}$ .
  
5. Burning:
  - need of manual labor for 1 ha : 20 M/D
  - cost of the manual labor :  $2 \times 2.50 = 50.00$
  
6. Clearing of stumps and piling:
  - need of manual labor for 1 ha 20 M/D
  - cost of the manual labor :  $20 \times 2.50 = 50.00 \text{ z}$
  
7. Burning of unusable plant material:
  - need of manual labor : 5 M/D/ha
  - cost of the manual labor :  $5 \times 2.50 = 12.50 \text{ Z}$ .
  
8. Planting:
  - need of manual labor : 200 M/D/ha
  - cost of the manual labor :  $100 \times 2.50 = 250.00 \text{ Z}$ .

## 9. Maintenance (2 or 3 for weeding):

- need of manual labor : 10 M/D/ha
- cost of manual labor :  $10 \times 2.50 = 25.00 \text{ Z.}$

## 10. Keeping the birds off:

- period : 1 month (30 days)
- need of manual labor : 60 M/D/ha
- cost of manual labor :  $60 \times 2.50 \text{ Z} = 150.00 \text{ Z.}$

## 11. Harvest:

- cutting : need of manual labor : 20 M/D/ha  
cost of manual labor :  $20 \times 2.50 = 50.00 \text{ Z.}$
- transport: need of manual labor : 40 M/D/ha  
cost of manual labor :  $40 \times 2.50 = 100.00 \text{ Z.}$
- threshing : need of manual labor : 20 M/D/ha  
cost of manual labor :  $20 \times 2.50 = 50.00 \text{ Z.}$

## 12. Conditioning:

- a) drying : need of manual labor : 10 M/D/ha  
cost of manual labor :  $10 \times 2.50 = 25.00 \text{ Z.}$
- b) winnowing and weighing : need of manual labor : 5 M/D/ha  
cost of manual labor :  $5 \times 2.50 = 12.50 \text{ Z.}$

Total production cost/ha : 907.50 Z.

Average yield : 1,750 kg/ha

Cost per ton :  $\frac{907.50 \text{ Z}}{1.75} = 518.57 \text{ Z.}$

Cost per kg : .52 7

Producer margin .18 Z/K

Farmgate price : .70 Z/kg.

## EQUATEUR SURVEYS DATA ANALYSIS

## 1. Frequency distribution of farm family size:

<u>Household</u>	<u>Members</u>
1	1
2	2
2	3
4	4
4	5
5	6
1	8
4	9
2	10
1	13
1	15
<u>31</u>	<u>16</u>
28	185

## 2. Frequency distribution by age of farm family members:

<u>Age</u>	<u>Members</u>	<u>% of total farmers response</u>
0 - 9 years	57	31
10 - 19	56	30
20 - 29	42	23
30 - 39	16	9
40 - 49	6	3
50 - 59	7	4
60 and over	<u>185</u>	<u>0</u>
		100%

## 3. Frequency distribution by land area in rice cultivation:

<u>Acreage</u>	<u>Farms</u>	<u>%</u>
0 - 0.99ha	1	4
1 - 1.99	18	64
2 - 2.99	8	28
3 - 3.99	<u>1</u>	<u>4</u>
	28	100%

AVERAGE 1,11 ha

## 4. Frequency distribution by varieties cultivated:

<u>Varieties</u>	<u>Farms</u>	<u>%</u>
R 66	<u>20</u>	71
MANZANI	13	65
MPEMBE	<u>1</u>	<u>4</u>
		140

Optional question over 100%.

## 14. Frequency by the location sale :

	<u>Farmers</u>	<u>% of total farmers response</u>
Village market	28	100
Village Houses	-	-
		<u>100%</u>

## 15. Frequency distribution by the time of selling:

Before harvesting	-	-
At harvesting period	-	-
After harvesting	28	100%

## 16. Frequency distribution by measure units:

<u>Measures</u>		
60 kg bag	28	100%
80 kg bag		
100 kg bag		

## 17. Frequency distribution relative to price received for paddy:

Most of them received official price : 70 K/kg

## 18. Farmers frequency distribution relative to price appreciation:

<u>Reasons</u>		
Expenses	16	57
Inflation	19	67
no answer	2	<u>7</u>
		131

Multiple answers over 100%.

## 19. Farmers frequency distribution relative to means of improving marketing:

<u>Means</u>		
Good price	11	38
Monitoring culture	13	45
Logistics	19	67
no answer	<u>1</u>	<u>154%</u>

Multiple answers over 100%.

## 5. Frequency distribution of quantity of seed used by ha:

<u>Volume/ha</u>	<u>Size/ha</u>	<u>Farmers</u>	<u>%</u>
30	1	8	28
60	1	16	58
80	1	2	7
no answer	1	2	7
		<u>28</u>	<u>100%</u>

## 6. Frequency distribution of months at which planting starts:

<u>Months</u>	<u>Farmers</u>	<u>% of total farmers response</u>
March	11	38
April	17	62
May		
June		
----	<u>28</u>	<u>100%</u>

## 7. Frequency distribution of agricultural tools used:

<u>Tools</u>		
Machette	25	89
Hoe	10	35
Hatchet	20	70
File	17	61
Rake	11	38
Spade	2	7
Sickle	5	18
		<u>318%</u>

Multiple answers over 100%.

## 8. Frequency distribution by reason for growing rice:

<u>Reason</u>		
cash	10	35
consumption	1	4
consumption and cash	19	<u>100%</u>

Multiple answers over 100%.

## 9. Frequency distribution of family labor force:

Farmers use labor force.

## 10. Frequency distribution of subsistence consumption of products:

<u>Rate of consumption</u>	<u>Household</u>	<u>% of total farmer response</u>
0 - 9%	15	53
10 - 19	7	25
20 - 29		4.0
30 - 39	1	11.0
50 - 59	3	<u>7</u>
70 and over	2	100

78% of households consume less than 30%.

## 11. Frequency distribution of problems in production:

<u>Problems</u>	<u>Farmers</u>	<u>%</u>
Insects	13	45
Soil preparation	18	64

Optional question over 100%

## 12. Frequency distribution of most profitable crops:

<u>Crop</u>		
Cassava	21	75
Rice	5	18
Corn	2	7
Plantain	<u>28</u>	<u>-</u>
		100%

Cassava is sold by leaves, cossettes, etc.

## 13. Frequency distribution by selling to different tradesmen:

<u>Agents</u>		
Villagers		
Retailers		
Wholesalers	25	89
Village tradesmen	<u>3</u>	<u>11</u>
	28	100%

## 20. Frequency distribution relative to transportation means:

<u>Means</u>	<u>Farmers</u>	<u>% of total farmers response</u>
Boat		
Truck		
Feet	28	28%
Small boat (canoe)		

## 21. Frequency distribution to expected paddy price for 1982:

<u>Price .</u>		
1.5 Z/kg	22	78
1.0 Z/kg	4	14
no answer	4	<u>10%</u>
	<u>28</u>	

Multiple answers/ 100%

## COMPARATIVE SUMMARY OF PRODUCTION AND MARKETING DATA IN 3 REGIONS

	<u>HAUT-ZAIRE</u>	<u>KIVU</u>	<u>EQUATEUR</u>
<b>PRODUCTION:</b>			
<b>% of Zaire</b>	31%	23%	17%
<b>Variety</b>	R 66 rainfall	IRS L7 irrigated and rainfall(973.8)	rainfall(1250)
<b>Yield</b>	973.83 kg	irrigated(1500kg)	irrigated(1580kg)
<b>Auto consumption</b>	30%	40%	30%
<b>Storage</b>	20%	20%	20%
<b>Processing</b>	mills(Riz tout venant) mortar-pestle	mills mortar-pestle	mills riz tout venant
<b><u>MARKETING CHANNELS</u></b>			
<b>Morphology</b>			
<b>System</b>	long-short formal-informal	long-short formal informal	long-short formal informal
<b><u>MARKETING AGENTS</u></b>			
<b>Organization</b>	Loose	Tight	Tight
<b>Management</b>	weak	functional	strong
<b>Economic power</b>	weak	weak	strong
<b>Producers</b>	Cooperative independents	Cooperative independents	independents
<b><u>LEGAL AND FINANCIAL</u></b>			
<b><u>ASPECTS</u></b>			
<b>Marketing campaign</b>	controled	liberalized	controled
<b>Marketing calendar</b>	Nov-April	April-May-Dec	Nov-April
<b>Terms of sale</b>	60 kg bag	100 kg bag	60 kg bag
<b>Conditions of sale</b>	glass,kg,sack	bowl.,kg,sack	glass,kg,sack
<b>Official price</b>	Respected	not respected	respected
<b>Location of sale</b>	markets-shops frontiers villages-agencies	markets-shops villages-agencies	idem
<b>Transportation</b>	trucks,porters boats	trucks,porters small boats	trucks,porters boat
<b>State control on farmgate</b>	strict	weak	strict
<b>Credit</b>	non-existent	non-existent	available for large millers only

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