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SELECTED POLICY ISSUES : RICE

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Preface

The purpose of this paper was to summarize selected aspects of the current economic situation with regard to rice.

The following members of the Service d'Etudes et Planification, Bureau d'Analyse Economique have provided inputs either of data or comments : Citoyens : Ngemba Leng-Nakanda, Kassenga Ali Zibuka, Tonyemba Ussamba, Boele Ilondo. Some helpful suggestions were made by members of the Chemonics team : F. Rawson, C. Camacho, G. Branson, D. Barnett and H. Ben Senia; by W. Dinh, World Bank project representative attached to the SEP, and Paul De Vuyst, Ingénieur Agronome, Belgian Technical Assistance. Final responsibility remains with the author, Brook A. Greene of Chemonics.

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Summary

The purpose of this short report was to comment on selected issues concerning availability of rice in Zaire. A more detailed look at production, demand and marketing has been carried out in commodity reports prepared by the office of economic analysis, Service d'Etudes et Planification (6).

National demand for rice exceeded local production resulting in imports representing an amount equivalent to 40 % of local estimated production in 1987 and a Kinshasa market value of $ 35 Millions. Given the data available and using FAO estimates of theoretical demand, production would need to increase by 10 %/year between 1988 and 2000 to equal demand. As this is unlikely, imports can be expected to continue. Given the small relative cost of these imports, one could argue from a political point of view that a cheap food policy could be useful in the very short term. Given existing marketing constraints, and large deficit in supply, it appears likely that further increases in rice imports might not affect producer prices in the short term.

Increasing demand has been reflected in a slow increase in the real price of rice and in rising consumption in spite of lower real prices for maize grain, maize flour, manioc tubers, and manioc flour. It would appear therefore that current and real prices of rice should be related to those of maize and manioc flour i.e. finished, ready to cook items like rice.

Some discussion was made regarding selected issues based on the author's experience in the Zone of Bumba in 1988. The main concerns were about the availability and reliability of basic data, the extreme shortage of improved seeds, a possible deterioration in existing seed quality apparently related to strong demand among traders and the existing attractive profitability of growing and marketing rice in spite of numerous well documented constraintes. The discussion suggested the need to futher clarify agronomic and economic aspects of production and marketing. In particular, the superior cost-of-production efficiency of traditional farmers was highlighted as well as the need to clarify the role of large established traders as policies of liberalisation come into effect. Future studies should review why Kinshasa Market prices reflect such higher prices over imported food costs, and the extent to which food imports might be further increased before affecting production prices.

Selected Policy Issues : Rice

Brook A. Greene

Introduction

In 1985, the estimated volume of paddy was 1.4 % of the total volume of agricultural crops estimated for Zaire. In the same year, paddy made up 1.8 % of the estimated total production of manioc, maize, and paddy (1,p10). Hence, the importance of rice production in the national economy in the physical sense is not large.

On the other hand, rice made up from 1 to 15 % of the carbohydrates consumed in the normal diet ranging from a low of 1 % in Shaba, 2 % Kasai-Occidental, 3 % Bandundu to 10 % in Equateur and Kasai-Oriental to 15 % in Kivu and Haut-Zaire. The average for Kinshasa was estimated at 7 % and for Zaire 8 % (2,p14). Therefore, the importance of rice in the national diet can be said to be considerable.

Finally, with continued high rates of population and urban growth, rice imports have become more important than previously. In 1987, an estimated 68,000 mt equivalent to 40 % of the total volume of national rice production (roughly 180,000 mt) was imported. This had a Kinshasa market value of roughly 35 million dollars. [1]

Therefore, rice has become a costly and important import in terms of dollar value and hence foreign exchange. It is, however, not very important in terms of the total value of food imports. For example, estimated data for 1987 suggests that rice imports were roughly only 2 to 3 % of the total Kinshasa market value of imports (Table 1).

One could therefore conclude that, from a political point of view and given present unstable economic conditions, the Government could do more in the short term to keep staple food prices down. Rice has become a staple food for some sections of the urban population. Liberalization of rice, maize and wheat imports might be a useful short term policy consideration. It would be interesting to estimate the extent to which imports could be increased before affecting local producer prices and discouraging local production. Given the extent of apparent supply deficits, there should be some potential for further imports without causing a negative effect on production.

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[1] 57 Z/Kg imported rice; 1 $ = 112 Z average for 1987. See Indice Officiel des Prix. (68,000,000 kg x 57)/112 = 34.6 M$. Imports in 1986 were estiamted at 60,000 mt valued at 19.6 M$ (4,p68).

Table 1 : Estimated Market Value of Selected Imported Food Products, Zaire, 1987 *

Product	Average Market Price Kinshasa [1]		Volume Imports [4]	Estimated Value		% of Total Value	Rank
	(Z/kg)	(Z/mt)	(mt)	(Z Current)	(M)	%	
Maize (grain)	33	33,000	56,000	1,848x10^6 [2]	16.5	1.2	7
Rice	57	57,000	70,000	3,990x10^6 [2]	35.6	2.6	6
Wheat flour	61	61,000	68,000	4,148x10^6 [2]	37.0	2.7	5
Wheat grain	25 [2]	25,000	215,000	5,375x10^6 [2]	48.0	3.6	4
Sugar	110	110,000	50,000	5,500x10^6 [2]	49.1	3.8	3
Meats	1000 [3]	1,000,000	50,000	50,000x10^6 [2]	446.4	33.1	2
Fish	1000 [3]	1,000,000	80,000	80,000x10^6 [2]	714.3	53.0	1
Total				150,860x10^6 [2]	1,347 [5]	100.0	

* Estimated by author Z = Zaires, mt = metric tonnes.

[1] INS Table of average prices for Kinshasa markets (3)

[2] 1985 = 17 Z, 1987 = 27 Z

[3] Estimated

[4] Estimated and rounded. Official figures from OFIDA were as follows :
$ Million value of imports (presumably at Matadi, and perhaps excluding grant portions) : Maize $M 5-7, Rice $M 15-17; Wheat grain $M 25-30; Sugar $M 17-20; Meat $M 25-30; Fish $M no estimate given. If we estimate fish at $M 50-60 then the total for this group equal roughly $M 130-170.

[5] 1 $ = 112 Z average for 1987, INS Official rate (3) M$ = Million $

Demand Exceeds Supply

Estimated rates of growth in production of paddy were 3.95 % / year between 1971 and 1981 (2,p57) and 3.5 % between 1980 and 1987 (Table 2). As a result, production per capita, assuming a population growth rate of 3 % / year after 1984 [1], has remained fairly stagnant since 1970 and since 1980. However using USAID estimates of imports, Kg per capita supply remained between 6.5 and 7 upto 1985 and only increased above 7.5 with a doubling of imports and after 1986 (Table 2).

Assuming the estimated theorical demand for rice as 414,000 mt in 1988 based on estimated calorie requirements of 3,000/day used by the FAO; a production of 186,000 mt; a rate of growth in demand for rice of 3.06 % per year to continue until year 2000, rice production would need to grow at a rate of 10 % per year to match requirements by the year 2000 (Case 1, Table 3). By reducing estimates of theoretical demand by 17 % or to 2,500 calories/day, rice production would need to increase at a rate of 8.9 %/year over this period (Case 2, Table 3). When demand was forecasted using estimates of current consumption, income elasticity of demand, estimated rate of growth in real income and population, rice production would need to grow at a rate to 7.6 % per year (Case 3, Table 3) from the current estimated production level of 186,000 mt in 1988 to match this demand in 2000. It therefore seems unlikely that local production will satisfy local demand within the next 11 years.

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1) Which may be too low. Using 19,236,000 for 1970 and 29,671,000 for 1984, the growth rate was 3.08 % / year between 1970 and 1980.

Table 2 : Estimated Per Capita Rice Production, Zaire, 1970-88.‡

Year	Paddy (1) Production	Rice (2) Production	Population (3) 3 % growth	Rice Production per capita	Rice Imports (6)	Total Supply	Supply / capita
	(000 mt)	(000 mt)	(000)	(kg / yr)	(000 mt)	(000 mt)	(kg)
1970	179.0	103.0	19,266.2	5.34	25	128	6.64
1980	234.0	140.6	26,377.3	5.33	10	150.6	5.71
1981	245.4	147.2	27,080.3	5.44	12	159.2	5.88
1982	250.9	150.5	27,917.8	5.39	(31.5) 14	(182.0) 164.5	(6.52) 5.89
1983	271.3	162.8	28,791.2	5.66	(35.0) 8	(197.8) 170.8	(6.87) 5.93
1984	286.0	171.6	29,671.4 (5)	5.78	(34.5) 33	(206.1) 204.6	(6.95) 6.90
1985	297.1	178.3	30,561.5	5.83	(34.4) 38	(212.7) 216.3	(6.96) 7.08
1986	298.6	179.2	31,478.4	5.69	(63) 68	(242.2) 247.2	(7.69) 7.85
1987	300.1	180.1	32,422.7	5.55	70 e	250.1	7.71
1988	310.7 (4)	186.5(4)	33,395.4	5.58	70 e	256.5	7.68

‡ : calculated by the author.

(1) 5, p.57.

(2) 60 % conversion; 7,p.201.

(3) using census figure for 1984.

(4) growth rate 1980-1987= 3.54 % / year. Figure for 1988 estimated.

(5) census estimate

(6) 7,p.201. Figures in brackets are USAID estimates.

TABLE 3 : ESTIMATED GROWTH RATES IN RICE PRODUCTION TO MATCH DEMAND.-

Year	Theoretical Demand (1) Case 1 (000 mt)	Theoretical Demand (1) Case 2 (000 mt)	Forecast Demand (2) Case 3	Rice Production (000 mt)	Required Rate of growth in Production From base year = 1988 (% / year) Case 1	Case 2	Case 3
1988	414	414	-	186	-	-	-
1990	440	365	295	-	43(3)	33.7	23.1
1995	510	423	355	-	14	11.7	9.2
2000	600	498	431	-	10	8.9	7.6(4)

* Calculated by the author. Figures rounded

1) Growth rate assumed : 3.06 % / Year, the rate between 1979, 1985. (2, P.65, 66) Case 1,1979 = 315,558 mt; 1985 : 379,081 mt; 1988 = 414,956 mt. This figure was based on an estimate of 3,000 calories/day/adult male. By assuming a certain consumption level (2,P.14), and population per region, calories/day were converted into Kg/day/per male, female and child and converted by total population estimates (2,P.59) into total estimated real needs or theoretical demand for each subcategory of food i.e. maize, rice, manioc cossette etc... Case 2. One could scale down the calorie requirements, and hence all estimates to 2.500 calories or by 17 %. 1990 would approach 365 and the required growth rates per year would then be 1990 : 33.7 % per year and so on for subsequent years.

2) Demand forecasted by using the income elasticity of demand for rice and the rate of growth in real income multiplied by estimated population figures in each year to 2000 (See 6, Demand by T.Ossamba).

3) The assumed rice production in 1988 was 186,000 mt. The figure for 1979 = 140,000 and for 1987 = 180,000 or an annual rate of growth r = 3.14 % between 1979 and 1987. To calculate the required rate of growth in production to equilibrate production and demand in 1990, r = (ln 440/186)/2 : 43.0 % / year. For 1995, r = (ln 510/186)/7 = 14.4 % and so on.

4) r = (ln 431/186)/11 = 7.6 % / year.

Given these figures, one could estimate the deficit between estimated theoretical demand and estimated production. This deficit would then indicate the level of rice imports required to match the demand (1). The result of this exercise using Case 1 demand was that imports ideally would need to increase from 230,000 to 330,000 mt between 1988 and 2000 or at a rate of growth of 3.0 % per year (Table 4). The cost of importing the rice would go up by about 4 M$ per year from roughly 107 Million $ in 1988 to 150 M$ per year in 2000.

The above estimates were only rough estimates. Market price of rice and official exchange rate were assumed to increase by 50 % per year although the increase was closer 100 % between 1987 - 1988 (3,December).

It is not clear to what extent this level of deficits should be addressed. What is clear is that it would not cost a great deal to do so. At the moment, with imports averaging around 70,000 mt, there appears to be a real and rather large deficit between demand and supply. This deficit should have an impact on prices which could then be reflected in greater demand for various subtitutes like perhaps manioc and maize flour.

The theoretical demand as here shown (Case 1) would represent roughly 730,000 mt paddy for 1990, 850,000 mt in 1995 and 1,000,000 mt in 2000. If we use the lower calorie requirement of 2500 (see note under Table 3), the results would be 608,000 mt 1990, 705,000 in 1995 and 830,000 in 2000 or a difference of roughly 17 %. Using the income elasticity of demand method (Case 3), the demand would be around 700,000 mt of paddy in 2000 or 30 % less than when using Case 1, Table 3.

Policy Option

A long term rice import policy should be preferable to an annual policy. The quantity of imports could be increased by 3 % per year.

One method is probably as hazardous as another. In this approach, currentlevels of consumption and income were used to forecast future demand. The estimated deficits were roughly 50 % of the levels estimated using the theoretical demand i.e. a deficit of roughly 150,000 mt by 2000. To close the gap between existing consumption and theoretical demand would then mean importing at some level between these two extremes i.e. say half way between 150,000 and 330,000 mt by year 2000 or around 240,000 mt. This is about 3/2 times the current level of imports.

Table 4 : Deficit in the Rice Production Estimated from Theoretical Demand (Base Year 1988).

Year	Theoretical Demand (1) (000 mt)	Estimated Production (2) (000 mt)	Resulting Deficit (000 mt)	Deficit Rounded (000 mt)	Current Price (Z / kg)	Exchange Rate (1$ = Z)	Estimated Value $M (3)
1988	414	186	228	230	85.5 (4)	183	107 (4)
1989	427	192	235	235	128	274	110
1990	440	198	242	240	192	410	112
1991	453	204	249	250	288	615	117
1992	467	210	257	260	432	920	122
1993	482	217	265	265	648	1380	124
1994	496	223	273	275	972	2100	127
1995	512	230	282	280	1460	3140	130
1996	527	237	290	290	-	-	-
1997	544	244	300	300	-	-	-
1998	560	252	308	310	-	-	-
1999	577	260	317	320	-	-	-
2000	595	268	327	330	-	-	150 (5)

* : estimates by author.

(1) rate of growth fixed at 3.06 % / year.

(2) rate of growth fixed at 3.14 % . year.

(3) using 1$ = 122 Z fixed at July 1987 official rate and kinshasa market price: 1987 = 57 Z / kg both increasing at 50 % / year.

(4) 1987 price = 57 Z / kg. 1988 price = 57 x .5 = 85.5 Z / kg = 85,500 Z /t x 230,000 = 19.665 x 10^9 Zaires divided by / (122 x .5 = 183 Z = 1 $) gives $M 107.

(5) 130 M$ in 1995 plus 4 M$ / year = 150 M$ in 2000.

Increase in Real Price

Current prices for local and imported rice have risen considerably between June 1987 and 1988 (Figure 1). Local rice went up 189 % and imported rice 141 % . Prices deflated by the index of official exchange rates showed a real price increase of around 70-80 % for local rice and 50 % for imported rice (Table 5).

These price increases in the Kinshasa markets reflect what appears to be an increasing demand for rice as seen by the widening deficit.

Increase in Consumption

In spite of a rising trend in the real price of rice, the real price had dropped after 1982 and this was reflected in rising consumption (Figure 2, Annex 3).

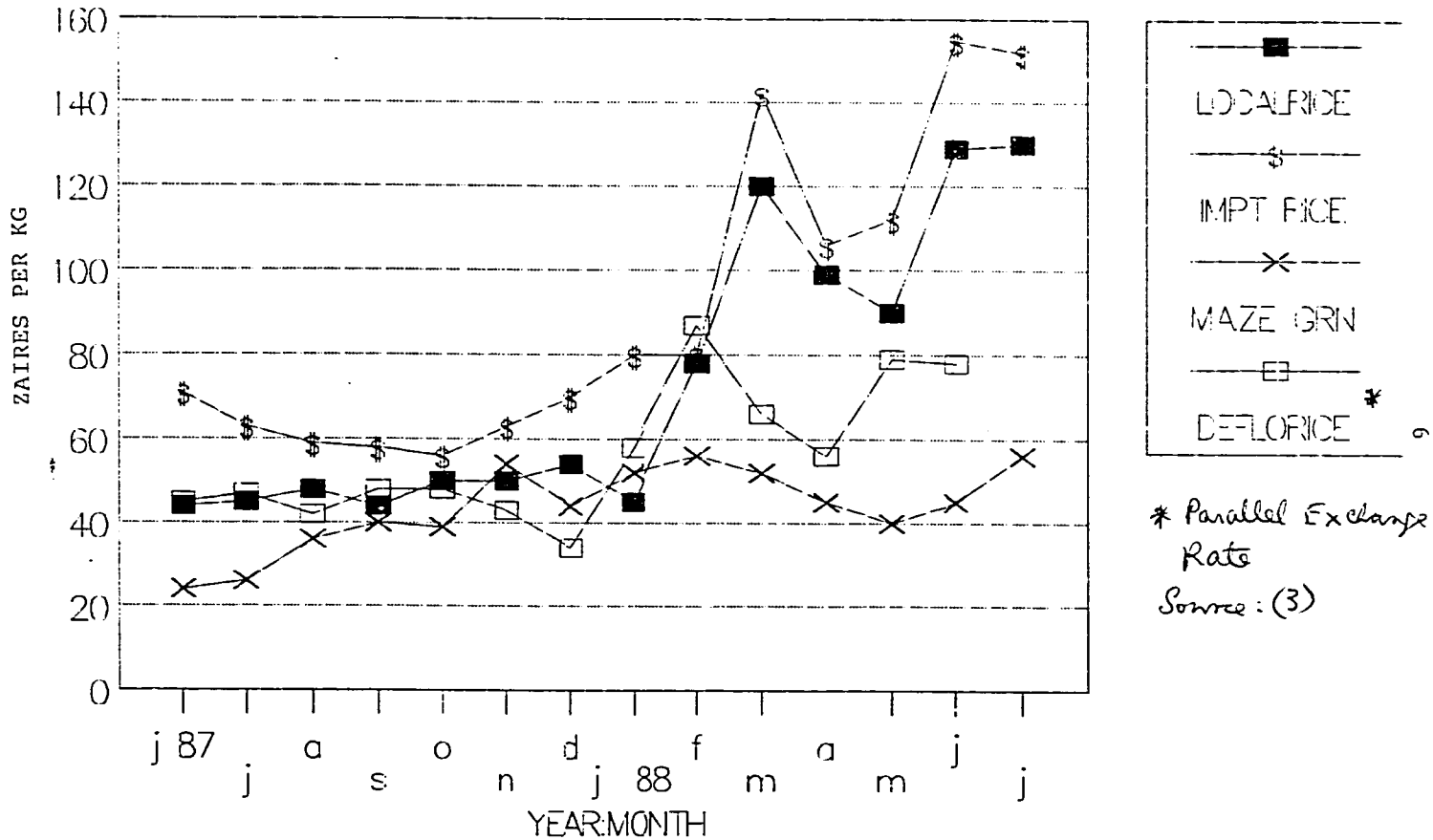
This rising consumption was highly correlated to rice imports (Figure 3). The effect of imports is to raise the estimates of total consumption i.e. production plus imports. Higher consumption was also taking place even though the real price for substitutes such as maize and manioc were lower than that of rice (Figure 4). It is highly probable that the price of rice should be related to the price of maize flour and manioc flour rather than to maize grain and manioc cossettes. In this case, rice was cheaper during 1987 but somewhat more expensive than either maize flour or manioc flour during 1988 (Annex 1). Rice consumption had increased in spite of cheaper maize and manioc flour. It appearred that factors other than price were involved. This might include a shift in consumer preference as incomes increase and/or less labour. Any change in consumption would need to be related to income and cultural groups.

Policy Option

The impact of lower real prices on rice consumption within income and social groups should be studied further. Other factors such as cooking time and costs between substitutes should be included.

SELECTED CONSUMER PRICES, KINSHASA MARKETS JUNE 87--JULY 88

FIGURE 1



* Parallel Exchange Rate
Source: (3)

Table 5 : Prices of Local and Imported Rice, Kinshasa Markets, June'87 to July'88 *

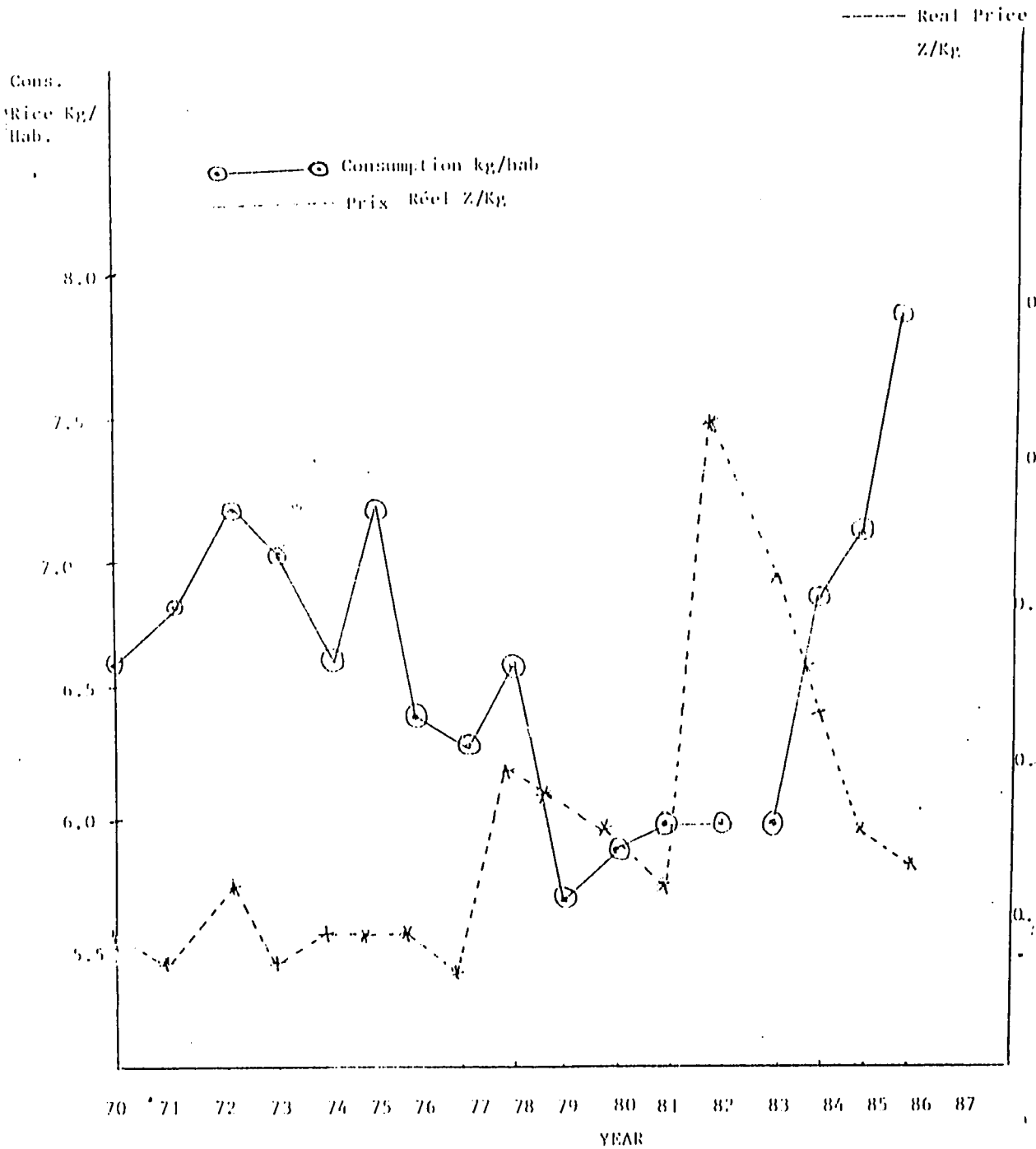
Period	Price Local Rice	Price Imported Rice	Index [1] Official Exchange Rate	Price Deflated Local	Price Deflated Imported	Index [2] Black Market	Price Deflated Local
'87	(Z/kg)						
	(1)	(2)	(3)	(4 = 1/3)	(5)	(6)	(7 = 1/6)
J	45	63	100	45	63	100	45
A	48	59	101.5	47	58	100.8	47
S	44	58	102.7	43	56	103.4	42
O	50	56	104.5	48	54	103.4	48
N	50	63	104.7	48	60	104.5	48
D	54	70	106.8	50	66	125.6	43
'88							
J	45	80	111.3	40	72	133.2	34
F	78	80	115.9	67	69	134.9	58
M	120	142	121.4	99	117	137.9	87
A	99	106	135.2	73	78	150.6	66
M	90	112	139.6	64	80	160.7	56
J	129	155	147.7	87	105	164.0	79
J	130	152	161.3	80	94	167.7	78
Increase (%)							
J'87-J'88	189	141		78	49		73

* INS (5) Calculations by author

[1] Index Official Exchange Rate

[2] Index Parallel Market Exchange Rate

Figure 2 : Consumption and Real Price of Rice



ONSUMPTION AND REAL PRICE OF LOCAL RICE,ZAIRE 1970–1986

FIGURE 2

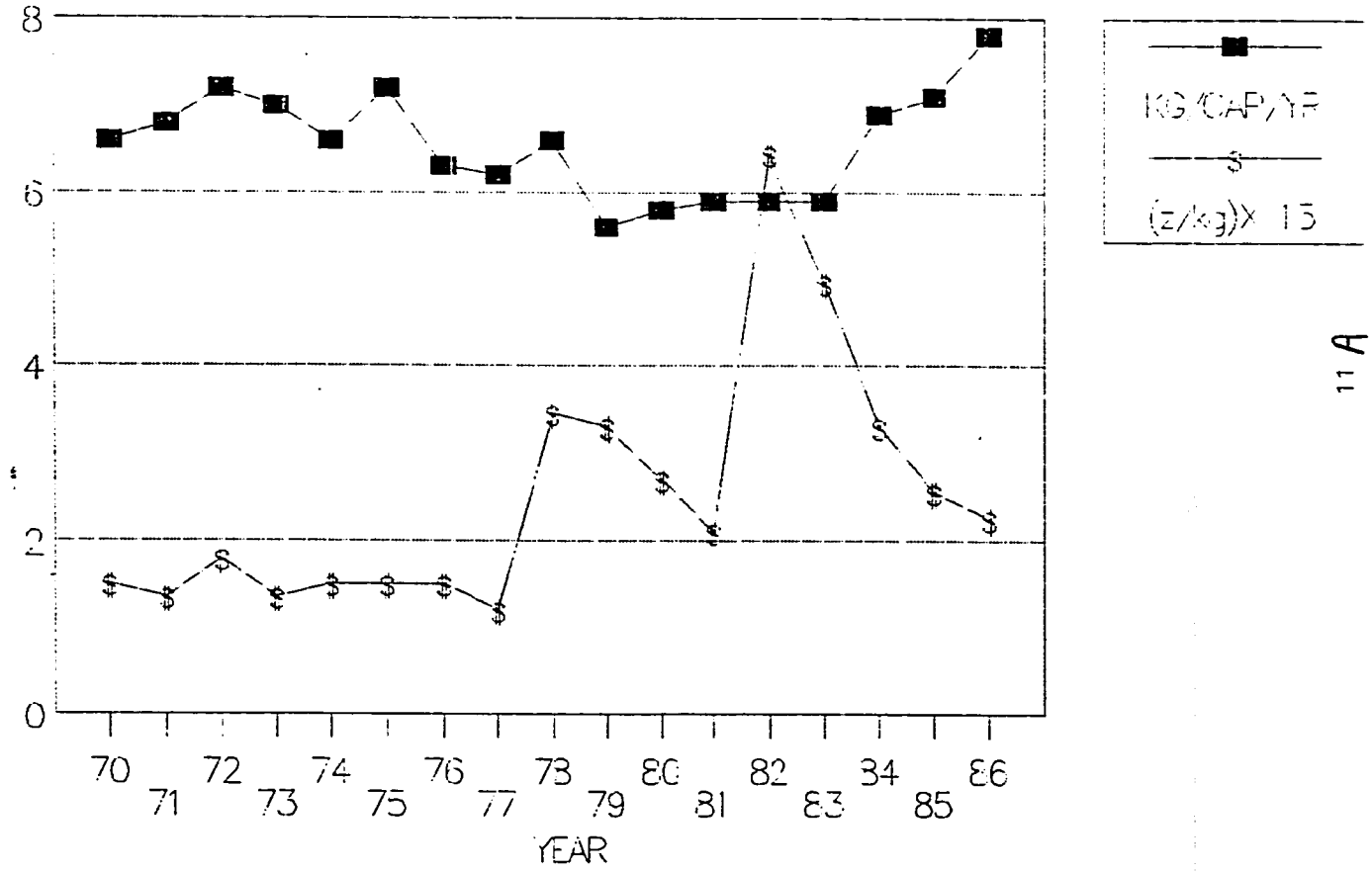


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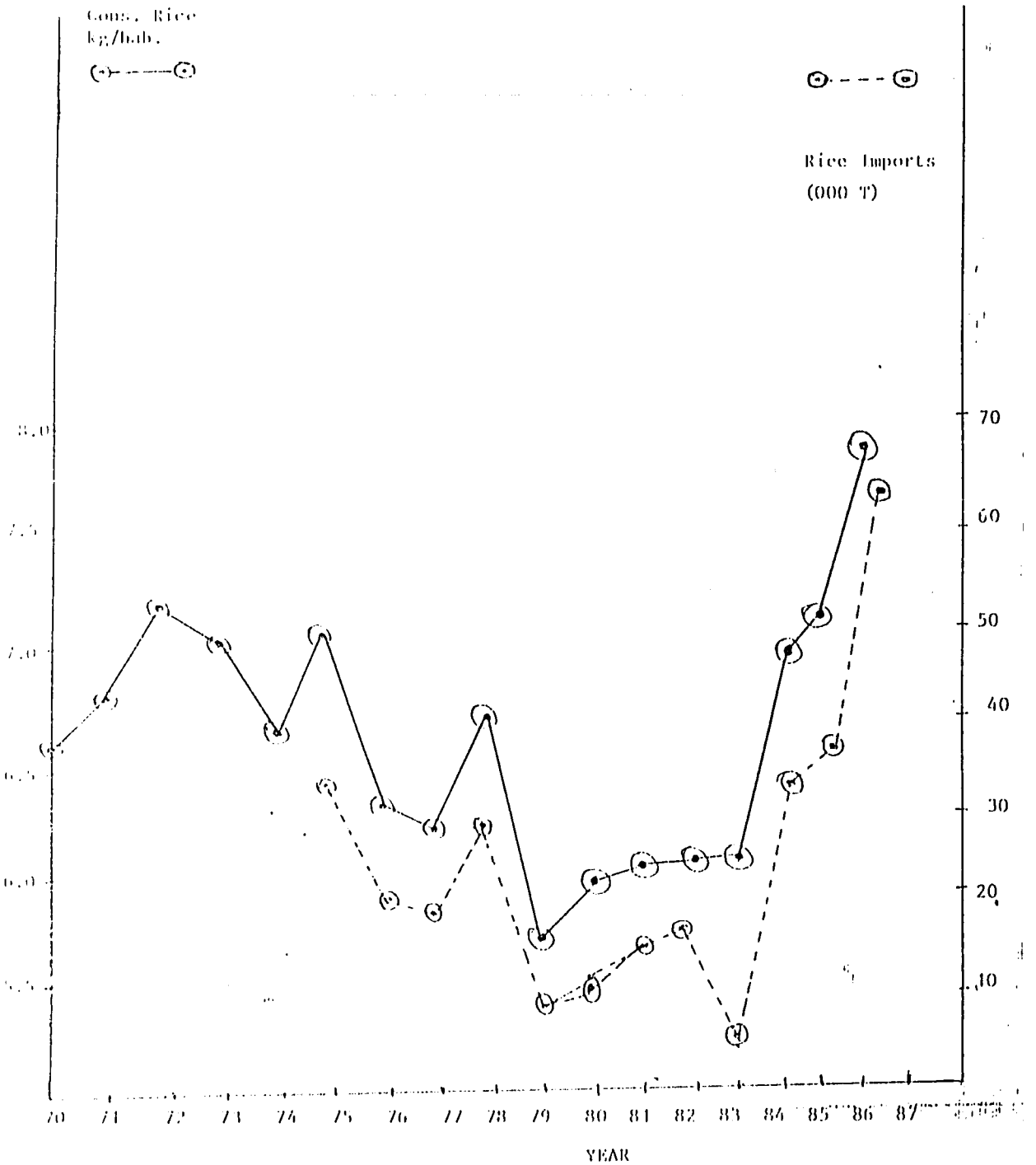
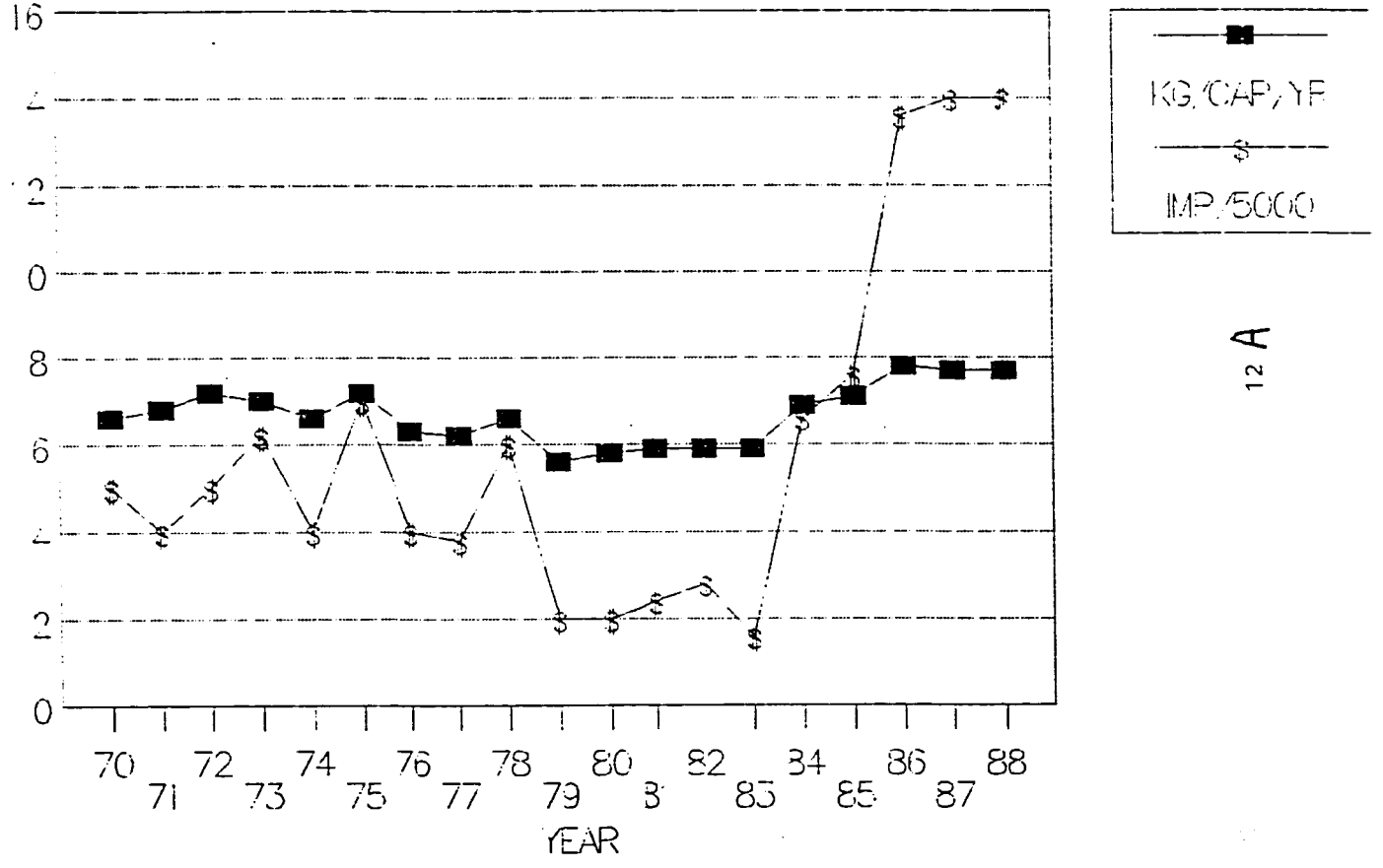
Figure 3 : Imports and Consumption of Rice



IMPORTS AND CONSUMPTION OF RICE

Zaire,1970–1988.

FIGURE 3



REAL PRICE:LOCAL RICE,MAIZE GRAIN MANIOC COSSETTE,KINSHASA MARKETS 70/86

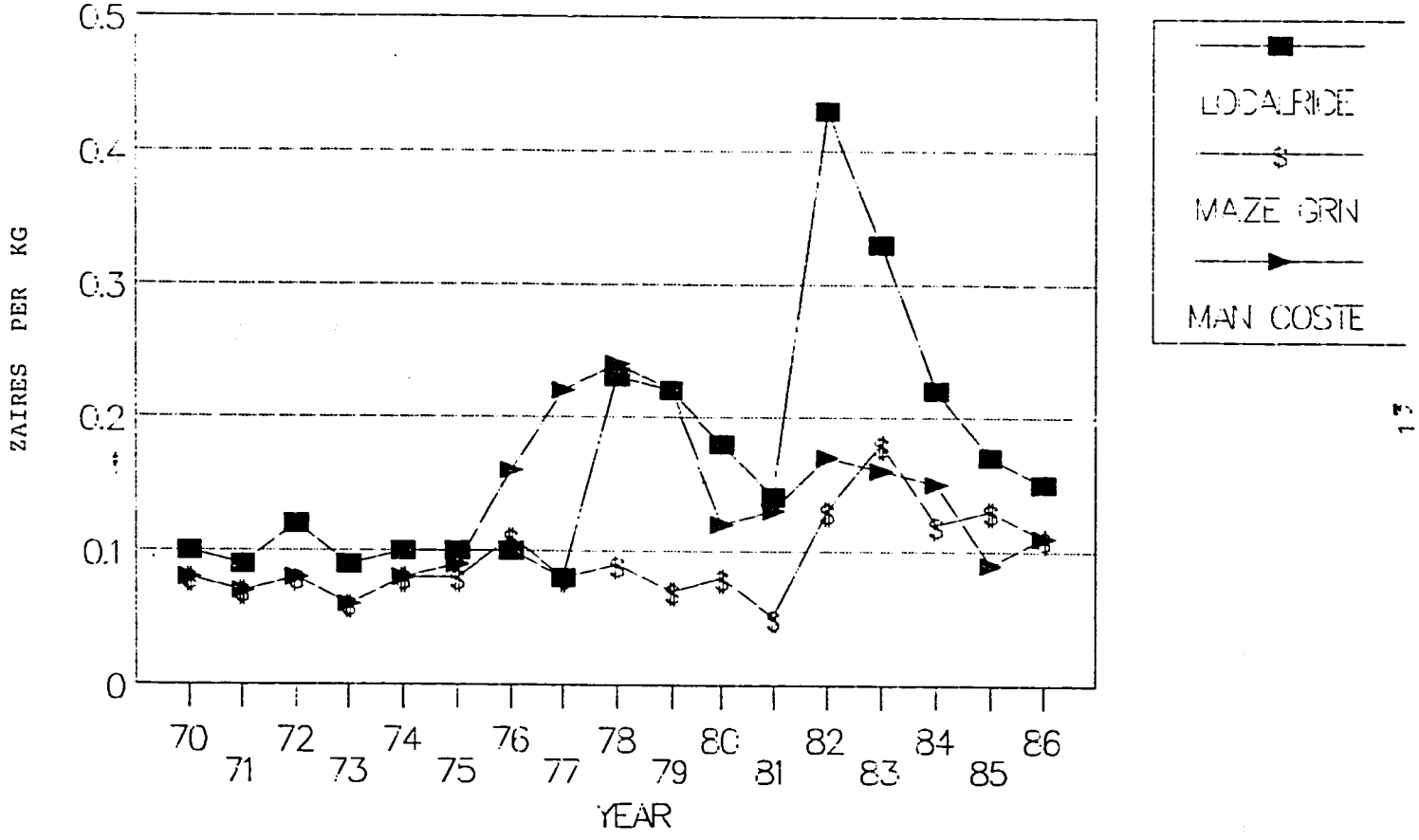


FIGURE 4

Discussion

The many constraints to the development of the agricultural economy of Zaire have been identified in many reports [1]. Recommendations have been made for each region and, within each region, for specific programs (1, Chap 2.3, 3.5). The general reader can look at these reports. Some of the broad problem areas apply to the agricultural economy as a whole i.e. infrastructure, marketing, finance, prices, training and extension, research, administration and organization.

The intention here is to comment on selected aspects within these broad constraints based on observations made during a three week visit to the Zone of Bumba in July/August 1988.

Problem Number One : Little Reliable Data

Starting from the 'Localité' (village) within any 'groupement' (area of several villages) and 'collectivité' (district within the zone made up of several 'groupement'), one generally finds that the agricultural extension officer has very little data about his collectivité. There are some that do and most that don't have any reliable data. After all, distances are large, transport is by foot and bicycle, pay is little and he must see after his own food requirements.

There are data sources-secondary data from reports, or from local missions for specific collectivités. There are data on population and area of production. An effort by the Division of Agricultural Statistics in the SEP/Department of Agriculture has been made to develop a data bank on basic statistical information. But it is difficult to obtain a sampling frame from which to draw a statistical sample. One can argue that this is not necessary. We still need village level production and socio-economic data.

Problem Number Two : Available data not analysed

Visiting the zonal agricultural officer, and on reading the annual agricultural reports, it is clear that most officers require retraining in basic descriptive analytical methods. They would then be able to collect and prepare coherent reports in their specific subject matter areas. They would also be able to better understand the reasons and need within specific programs. For example, collection of weekly market prices in the zone of Bumba should include prices for rice, maize, and coffee as these are major cash crops. These prices were not being collected in July/August 1988 although many others were being collected as part of the permanent statistics program. The reason given for not collecting these prices was that they were too variable!

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[1] See for example 1, p15-17; See 2 for a good discussion of constraints. See 6, Chap 3. See 7, Chap 1.3, p9. Chap 7, p374. Chap 9, p421.

Problem Number Three : Improved Rice Seeds

With a total area of roughly 25,000 Ha in the Zone of Bumba (9, Chap 2) assuming 35 Kg per Ha, a low figure, one would need about 980 tons of improved seed for 100 % coverage.

In 1987, only seeds under the PRAAL program were available for distribution by the PNR. These seeds were local varieties. The local PNR distributed these after the planting dates. Roughly 10 Ha out of 1030 Ha available were used by PNR mainly to support current expenses. The goal is to plant roughly 40 Ha in 1988 to produce 100 tons of local varieties R_{44} and $IRAT_{5}$ early in 1989 [1]. Fourteen varieties of rice imported from Ibadan (IITA) were not tested in 1986/87 due to the failure of an irrigation pump (even though the water table is only 4-6 meters deep)! In 1987/88, there were no results with these seeds (10,p12).

One must conclude that there are serious doubts as to the ability of PNR to function in a serious manner. The solution might be to distribute improved seed to as many private growers (i.e. ECOMAPRO, ADAZ, PLZ, Chefs des collectivités) as possible so that they can multiply and distribute them locally. Initial multiplication could take place under BUNASEM and private seed farms as already being done.

Problem Number Four : Seed Quality

Most farmers keep seed to plant the next year. There are indications that as competition increases between small traders and larger private companies, farmers have been selling their rice too early. Increasing cash needs could be a factor. The reported problems include immature grains; insufficient drying; increase in sand, stones, foreign matter; lower milling rates; poorer storage quality and hence lower germination rates, vigour, higher seeding rates, and lower yields. The extent of these problems would need to be determined.

Problem Number Five : Other Agronomic Concerns

If seed quality is declining in some areas, more grain must be used for seeding and less is available for sale. The presence of criquets that eat young seedlings compounds the problem. There are no insecticides available in this zone.

This appears to be part of the larger problem of trying to grow crops in the European manner i.e. monocropping as opposed to the traditional mixed cropping. Greater emphasis on mixed cropping to include leguminous crops and cover crops with a view to soil maintenance and improvement must be made. Crops suitable for intercropping with upland rice under Zairian conditions need to be identified.

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[1] This would represent 10 % of the 980 tons total seed requirement. The problem is that there seems to have been little change in rice varieties available over the last 10 years. Hence these varieties are considered local.

There were indications that high labour requirements for rice may be encouraging a shift to maize and coffee. Rural urban migration maybe exacerbating this problem. This needs to be explored. Inadequate small tools and equipment for rice production was common. For example, there were no sickles to be purchased anywhere in the zone. With a small amount of funding, a local forge could make these locally. The forges exist. The scrap metal exists. Farmers would like a pedal thresher. What type of storage improvements can be made ? For example, seed stored in coarse sacks deteriorates whereas that in tins or clay jars keeps longer.

There were some indications of highly variable climatic conditions that affect rainfall distribution and days of sunshine.

The further problem of whether or not to encourage the use of chemical fertilizers remains. Given the high import and local transport costs, it is doubtful whether this should be encouraged in general. Any subsidized program would be very costly. The 1987 average price of 50 Z/kg represented a subsidy of roughly 50 % in the Kinshasa region alone (8, p.41). Much more emphasis should be placed on a long term, sustainable production system involving intercropping with green manure crops, mixed cropping with legumes, rotation involving fallows, erosion control and soil maintenance programs. One can argue that with rainfed rice, chemical fertilizer use would be less profitable than it would with irrigated rice especially with improved high yielding varieties. At the moment, the same variety 'Pekin' is being used and the returns with improved seeds i.e. those currently in use, plus fertilizer are quite similar for irrigated (Annex 6, line 5 and 6) and rainfed rice (line 8). The variable cost per Kg produced is lower for local sale without, or with improved seed than with fertilizer. Hence, concentrating limited fertilizer supplies where irrigated rice can be grown would probably be a sustainable policy. Even so, it would appear that production would be profitable only with subsidized fertilizer.

Since the river/stream network is so pervasive, one would need to carefully consider the impact of chemicals, of all kinds, on fish, nutrition and health of population.

Problem Number Six : Some Economic Issues

There appears to be strong competition for rice among traders and breweries. Anywhere from 60-80 % of production in the zone of Bumba may be sold to breweries who purchase on the river. The extreme case would be that breweries purchase all local marketed rice while urban centers depend totally on imported rice. If this is not a desirable situation, due to excessive dependance on imports, ways should be found to prevent it happening.

Marketing constraints by the government seem to be lifting in 1988 as far as producer sale price is concerned. Small traders are coming into the area and the current price has increased (although the real price has remained fairly steady to the

producer). Traders both big and small can and do make a profit both within the zone and between Bumba and other large urban centers (See annex 4.5). Variable uncontrolled levies are still apparently made by government employees both on the roads and in the market town. The fact that marketing takes place to the extent that it does shows the tenacity and ingenuity of local traders in the face of existing problems. The role of large traders needs to be clarified. Since they at present control most transport, any disruption in their activities cannot be replaced by small traders using one or two trucks. The real question may be to what extent should the government use the larger traders to foster development and to what extent should they encourage small traders.

Large monopsonistic traders used to help maintain the roads in their exclusive purchase sectors. Should this be encouraged? In some areas of Bumba (beyond Bokata), poor roads and lack of transport have meant that a smaller percentage of production has been sold than might have otherwise been the case. Who will maintain the roads?

Large traders provide a wide range of other services i.e. credit for household needs such as medecine, school fees, tools, dispensary services, transport, insecticides, marketing. If the larger traders are replaced, these services need to be provided by the government and/or others . Free entry of traders should be encouraged with minimum of official and non-official government intervention. Questions such as the role of ONATRA in transportation should be addressed. Disincentives to large traders with regard to transport licensing taxes could lead to severe problems of timely marketing of food crops, storage capacity and losses. Hence, there may be a need for clear policies that encourage both large and small traders.

Other issues involve : the modernization of milling capital to improve the quality of the rice, the role of small village mills, provision of credit to traders, river and rail transport constraints, labour shortages and the balance between food crops and cash crops.

CONCLUSIONS AND RECOMMENDATIONS

The main policy issues addressed here were :

(1) The large difference in food import costs and urban Kinshasa market prices affects all consumers but specially the nutritional standards and cost of minimum food package for lower income households. Why is the price difference so large? What can be done about it in the short and long term? The apparent oligopsonistic situation should be further studied with a view to increasing the number of traders and diminishing existing differences.

(2) Regardless of alternative estimates of future demand for rice, the probability of local production meeting this demand by the year 2000 is very low unless production increasess by over 7.6 %/year between 1988 and 2000 at the lowest estimate. Hence a long term import policy should be implemented.

(3) Given existing marketing constraints, existing strong competition for non-bleached rice for beer production, and the existing large deficit in supply, it appears very likely that further imports of rice would not dampen producer prices. Doubling of imports after 1986 did not lower producer prices in current or real terms. If these imports were in the form of PL 480, further counterpart funds could be generated and directed toward investment in the agricultural sector. Estimates of existing marketing margins show profits at well over 100 % in spite of constraints and probably due in some part to subsidized transport costs (excessively low fuel costs prior to 1989) and gains due to inflationary exchange rates. Hence, some dampening of urban prices through more imports should not interfere with profitable marketing.

(4) Per capita production appears to have been stagnant in spite of government projects. Policies to make improved seeds available in local areas at a reasonable cost must be implemented. This means improving the performance of BUNASEM and PNR, for example, in fact rather than on paper. The possibility of using mission and other local NGO for this purpose should be explored.

(5) Current cost of chemical ferrtilizers includes a subsidy of anything from 25 % (near Matadi) to 75 % or more in Eastern areas. At present subsidized prices, only irrigated rice is profitable when fertilizer is applied. At real i.e. higher prices, this would probably not be the case. This issue should be explored further.

(6) Liberalization of marketing in the Zone of Bumba appears to have really begun to take effect in 1988 with greater competition between small and large traders. There are many agronomic implications of this greater competition which should be studied now not later. For example, more competition, according to one Mill Manager, apparently has led in some areas to lower milling conversion rates and poorer

grain quality for subsequent seeding due to early harvesting and inadequate drying . This in turn may help explain a supposed decline in the area. The lapse in exclusive purchasing zones for selected traders has resulted in fewer services to the zone by these traders.

(7) Higher relative labour requirements for upland rice may increase pressure on the farmer to shift to maize and coffee and/or other crops. Labour saving inputs such as harvesting sickles, pedal threshers and flat bottom cycle-rickshaws might be made locally. A study could be carried out in this problem area.

(8) In what way can the existing resources of large local traders be harnessed for local development goals? A detailed study of the positive role of large traders (i.e. road maintenance,social credit, crop collection and marketing) and the negative effects of government poliicies on local traders and farmers (i.e. transport taxes) should be carried out. Any study should include recommendations that encourage rather than discourage the continued participation of these traders in overall rural development.

(9) A training program in descriptive data analysis might be arranged for all local government agricultural technical staff. This would take the form of a two or three week short course presented at the local level and using local data and resources. This course and, eventually, subsequent short courses might be institutionalized at the regional level. The long term purpose of these would be to help improve the quality of local data.

(10) There appeared to be a shortage of trucks on the roads in the Zone of Bumba. This is related to lack of credit to purchase vehicules as well as to maintain them. IVECO and other companies might be persueded to institute a credit - purchase system to address this need. This would include a local spare-part dealer. This would require further study.

(11) An attempt might be made to estimate the immediate benefits to be obtained from road improvements in selected Zonal areas. For example, one trader reported that a great deal more output could be marketed in the area beyond BOKATA if the road was improved. A quick study could estimate the benefits and costs of this project.

(12) A number of follow up studies in the Zone of Bumba should be considered as suggested herein. Among these could be studied that :

* Clarify the impact of rice imports on producer prices

* Verify the impact of government policies on large and small traders

* Study those factors affecting seed quality

* Explore small and large scale storage and milling capacity

* Quantify credit needs of large and small traders

* Estimate comparative profitability and labour requirements among major cash crops such as rice, maize, coffe, manioc and plantain

* Estimate agricultural and non agricultural incomes

* Identify immediate investment possibilities

* Clarify transport costs and constraints.

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Annex 1 : Selected Consumer Prices, Kinshasa, June '87 - July '88 * (Z/Kg)

Month / Product	Current Price: Local Rice (1)	Imported Rice (2)	Maize Grain (3)	Maize Flour (4)	Manioc Flour (5)	Index ** (6)	Real Price: Local Rice (7)=1/6	Imported Rice (8)=2/6	Maize Grain (9)=3/6	Maize Flour 10=4/6	Manioc Flour 11=5/6
June' 87	44	71	24	44	51	-	-	-	-	-	-
July	45	63	26	45	43	100	45	63	26	45	43
August	46	59	36	67	51	101.8	47	58	35	66	51
September	44	58	40	68	55	103.4	42	56	39	66	53
October	50	56	39	82	59	103.4	48	54	38	79	57
November	50	63	54	81	61	104.5	48	60	52	78	58
December	54	70	44	81	72	125.6	43	56	35	64	57
January '88	45	80	52	95	84	133.2	34	60	39	71	63
Febuary	78	80	56	108	86	134.9	58	59	42	80	64
March	120	142	52	94	86	137.9	87	103	38	68	62
April	99	106	45	117	75	150.6	66	70	30	78	50
May	90	112	40	100	84	160.7	56	70	25	62	52
June	129	155	45	104	83	164.0	79	94	27	63	51
July	130	152	56	95	77	167.7	78	91	33	57	46

* Source : 3 Real prices calculated by Author

** Parallel Market Exchange Rate. (4) Index calculated by Author.

Annex 2 : Consumption Importation of Rice, Zaire, 1970 - 1987 (mt).

Year	Local Production	Imports	Total Consumption	Population	Consumption Kg/Capita
1970	103	25	128	19.451.2	6.6
1971	117	20	137	20.052.8	6.8
1972	124	25	149	20.673.0	7.2
1973	118	31	149	21.312.4	7.0
1974	125	20	145	21.971.5	6.6
1975	127	35	162	22.651.0	7.2
1976	127	20	147	23.351.6	6.3
1977	131	19	150	24.073.8	6.2
1978	135	30	165	24.818.4	6.6
1979	134	10	144	25.586.0	5.6
1980	144	10	154	26.377.3	5.8
1981	147	12	159	27.080.3	5.9
1982	151	14	165	27.917.8	5.9
1983	162	8	170	28.781.2	5.9
1984	172	33	205	29.671.4	6.9
1985	178	38	216	30.561.5	7.1
1986	179	68	247	31.478.4	7.8
1987	180	70	250	32.422.7	7.7
1988	187 e	70 e	257 e	33.395.4 e	7.7

1) 5.07 at 60 % conversion = rice production

2) Using 1984 census figures and 3 % growth rate/year to calculate all figures below and above 1984.

Annex 3 : Local and Real Price of Rice, Maize, and Manioc , Kinshasa 1970 - 1986

Year	Current Price Z/Kg [1] Local Rice	Imported Rice	Maize	Manioc Cossettes	Index GNP [2] 1970 = 100	Real Price Z/Kg Local Rice	Imported Rice	Maize	Manioc Cossettes
1970	0.10	0.36	0.08	0.08	100	0.10	0.36	0.08	0.08
1971	0.10	0.48	0.08	0.08	111.9	0.09	0.43	0.07	0.07
1972	0.10	0.67	0.10	0.10	123.3	0.12	0.54	0.08	0.08
1973	0.15	0.90	0.10	0.10	159.1	0.09	0.56	0.06	0.06
1974	0.20	1.22	0.15	0.15	192.4	0.10	0.63	0.08	0.08
1975	0.20	1.68	0.15	0.18	199.3	0.10	0.84	0.08	0.09
1976	0.30	2.30	0.32	0.47	290.0	0.10	0.79	0.11	0.16
1977	0.30	3.13	0.32	0.86	391.8	0.08	0.80	0.08	0.22
1978	1.20	4.26	0.40	1.29	526.8	0.23	0.81	0.09	0.24
1979	2.30	4.73	0.74	2.34	1052.0	0.22	0.45	0.07	0.22
1980	3.00	5.22	1.28	1.95	1640.9	0.18	0.32	0.08	0.12
1981	3.20	10.42	1.15	2.79	2217.5	0.14	0.47	0.05	0.13
1982	12.00	12.87	3.50	4.60	2787.1	0.43	0.46	0.13	0.17
1983	17.78	27.02	10.00	8.87	5401.1	0.33	0.50	0.18	0.16
1984	21.05	26.10	11.68	14.45	9473.6	0.22	0.28	0.12	0.15
1985	29.72	28.22	18.40	13.12	14355.0	0.17	0.20	0.12	0.09
1986	26.72	32.81	19.80	19.03	18019.0	0.15	0.18	0.11	0.11

1) 1970-74 from Archives. Div. of Statistics. Dep. of Agriculture; 1975-81 from op 51.52
Etude sur la Compétitivité Fev. 1987; 1982-87 from INS. .Notes sur les prix..... Rapports trimestriels 1982-87

2) Banque du Zaire . Rapports Annuels. Calculated from total of PIB (GNP).

Annex 4 : Commercialisation de Riz : Banda Yowa à Bumba à Kinshasa, 1988 *

	Quantité	Prix/Valeur	Valeur (Z)
Paddy	1000 Sacs	750 Z/60 Kg	750.000
Sacs Vide	1000 Sacs	200 Z/Sac	200.000
Camion Loué	1000 Sacs	300 Z/Sac	300.000
Rizérie	54.000 Kg (Perte 10 % = 100 Sacs = 6000 Kg)	2.7 Z/Kg	145.800
Sous-total	1000 Sacs		1.395.800 (1.400.000)
Rendement	54.000 Kg Paddy 32.400 Kg riz blanc	3.800/60 Kg	2.052.000
Rentabilité % de coûts total			652.000 46 %
Riz	540 Sacs de 60 Kg à Bumba		
Stockage,Bumba	540 Sacs		10.000
Transport à Kin	540 Sacs	400 Z/sac	216.000
Billet			10.000
Total Coûts	1.400.00 + 236.000		1.636.000
Vente	460 Sacs (10 % Perte)	(1) 6000 Z/sac (2) 7000 Z/sac	(1) 2.916.000 (2) 3.790.800
Rentabilité (1)			(1) 1.280.000
- % de coûts total			78 %
- Bénéfices : Coûts			1.78 : 1
(2)			(2) 2.154.800
- % de Coûts total			130 %
- Bénéfices : Coûts			2.30 : 1

* Estimés par auteur.

Annex 5 : Commercialisation de Riz : Bokata à Bumba à Kinshasa, 1988 *

(Locale rurale à la Ville de Bumba et à Kinshasa)

	Cargo (Z/Kg)	Riz	Commentaires)
Prix Achat	12.5		750 Z/60 Kg Paddy[1]
Transport	5.0		300 Z/60 Kg
Sac vide	3.3		200 Z/60 Kg sac
Perte de poids en rizerie	4.4	6.0	60 Kg paddy x 0.65 = 39 Kg cargo[2]
Prix rizerie	2.7		60 kg paddy x 0.55 = 33 kg riz
Couts en rizerie	27.9	29.5	
Transport à Kin	6.0		300 Z/50 Kg riz Cargo
Labour	3.0		
Sous-total	36.9	38.5	
Finance	8.3	8.7	22.5 % par 6 mois x 36.9 = 8.3
Couts à Kinshasa	45.2	47.2	
Extra Couts	13.6	14.2	30 % par Administration etc.
Prix final	58.8	61.4	
Prix de Vente (1)		120	6000 Z/50 Kg
(2)		156	7800 Z/50 Kg
Rentabilite (%) (1)		95	120-61.4/61.4 = 95
(2)		154	156-61.4/61.4 = 154

* Prix ont été rassemblé aux mois de Juillet et Aout 1988 dans la zone de Bumba par le BAE/SEP. Calculs par l' auteur.

[1] Prix officiel = 750 Z/60 Kg paddy. Prix unofficiel = 750 Z à 1000 t.

[2] Perte = 21 kg/60 Kg = 35 % ou 35 % x 12.5 Z/Kg = 4.4 Z/Kg

Perte = 29 kg/60 Kg = 48 % ou 48 % x 12.5 Z/Kg = 6.0 Z/Kg.

ANNEXE 6 : RENTABILITE DE RIZ, ZONE DE BUMBA, 1988 (PAR Ha, PAR SAISON) *

SEMENCES	ETUDES ++	TYPE (I)	(RIZ) (2) RENDEMENTS Kg/Ha	(3) DEPENSES MONETAIRES (DM)	MARGE BRUTE %	MARGE NETTE %	(4) KG/TETE PAR Ha	(5) KG / DM	(6) DM / Kg
Local	I	Irrigué WB	2.570	22.800	54	49	320	0,11	8, 9
"	2	Irrigué WB	2.060	19.450	54	48	260	0,10	9,4
"	3	Pluvial V L	420	1.250	18	16	52	0,34	33,0
"	4	Pluvial	420	10.620	38	24	52	0,04	25,3
Améliorée	5	Etude I + SA.WB	2.000	22.650	52	46	250	0,09	11,3
"	6	Etude I + SA+E WB	3.000	46.900	48	39	375	0,06	15,6
"	7	Etude 3 + SA VL	1.700	10.000	6,6	3,5	212	0,17	5,9
"	8	Etude 3 + SA + E WB	2.400	39.480	47	38	300	0,06	16,4

(1) Type d'exploitation : WB = Vendu Ville de Bumba ; V L = Vendu Local ; S A = Semences Améliorées E = Engrais

(2) Exprimé en Kg/Ha de riz décortiqué

(3) Dépenses monétaires (DM) n'incluent pas ni le coûts d'intérêt ni le coût d'opportunité de main-d'oeuvre

(4) Supporant 8 Tête par ménage.

(5) La production de riz en kg par chaque Z de dépenses

(6) Les dépenses monétaires par chaque kg de riz produit.

* Source : Brock A. Greene. Estimation de Revenu de Maïs, et le Riz, Lieu Selectionnée, Zaïre 1988. (En préparation)

Annex 7 : Abbreviations Used

-	: Zaire, Unit of currency, 1 U.S. $ = 112.7 average 1987
Ha	: Hectare
mt	: metric tonne = 1000 kg
M$	: Million U.S. dollars
ln	: natural logarithm
DSA	: Division de Statistiques Agricoles
SEP	: Service d'Etudes et Planification
PNR	: Programme National Riz
INS	: Institut National de Statistiques
IITA	: International Institute of Tropical Agriculture
OFIDA	: Office des Douanes et Accises : Custom Office
PSAAL	: Programme d'Appui pour l'Autosuffisance Alimentaire
ONATRA	: Office National de Transport
BNDSEM	: Bureau National des Semences.