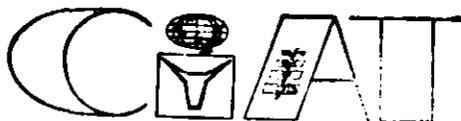


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## Bean Production Trends in Africa 1966 - 1979

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CENTRO DE DOCUMENTACION

Africa produces approximately 1.35 million tons of beans annually, equivalent to 37% of Latin American production. Within Africa, bean production is concentrated in Eastern Africa, with 61% of the total approximately equally divided among the five producers, Uganda, Rwanda, Kenya, Burundi, and Tanzania (Table 1). The combined production of these Eastern Africa countries of 822,000 t is below that of either Brazil or Mexico but is substantially larger than that of any other Latin American country.

The data available from African sources gives very different results for the principal Eastern Africa producers. These estimates increase the total Eastern Africa bean production from the 822,000 t in the FAO estimate in 1977-1979 to 1,399,000 t, a 69% increase (Tables 2 and 9). The apparent explanation for the divergence is the difficulty in estimating production of a basic food crop, which is principally kept for home consumption in a large number of the small farms producing beans<sup>1</sup>. The yield data from the Eastern Africa countries are also substantially higher than those of FAO (Tables 8 and 9). The rest of the paper used the FAO data for their longer time series.

International trade data are only available for dry legumes. In Africa beans are a much smaller proportion (27%) of dry legumes than in Latin

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<sup>1</sup> See country reports on bean production for their discussions on marketing.

Table 1. African bean production in the last decade, 1966-68 to 1977-79.

Country or region	1966-68		1977-79	
	Annual		Annual	
	Production (%)		Production (%)	
	(000 t)		(000 t)	
<b>Eastern Africa principal producers</b>				
Uganda	175	17.0	175	13.0
Burundi	133	13.0	162	12.0
Kenya	133	13.0	161 <sup>a</sup>	11.9
Rwanda	126	12.3	174	13.0
Tanzania	108	10.5	150	11.1
<b>Other African countries</b>				
Ethiopia	68	6.6	13	1.0
Angola	64	6.2	64	4.7
South Africa	50	4.9	75	5.5
Madagascar (Malagasy)	49	4.8	47	3.5
Cameroun	24	2.3	82	6.1
Zimbabwe (Rhodesia)	23	2.2	25	1.8
Togo	20	1.9	16	1.2
Others <sup>b</sup>	54	5.2	206	15.8
<b>Africa</b>	<b>1027</b>		<b>1350</b>	

a The Ministry of Finance and Planning data for 1978, since FAO does not report the Kenya data.

b Includes all the African countries producing less than 1% of the bean production in the continent, either at the beginning or at the end of the decade.

Source: FAO, *Production Yearbooks*, various years. Estimates for Kenya from the Kenyan Central Bureau of Statistics, *Statistical Abstract*, 1978, Nairobi, Kenya. Niger was excluded since the latest FAO documents include only dry legumes and no beans.

America (84%)<sup>2</sup>. Per capita consumption of dry legumes is lower in Africa than in Latin America; however, the opposite is true in some of the principal Eastern Africa producers (Table 3). The extremely high consumption of dry legumes in Rwanda, Burundi, and Uganda has been associated with the predominant calorie sources of low protein content especially root crops and plantains<sup>3</sup>.

2 For Latin America data see J.H. Sanders and C. Alvarez P., *Evolución de la producción de frijol en América Latina durante la última década*, Serie 06SB-1, CIAT, Cali, Colombia, Agosto 1978, pp. 6 and 8. See Tables 1 and 3 in this paper for the African data.

3 W.R. Stanton, *Grain Legumes in Africa*, Food and Agriculture Organization of the United Nations, Rome, 1966, p. 17.

Table 2. National bean production, area and yield data for the Eastern Africa producers.

Country	Year	Production (t)	Area (ha)	Yield (kg/ha)
Kenya	1974-75	476,513	763,500	624
Uganda	1975-77	305,133	393,400	776
Tanzania	1975-77	253,932	295,000	861
Rwanda	1976-78	168,407	210,365	801

Source: See the data and references in Table 9 of this paper.

Table 3. Annual production, trade and per capita consumption of dry legumes, 1975-77.

Country or region	Production	Imports	Exports	Imports minus exports	Apparent per capita consumption <sup>a</sup>
	(000 t)				(kg/capita)
<b>Eastern Africa principal producers</b>					
Uganda	350	0.038	0.001	0.037	29.3
Kenya	305	2.902	17.519	-14.617	21.0
Rwanda	217	—	0.031	-0.031	50.6
Tanzania	203	1.899	17.299	-15.400	12.0
Burundi	171	—	—	—	44.3
<b>Other African countries</b>					
Nigeria	878	0.800	—	0.800	13.6
Ethiopia	682	0.020	73.287	-73.267	21.2
Morocco	362	0.120	97.436	-97.316	14.8
Egypt	352	116.723	0.751	115.972	12.3
Niger	245	—	2.716	-2.716	51.2
Zaire	148	1.100	—	1.100	5.8
Cameroun	88	0.012	0.288	-0.276	13.1
South Africa	82	6.924	7.333	-0.409	3.1
Angola	71	3.180	8.233	-5.053	10.5
Madagascar (Malagasy)	65	0.002	18.640	-18.638	5.6
Chad	57	0.006	0.063	-0.057	13.8
Zimbabwe (Rhodesia)	27	6.900	—	6.900	5.2
Togo	23	0.013	—	0.013	10.1
Benin	21	0.009	0.196	-0.187	6.5
Others <sup>b</sup>	736	72.047	74.795	-2.748	8.0
<b>Africa</b>	<b>5083</b>	<b>212.695</b>	<b>318.588</b>	<b>-105.893</b>	<b>11.7</b>

a Production plus imports minus exports all divided by population is the apparent per capita consumption of dry legumes. No deductions were made for use as animal feed, seed or losses.

b Countries with less than 1% of dry legume production. However, a few additional countries were included here due to their importance in either dry legume production or trade.

Source: FAO, *Production Yearbook and Trade Yearbook*, Rome, various years.

Most of the African countries are exporters of dry legumes. However, Egypt is a large importer with almost 116,000 t annually; Zimbabwe, Rhodesia imports a small quantity (7000 t). Africa was a net exporter of 106,000 t of dry legumes in 1975-77; Latin America exported 230,600 t of dry legumes but was a net exporter of only 3600 t of dry legumes in this same period.<sup>4</sup>

In most of Africa, bean production has been increasing faster than population growth. These production increases have been obtained principally with area expansion since yields have been stagnant or

Table 4. Growth rate<sup>a</sup> for population, production, area and bean yield in Africa, 1962-79.

Country or region	Population	Production	Area	Yield
Eastern Africa principal producers <sup>b</sup>				
Uganda	3.28	4.34	6.67	-2.33
Rwanda	2.90	4.07	3.74	0.33
Tanzania	2.62	3.52	2.65	0.87
Burundi	1.70	2.71	3.59	-0.87
Other African countries				
Zimbabwe (Rhodesia)	3.34	1.28	0.37	1.65
South Africa	3.11	3.34	-1.61	4.65
Madagascar (Malagasy)	2.78	0.50	0.10	0.40
Togo	2.77	0.80	1.39	-0.59
Cameroun	2.64	7.11	6.73	0.38
Egypt	2.35	10.69 <sup>c</sup>	7.71 <sup>c</sup>	2.98
Ethiopia	2.07	-8.95	-8.76	-0.19
Angola	1.74	0.63	2.70	-2.07
Africa <sup>d</sup>	2.74	3.61	3.75	-0.14

a Calculated from the annual data utilizing the equation  $LY = a \pm bT$ , where L is the log of population, production, area or yield, T is the trend term; a and b are the parameters, where b is the geometric growth rate over time of the dependent variable.

b Kenya was not included due to the lack of prime series data at the beginning and end of the period.

c Data were not available for 1979 hence these rates were only calculated for 1962-1978.

d Includes the 12 countries above plus the following nine: Somalia, Benin, Zaire, Swaziland, Sudan, Malawi, Dahomey, Morocco, and Chad, each of which produces less than 1% of African bean production.

Source: FAO, *Production Yearbook*, various years; FAO, *Demographic Yearbook*, various years.

<sup>4</sup> FAO, *Production Yearbooks*, various years.

declining in most countries. In the principal production area, Eastern Africa, production increased more rapidly than demand in the 1960-70 decade enabling falling prices or increased exports (Table 5). However, the economic disruptions of the seventies led to economic declines in almost all of the African countries. Even with the declining per capita income, high population growth and production stagnation resulted in a more rapid growth of demand than of supply with upward pressures on prices (Table 6).

Table 5. Growth rates of demand and supply for beans and components of demand growth in African countries, 1960-70.

Country	Growth rate		Income elasticity of demand <sup>a</sup>	Growth rate	
	GNP per capita	Human population		Bean demand <sup>b</sup>	Bean supply
<b>Eastern Africa principal producers</b>					
Kenya	3.3	3.0	0.42	4.4	N.A.
Tanzania	2.9	3.0	0.60	4.7	4.3
Uganda	2.8	2.7	0.46	4.0	16.9
Burundi	1.0	2.0	0.21	2.2	3.5
Rwanda	-0.8	3.5	0.41	3.2	7.5
<b>Other African countries</b>					
Togo	5.2	2.9	0.23	4.1	8.9
South Africa	3.1	3.0	N.A.	N.A.	1.9
Ethiopia	2.8	2.0	0.51	3.4	2.4
Cameroun	2.8	2.0	0.34	2.9	-2.6
Zaire	2.4	2.6	N.A.	N.A.	N.A.
Egypt	1.6	2.5	N.A.	N.A.	15.0
Niger	1.6	2.7	0.30	3.2	N.A.
Morocco	0.9	2.8	0.30	3.1	10.7
Madagascar (Malagasy)	0.4	2.5	0.60	2.7	2.1
Benin	0.4	2.7	N.A.	N.A.	N.A.
Zimbabwe (Rhodesia)	-0.3	3.2	0.40	3.1	2.1
Nigeria	-0.3	2.5	0.51	2.3	N.A.
Chad	-1.1	1.7	0.20	1.5	N.A.
Angola	N.A.	N.A.	0.40	N.A.	2.2

a Includes pulses, nuts and seeds.

b Demand growth is the sum of population growth plus the income elasticity of demand times per capita GNP growth.

N.A. = not available.

Sources: World Bank, 1978 World Bank Atlas, Washington, D.C., 1979  
 FAO, Demographic Yearbook, Rome, 1977, p. 158.  
 FAO, Production Yearbook, Rome, various years, vols. 25 to 32.

Table 6. Growth rates of demand and supply for beans and components of demand growth in African countries, 1970-76.

Country	Growth rate		Income elasticity of demand <sup>a</sup>	Growth rate	
	GNP per capita	Human population		Bean demand <sup>b</sup>	Bean supply
Eastern Africa principal producers					
Tanzania	-1.3	3.0	0.60	2.22	1.5
Rwanda	-1.8	3.0	0.41	0.86	1.3
Kenya	-2.9	3.8	0.42	2.58	N.A.
Burundi	-3.1	2.7	0.21	2.04	-3.4
Uganda	-6.1	3.0	0.46	0.19	-5.15
Other African countries					
South Africa	N.A.	2.57	N.A.	N.A.	4.97
Nigeria	2.2	3.2	0.51	4.32	N.A.
Egypt	0.5	2.6	N.A.	N.A.	8.25
Morocco	0.1	3.2	0.30	3.23	N.A.
Cameroun	-1.3	2.3	0.34	1.86	14.8
Zimbabwe (Rhodesia)	-1.9	3.4	0.40	2.64	0.72
Togo	-1.9	3.0	0.23	2.56	-20.66
Benin	-2.0	3.0	N.A.	N.A.	N.A.
Niger	-2.2	2.7	0.30	2.37	N.A.
Ethiopia	-2.3	2.5	0.51	1.33	-16.95
Zaire	-2.4	2.8	N.A.	N.A.	N.A.
Angola	-3.0	2.4	0.40	1.20	-0.64
Chad	-3.7	2.3	0.20	1.56	N.A.
Madagascar (Malagasy)	-4.9	2.6	0.60	-0.34	1.50

a Includes pulses, nuts and seeds.

b Demand growth is the sum of population growth plus the income elasticity of demand times per capita GNP growth.

N.A. = not available.

Sources: International Agricultural Development Service (IADS), *Agricultural Development Indicators. A Statistical Handbook*, 1980, New York; FAO, *Proyecciones para Productos Agrícolas, 1970-1980*, Rome 1971, pp. 162-178; FAO, *Production Yearbook*, Rome, various years, vols. 25 to 32.

For all of Africa a yield decline was offset by a rapid area increase rate of 3.8% over the last decade. South Africa is an exception and did not depend on area expansion to offset declining yields. As in Mexico, substantial yield growth in South Africa has been obtained while the area under cultivation declined as more profitable crops displaced beans. Egypt increased bean area rapidly and achieved impressive yields by the end of the decade (Tables 7 and 8).

Table 7. Area in beans in Africa, 1966-68 to 1977-79.

Country or region	1966-68		1977-79	
	Area		Area	
	(000 ha)	(%)	(000 ha)	(%)
<b>Eastern Africa principal producers</b>				
Kenya	323	18.1	764 <sup>a</sup>	27.6
Uganda	266	14.9	356	12.9
Tanzania	219	12.2	300	10.8
Burundi	203	11.3	259	9.4
Rwanda	155	8.7	213	7.7
<b>Other African countries</b>				
Angola	199	6.7	120	4.3
Ethiopia	92	5.1	18	0.6
South Africa	79	4.4	72	2.6
Madagascar (Malagasy)	62	3.5	59	2.1
Cameroun	54	3.0	133	4.8
Togo	54	3.0	60	2.2
Zimbabwe (Rhodesia)	50	2.8	50	1.8
Egypt	5	0.3	7 <sup>a</sup>	0.3
Zaire	N.A.	N.A.	162 <sup>a</sup>	5.8
Chad	N.A.	N.A.	97 <sup>a</sup>	3.5
Others <sup>b</sup>	108	6.0	100 <sup>a</sup>	3.6
<b>Africa</b>	<b>1789</b>		<b>2770</b>	

a Data were only available for 1976-78 instead of 1977-79.

N.A. = not available.

b Includes all African countries producing less than 1% of the bean production in the continent.

Source: FAO, *Production Yearbook*, various years. The Kenyan data were obtained from the Kenyan Control Bureau of Statistics, *Statistical Abstract*, 1978, Nairobi, Kenya, 1979.

In the principal bean producing countries in Eastern Africa the area increases during the last decade have been very large. Uganda increased its bean area by 90,000 ha, Rwanda by 58,000 ha, Burundi by 56,000 ha, Kenya by a staggering 441,000 ha, and Tanzania by 81,000 ha (Table 7). Absolute yields were still very low with falling mean values for all of Africa and for most of Eastern Africa, with an especially rapid decline in Kenya (Table 8).

Table 8. Bean yields in Africa, 1966-68 to 1977-79.

Country or region	Average yields	
	1966-68 (kg/ha)	1977-79 (kg/ha)
Eastern Africa principal producers		
Rwanda	815	815
Uganda	667	492
Burundi	644	626
Tanzania	492	503
Kenya	412	211 <sup>a</sup>
Other African countries		
Egypt	1400	2571 <sup>a</sup>
Madagascar (Malagasy)	789	798
Ethiopia	743	705
South Africa	631	1040
Angola	534	533
Cameroun	468	620
Zimbabwe (Rhodesia)	463	507
Zaire	N.A.	577 <sup>a</sup>
Others <sup>b</sup>	448	710 <sup>a</sup>
Africa	574	487

<sup>a</sup> Data were not available for 1979 hence these estimates include only 1976-78.

<sup>b</sup> Includes all African countries with less than 1% of the bean production in the continent.  
N.A. = not available.

Source: FAO, *Production Yearbooks*, various years. The Kenyan data source was mentioned in the previous table.

In many regions of Africa there are serious nutritional problems often involving inadequate protein intake due to a predominant starch diet of cassava and plantains<sup>5</sup>. In spite of an estimated per capita bean consumption of 35.5 kg/year, protein consumption is still inadequate in Rwanda<sup>6</sup>. Increases in pulse production for protein need to accompany

<sup>5</sup> These deficiencies were reported for Uganda by the World Health Organization. See P.R. Rubaihayo *et al.*, "Bean Production in Uganda".

<sup>6</sup> P. Nyabyenda, *et al.*, "Bean Production in Rwanda".

production increases of calories from roots or cereals. Animal protein consumption is much lower and is less likely to compete with grain legumes in Africa than in Latin America. The production situation of beans in Africa has become very serious in the seventies with decreasing incomes and rising bean prices. Increased prices for beans and other pulses are expected to have aggravated the already serious urban malnutrition<sup>7</sup>.

Table 9. Bean production, area and yield data for four Eastern Africa producers from the country reports and additional data sent by participants.

Country	Production (t)	Area (ha)	Yield (kg/ha)
Uganda <sup>a</sup>			
	1920	37,000	
	1925	56,000	
	1930	84,000	
	1935	113,000	
	1945	151,000	
	1950	185,000	
	1955	214,000	
	1960	233,000	
	1965	371,000	
	1966	114,300	383,495
	1967	162,600	532,494
	1968	206,100	371,871
	1969	162,200	377,541
	1970	186,800	376,448
	1971	221,800	459,000
	1972	236,800	309,000
	1973	170,000	359,000
	1974	196,300	408,000
	1975	325,800	407,000
	1976	337,100	434,900
	1977	252,500	338,300

<sup>a</sup> The 1920-1970 data were taken from annual reports of the Ugandan Department of Agriculture. The 1971-1977 data are from unpublished data in the annual reports of the Planning Division of the Department of Agriculture. Cited in P.R. Rubaihayo, D. Mufindwa, T. Sengooba, F. Kamugira, "Bean Production in Uganda".

<sup>7</sup> See W.R. Stanton, *op. cit.*, p. 16, for a discussion of the deterioration of nutrition levels upon migration to African cities thereby increasing dependence upon lower quality diet especially the increased consumption of cassava.

Table 9 (continued)

Country		Production (t)	Area (ha)	Yield (kg/ha)
Rwanda <sup>b</sup>	1966	130,900	154,000	850
	1967	131,700	155,000	850
	1968	116,225	156,300	744
	1969	146,124	162,360	900
	1970	143,604	159,560	900
	1971	144,445	160,494	900
	1972	131,404	154,593	850
	1973	133,059	160,025	831
	1974	114,816	186,723	615
	1975	152,744	190,600	801
	1976	163,401	202,880	805
	1977	171,590	213,276	805
	1978	170,231	214,939	792
Kenya <sup>c</sup>	1974-75	476,513	763,500	624
Tanzania <sup>d</sup>	1963-64	92,656		
	1964-65	79,705		
	1965-66	102,443		
	1966-67	111,849		
	1967-68	111,527		
	1968-69	102,799		
	1969-70	122,438		
	1970-71	124,190		
	1971-72	167,938		
	1972-73	191,466		
	1973-74	189,196		
	1974-75	197,294		
	1975-76	220,719	295,000	748
1976-77	287,145	295,000	973	
1977-78	223,397			

b Ministère de l'Agriculture, "Rapports Annuels du Ministère de l'Agriculture et de l'Elevage. Rwanda, various years. The data were provided by N. Nyabyenda.

c D.M. Thairu, "Grain Legume Production in Eastern Africa with Special Reference to Kenya", paper presented at the Symposium on Grain Legume Improvement in Eastern Africa, Nairobi, August 1979, cited in S.K. Njungunah, A.M.M. Ndegwa, H.A. van Rheenen, and D.M. Mukunya, "Bean Production in Kenya", March 1980, p. 1. The authors would like to gratefully acknowledge the help of Dr. H.A. van Rheenen, Project Manager, Grain Legume Project, National Horticulture Research Station, Scientific Research Division, Ministry of Agriculture, Thika, Kenya, in putting together these data since data in Kenya have been extremely scarce.

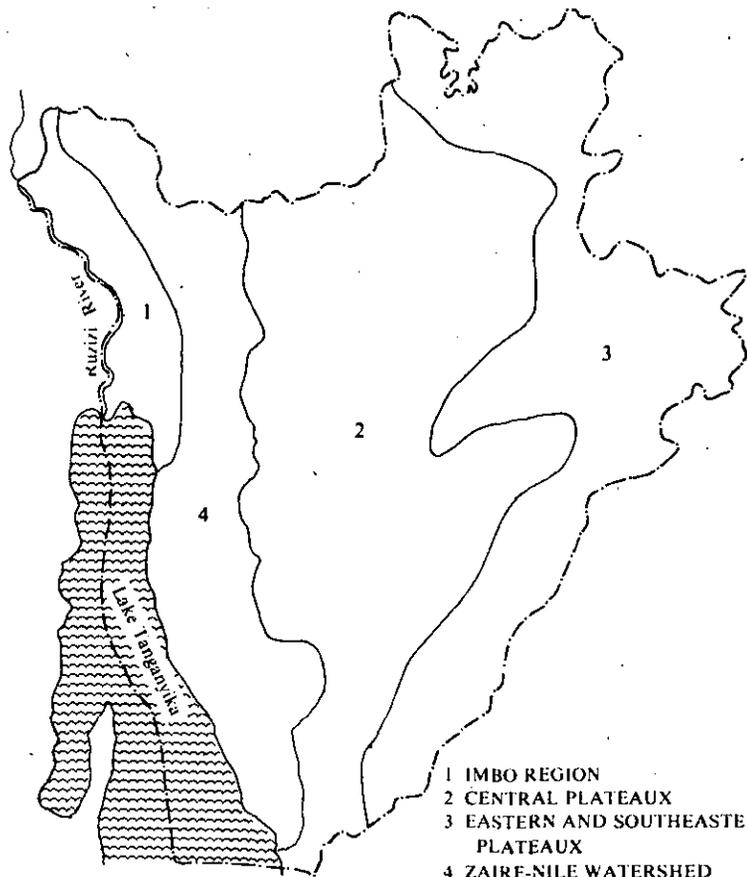
d The production and area data for Tanzania were taken from Statistics Section, Planning Division, Ministry of Agriculture, *Bulletin of Food Crop Production Statistics*, Dar es Salaam, Tanzania, various years and were cited in A.K. Karel, "Bean Production in Tanzania - Problems and Prospects", seminar paper, University of Dar es Salaam, Faculty of Agriculture, Department of Crop Science, Morogoro, Tanzania, 1980.

Except in South Africa and Egypt, bean production increases have depended upon area expansion. Absolute yields for most countries are very low and declining reflecting planting in association, low inputs, soil exhaustion, and shifts to more marginal agricultural areas. Low absolute yields reflect opportunities as well as problems since countries, such as Mexico and Colombia, whose national bean programs selected or produced new varieties, were able to obtain significant growth in yields over time<sup>8</sup>.

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<sup>8</sup> Sanders and Alvarez, *op. cit.*, p. 36.

# BURUNDI



- 1 IMBO REGION
- 2 CENTRAL PLATEAUX
- 3 EASTERN AND SOUTHEASTERN PLATEAUX
- 4 ZAIRE-NILE WATERSHED

