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Industry

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PRESENT AND POTENTIAL SUGAR PRODUCTION AND

CONSUMPTION IN AFRICA 1/

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CONTENTS

S U M M A R Y

In the decade 1964-1974, sugar production, consumption, exports, and imports in Africa have all grown; but each at a different growth rate. Production grew by an annual rate of 4.8%, consumption by 4.6%, exports by 2.8%, and imports by 1.8%. Africa's share in world production grew from 5.8% in 1964 to 7.1% in 1974; the corresponding rates for consumption were 5.6% and 6.1%; for exports about 10% for both years and for imports 8% and 7%.

Despite its potential, the share of Africa in each of these activities on a global scale is generally small, though somewhat high for exports than for the other three variables. During the decade, Africa managed to maintain its initial position as a net exporter of sugar.

The kind of sugar produced, consumed, imported and exported is of the centrifugal variety. Non-centrifugal sugar occupies a very insignificant place in Africa. Likewise, sugar cane rather than sugar beet provides the main raw materials for Africa's mills.

Until 3 or 4 years ago, the world market for sugar was highly regulated by various types of international agreements and national legislations, and only 25% of the sugar that entered world commerce was transacted outside of these arrangements. Partly because some of the agreements have expired and have not been renewed, and partly because some of the national legislations have been liberalized, the amount of sugar transacted in the "free" market has risen from 25% to 75% of all sugar entering international trade.

By 1985, Africa's production, consumption of and trade in sugar will increase considerably. In that year, the continent will have expanded output by between 2.2 million tons and 5.4 million tons. The lower figure is based on the assumption that the continent's consumption will, as in the past, be partly met by domestic production and partly by imports; whereas the higher figure assumes that all consumption requirements will be met by domestic mills and that exports will continue to grow as in the past. The corresponding requirement for investment is about $2.4 billion for the lower figure and $5.4 billion for the higher; between 153,000 and 374,000 jobs will be created; and some 220,000 to 539,000 ha. may be required. If enough countries have the determination, sucrose - based industries could also be established to produce citric acid, and sorbitol for the continent's food, beverage, and pharmaceutical industries.

The export forecast assumed in the higher production figure is ambitious. The continent could of course produce that much and even more extra sugar; but importing countries (both in Africa as well as outside the continent) would have to adopt trade policies to enable the continent's mills to supply their respective markets. For those African countries which now get their supplies from extra-continental sources, this would mean a considerable undertaking in continental cooperation but, if realised, it would mean an equally considerable achievement. The developed countries today importing sugar from Africa and those capable of doing so also have a significant role to play in helping Africa realise its export target.

Introduction

In 1974, Africa produced about 5.6 million tons of centrifugal sugar.* Ten years earlier, the figure was 3.5 tons. This represents a growth rate of about 4.8%. Consumption, exports, and imports have also grown, though of course at different rates. What are the specific components of this general picture? How does the continent compare with other regions and countries? And, more important, what are the prospects for the future?

The primary purpose of this paper is to examine these and related questions. Chapter I explores the developments over the 1964-74 decade of the principal variables around which the paper's discussion revolves: production, consumption, exports and imports. Chapter II considers prospects for the succeeding decade, with 1985 as a convenient target year. Though in essence the variables remain the same, attention will mainly focus on the production/consumption relationship, and what it takes to close the gap between the present** level of consumption and that forecast for 1985. The implications of raising production to the anticipated level of consumption will be analysed in terms of investment, manpower, land area, and such other related factors as it is possible to raise for discussion. The closing section

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*Much of the discussion in this paper will be in terms of centrifugal sugar (both refined and raw being given in raw equivalent). Non-centrifugal sugar production in Africa is insignificant, and both its level and relative importance in the world scene over the past decade will be examined briefly in Section A, Chapter I.

**This refers to 1974, the last year for which reliable and complete figures are available.

of Chapter II will consider the foreign trade dimension of the continent's sugar industry, i.e. the possibility of exports. As will subsequently be appreciated, the discussion would not go beyond some very tentative (but nonetheless essential) indications of the prospects that need to be exploited in this respect.

CHAPTER I

REVIEW OF PAST DEVELOPMENTS: 1964-1974

A. PRODUCTION OF SUGAR

1. **The Level and Growth of Production:** Africa, despite its potential, is among the less important sugar producers in the world. Its output hardly equals that of Cuba, whose population is less than 2.5% of the continent's. In terms of the world as a whole, it contributes a little over 7% of total production*.

   That is the picture which emerges from the statistics of 1974. A comparable snapshot in the opening year of that decade appears basically the same. But over those ten years, the picture has changed somewhat. In the accompanying chart (Fig. 1), it can be observed that production in 1964 was about 3.5 million tons, or 5.8% of the world total Midway through the decade, the level rose to 4.6 million tons (6.6%), and reached 5.6 million tons (7.1%) at its close. A similar development can be seen vis-a-vis Cuba. Whereas the continent was about 0.9 million tons behind Cuba in 1964, it was within 0.3 million tons in 1974. In terms of per capita production, the world level was 19.0 kg. in 1964 and 20.2 kg. in 1974; whereas Africa's rose from about 12.2 kg. in 1964 to 14.4 kg. over the same period**.

   Africa remains a relatively unimportant producer, yet its position has improved marginally. The figures in the previous paragraph show that both in absolute and per capita

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*A more exhaustive comparison of Africa and other world producers can be made by examining Tables 2 and 3 of Annex II.

**These are very approximate figures because the population data are especially weak.

Fig 1: Sugar Production in Africa, Cuba, & World
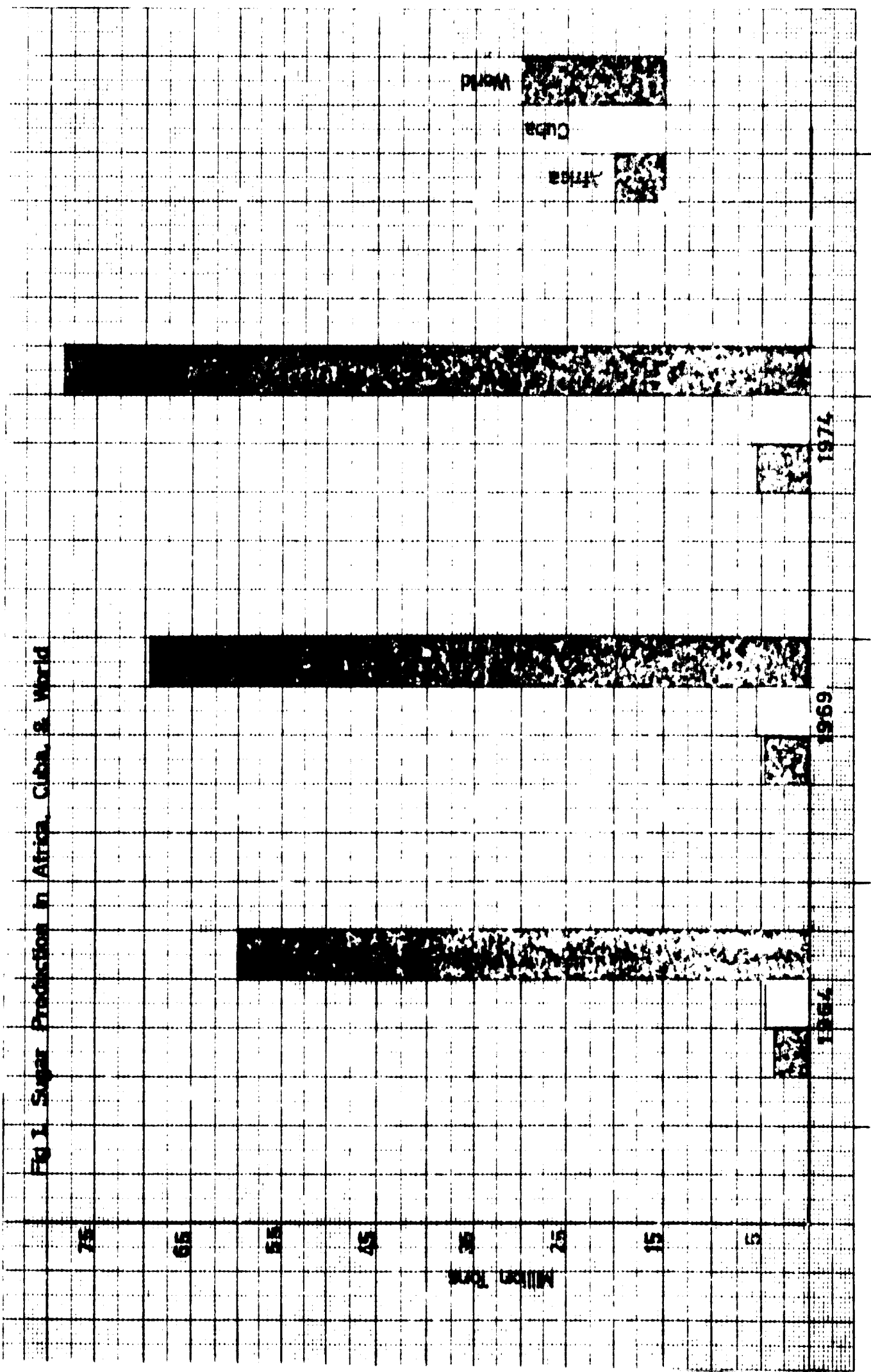
terms, sugar production in Africa has grown more rapidly
than that of the world: viz, 4.8% as against 2.7% for
total production, and 1.9% as against 1.8% for per capita
production.

2. Distribution of Production Among Countries: Over half the
total number of African countries produce sugar.* During
the 64-74 decade, six countries joined the ranks of estab-
lished producers,** raising the number to 26 in 1974. South
Africa, with a figure of almost 2 million tons, leads the list
followed by Mauritius (0.7 million), Egypt (0.5 million),
and Mozambique (0.3 million). Tunisia is the smallest producer
with 4,000 tons.

As can be readily observed from Table 4 of Annex II,
production is heavily concentrated in a handful of countries.
The four largest producers mentioned above collectively
accounted for about 3.5 million tons and of the continental
total of 5.6 million. This represents a share of 63%, as
against their relative demographic share of just over 18%.
The next four countries in importance are Morocco (260,000
tons), Rhodesia (255,000 tons), Reunion (228,000 tons) and
Lesotho (204,000 tons). The combined output of these eight
countries is about 4.5 million. Just under 80% of the
sugar produced in the continent is thus contributed by
countries which only accommodate less than 25% of its

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*See Table 4 of Annex II.

**The six were Ghana, Malawi, Mali, Nigeria, Cameroun and Zambia.

population. Even among these, there is an imbalance.
South Africa alone with its 2 million tons accounts for
roughly 36%, and Mauritius (0.7 million tons) for over 13%;
and the two for practically half of the continent's output.

Output per head is similarly varied. Not surprisingly
Mauritius holds the record with 848 kg. per head, a level
that is probably among the highest (if not the highest)
in the world. Again not surprisingly, Reunion* comes
second with 485 kg. per person. Lesotho* (206 kg.), South
Africa (79 kg.), and Egypt (15 kg.) follow, with countries
such as Tunisia, Nigeria, and Ghana coming at the end
showing levels of considerably less than 1 kg. per head.
This sharp contrast obviously reflects a pattern in which
the smaller countries produce much more than the more
populous ones. Mauritius and Reunion with populations of
less than a million each produce 740,000 tons and 230,000
tons respectively, whereas Nigeria with a population of
about 61 million only produces 40,000 tons.

With the exception of one country,** sugar production
during the decade did not suffer a reverse. The general
picture is one of growth, quite rapid in some instances,
with only a few countries either showing signs of stagnation
or marginal increase. The latter group consists of Angola,

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*In 1974, Reunion had a population of 0.47 million, Lesotho
0.99 million, and Rhodesia 5.9 million.

**In Uganda, output declined from 126,000 tons in 1964 to
44,000 tons in 1974.

Congo, and Madagascar. But by far the largest number
raised production by significant amounts. Morocco's
output was 21,000 at the beginning; ten years later it had
grown to 260,000 tons, a rise of more than ten times.
Kenya, Sudan, and Ethiopia raised theirs by between two-and
six-fold. The more established producers also increased
their production, though at rates somewhat less than those of
the preceding countries. Mauritius' output of 549,000 tons
(1964) rose by 35% to 738,000 (1974). In Egypt and South
Africa, the rise was 13% and 13.5% respectively. In addition,
of course, six newcomers joined these and the other producers.

3.   Nature of Sugar Production: As has been already pointed out,
the date in the statistical annex all refer to centrifugal
sugar, both refined and raw sugar being expressed in raw
terms. There is naturally some non-centrifugal sugar pro-
duction in Africa. But as can be observed from the following
table, its place in global production is practically next to
nothing. In the four-year period 1961-1965, production was

TABLE   I: Production of Non-Centrifugal Sugar
                        ('00 metric tons)

Country, Region	1961-1965	1972	1973	1974
1. Africa	110	150	140	160
—of which, Nigeria	(80)	(100)	(80)	(100)
Tanzania	(30)	(50)	(50)	(60)
2. India	62910	63340	69760	81100
3. World	104050	117300	120120	133420

Source: FAO, Production Yearbook, 1974, p. 160

11,000 tons as against the world total of over 10 million tons, which is about 1/10 of 1%. This level was more or less maintained throughout the decade. Even in comparison with India, Africa is a miniscule producer, accounting only for one-fifth of 1% of the former's output.

In world terms non-centrifugal sugar is of course not unimportant. If the 13.5 million tons in the preceding table is added to the corresponding figure of 78.7 million tons of centrifugal sugar production in 1974 /see Table 1 in Annex II/, the total exceeds 92 million tons. And the share of centrifugal as against non-centrifugal sugar in this total comes to 85% and 15% respectively. The above table brings out one more significant fact - viz, that one country alone contributes to more than half of world output of non-centrifugal sugar. In 1961-1965, India was responsible for 60% of total output. This ratio comes down slightly to 54% in 1972 and 58% in 1973; but recovers its original level in 1974.

As Africa is an insignificant producer in this respect, comparing its combined production with the world total of 92 million tons pushes it even further down the scale of importance. Its world share of output when centrifugal sugar alone is taken was 7%. Now, it goes down to 4%. The earlier observation that Africa, despite its potential, is among the less important producers in the world is confirmed _a fortiori_.

Table II below gives another aspect of sugar production in Africa, again with comparative global figures. The question as to what type of raw material the continent

TABLE II: Production of Sugar Cane and Beet in Africa and the World

('00 metric tons)

Type of Raw Material	1961-1965	1972	1973	1974
1. Sugar Cane – Africa	306630	510700	506710	536690
– World	4727690	5973250	6265990	6654140
–Share of Africa (%)	6.5	8.7	8.1	8.1
2. Sugar Beet – Africa	1320	18880	15620	22400
– of which, Algeria	(70)	(1800)	(2200)	(2300)
Morocco	(860)	(16770)	(12930)	(19500)
Tunisia	(400)	(310)	(500)	(600)
– World	1797620	2442750	2523310	2371900
–Share of Africa (%)	–	–	–	–

Source: FAO Production Yearbook, 1974, pp. 157, 159.

uses for sugar production is readily answered by a quick inspection of the table. Emphatically the more important is sugar cane. In 1961–65 sugar cane was used almost exclusively. Beet sugar made some headway in later years, but by 1974 it was still below 5% of the weight of cane sugar used by the continent's mills. Throughout the decade beet production was concentrated in three North African countries – Morocco, Algeria, and Tunisia. And of the three, Morocco was the most important producer (close to 90% in 1974).

On a world level, the insignificance of African beet takes sharper significance. As the table shows at no time in the decade did Africa's beet production reach even the level of 1%. The share of cane production, on the other

hand, rose from 6.5% in 1961-65 to 8.1% in 1974, implying
once again the continent's growth was more rapid than the
world's.

B. CONSUMPTION OF SUGAR

1. <u>Level and Growth of Consumption</u>: As in the case of pro-
duction, Africa's consumption of sugar in world terms is
quite low. In 1974, world consumption stood roughly at
79.8 million tons (Table 7 in Annex II). With 4.9 million
tons, Africa's share was only 6.1%. India alone consumed
3.8 tons in that year. Figure II shows the relative position
of these figures for three selected years in the decade
under review.

Again as for production, this picture remains
basically correct for the entire decade, but there
appears to have taken place a marginal improvement in
Africa's position. When the decade opened (1965), total
consumption for the continent was about 3 million tons.
World consumption in that year was 53.3 million tons. In
percentage terms, Africa consumed 5.6% of the world total.
Halfway through the decade, this position remained un-
changed; i.e. 3.9 million tons compared with 68.4 million
tons, or about 5.7%. In 1974, as has already been noted,
the level reached 6.1%. Vis-a-vis India, a similar
development took place; the gap between the Indian and
African consumption widening in favour of Africa. What this

Fig.11 Sugar Consumption in Africa, India & World
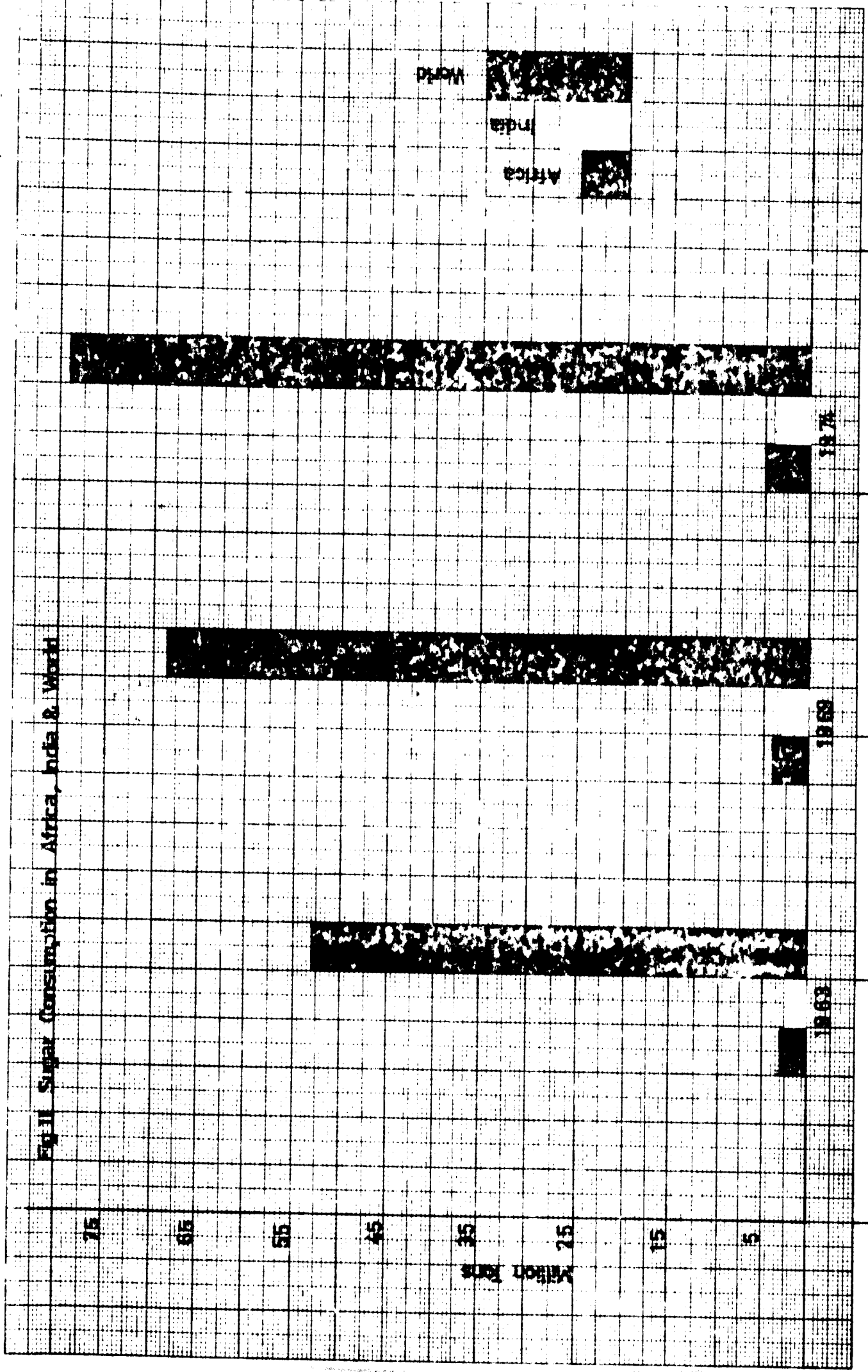
means is that total consumption in Africa between
1963-1974 grew at a rate faster than both that of India
and the world. The growth rate for Africa was 4.6%,
compared with 3.7% for the world and 3.4% for India. To
repeat, however, all this did not lift Africa from its
position of unimportance in the world context.

Per capita consumption figures (Tables 8 and 10)
place the continent in more favourable light. In 1963,
consumption per head in Africa was 10.5 kg; the world figure
was 16.9 kg. In 1974, the figures were 12.7 kg. and 20.3
respectively. For both years, the continent was at about
62% of the world figure. A brief glance at table 9 also
shows that there are countries in other continents whose
figures are considerably lower than the African average.
Country for country, of course, a good number in Africa
show figures much higher than those of China (4.8 kg. in
1974), India (6.5 kg.), and Indonesia (8.2 kg.). Even
leaving aside the untypical case of South Africa, one still
sees high per capita figures for Morocco (28.4 kg. in 1974),
Algeria (20.3 kg.), Kenya (18.8 kg.), Egypt (17.0 kg.) and
the Sudan (15.6 kg.).

TABLE III: Per Capita Sugar Consumption (kg.)

No.	Country	1964	1969	1974
1.	Madagascar	6.2	6.1	14.5
2.	Tanzania	6.0	7.0	9.5
3.	Ghana	6.1	9.1	5.4
4.	Ethiopia	2.5	2.8	4.4
5.	Cameroun	1.4	1.6	2.9
6.	Nigeria	-	1.7	1.8

The figures in Table III are far less reliable than those given in Table 8 of Annex II. First, they are compiled from the production and trade statistics given in the Annex. Consumption was consequently arrived at by adding production and imports and subtracting exports. This gives apparent rather than real consumption as it ignores changes in stocks. Secondly, population data for some of these countries are unavailable; hence rough estimates have had to be made. Thirdly, trade data were in some instances curiously missing, and no clue could be obtained as to whether this meant that figures were unavailable, negligible, or unreliable. With all this in mind, if the figures in Table III (compiled from Tables 4, 6, 12 and 13 of Annex II) are taken as indicative of rough orders of magnitude, they partly confirm the statement made about the relative position of Africa's per capita consumption vis-a-vis the rest of the world. Madagascar, Tanzania, and Ghana compare favourably with the developing Asian countries mentioned. Partly also, they show some rather low consumption figures for such countries as Ethiopia, Cameroun and Nigeria, particularly for the earlier years of the decade. In 1964, for instance, per capita consumption for Nigeria was less than 1/10 of a kilogramme. No comparable data are available for low consumption Asian or Latin American countries. Even so, a figure of that magnitude is pretty low by any standard. And the fact that it had grown to 1.8 kg. by 1974 does not alter the situation radically.

For the continent as a whole, however, the rate of growth of per capita consumption can be said to be fairly satisfactory. Between 1963-1974, the level of consumption for the continent grew by 1.7% per annum, in comparison with 1.6% for the world level. With some exceptions, many countries have also witnessed significant increases. Kenya

raised its per capita consumption from 11.1 kg. in 1963
to 18.8 kg. in 1974; over the same period Madagascar
raised its figure from 6.2 kg. to 14.5 kg; Tanzania from
6.0 kg. to 9.5 kg., Ethiopia from 2.5 kg. to 4.4 kg, Sudan
from 12.0 kg. to 15.6 and Egypt from 16.0 kg. to 17.8 kg.
A few countries remained stagnant: e.g. Algeria and Ghana.
For some others, there was a decline. South Africa's
level dropped from 44.9 kg. to 41.5 kg, Morocco's from
32.4 kg. to 28.4 kg. Both of these countries already had
high per capita figures and such declines in these figures
as are seen during the decade were marginal. The case of
Uganda is, however, somewhat more serious as the decline
was from a respectable level of 10.3 kg. in 1963 to 4.4 kg.
in 1974.

2. The Major Consumers in Africa:

Out of the forty odd independent countries, consumption
is largely concentrated in just a dozen. The five listed
below plus the seven enumerated in Table 7 collectively

TABLE IV: Sugar Consumption in Selected Countries ('00 tons)

No.	Countries	1964	1969	1974
1.	Tanzania	656	920	1400
2.	Ethiopia	549	680	1195
3.	Nigeria	442	948	1122
4.	Madagascar	368	403	1062
5.	Ghana	448	768	521
	TOTAL	2463	3719	5300

consumed about 3.7 million tons in 1974. That was roughly
74% of total consumption for Africa. The corresponding
ratios for 1964 and 1969 were 80% and 75% respectively.

In a sense this is not surprising. Though small
in number, these twelve countries represent a high concentr-
ation of population. The most populous countries (Nigeria,
Egypt, and Ethiopia) are in this group. A number of medium
sized countries (Algeria, Morocco, Sudan, and Tanzania) are
also to be found here. All in all, their populations add
up to 256 million (1974), which is 65% of the continental
total. In 1964 also their demographic weight was just
about the same - 68%.

Consumption concentration is not, however, entirely
to be explained in terms of population concentration. While
in 1974, these twelve countries accounted for 65% of the
continent's population, their corresponding share in con-
sumption was 74%. In 1964, the imbalance was even more
striking; 68% of the population consumed 80% of the marketed
sugar. The twelve countries obviously had more than their
fair share of sugar.

Among these countries also, consumption did not
correspond with demographic weight. By far the single most
important consumer was South Africa. With just over 1 million
tons in 1974, it had about ⅓ of the sugar consumed in the
twelve countries and about 1/5 of the continental total.
Its population was however far below that of Nigeria or
Egypt or Ethiopia. The next important consumer in the
group of twelve (again in 1974) was Egypt, which had a
sizeable population of about 36 million, but still way behind
Nigeria's 61 million. Morocco comes with roughly half a

million tons in 1974 followed by Algeria (330,000 tons)
and Kenya (243,000 tons).

There is of course some justification for expecting
demographic weight to explain the location of heavy consumers.
But this is only one factor. Income per capita is an
equally valid guide. It is indeed where these two converge
in significance that consumption reaches high levels.
Neither the most populous country if it is poor, nor the
richest country if it is demographically insignificant is
a good market for sugar, or steel or sandals for that
matter.

3. Consumption by end-use: Paucity of adequate and reliable
information prevents a detailed examination of consumption
by end-use in the continent, both at country and continental
levels. But a general exploration can be made of the broad
pattern of end-users as well as the specific uses which can
be made of sugar and its by products.

Households and food producers would be incomparably
the most significant end-users of sugar. Practically the
whole of the sugar that comes out of mills is probably
consumed in this way. A wide range of end-uses, both
direct and indirect, are also made of the single most
important by product of sugar mills - molasses. As
molasses rather than sugar provides the main basis for
sucrose based industries, and as this may be of some
significance to the continent's potential development, an
analysis of the various aspects of molasses consumption
and transformation will be given in some detail.

"Molasses is" the syrupy liquid that remains after the repeated crystallization of sucrose (usually in three phases) from the so called mother syrup.*" The mother syrup is the liquid obtained from the extraction of sugar cane or beet. Molasses is consumed in two principal ways. First, directly as animal feed, or as an ingredient by distilleries, yeast factories, and other industrial users. These two uses constituted about 73% of all the molasses consumed in France in 1971 and 80% of that consumed in the U.S.A. To the extent that molasses is consumed in African countries (some is exported and perhaps a lot more is thrown away as waste), this pattern seems to hold. In Ethiopia, for instance, about 43,000 tons of molasses was produced in 1975/76.** Of this, roughly 8,500 tons went to local distilleries and cattle-feed producers. (Of the remaining, 21,300 was exported and the rest presumably discarded as waste).

Secondly, molasses is used as a raw material in a wide spectrum of sucrose-based chemical products. As always, the theoretical possibilities are much wider than the practical, economic uses. Through fermentation, esterification, oxidation, etherification, hydrogenation, acid degradation, alkali degradation, etc. a bewildering variety of products, can be obtained. But only three appear to merit practical consideration.

*International Trade Centre, The Market For Sucrose-Based Chemical, Geneva, 1972, Much of the following discussion draws on this publication.

**Planning Commission Office, Sugar Requirements For the Domestic Market, Addis Ababa, December, 1976.

(a) <u>Citric acid:</u> This product is obtained through
the fermentation of molasses, and is used in food and
beverage industries, pharmaceuticals, and other industrial
applications. Citric acid is a principal food acidulant,
(e.g. in cheese) and is used as a flavour enhancer (e.g.
in carbonated beverages), as well as an ingredient in the
production of frozen foods. In dairy products, it is used
as an important additive (e.g. as an emulsifier in ice
cream). In pharmaceuticals, the acid is used as a solvent
(e.g. expectorants), a flavouring agent, and as an effer-
vescent when combined with bicarbonates. In industrial
applications, it is used as a plasticiser and foam in-
hibiter in the manufacture of plastics.

(b) <u>Sorbitol:</u> This is a type of alcohol obtained
by molasses hydrogenation. The main uses of sorbitol
are in pharmaceuticals and cosmetics, food and beverages,
in the manufacture of vitamin C and in miscellaneous
other industrial uses. Toothpastes, mouthwashes, various
lotions all use sorbitol in varying degrees. In the food
and beverages domain, sorbitol is used with other whipping
agents in the more uniform production of whips and frappes
for icings and fillings; and in low calorie foods, soft
drinks, and frozen foods. When converted into vitamin C
(ascorbic acid), it is used in the curing of meat and meat
products, in the stabilisation of foods and drinks, and
in the improvement of the baking qualities of flour. Its
other miscellaneous industrial applications include leather
manufacture, paper, textiles, shoe polishes, glues and
adhesives.

(c) <u>Sugar esters:</u> Through the esterification of
molasses are obtained a number of sugar esters such as
sucrose monoacetate, sucrose octanitrate, sucrose
octaacetate and others. Though less widely used than either
citric acid or sorbitol these esters have applications
in the manufacture of foods, detergents, plastics, herbi-
cides and pesticides. Their food uses include the pro-
duction of instant cocoa, chocolates, chewing gums, ice
creams, etc. In the manufacture of detergents, their
main advantage over other competing products (e.g.
phosphates) is in their biodegradability and non-toxicity
(important environmental considerations). Apart from
their uses in the plastics industry as plasticizers and
adhesives, esters are also used in the production of
herbicides and pesticides, to increase the effectiveness
of these products. Increased penetration of herbicides
and pesticides into plants is facilitated by the use of
esters, and additional non-toxicity is simultaneously
provided.

Africa is of course not yet a major producer of
sugar. A corollary to that is that it is not a major
producer of molasses either. But just how much is the
amount of molasses produced in Africa?

The two earlier studies quoted on page 15 provide a
basis for an estimate. The Ethiopian study shows that
for a total sugar output of about 123,000 tons in 1975/76
the countries mills produced 43,000 tons of molasses -
a ratio of 350 kg. for every ton of sugar produced. The
International Trade Centre study gives a somewhat different

ratio of 310 kg. to 1 ton. Based on the production
figure of 5.6 million tons, these ratios give a range of
1.6 million to 1.8 million tons of molasses output for
Africa in 1974. That much molasses could sustain a number
of sucrose - based industries in Africa, as is evident
from the data of developed countries. In France, molasses
consumption for all purposes in 1970/71 was less than a
million tons. Africa does have enough raw material for sua-
rose based industries, and will have much more by 1985*.
But what are the prospects for the establishment of
sucrose - based industries, for there are hardly any in
Africa today? A tentative exploration of this question
will be given in Chapter II.

C.   T R A D E

1.   Exports: World exports of sugar in 1964 were approximately
17.3 million tons. This figure rose to 19.6 million in
1969 and about 23 million in 1974. Throughtout the decade
Africa's exports remained at about 10% of the world total
(1.7 million in 1964, 2.0 in 1969 and 2.3 million in 1974).
If comparison is made between this and the Africa/World
production relationship, it would be observed that the
relationship is essentially similar - i.e. that in both
production and exports, Africa occupies a not so signi-
ficant place in the world.

Nonetheless, a closer examination of the relevant
ratios shows that marginally, Africa's share in global
exports (10%) is higher than its corresponding share in

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*See Chapter II.

production (6%-7%). If one were pressed for an inter-
pretation of this one would conclude that the sugar industry
in Africa is slightly more export-oriented than the world
'average'.

Africa as a continent is a more important exporter
than any of the countries shown in Table 13, with the
exception of Cuba and Brazil. The case of Cuba is self-
explanatory. At the beginning of the decade, Brazil's
exports were about 15% of Africa's. Five years later,
they reached 55% and at the close of the decade they
were 7% in excess - witnessing Brazil's phenomenal growth
of a nine-fold increase in sugar exports.

Country for country, Africa does not cut a very
impressive figure. Nonetheless, a little less so than
the corresponding production comparisons would show.
There are five major sugar exporters in Africa - South
Africa, Mauritius, Reunion, Mozambique, and Rhodisa
(in that order of importance according to the figures
of 1974). Some of these countries compare favourably with
middle - level exporters. Mauritius, for instance, was
ahead of India, China, and Mexico (Tables 12, 13). South
Africa was of course furthest ahead. But two points
need immediately to be underlined. First, the special case
of South Africa and Rhodesia where the developmental
impact of the growth of exports (indeed of any economic
indicator) on the indigenous population is far from
significant; and second, the fact that these handful of
countries which represent just over 10% of the continents

population dominated over 85% of its exports. This
imbalance is indicative of the unexploited potential of
the rest of the continent rather than of an imbalance
in the distribution of resources.

One final point on exports. Between 1964 and 1974,
Africa's exports grew at 2.8%; slightly less than the
world average of 2.9%. Compared with the performance of
most of the major exporters, that of Africa appears also
to be somewhat sluggish. The case of Brazil has already
been noted. Leaving the U.S. and the U.S.S.R. aside
(major producers and importers rather than exporters),
all the countries in Table 13 had on the whole higher growth
rates than the five major exporters. Among the developed
countries, the case of France (Table 14) is striking. During
the period under review, French sugar exports climbed
by an impressive 82% - a growth rate of just under 7%.
This was a result of a conscious government policy of
encouraging exports, and the implications of this for the
future of world trade (particularly of exports from the
developing to the developed countries) are evident*.

2.   Imports: An examination of Africa's consumption and
production performance in the last decade might seem to
suggest that Africa is fully self-sufficient and would
hardly require imports. That of course is not the case.

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*For an examination of growth in European sugar production, see
The Economist, Sept. 22, 1973. In Chapter II, this problem will
be reconsidered from the standpoint of the prospects for Africa's
exports in 1985.

Africa is as important an importer of sugar as it is
an exporter. From 1.4 million tons in 1964, imports
rose to 1.6 million in 1974 (See Figure III, and Table
15). There would seem to be two reasons for this
development. There are in the first place countries
which get their supplies from extra-continental sources
because their domestic sugar industry is either virtually
non-existent or not large enough to satisfy domestic
demand. Inadequate transport facilities, lack of tradi-
tional trade contacts and obstacles in establishing new
ones, the type of commodity required by domestic consumers,
more attractive price and delivery conditions may be some
of the main factors turning away these customers from
their continental neighbours. In addition, some important
exporters import sugar because, among other reasons, what
they produce is probably only partically suitable for
domestic consumer preferences, making it necessary to
export the surplus so obtained and import what the local
market additionally demands.

The level of sugar imports has, however, been lower
than exports; so has its growth in the last decade -
(See Figure III). The next section will take up this
relationships and examine it in some detail. But before
that, a few words on Africa's relative position in the
world.

Between 1964 and 1974, Africa's imports declined
from about 8% to about 7% of the world total. In other
wards, total world imports grew by 3.1% per annum in
that decade while those of Africa increased by about 1.8%.

Fig.III Africa Exports & Imports of Sugar
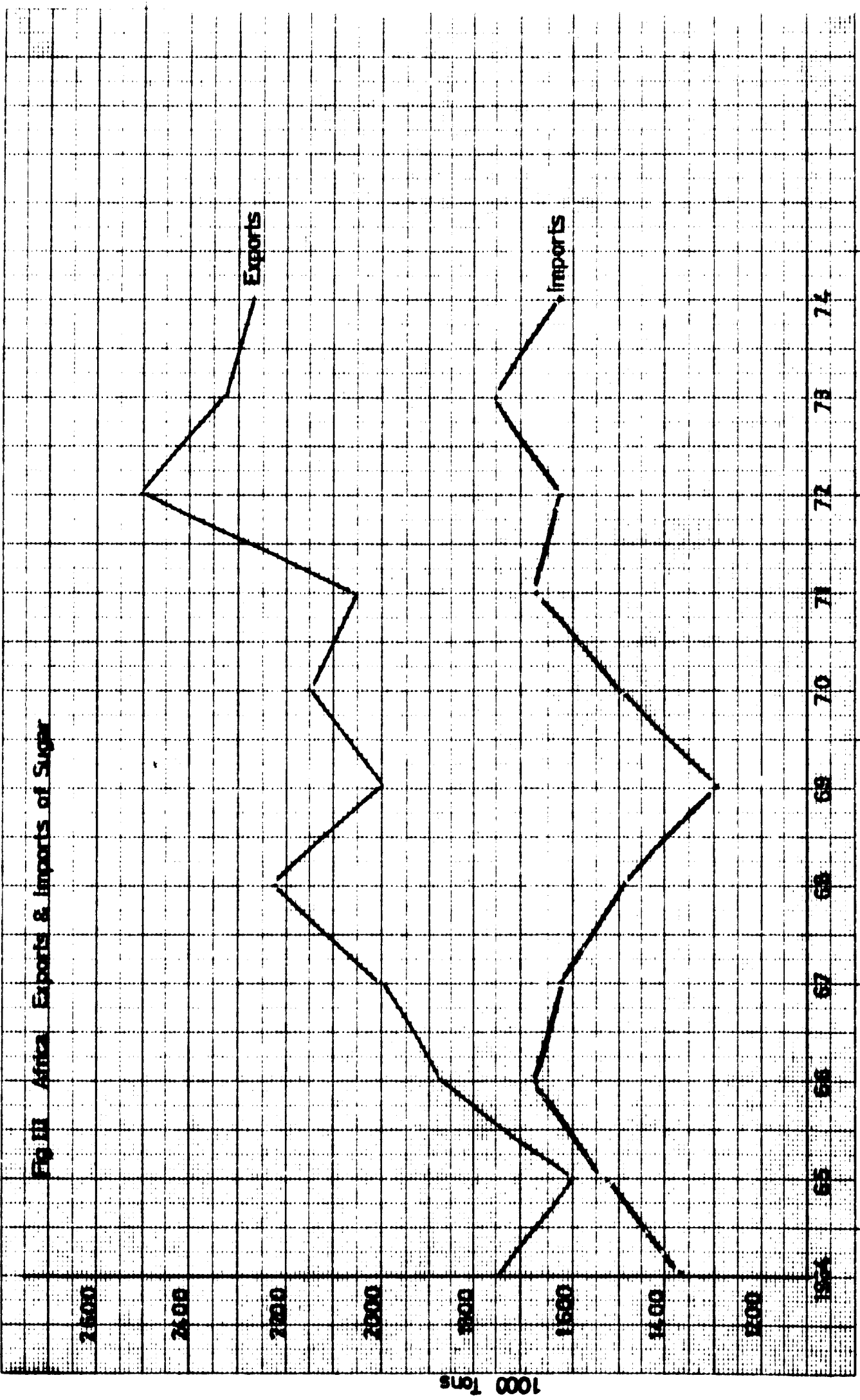
Compared with the consumption ratios discussed earlier
where it was shown that in world consumption terms
Africa increased its share from 5.7% to 6.1%, the relative
decline in imports means that Africa became relatively
more self-sufficient in satisfying demand requirements.
This is corroborated by another set of data. In 1964,
imports were 45% of total consumption.* During the
succeeding nine years, 66-74 inclusive. These ratios
were 48%, 46%, 42%, 34%, 37%, 38%, 35%, and 33%; indicating
a marked downward trend. The picture portrays an emphatically
more self-sufficient situation when imports and exports
are examined together, as is done in the succeeding section.

Unlike exports, imports of sugar are more evenly
divided among the countries of the continent. There are
of course wide variations among importing countries, but
no monopoly of a handful of countries. Algeria with 3.5
million tons, Morocco (2.9 million tons), Tunisia (1.1
million tons), Libya (0.9 million tons), and Senegal
(0.8 million tons) were the front line importers in
1974 (Table 15). Kenya, Niger, Nigeria, Sudan and
the Ivory Coast imported amounts varying from just over
550,000 tons to just under 800,000 tons. On the lower
rungs of the ladder were Ghana, Tanzania, Somalia,
Mauritania, and South Africa representing imports of
between 200,000 and 500,000 tons. A good number of
countries also imported lesser amounts.

---

*The consumption figure is for 1963.

Two countries show what appears to be a downward
trend in imports acccompanied by an upward trend in production,
an evident case of import substitution. Sudan imported
about 132,000 tons in 1964 (and produced 21,000 tons). In
1974, it imported only 72,000 tons (but produced 120,000 tons).
Morocco started the decade with an import figure of about
384,000 tons (production: 21,000) and ended with 287,000 tons
(production: 260,000). Among the new producers, Nigeria
had reached a level of 40,000 tons in 1974, but this was not
enough to stop the surge in imports. Zambia did better,
reducing imports from 18,000 tons in 1964 (and even higher in
subsequent years) to 13,000 tons in 1974. Meanwhile production
had increased from 0 in 1964 to 65,000 tons in 1974. There
are other observable patterns (in Table 15) of growth, of
stagnation, of marginal growth or decline, but none calling
for any particular comment.

3. Balance of Trade: Figure III and Table V demonstrate the
    relative position of African exports and imports over the

TABLE V: African Exports and Imports ('00 metric tons)

Year	Exports	Imports	Surplus of Exports Over Imports
1964	1,7393	1,3731	3662
1965	1,6068	1,5318	750
1966	1,8778	1,6715	2063
1967	1,9958	1,6206	3752
1968	2,2300	1,4905	7395
1969	2,0046	1,2890	7156
1970	2,1565	1,5004	6561
1971	2,0623	1,6676	3947
1972	2,4677	1,6333	8344
1973	2,3317	1,7541	5776
1974	2,2850	1,6347	6503

decade under review. It is evident that through each year
of this period, exports exceeded imports; sometimes, as in
1968 and 1972, by a considerable margin. In those years,
exports exceeded imports by 834,000 tons and 740,000 tons
respectively. With the exception of 1965, the surplus
never declined below 200,000. In the four best years of
export surplus, the figures ranged between 14% and 24% of
exports. Evidently, gross exports show much higher per-
centages, reaching, as they did in 1964 for instance, a
level of close to 50% of production. Because it is a
net exporter, Africa can be said to be self-sufficient in
sugar.

In addition, both Figure III and Table V demonstrate that
the underlying trend for exports is more sharply upwards
than that for imports. A least squares regression line was
fitted for each of the two series of data, and the following
functions were obtained:

(i) Export trend:- $Y_E = 2.69 + 0.068 \ X$,
                       origin 1969; X units, one year

(ii) Import trend:- $Y_M = 1.561 + 0.02 \ X$,
                       origin 1969; X units, one year

The slope of the export function (0.068) is greater
than that of the import function (0.02); which means that
exports were growing faster than imports. This can also
be observed by visual inspection of Figure III.

Section C, 1 above shows where the bulk of the export
surplus was generated. Whether this surplus can be sustained
into the future, and if so by what countries (the same half

a dozen countries, or by additional new producers) is
hard to say. In Chapter II, a number of alternative
projections will be made for 1985 and the trade assumptions
behind these will then be discussed in the light of the
expected surplus; and what this means for trade policy.

4.   The World Market for Sugar: International trade in
sugar was until recently very much governed by various
multinational pacts or national legislations regulating
imports into domestic markets. The main ones were the
U.S. Sugar Act which periodically allocated import quotas
for various suppliers; the Commonwealth Sugar Agreement which
regulated trade among member countries, and the agreements
between Cuba, the Soviet Union, and other East European
countries. About three-quarters of sugar that entered
world commerce was governed by these agreements. The
remaining one-fourth was exchanged in the "free" market which
was in turn regulated by the International Sugar Agreement
of 1968. Sugar was consequently a highly controlled commo-
dity in world commerce.

This situation has changed in the last three to four
years. At the end of 1973, the International Sugar Agreement
expired and has not yet been replaced by another. In 1974,
the U.S. Sugar Act under which 5 million tons of sugar
were annually imported at preferential prices within allocated
quotas expired and was not replaced by a similar Act. Instead,
a Presidential Order fixed imports at 7 million short tons
annually, without the previous price/quota arrangements.
As a result of these two developments, the "free" market for

sugar now covers 75% of world trade. In addition, the
Commonwealth Sugar Agreement also expired in 1974. Upon
the entry of the United Kingdom into the European Economic
Community, a special arrangement regulating the sale of
Commonwealth sugar in the European Economic Community
(about 1.4 million tons a year) was agreed upon. Special
bilateral agreements have also been recently negotiated
between Australia, Brazil, and Cuba covering periods of
up to 5 years.

In the last 5 years, the price of sugar has undergone
a major fluctuation. As the Table below shows, a major
upturn took place in 1972 when the level was about 12¢
per pound, reached a level of 15¢ in 1974 and 47¢ in 1975.
The 1974 figure was for the month of January; and by
December the level had dropped to about 13¢ per pound.
This was partly attributed to increased production in the
E.E.C. and the U.S. and partly to a decline in consumption
in some major consuming countries. Until a new International

TABLE VI: New York Spot Sugar Price (for raw sugar, duty paid)

Year	Cents per pound	Year	Cents per pound
1964	13	1970	11
1966	9	1972	12
1968	10	1974	15
		1975	47

Source: 1975 Commodity Yearbook, Commodity Research
Bureau, N.Y. p. 328.

N.B.   These prices are approximate, as they were simply
read off from a somewhat compressed chart given in
the above publication.

Sugar Agreement is signed, prices are expected to continue
to fluctuate. There is expectation in some circles, however,
that in the long-run prices will stabilise at about their
December, 1975 level.

CHAPTER II

PROSPECTS FOR THE FUTURE

Three main issues will be analysed in this Chapter:
an estimate of total sugar consumption in Africa for 1985,
what it takes by way of additional resources to generate
the additional production that this level of consumption
requires, and finally the prospects for sugar exports.
The difficulties of estimating any economic variable that
far ahead and at such an aggregative level are widely under-
stood and any general warnings on the pitfalls relating to
forecasting or special factors frustrating the fulfilment
of these estimates are scarcely required. Instead, a
number of alternative assumptions will be offered for
estimating consumption in 1985, the assumptions (and their
meanings) fully discussed, and one of the alternative
projections selected for further discussion in section B.

A. SUGAR CONSUMPTION IN 1985

Two basically different approaches have been used for
forecasting sugar consumption in Africa in 1985. The first
is based on the assumption that the trend in the per capita
consumption of sugar observed in the nine years 1966-1974
inclusive will continue into the following eleven years.
In addition an arbitrary choice of the rate of population
growth has been made to estimate this variable in 1985
and thus obtain a figure for total consumption. The second

approach centres around the relationship between the
growth of per capita income and that of per capita
consumption. In addition to the population assumption, an
estimate of the probable growth in gross domestic product
(again arbitrary) was made in this approach. On the
resultant growth rate of per capita income was applied an
income elasticity coefficient for sugar consumption to
obtain an estimated level of per capita consumption in 1985.
From two different assumptions concerning the probable
growth in GDP were obtained two sets of projections. These,
together with the estimate emerging from the first approach,
gave three alternatives. A brief examination of these
alternatives and the assumptions underlying them is now in
order.

TABLE   VII: Sugar Consumption in 1985

No.	1974	1985
1. Alternative I		
Per capita consumption (kg)	12.70	16.48
Population (millions)	389.4*	505.9
Total consumption ('00 tons)	49460	83372
2. Alternative II		
Per capita consumption (kg)	12.70	15.45
Population (millions)	389.4*	505.9
Total consumption ('00 tons)	49460	78162
3. Alternative III		
Per capita consumption (kg)	12.70	14.32
Population (millions)	389.4*	505.9
Total consumption ('00 tons)	49460	72445

*This figure is implied in the per capita consumption figure of
12.7 kg. But it is not much different from the 391 million
given in Table 6.

The trend in per capita sugar consumption between 1968 and 1974 is obtained through the least squares method. The resulting function is

$$Y = 11.78 + 0.313 \, X$$

origin 1970; X units, 1 year.

A number of factors are implied in this method which may cast doubt on the wisdom of using it for the purpose at hand. The most potent of these is the fact that this method assumes growth to be linear, whereas sugar consumption is of course not. At lower levels of per capita income, sugar consumption (as is the consumption of all food) is proportionally high. With growth, it too grows; at a fast rate towards the beginning, but slower subsequently and much slower at high per capita income levels. Eventually there comes a level at which per capita consumption is stabilised and hardly grows with further increases in income. All this means that the relationship between per capita income and per capita consumption is non-linear.

The one justification for using the least squares method in the face of such overriding arguments is that over shorter periods of time, the relationship can be taken to be roughly linear; as is obvious from the observation of a short arc of a circle which has a huge circumference. The preceding argument of the relationship between per capita income and consumption implies long periods of time when it speaks of "earlier","subsequently" and "eventually," so that the non-linear function spans half centuries and even centuries (closing the gap in the per capita consumption of sugar between the least developed and the most developed countries of today is not to be viewed in terms of one or two decades). As indicated in

Table VII above, per capita consumption in 1985 projected by this method is 16.48 kg. (See Figure IV).

An estimate of population is required to obtain total consumption in that year. Between 1965 and 1975 the population of Africa grew at 2.7% per annum*. If the current concern over population explosion means anything, it is that over the coming years that pace of expansion will put a strain on resources and should not therefore be sustained. Indeed there is some fragmentary evidence already that a decline may have set in. In the latter half of the 1965-1975 period, population grew not by the 2.7% shown for the decade as a whole, but by 2.5%. What rate should be selected for the following ten years? There is obviously no reliable guide apart from the preceding indications. On that basis (and with a somewhat additional bias for a lower rate) a figure of 2.4% has been used. Alternative I now gives a total sugar consumption figure for Africa of approximately 8.3 million tons in 1985, which assumes a growth rate of 4.9% on the 1974 level.

Alternatives II and III use, as already indicated, the same methodology, but two different growth rates for gross domestic product (and naturally for per capita income as well). In this method, an estimate is made of the probable growth in per capita income and, based on an estimate of the income elasticity of sugar, the resulting growth in per capita consumption obtained.

The growth rate in Africa's GDP over the last decade has been high. For 1964-1974, a rate of about 5.6% appears

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*UN, Statistical Yearbook, 1975, p. 161.

Fig IV. Per Capita Consumption of Sugar in Africa 1966-74 & Projection for 1985.

Alt. I
Y = 11.78 + 0.373x

Alt. II

Alt. III

Per Capita Consumption of Sugar (in Kg)
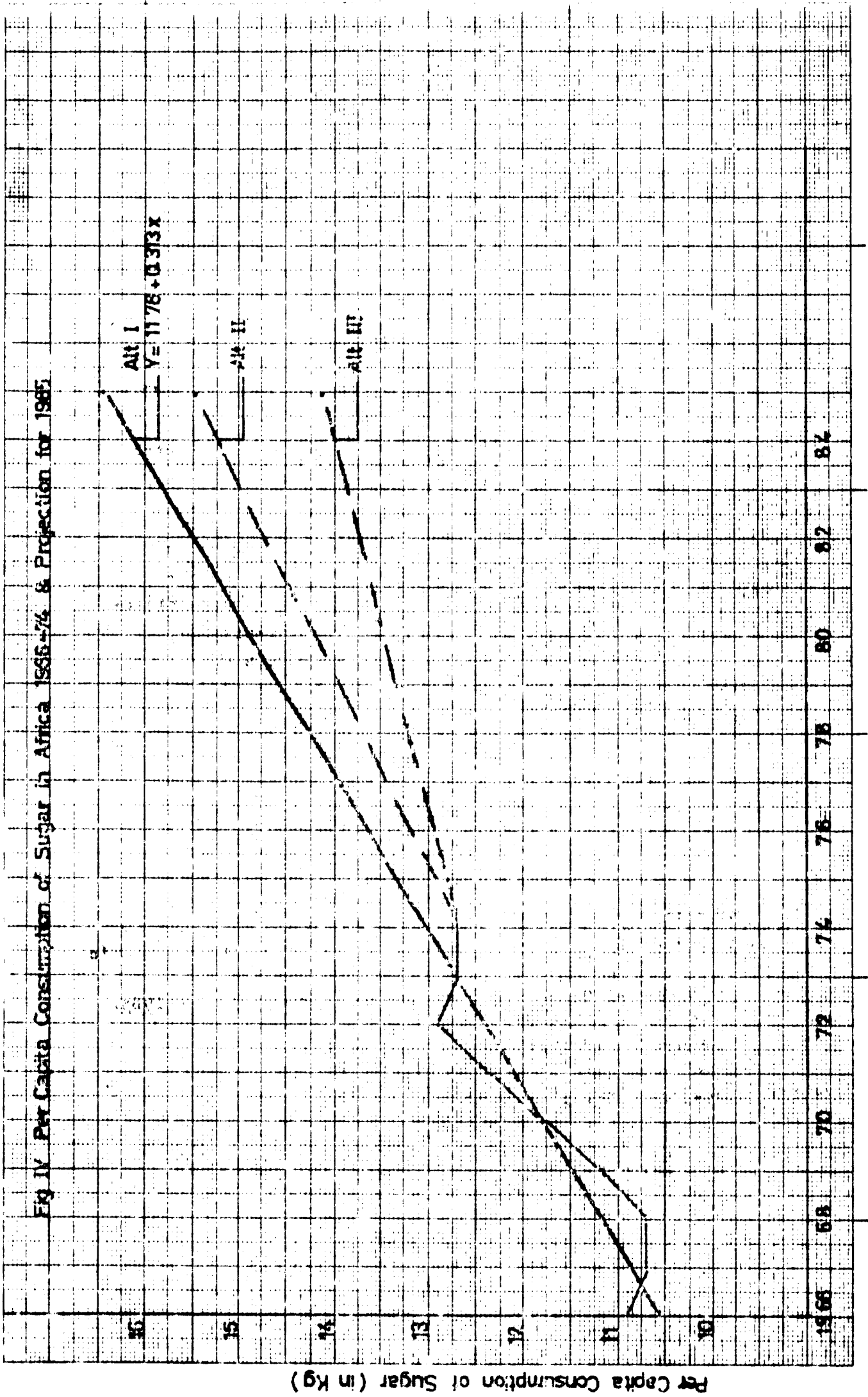
to have been achieved*. In the period up to 1985, two
different rates have been assumed: a low rate of 4.0% and a
higher one of 5.0%. The growth rates in per capita income
resulting from these are 1.6% and 2.6% respectively.

Alternative II is based on the higher rates (5% for GDP
and 2.6% for per capita income). Data on the income elast-
icity of demand for sugar are not easily available. When
FAO made commodity projections in 1967, it used a set of
elasticity data for a wide range of agricultural products,
including sugar*? Though the projections for Africa have
not materialised,*** the elasticities can be used at least
as a point of departure. For Africa as a whole, the income
elasticity of demand for sugar was estimated to be 1.0.****
The following figures are given for some African countries:-
Madagascar 1.5, Somalia 1.5, Nigeria 1.5, Tanzania 1.4,
Tunisia 0.8, Algeria 0.7, and Morocco 0.5. With the
exception of the last two countries, these estimates
(including that for Africa itself) would appear high for
the present. Apart from their general appearances, there is
the expectation of lower elasticity coefficients at higher
income levels. How much lower than 1.0 one should reduce
Africa's elasticity figure involves an arbitrary exercise.

*See, UN, National Accounts Yearbook, 1975, Volume III, p. 235.
This rate was obtained from index numbers of real gross domestic
product.

**FAO, Agricultural Commodities - Projections for 1975 and 1985,
Volume I, and Volume II, Rome, 1967.

***For a comparison of these projections with those of this
paper, see Annex I.

****FAO, Idem, Vol. II, pp. 30, 32.

One way to guess is to estimate Africa's per capita income
for 1974, and see the elasticity coefficients of those
countries (both in Africa and outside) which then had
per capita income level's close to Africa's level of 1974.
From this, some idea of Africa's figure for the year in
question may be estimated.

As the following Table shows, this method of guessing
is in fact not very helpful. The first two countries with
similar per capita incomes had widely different elasticity
coefficients. The Philipines and Taiwan which had identical
coefficients of 1.1 had somewhat different per capita incomes

TABLE IX: Elasticity Coefficients for Africa (1974) and other
Countries (1965)

No.	Country/Continent	Per Capita Income ($US) = 1965	Elasticity Coefficient
1	Paraguay	172	0.6
2	Zambia	171	1.2
3	Morocco	156	0.5
4	Philippines	142	1.1
5	Egypt	141	0.9
6	India	134	0.9
7	Bolivia	128	0.5
8	Taiwan	118	1.1
9	Thailand	102	1.0
10	Africa*	131	0.7

*1974, All incomes are in terms of constant 1961-63 prices.

Source: FAO, Op. cit Vol. II, pp. 12, 13, 30, 32.

($142 and $118 respectively). But there is also a tendency
(though not a very strong one) for lower coefficients to be
associated with higher incomes - e.g. Morocco, Bolivia,
Thailand and to a lesser extent India and Egypt. On this
basis Africa's coefficient may be placed at 0.7. That this
guess is only marginally better than a wild shot in the
dark cannot be over emphasized.

An income elasticity of demand of 0.7 means that if
per capita income grows by 10%, the demand for sugar grows
by 7%. On this basis and on the basis, further, that per
capita income would increase by 2.6% per annum under Alter-
native III, per capita consumption of sugar in 1985 becomes
15.45 kg. (See Figure IV). And total consumption, following
population projection of 505.9 million, reaches 7.8 million
tons (See Table VII); implying a rate of growth of 4.2.*

For Alternative III in which all the other assumptions
remain the same except that per capita income grows at 1.6%,
(Figure IV) the corresponding projection is 7.2 million tons,
giving a growth rate of 3.5%. The additional demand tonnage
implied by the three Alternatives is consequently as follows:-

- under Alternative 1, (83372-56020**) = 2.7 million tons
- under Alternative II, (78162-56020) + 2.2 million tons
- under Alternative III,(72445-56020) = 1.6 million tons

---

*An interesting comparison can be made between this rate and two
others recently made by an international institution which has
to remain unspecified. Between 1972/74 and 1980, demand for
sugar in the developing world as a whole was expected to grow
at 4.8% and at 3.6%, between 1981-85. If Africa were assumed
to represent the average, and one convenient rate were derived
from the preceding two, 4.2% is just the rate that would be
ascribed to the continent; exactly what Alternative II implies.

*This is the amount of sugar produced by Africa's mills. Strictly
speaking, the capacity of the mills should have been used.
Apart from the fact that this is unavailable, there is probably
not much difference between the two as sugar mills mostly operate
near capacity.

Any of these final figures could be used to work out
the required investment, manpower, land area, etc. needed to
generate that much production. A reasonable choice would
seem to be the result emerging from Alternative II. Hence
that figure would be used in the following discussion.

B. REQUIREMENTS & CONSEQUENCES

Most tentative of all the forecasts and conclusions
presented in this paper are those falling in this section.
To attempt to estimate the investment, the manpower, the
amount of land and the other attendant factors that are
required to set up a large number of sugar mills in Africa to
generate the additional 2.2 millions tons of sugar required
by 1985 from simple arithmetical manipulations is not merely
unwise, but highly unrealistic and may even be considered
misguided. How many sugar mills will be required? What will
be their different sizes? Where will each be located? Under
what soil conditions will the raw material be grown? And
what are the precipitation and temperature conditions? These
and dozens more questions face anyone trying to make a
realistic estimate of the foregoing factors. Clearly, one
cannot even begin to deal with these questions in a paper
of this sort.

The purpose of this section is to give the roughest of
rough ideas of what is implied in the consumption projections
of the preceding section. A fundamental policy problem (and
option) needs to be posed before a closer examination of these
implications is attempted, however. Before putting up the mills

to produce the additional sugar required, each country needs
to explore (if not to resolve) whether there is not an
alternative to the conventional mills and large scale plant-
ations that are normally and perhaps automatically considered
whenever new projects come up for decision. A number of
studies do suggest that there are such alternatives*. Big
sugar mills accompanied by large estates are efficient, but
employ relatively less people. Small cane farms are relatively
less efficient, but provide an opportunity for more employment.
Given the pressing demand for more and more jobs in almost
every country of the continent, there is some justification in
considering employment maximizing options. The calculations
which follow, largely because of the complexity of the problem
but also because of the simplicity of their arithmetic, are
based on large scale plantation - type establishments, based
on the experience of only one country.

Ethiopia in 1975 was considering various options to
increase sugar production. One of these was the establishment
of a large plantation of about 150,000 tons per annum. Based
on the calculations for this proposed mill as well as on the
experience of the country's existing two mills, the investment,
manpower, and land area required for the 2.2 million tons that
will have to be produced by the continent by 1985 are as
follows:

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*For a more thorough discussion of this problem see, for
instance, Barnett, D.F, and Valle, P.A.D., "An Analysis of
Sugar Production in a Changing Political Environment." The
Developing Economies, March, 1976, number 1.

TABLE X: <u>Capital, Land & Manpower Required for 2.2 million tons</u>

No.		Rate	Total
1	Total investment ($'000 million)	$1.100 per ton	2.4
2	Total manpower (000)	14.7 tons per person	152.7
3	Total land area (000 ha)	10 tons per ha.	220.0

The investment estimate of $2.4 billion, apart from the fact that it is based on one country's experience, does not take into account unforeseeable jumps in the price of capital goods, especially in the years furthest away from the year in which these estimates are made (e.g. 1983, 1984, & 1985). A sudden jump in the price of commodities (such as that witnessed in the last 3 or 4 years) could add anywhere between 25-50% to the $2.4 billion. The productivity figure of 14.7 tons per person is a very crude one obtained by dividing annual output by total employment. The latter includes seasonal employees who, although regular, only work during the cane cutting season. And most serious of all, the estimate of the 220,000 ha. assumed to be required for the production of the additional sugar, is based on the climate, precipitation, soil conditions, etc. of a specific area which was expected to yield 10 tons per hectare. There are areas not far from this location whose yield is half as much. Obviously that means a doubling of the land area.

Despite these and other weaknesses, the estimates do give a rough idea of the scale of the investment required, and the level of employment opportunities that could be generated by

the industry. As Africa's land potential for growing
sugar cane is not yet fully developed, an erroneous estimate
of the land area required poses no serious obstacle to an
appreciation of the problem. If the land area required is
even trebled (say 660,000 ha.) that is still a small fraction
of the unutilized area waiting to be exploited. In so far as
the employment figure is concerned that, as has been pointed
out already, is an indication of the opportunity to create
jobs, rather than of a manpower constraint. The investment
figure of $2.4 billion may look large. Even this cannot pose
serious problems. Two or three of the larger countries in
Africa can invest that much in the industry over a ten-year
period. In many African countries, the capital constraint has
now become much less severe. As is widely appreciated, the
limitations lie in the paucity of viable projects, which often
reflect underlying constraints, such as inadequate market
outlets, inadequate transport systems, and not well developed
technocracies. All in all, therefore, it can be safely stated
that the requirements to generate an additional 2.2 million
tons could be made available without great difficulty.

Once the mills begin to operate, other consequences
immediately follow. One such consequence manifests itself
in the balance of payments. Fuel, chemicals, and spare parts
for wear and tear as well as repatriation of capital, profits,
and personal emoluments create pressures on the payments side
of the balance of payments. On the opposite side would be
import saving (if there is import substitution) and export
earnings (if sugar is sold abroad). The net effect depends on

whether receipts exceed payments, or vice versa. In general, it could be taken for granted that such industries have a net positive impact on the balance of payments.

Another important consequence is in the area of by-products. The major by-product of sugar mills is molasses. Based on earlier ratios, 2.2 million tons of sugar gives rise to between 700,000 to 800,000 tons of molasses. Some of this will go to waste, but some of it will be exported and/or used by producers of animal feed. Other producers, and activities, will also be encouraged. Those engaged in transporting and distributing the commodity as well as those producing bags and other packaging materials for sugar will increase their activity and new ones will join their ranks.

Molasses, as discussed earlier, can also be used as a raw material for the establishment of sucrose - based chemicals. Citric acid, the major chemical product manu-factured from molasses, is largely produced and consumed in the developed countries.* In 1972, Western Europe is believed to have produced between 70,000 and 80,000 tons of the chemical. The largest producers were the U.K., Belgium, the Netherlands, Italy, France, and the Federal Republic of Germany. A similar amount was produced also by the U.S. Japan was reported to have produced 5,000 tons. All of these countries are either net exporters or are fully self-sufficient with negligible trade. The exports partly go to developing countries, so that many of there are dependent on the developed countries.

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*Once again, the following discussion draws mainly on the International Trade publication quoted on page 15.

There are a few exceptions, however Nigeria in
Africa, China, India, Pakistan, and Israel in Asia, and
Brazil and Mexico in Latin America produce citric acid for
domestic consumption and, in the case of Mexico and Israel,
for exports. Between 1966 and 1970 Israel exported 800 to
1,000 tons of the chemical, and Mexico between 280-700 tons
per year.

What are the prospects for Africa, apart from Nigeria
which already has a plant, for establishing citric acid
producing plants? Raw material is of course no problem as
can be confirmed not only by the Nigerian case (one of the
less important sugar and molasses producing countries in
Africa), but also because there is already enough of it
and there will be much more by 1985. Unlike so many other
instances, scale of operations is also not a problem. The
minimum capacity for the establishment of a citric acid
plant is some 3,000 tons. At that level of operation, a
plant is expected to make a good return on investment. The
problem is one of markets. Taken individually, there
probably are a few African countries whose food and beverage
industries could support such a plant. Firstly, such
countries should join Nigeria in producing citric acid.
And secondly, countries whose domestic markets are too
small could go into joint ventures and set up citric acid
plants for their collective markets. Not only will this enable
them to put to use part of the molasses which would otherwise
be thrown away, but also to save on imports.

Generally the same situation applies also to sorbitol,
the second most important chemical that is derived from
molasses. Once again Western Europe, Japan and the U.S. are
the major producers. Western Europe is basically self-sufficient

with some exports to the developing countries in Latin
America. The U.S., with its annual production of 70,000,
supplies other countries (e.g. Brazil) with its supplies.
Japan with an annual consumption figure of some 50,000 tons
but with a capacity of over 80,000 tons has considerable
excess capacity. Among Eastern European countries, Czech-
oslovakia produced about 1,000 tons in the early seventies,
and Hungary about 1,600 tons with an additional capacity
of 3,600 tons planned for the early seventies. In the
developing world, Brazil, India and Mexico produced varying
amounts, with Brazil manufacturing 2,000 tons, India 1,000
tons and Mexico 900 tons. Each of these countries was,
however, a net importer of sorbitol.

As in the case of citric acid, the minimum capacity of
a sorbitol producing unit is not large; waning as it does
between 1,000-2,000 tons a year. It is thus possible for a
number of African countries to produce the chemical for
their domestic market. Two or three may go on their own,
but most need to put up cooperative schemes.

C. BEYOND CONSUMPTION REQUIREMENTS

The prospects for the growth of Africa's sugar industry
have so far been discussed solely in terms of meeting domestic
requirements. There is of course the supplementary (but in
terms of economic development the very central) aspect of
production for exports. In Chapter I, Africa's contribution
to world exports was shown to be about 10%. Another way to
measure the importance of sugar exports is to relate them to
domestic production. Table XI shows how Africa compares
with five leading exporters in terms of its exports/production
ratio. If exports are compared with production without

subtracting imports (the gross exports column in the table),
Africa ranks fourth with 41%. That is quite a significant
portion to export. If imports are taken into account, how-
ever, the other countries do not show any change at all, with
only France dropping by 6 percentage points. But Africa drops
by 30 percentage points and falls to last place. This mani-
fests the weakness of Africa as a net exporter of sugar.

TABLE XI: Production and Export of Sugar in Africa and Selected
Countries ('00 tons); 73/74 average

No.	Countries	(1) Production	(2) Gross Exports	(3) Net Exports	(4) (2) as % of (1)	(5) (3) as % of (1)
1	Cuba	56545	49691	49691	88	88
2	Philippines	23875	15085	15085	63	63
3	France	29300	14286	10221	49	35
4	Brazil	69340	25611	25611	37	37
5	Mexico	28240	5169	5169	18	18
6	Africa	55845	23084	6140	41	11

The projections for 1985 presented earlier in this
Chapter were given in terms of Africa's total consumption
and thus imports are subsumed in the projected figures. But
two revisions could be made in these figures whose effect
will be to add to the continent's production requirements.

The first is an adjustment of the figures by an amount representing net exports in 1985. In the past Africa has been a net exporter of sugar of varying quantities. Table V on page 23 gives the record for 1964-1974. As can be observed from column 4 of that table there was a significant surplus in almost all years. In 1972, 1968 and 1969 especially record levels were reached as the surpluses stood at 34%, 33% and 37% of exports respectively. What will the surplus be in 1985?

As has been observed earlier, a projection of the export and import trends of 1964-74 to 1985 gives the following results:

(i) For exports the regression line assumes the function $Y_E = 2.069 + 0.068 X$; the origin being 1969 and X being units of one year. In 1985, therefore, exports will be 3,157,000 tons.

(ii) For imports, the trend line is $Y_M = 1.561 + 0.020 X$, where X and the origin are as before. Imports in 1985 will hence be 1,881,000 tons.

Net exports in 1985 will hence amount to 1,276,000 tons. Africa needs not only to produce 2.2 million tons by 1985, but an additional 1.3 million tons for its exports surplus. The investment, the manpower, etc. required for additional output will thus be for 3.5 million tons.

On past performance, that is the least that should be expected. In addition, however, Africa may replace all its imports by domestic production and maintain its trend of exports. This is a very optimistic assumption. But it is worth exploring it, for there are many countries that do just that. (That is what the figures tell for Cuba, Mexico,

Brazil and the Philippines in Table XI). On the basis
of this assumption, the figure to be added to 2.2 million
is 3.2 million. Additional output will consequently be
5.4 million tons.

TABLE XII: Capital, Land, & Manpower Required Under Different
Assumptions.

No.		Requirements Under Alt. II	Requirements Under Export Surplus Assumption	Requirements under total self-sufficiency + gross exports
1	Investment ($000 million)	2.4	3.8	5.9
2	Manpower (000)	152.7	242.8	374.1
3	Land Area (000 ha.)	220.0	349.8	539.0

Table XII summarizes the implications of these estimates
in terms of the required capital, land, and manpower. The
second column gives, for comparison, the results obtained
under Alternative II; column three is based on the export
surplus assumption and the last column under the assumption
of total self-sufficiency (i.e. no imports) plus the main-
tenance of exports at the past trend.

As suggested earlier, the export surplus assumption
is not unrealistic; rather a development which should be
expected to come about if past performance is an indication.

More difficult to achieve (though not impossible) is the
target of producing 5.4 million tons by 1985. That is
about as much as Africa produced in 1974, and represents
an annual rate of growth of 6.3%.*

This two-fold increase will, of course mean, a
much higher amount of investment (close to $6 billion).
Other resources will also be put to strain. The most
difficult problem is not, however, in the area of resource
mobilization. It lies in the domain of trade policy.

Two principal issues are involved in this regard.
First, those African countries which are total or net
importers would have to re-orient their imports towards
surplus producers in the continent. This is a considerable
taks in continental cooperation, but if realised, it would
also represent an equally considerable achievement. Those
obstacles and situations that in the first instance drove
sugar-deficit countries to import from outside Africa
would have to be overcome and rectified.

The second issue involves world trade as a whole.
To continue to export 41% of production (as Africa did
in 1973/74) without the special considerations that some
developed countries give to such countries as Cuba, and the
Philippines is a formidable undertaking. As in so many other

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*An estimate of the expected growth of production in the developing
countries made by the international institution mentioned earlier
projects growth rates of 4.0% for the period 1972/1974 to 1980
and 4.3% for 1981-85. It is not unreasonable to export a some-
what higher growth rate for Africa in this third-world average.

areas, the developed countries would have to adopt less
restrictive trade policies towards exporters in the
developing world. The 1967 FAO study cited earlier said
that prospects for sugar exports would become very promis-
ing "if policies were modified to limit relatively high cost
domestic production /in the developed countries/ and to
lower consumer prices in order to increase imports from
the developing countries. For example, if high income
countries would adopt policies, as a result of an inter-
national agreement to limit future production to the degree
of self-sufficiency achieved in 1961-1963, this net import
demand could increase by 35 percent over the 13 years period
(i.e. up to 1975); a significant expansion could be achieved
also by reserving all future consumption growth for imports.
Again total consumption could be increased substantially
by reducing retail prices through elimination of tariffs,
duties and excise taxes and other fiscal imposts"*. Though
ten years have elapsed since these wards were written, the
situation remains essentially the same. Recent developments
in some developed countries do not appear to indicate that
a re-orientation of trade policies in the proposed direction
is about to take place. From a net importer in 1967, the EEC
became a net exporter in 1972 with about 1.5 million tons;
and current EEC policy is to be at least self-sufficient in
1980.*"

    The International Sugar Agreement of 1968, on the other
hand, did give some hopeful signs about trade and production
policy in the developed countries. In an Annex to that

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*FAO, Agricultural Commodities-Projections for 1975 and 1985,
Vol. I, p. 67

**The Economist, Sept. 22, 1973.

agreement, Canada undertook not to provide incentives to
producers of sugar beyond 20% of domestic production; Finland
and Sweden to limit sugar beet growing to 25,000 ha. and 40,000
ha. respectively, Switzerland to import not less than 70%
of its domestic production; the U.K. and Japan to import a mini-
mum figure of 1.5 million tons in addition to 35% of future
growth in domestic consumption over and above 1.8 million
tons (1.8 million tons for Japan); and New Zealand to import
all its requirements*.

Such policies, more generously conceived and more widely
adopted, could enable the continent to achieve its target of
exporting an additional 3.2 million tons by 1985.

he International Sugar Agreement, Annex A, United Nations Treaty
eries, Vol. 654, Nos. 9369-9372, p. 106.

ANNEX I: Consumption Projections of Alternative II
Compared with FAO Projections

Projections Compared

		FAO Projection:1985 (Highest Variant)	Alt. II Projection:1985
A	Assumptions		
	1. Initial Level of Consumption (million tons)	1.83	3.45
	2. Growth rate of GDP (%)	5.6	5.0
	3. Growth rate of Population (%)	2.7	2.4
	4. Elasticity	1.0	0.7
B	Final Estimates		
	1. Total Consumption (million tons)	5.30	7.82
	2. Per Capita Consumption	12.30	15.45

Sources: (1) See Chapter II.

(2) FAO, Agricultural Commodities-Projections
for 1975 and 1985, Rome 1967, Vo. I, pp. 9, 193;
Vol. II, pp. 30, 185.

The FAO projections are given in four variants. Two
assumptions each were made for population growth and GDP
growth, a high and a low rate of growth. Four combinations
were obtained from these. The projections shown above take
the high population and the high income variant.

As can be easily seen, the final results are at
variance. While most assumptions are not too dissimilar,
the points of departure are very different. FAO started
with a total consumption figure of 1.38 million tons;
Alternative II with 3.45 million. And that of course
is the basic cause of the divergence. The consumption
figure of Alternative II was re-checked, first against
the source, and secondly by adding production to imports and
subtracting exports (a rough indicator of consumption).
And no errors were apparent. It seems, therefore, that
since 1967 consumption data were drastically revised.

Though not too disimilar, the other assumptions are
such that Alternative II's are more conservative than
FAO's. Higher results could have been obtained, _ceteris
paribus,_ with FAO's.

The revisions made on the consumption projection of
Alternative II after the discussion on trade are not shown
here because FAO's projections do not make allowance for
such additions.

ANNEX II: STATISTICAL TABLES

Note to Statistical Tables

1. The figures for production, consumption, exports,
and imports are all given in terms of centrifugal sugar, the
appropriate conversions having been made into their raw
equivalents.

2. The desire for more detail as well as consistency
in compiling data have made it necessary for the data to
be expressed in 100-ton units.

3. Unavailable figures for specific years have when
necessary been extrapolated or interpolated from their
respective series. This is particularly true of the
population data of Table 6 where figures so obtained are
shown in parenthesis.

4. From 1969 onwards data for members of the European
Economic Community are given collectively (See Table 11, for
example), and it has not been possible to continue the
individual country data series beyond that year.

TABLE 1. World Production Exports, & Imports of Sugar

(100 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. Production	602100	648800	640500	663000	668300	695950	728990	738590	757450	781310	786900
2. Exports	172506	193410	187969	203218	204879	195989	218178	213781	221604	232141	229940
3. Imports	170456	187936	191727	201580	200559	190846	221439	212144	218236	234004	231525

Sources: 1) FAO Trade Yearbook,   1074 pp 220,223

2) " "   1970 pp 228,230

3) UN Statistical Yearbook,   1074 pp 232,233

4) UN " "   1975, pp 240,250

TABLE 2   AFRICA and Major Sugar Producing Countries

(in 00 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. U.S.S.R.	76430	97000	90190	91880	98150	100780	88470	84020	86740	96000	85260
2. U.S.A.	50680	48720	47900	48020	51040	49710	53270	52780	54940	55010	51350
3. Cuba	45900	60820	48670	62560	53150	55340	75590	59500	46880	53830	59260
4. Brazil	33910	46140	38420	42750	43820	41740	50190	52980	54510	69370	69310
5. India	28390	34930	36330	23570	23750	41900	46340	34590	37070	39320	44890
6. China	20000	22000	24000	25750	26500	27000	29000	30500	31500	33300	39000
7. Mexico	19330	21210	22660	24110	23360	25640	24020	24890	25370	28100	28380
8. Philippines	17330	16580	14450	15990	16120	15780	19800	21710	20990	22300	25250
9. Africa	35350	34920	39790	43990	46200	45880	48150	51300	55240	55670	56020

Sources: 1) U.N. Statistical Yearbook 1974, p. 232,233
2) " " 1975, p. 249,250

TABLE 5.   Production of Sugar - Selected European Countries

(00 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. France	22100	21840	17050	15960	21910	24350	25490	29460	27420	29160	29440
2. Fed. R. of Germany	21080	16010	19170	20490	20180	21300	21000	23760	22640	24530	24230
3. Italy	10800	12410	13420	16610	12900	14070	11900	11230	12530	11490	9680
4. U.K.	8890	9730	9360	9760	9770	10060	9250	10550	11240	9080	6160

Sources: 1) FAO Production Yearbook,   1974 p. 161

2) UN Statistical Yearbook,   1974 pp. 232,233

3) UN   "   "   1975 pp. 249,250

TABLE 4   Sugar Production in African (Countries)
(00 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. Algeria	20	10	30	60	70	100	50	190	200	250	250
2. Angola	650	670	680	670	650	660	790	760	840	900	700
3. Congo	300	300	570	990	920	950	850	700	400	380	280
4. Egypt	4110	4040	3600	3640	4140	4890	5200	5500	5500	5720	5340
5. Ethiopia	680	750	550	770	700	700	1030	1200	1310	1400	1300
6. Ghana	0	0	0	20	30	30	80	80	100	100	50
7. Kenya	350	290	390	660	880	1250	1410	1400	1000	1150	1790
8. Madagascar	1050	1030	1050	1030	1050	990	1080	990	1100	1050	1220
9. Malawi	0	0	30	170	200	280	330	330	340	500	470
10. Mali	0	0	0	30	40	50	60	60	80	100	150
11. Mauritius	5490	7040	5930	6780	6320	7080	6100	6570	7270	7610	7380
12. Morocco	210	320	500	330	900	1430	1530	2270	2450	2300	2600
13. Mozambique	1510	1640	1760	2000	2140	2260	2870	3260	3280	3350	3000
14. Nigeria	0	80	170	220	220	270	270	310	280	300	400
15. Reunion	2090	2480	2240	2300	2530	2600	2110	1860	2320	2400	2280
16. Somalia	160	170	350	320	360	510	500	490	410	500	330
17. South Africa	14560	10140	15360	17320	17880	14980	16490	17200	21110	19530	19700
18. Rhodesia	1710	2310	2500	1500	1500	1200	1350	2000	2000	2250	2250
19. Sudan	210	180	260	770	1010	870	820	790	990	1000	1200
20. Lesotho	..	1190	1430	1730	1620	1550	1800	1780	1920	1760	2040
21. Tunisia	60	50	60	70	40	50	60	30	40	50	40
22. Uganda	1260	1180	1270	1370	1500	1510	1540	1520	1310	740	440
23. Cameroun	0	0	0	0	30	50	100	120	120	120	140
24. Tanzania	610	670	710	720	820	920	870	960	880	1070	1050
25. Zaire	310	380	350	470	430	400	460	480	480	500	670
26. Zambia	0	0	0	0	220	300	400	450	510	540	650
Total	35330	34920	39790	43990	45200	45880	43150	51300	56241	55670	56020

Sources: } UN St tistical Yearboo . 1974   pp 232,233
         }   "   . 1975   pp 240,250

TABLE 5. Estimates of Mid-year Populations for Selected Countries (in Millions)

	1964	1965	66	67	68	69	70	71	72	73	74
1. China	694.71	707.44	720.41	733.54	746.34	760.26	773.66	787.18	800.72	811.35	824.96
2. India	472.13	483.41	494.11	505.08	516.35	527.95	539.86	551.83	563.49	574.42	586.27
3. U.S.S.R.	228.15	230.94	233.53	235.99	238.32	240.55	242.76	245.09	247.46	249.75	252.06
4. USA	191.89	194.30	196.56	198.71	200.71	202.68	204.38	207.05	208.84	210.40	211.89
5. Brazil	78.73	81.01	83.34	85.75	88.22	90.77	93.79	96.08	98.85	100.56	103.35
6. U.K.	54.01	54.37	54.66	54.09	53.30	55.55	55.73	55.57	55.79	55.93	55.97
7. Germany, F.R.	58.29	59.04	59.48	59.87	60.17	60.84	60.65	61.29	61.67	61.97	62.04
8. France	48.31	48.76	49.16	49.55	49.91	50.32	50.57	51.25	51.70	52.13	52.51
9. Philippines	30.75	31.57	32.63	33.63	34.66	35.74	36.85	37.92	39.04	40.12	41.30
10. Mexico	39.99	41.34	42.79	44.27	45.81	47.42	49.09	50.83	52.64	55.16	58.16
11. Italy	51.57	51.94	52.28	52.61	52.91	53.23	53.57	53.80	54.75	54.01	55.41
12. Cuba	7.51	7.72	7.89	8.05	8.20	8.74	8.47	8.60	8.75	9.02	9.00
13. Canada	19.33	19.68	20.05	20.41	20.73	21.03	21.32	21.60	21.85	22.13	22.48
14. World	3162*.0	3289.0									

Sources: UN Demographic Yearbook, 1972   : 119,141,142,143
     2) "   "   "   1975   pp   161,162,163,164,139

* 1963

TABLE 6 Estimate of Mid-Year Population for African Countries (million)

	64	65	66	67	68	69	70	71	72	73	74
1. Algeria	11.58	11.92	12.??	13.68	13.?0	13.51	14.??	14.??	15.77	15.??	15.28
2. Cameroun	5.11	5.?1	5.42	5.52	5.63	5.74	5.84	5.94	6.0?	6.17	6.28
3. Zaire	16.94	17.?5	18.29	19.06	19.??	20.70	21.64	22.48	22.86	23.56	24.??
4. Congo	0.8?	0.84	0.86	0.?8	0.90	0.92	0.94	0.96	0.9?	1.0?	1.31
5. Benin	2.31	2.37	2.4?	2.40	2.55	2.60	2.69	2.76	2.27	2.95	3.0?
6. Ethiopia	22.?0	22.70	23.14	23.87	23.24	24.02	24.??	25.25	25.0?	26.??	27.24
7. Gambia	0.??	0.7?	0.?4	0.?4	0.35	0.?6	0.36	0.?7	0.3?	0.50	0.51
8. Ghana	(7.?5)	...	...	...	...	(?.?0)	8.64	8.?6	9.0?	?.??	9.61
9. Guinea	?.42	3.51	3.?1	3.70	3.?5	3.8?	3.92	4.01	4.11	4.21	4.31
10. Ivory Coast	3.75	3.84	3.92	4.02	4.11	4.21	4.?1	4.42	4.5?	4.65	4.77
11. Kenya	(9.2)	...	9.78	10.12	10.4?	10.??	11.22	11.67	12.07	12.4?	12.01
12. Liberia	1.04	1.07	1.09	1.11	1.1?	1.15	1.52	1.57	1.59	1.63	1.67
13. Libya	1.??	1.?2	1.68	1.74	1.??	1.87	1.94	2.01	2.0?	2.25	2.?5
14. Madagascar	5.91	6.08	6.20	6.??	6.4?	6.??	6.75	...	...	...	(7.36)
15. Mali	4.49	4.58	4.65	4.74	4.??	4.93	5.05	5.14	5.2?	5.?8	5.5?
16. Mauritania	1.0?	1.05	1.07	1.10	1.12	1.14	1.17	1.20	1.23	1.2?	1.29
17. Mauritius	0.74	0.7?	0.7?	0.7?	0.?1	0.82	0.83	0.84	0.8?	0.9?	0.?7
18. Morocco	12.96	13.?2	13.7?	14.14	14.58	15.03	15.52	15.23	15.83	16.31	15.88
19. Mozambique	6.93	7.01	7.10	7.19	7.27	7.36	...	5.??	8.5?	8.82	9.0?

20. Niger	3.42	3.51	3.61	3.71	3.81	3.91	4.02	4.13	4.21	4.30	4.48
21. Nigeria	47.49	48.68	49.88	51.12	52.39	53.70	55.07	56.51	58.02	59.66	61.27
22. Malawi	3.79	3.91	4.03	4.12	4.22	4.33	4.44	4.55	4.67	4.70	4.92
23. Rwanda	3.02	3.13	3.26	3.37	3.46	3.57	3.68	3.79	3.90	4.01	4.12
24. Senegal	3.40	3.49	3.57	3.62	3.69	3.78	3.93	4.02	4.12	3.97	3.96
25. Sierra Leone	2.33	2.37	2.40	2.44	2.48	2.51	...	2.59	2.63	2.57	2.71
26. Somalia	2.45	2.50	2.56	2.61	2.67	2.73	2.79	2.88	2.94	3.04	3.09
27. South Africa	17.89	18.43	19.00	19.58	20.16	20.77	20.82	22.40	22.00	24.31	24.94
28. Sudan	13.33	13.73	14.12	14.50	14.94	15.31	15.76	16.09	16.49	16.30	17.32
29. Tanzania	11.39	11.67	11.96	12.26	12.59	12.93	13.27	13.63	14.00	14.37	14.76
30. Togo	1.66*	...	...	...	...	(1.92)	1.97	2.02	2.09	2.12	2.17
31. Tunisia	(4.51)	...	4.72	4.82	4.92	5.03	5.14	5.24	5.58	5.44	5.64
32. Uganda	8.17*	...	...	...	...	9.55	9.81	10.13	10.46	10.81	11.17
33. Egypt	28.66	29.39	30.14	30.91	31.69	32.50	33.33	34.08	34.84	35.52	36.42
34. Upper Volta	4.76	4.86	4.96	5.05	5.18	5.28	5.38	5.49	5.61	5.76	5.90
35. Zambia	3.60	3.70	3.80	3.90	4.01	4.06	4.18	4.30	4.42	4.50	7.75
36. Other	11.8	...	...	...	...	...	344.0		364.0		391.0

* 1963

Sources: (1) UN Demographic Yearbook, 1972 pp 119,1140,141

(2) Idem, 1975 pp 139,160,161

TABLE 7 Sugar Consumption in Africa & the World

(in 00 metric tons)

	1963	1966	67	68	69	70	71	72	73	74
1. Algeria	2230	2320	2560	2230	2350	2420	2450	2550	2590	3300
2. Kenya	980	1320	1320	1440	1530	1770	2140	2100	2200	2430
3. Morocco	4110	3780	3790	3800	4020	4110	4220	4600	4800	4800
4. South Africa	7620*	8110	8000	8120	8590	9160	9560	10000	10680	11390
5. Sudan	1570	1750	1880	2000	2210	2460	2730	2770	2850	2730
6. Uganda	740	1050	1020	1010	1210	1430	1490	1330	740	490
7. Egypt	4470	5510	4970	4820	5070	5200	5580	5800	6010	5370
8. Africa	30330	34510	35040	35730	38120	41070	44350	46050	48350	49450
World	533490	623290	642720	667310	684020	721190	743780	762050	786850	797650

Sources: 1) UN Statistical Yearbook. 1969 p 485
        2) " " "   1974 p 540
        3) " " "   1975 p 587

* including data for Lesotho

TABLE 8 Per Capita Sugar Consumption in Africa and the World

(in kilogrammes)

	1963	1966	67	68	69	70	71	72	73	74
1. Algeria	19.5	19.1	20.4	17.7	16.9	16.7	16.6	16.7	17.8	20.3
2. Kenya	11.1	15.7	17.2	14.1	14.1	15.7	16.3	17.4	17.6	13.8
3. Morocco	32.4	28.1	26.8	26.7	24.7	26.4	28.7	29.0	29.5	28.4
4. South Africa	44.9*	44.3	42.7	42.3	35.5	39.7	40.3	42.2	42.1	41.5
5. Sudan	12.0	12.6	17.1	17.5	14.4	15.7	16.9	16.8	16.9	15.6
6. Uganda	10.3	13.6	12.9	12.4	12.7	14.6	16.2	12.7	6.8	4.4
7. Egypt	15.0	18.2	17.1	15.2	15.6	15.6	16.4	16.6	17.0	17.0
8. Africa	10.5	10.9	10.7	10.7	11.2	11.8	12.4	12.0	12.7	12.7
9. World	16.9	16.6	18.9	19.4	19.3	19.0	20.3	20.4	20.7	20.3

Sources: 1) U.N. Statistical Yearbook, 1969 p. 485
2) " " " 1974 p. 540
3) " " " 1975 p. 587

* includes data for Lesotho

TABLE 9 Sugar Consumption in selected Countries of the World

(in 00 metric tons)

	1963	66	67	68	69	70	71	72	73	74
1. U.S.S.R.	68110	102000	108000	112000	98890	102470	103500	107500	112000	112500
2. U.S.A.	92360	96240	96850	102180	98000	104010	103770	104600	104640	103250
3. Cuba	4560	5410	6290	6820	6360	6190	6160	4710	4640	5220
4. Brazil	27360	27350	28990	35410	34040	34950	37960	41250	42660	45770
5. India	26730	31440	25600	24000	31220	37670	44730	39140	38270	37900
6. China	19040	25500	29000	28000	29600	31500	33400	35500	38000	42000
7. Mexico	13120	15550	16500	17670	18750	19220	19200	20750	22950	23440
8. Philippines	4260	5280	6080	6450	6270	6130	6390	7640	8000	8500
9. Japan	16870	19990	22230	23320	26440	30290	31010	32490	32940	33360
10. Canada	8590	9200	10250	9680	10730	10740	10540	10370	12120	9840
11. Indonesia	3860	5480	7250	7400	8120	8870	8720	9610	10000	10500

Sources: 1) UN Statistical Yearbook 1969 pp 485,486
2) " " 1974 pp 540,541
3) " " 1975 pp 587,586

TABLE 10 Per Capita Sugar Consumption in Selected Countries

(in kilogrammes)

	1963	66	67	68	69	70	71	72	73	74
1. U.S.S.R.	30.3	43.6	45.9	47.1	41.1	42.2	42.1	43.4	44.8	44.6
2. USA	48.2	48.3	48.0	50.0	48.5	51.0	50.3	50.3	49.8	48.5
3. Cuba	63.0	69.1	78.4	81.9	76.3	72.4	71.2	57.8	52.3	57.4
4. Brazil	35.3	32.3	33.8	40.1	37.5	37.4	36.0	41.7	42.1	42.5
5. India	5.8	6.3	5.0	4.6	5.9	5.9	8.1	7.0	6.7	6.5
6. China	2.8	3.6	5.0	3.8	4.0	4.2	4.3	4.5	4.8	4.8
7. Mexico	32.9	35.2	36.1	37.4	39.7	41.2	38.4	40.1	42.3	41.7
8. Philippines	14.1	15.8	17.5	17.9	17.5	16.6	17.5	19.2	19.9	20.5
9. Japan	17.4	20.0	22.0	22.9	25.6	29.0	29.4	30.4	30.1	30.4
10. Canada	45.4	46.2	50.0	46.2	50.9	50.2	48.6	47.0	35.0	43.8
11. Indonesia	3.8	5.1	6.5	6.5	4.8	7.3	7.3	7.8	6.0	6.2

Sources: 1) UN Statistical Yearbook, 1969 pp 485,486
2) " " " 1974 pp 540,541
3) " " " 1975 pp 587,589

TABLE 11 a. Sugar Consumption in Selected European Countries

(In 00 metric tons)

	1953	1956	62	68	69	70	71	72	73	74
1. France	16740	17710	18560	19370						
2. Fed. Rep. of Germany	19290	21660	21720	24320						
3. Italy	12830	14540	14750	15080						
4. U.K.	29740	28910	18700	28870						
Europe	151930	162420	166360	175040						
European Economic Community					104450	106920	104610	104750	111160	116980

Table 11 b. Per Capita Consumption (in kilo grams)

	1953	1956	62	68	69	70	71	72	73	74
1. France	34.1	35.8	37.2	38.3						
2. Fed. R. of Germany	33.5	36.3	36.3	40.2						
3. Italy	25.3	28.0	28.2	23.6						
4. U.K	55.2	52.6	51.9	51.9						
Europe	34.7	36.2	36.8	38.4						
European Economic Community					41.4	42.1	40.9	40.9	43.5	45.5

Sources 1) UK Statistical Yearbook 1969, p 486
2) " " " 1974, p 541
3) " " " 1975, p 588

TABLE 12 Exports of Sugar from Africa (00 Metric tons)

	1964	65	66	67	68	69	70	21	72	23	24
1. Angola	246	335	274	263	137	144	74	81	104	97	90
2. Congo (Bra)	-	27	17	608	92	145	508	469	496	281	230
3. Ethiopia	131	4	-	-	12	20	133	166	223	352	105
4. Ivory coast	-	-	-	1	1	2	-	1	12	-	-
5. Kenya	-	-	1	39	1	1	-	-	-	2	21
6. Madagascar	684	360	924	799	577	647	520	354	389	394	156
7. Mali	1	3	3	1	-	11					
8. Mauritius	5757	5694	5799	5158	5961	5962	5750	4893	6720	7017	6699
9. Morocco	148	86	51	28	1	-	94	306	150	70	18
10. Mozambique	833	949	1471	1095	1318	1701	1786	2070	1971	1744	1500
11. Nigeria	-	-	-	6	6	-					
12. Reunion	2073	1910	2217	2099	2834	2095	2707	1793	1718	2624	1974
13. Malawi	-	-	-	30	-	25					
14. Rhodesia	911	2535	650	540	751	749	899	900	950	1200	1200
15. Zambia	12	18	1	-	-	-	-	4	-	11	-
16. Senegal	3	6	4	2	-	-					
17. South Africa	5860	3754	7247	8834	9613	7143	6335	6802	9975	7266	8270
18. Tanzania	2	-31	4	3	-	1	1	4	2	-	-
19. Tunisia	-	-	-	-	-	69					
20. Uganda	472	194	60	332	364	472	223		203		
21. Egypt	260	161	57	120	633	862	867	1196		393	506
Total	17393	16068	18778	19958	22300	20046	21565	20623	24677	23317	22850

Sources: FAO
1) Trade Yearbook 1970, p 228
2) FAO Trade Yearbook 1974, p. 223

TABLE 13   Exports of Sugar for Selected Countries

(00 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. U.S.S.R.	3781	5547	10792	11221	14127	11748	11731	10893	538	456	1035
2. U.S.A.	41	23	29	14	13	9	14	5	8	39	418
3. Cuba	41145	52309	43610	56831	46122	48005	69063	55110	41397	47974	51407
4. Brazil	2526	7600	10001	10013	10262	10987	11262	12512	25349	28217	23027
5. India	2645	2725	4450	1776	1636	950	2395	4155	1081	1686	5351
6. China	3617	3898	5275	3887	2440	1452	4977	6402	2439	5301	6241
7. Mexico	5250	5277	4756	5503	6412	6039	5780	5462	5770	5066	4272
8. Philippines	11227	10477	9430	9441	9059	10109	12372	14221	12402	14748	15421

Sources 1) FAO Trade Yearbook 1970   pp 227,228

2) FAO   "   "   1974   "   p 223

TABLE 14 Exports of Sugar for Selected European Countries

(00 metric tons)

	54	55	66	67	68	69	70	71	72	73	74
1. France	5506	9920	7777	4714	7185	5829	10339	11788	14178	16551	12021
2. Fed. Rep. of Germany	154	5	9	219	1269	1183	1360	624	2957	2419	4187
3. Italy	-	-	-	-	1103	769	-	-	-	1	-
4. U.K.	4828	3786	3289	3551	2279	2209	2058	2535	3297	2994	3284

Sources:

1) FAO Trade Yearbook, 1974 pp 223,224

2) FAO " " 1970 p. 227

TABLE 15 Imports of sugar into Africa (00 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. Algeria	2119	1911	2117	2131	2423	2000	2371	2611	2601	2517	2544
2. Cameroun	75	109	94	151	144	9?	153	169	167	139	184
3. Congo	1	-	1	-	-	-	-	-	-	-	-
4. Benin	53	58	68	37	126	110	100	91	77	80	97
5. Egypt	530	242	2635	1687	1193	1113	107	-	91	-	125
6. Ethiopia	-	14	199	30	18	1	1	1	1	-	-
7. Gambia	14	55	41	76	85	84	71	86	72	75	35
8. Ghana	443	619	713	651	950	736	1416	649	490	610	471
9. Guinea	101	170	150	113	121	130	132	152	147	141	109
10. Ivory Coast	256	738	388	350	400	412	551	534	590	559	572
11. Kenya	771	1024	1161	477	586	284	405	784	1129	842	769
12. Liberia	24	40	42	47	-9	41	65	49	42	79	74
13. Libya	307	194	475	929	340	701	651	565	794	939	939
14. Madagascar	2	2	1	1	1	-	1	-	1	-	-
15. Mali	152	711	231	144	328	174	180	223	277	272	217
16. Mauritania	42	12	75	179	204	115	199	190	160	223	213
17. Mauritius	-	-	-	-	-	-	-	-	-	-	-
18. Morocco	3638	2772	3411	3337	2613	2530	2632	2454	2220	2779	2845
19. Mozambique	-	-	245	60	-	-	-	-	-	-	-
20. Niger	57	70	92	78	77	82	98	75	116	109	761
21. Nigeria	442	580	652	572	390	728	944	1504	1274	1549	722
22. Malawi	108	172	157	65	41	24	17	28	59	24	73
23. Rwanda	5	10	31	34	45	25	37	22	7	17	16
24. Senegal	742	718	702	465	594	600	741	793	371	524	524

25. Sierra Leone	156	235	255	245	275	266	31	26	22	50	53
26. Somalia	161	52	93	1	...	1	-	-	163	283	272
27. South Africa	456	1029	91	99	108	112	132	142	149	208	216
28. Sudan	1318	2030	910	822	1747	873	1368	2168	1453	2256	715
29. Tanzania	48	41	66	62			50	294	547	513	350
30. Togo	45	34	82	90	122	121	82	48	73	70	54
31. Tunisia	1052	619	679	908	938	867	1099	1142	1144	863	1152
32. Uganda	1	7	190	1	1	1	-	118	98	77	-
33. Upper Volta	92	86	96	90	133	108	129	132	185	106	76
34. Zambia	184	209	227	471	349	223	238	148	156	123	128
35. Zaire	-	-	57	101	10	67	136	202	142	147	170
36. Other	149	223	288	261	332	294	1167	1127	1045	1227	590
Total	13731	15318	16715	16206	14905	12890	15004	16676	16333	17541	16347

Sources: 1) FAO Trade Yearbook, 1970 pp 230,231

2) FAO " " 1974 pp 220

TABLE 15   Imports of sugar for selected countries

(00 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. USSR	4722	5354	5087	4887	3858	3304	3275	3708	3505	4102	4028
2. Fed. R. of Germany	544	2433	3153	3107	2849	1812	1945	1776	1252	1399	1001
3. Italy	4974	3602	1465	955	524	3504	3868	5381	5785	5611	7660
4. U.K.	23069	21707	22154	21909	20497	21496	21000	21278	21630	20501	22694
Total											

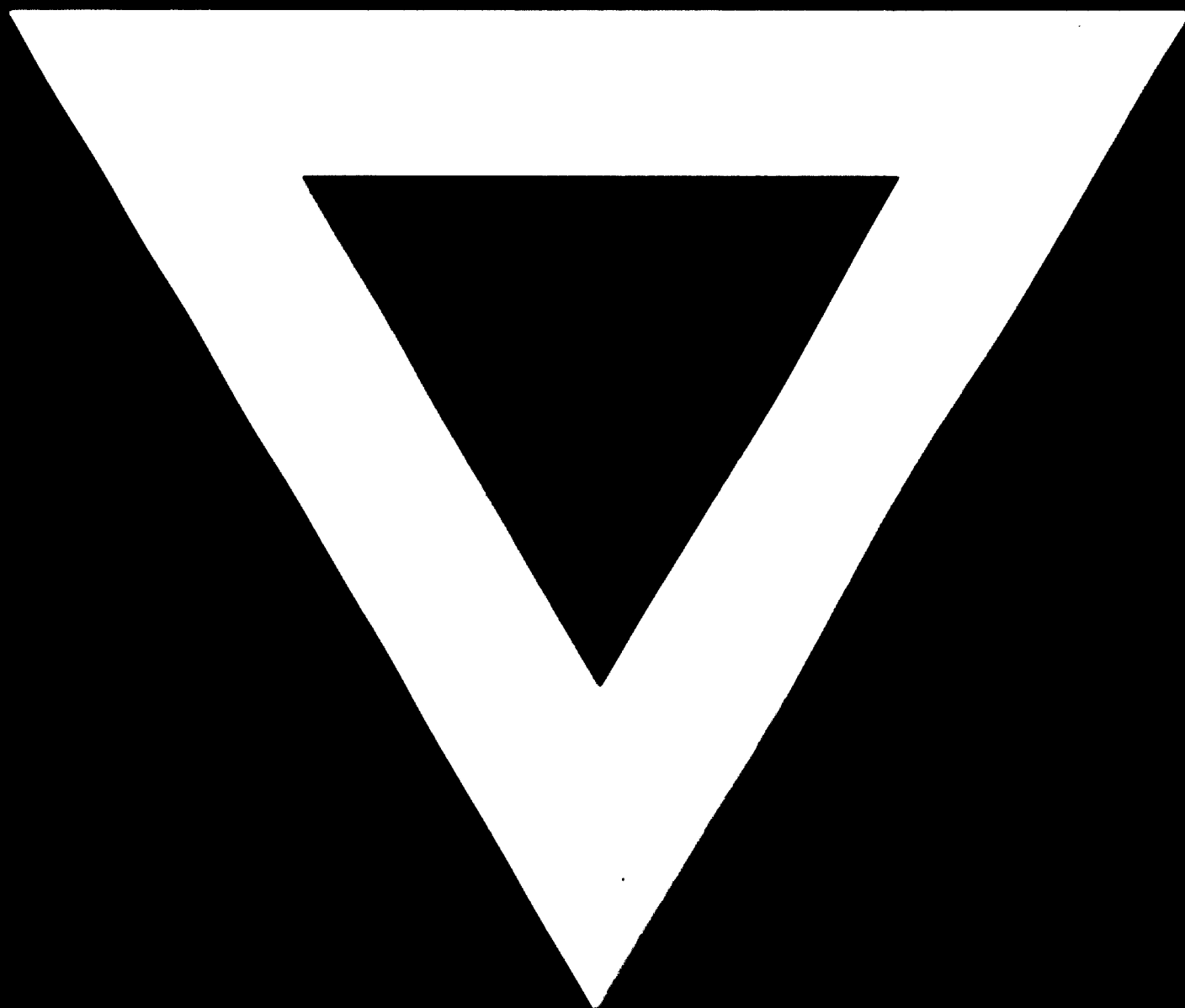Sources: 1) FAO Trade Yearbook   1970   p 229
2) FAO " " 1974   p 221

TABLE 17 Imports of Sugar - Selected European Countries

(00 metric tons)

	64	65	66	67	68	69	70	71	72	73	74
1. France	4622	4754	5097	4887	3958	7304	3675	3779	3555	4102	4028
2. Fed. R. of German.	644	2433	3153	3197	2849	1812	1945	1776	1252	1700	1001
3. Italy	4974	3602	1455	655	524	2504	2869	5261	5785	5611	7660
4. U.K.	23059	21707	22154	21909	20407	21496	21000	21278	21630	20501	22694

Sources: 1) FAO Trade Yearbook 1970 p. 229
 2) FAO " " 1974 p. 221

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