

DEVELOPMENT OF FISHERIES IN AREAS  
OF THE RED SEA AND GULF OF ADEN

FISH PRODUCTION IN SUDAN  
A STUDY ON THE METHODOLOGY AND THE DATA  
COLLECTED DURING 1979 AND 1980



**UNITED NATIONS DEVELOPMENT PROGRAMME**  
**FOOD AND AGRICULTURE ORGANIZATION**  
**OF THE UNITED NATIONS**

FISH PRODUCTION IN SUDAN  
A STUDY ON THE METHODOLOGY AND THE DATA  
COLLECTED DURING 1979 AND 1980

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PROJECT FOR DEVELOPMENT OF FISHERIES IN AREAS  
OF THE RED SEA AND GULF OF ADEN

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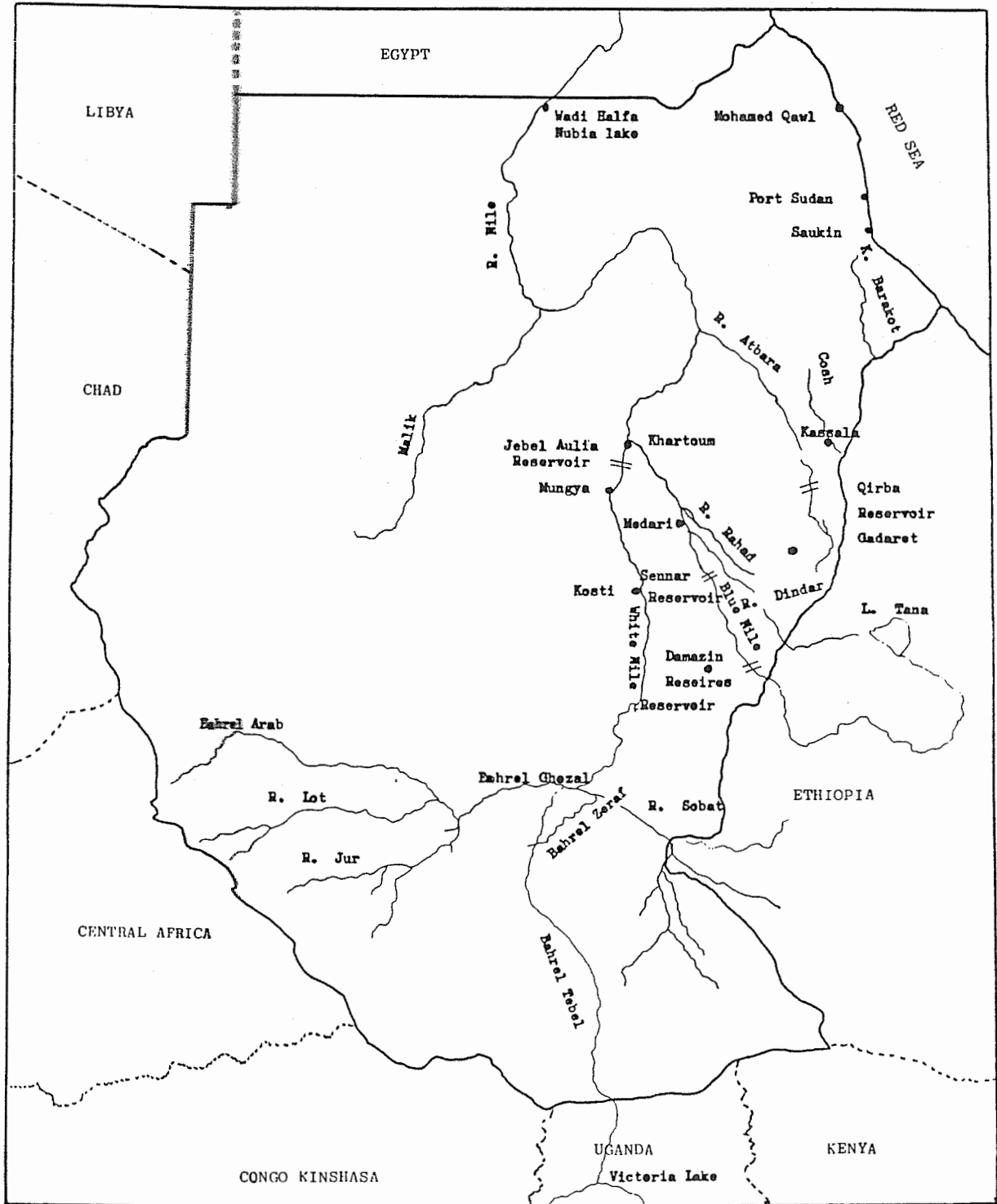
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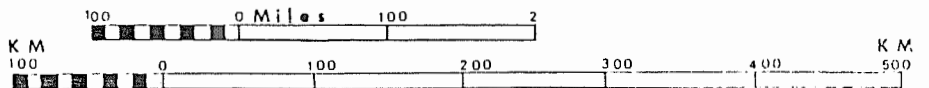
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Sketch map of Sudan showing the water resources and the field stations.



Key  
● Field station  
= Dams

SCALE 1:8,000,000



Abstract

The paper presents the existing Statistical Systems for the collection and estimation of fishery data covering both the fresh waters and marine waters in Sudan. The patterns of production in the Nile and El Nuba Lake, the Blue Nile, and White Nile in the northern region, and in the marine waters have been examined with respect to their distribution over months and species composition of the catches for the years 1980 and 1979. The associated fishing efforts in terms of 'boat - days' and 'fisherman - days', have been estimated in some cases. The mode of disposition of catches has also been studied.

The total fish productions in Sudan during 1980 and 1979 were estimated at 26,283 tonnes and 28,6282 tonnes respectively. Out of the total the productions from the fresh waters constitute 96 - 97%, the rest being accounted for by the productions from the marine sector.



1. Introduction:

Sudan has got vast water resources. The Nile and its tributaries constitute the fresh water sector while the Red Sea is the marine sector. Fishing takes place in all the sectors through out the year mostly by traditional methods. A majority of the catches pass through a few markets either in fresh or processed form. Unfortunately there is no organised statistical system for collection of fishery data which are so vital for the planned development of the fishery Sector in Sudan. However, arrangements exist for the collection of some basic fishery data at important market places, field stations in the country. Based on these data and the periodic reports prepared by the statistical section of the Department of Fisheries Administration, an attempt has been made to present the system of collection of data; study the production pattern and the associated fishing efforts in some water areas during 1980 and 1979.

The local vernacular names of fishes have been used. The corresponding scientific names and the English equivalents are given in table 26. The report brings out the gaps and the deficiencies in the present system of collection of data and their interpretations. This will greatly help in establishment of an improved fishery statistical system in Sudan.

2. Water resources and data collection systems.

2.1 Fresh Waters

2.1.1 The Nile and El Nuba Lake

This is a part of the Nile north of the confluence at Khartoum where the Blue Nile and the White Nile join extending to the Egypt/ Sudan border. It includes El Nuba Lake inside Sudan. Data on daily market arrivals are collected by Statistical enumerators in the following two markets. Additional information on fishing effort etc. is taken from the monthly reports of the statistics section.

( i ) Wadi Halfa.

Fishes are brought to this market by fishermen belonging to the Public Sector operating in this area, private fishermen also bring their catches for sale to this market. Data are collected and presented separately for the public sector and the private sector.

(ii) Atbara

Daily market data are recorded in this market.

2.1.2 The Blue Nile

This is a part of the Blue Nile in Sudan extending from the Ethiopia/ Sudan border to the confluence of the Blue Nile and the White Nile at Khartoum. It includes the lake of Sennar and El Roseires Reservoir. Daily data are collected at the following stations.

- ( i ) Damazin
- (ii ) Singa
- (iii) El Souki
- (iv ) Sennar
- (v ) Medani

### 2.1.3 The White Nile

This is the part of the White Nile from the point situated between the two mountains in the South extending up to the junction of the White Nile and Blue Nile at Khartoum. It includes Jabal Al Awliya lake as well.

Daily data are collected at the following stations.

- (i ) Kosti
- (ii ) Ed Dueim
- (iii) Khartoum

At Khartoum data are collected at two markets: North El Khazan and South El Khazan.

### 2.1.4 Atbara river.

The production from this river and the associated lakes are marketed at Khasla, El Gedaref, Khasham aḷ Qirbah and New Halfa. Daily data on market arrivals are collected at El Gedaref city market only.

### 2.1.5 The Southern region

This includes all the water resources in the Southern region. There is no established field stations for the collection of data.

## 2.2 Marine waters

Sudan has got about 720 Km. of coast line along the Red Sea. Port Sudan is the most important fish market for the marine fish in the country. The daily ( excepting Fridays and holidays) quantity of fish passing through the market is recorded by a field enumerator.

3. Method of estimation

3.1 Fresh Waters

3.1.1 The Nile and El Nuba Lake

Data relating to Wadi Halfa private and public Sectors had been collected for both 1980 and 1979. But the market data for Atbara and Wadi Halfa have not been recorded. In the absence of these data for the years under review, the available recorded production statistics relating to the previous split year, (July to June 1978 - 79) have been used. Apart from the production passing through Wadi Halfa and Atbara, the amount of production from the Nile and El Nuba Lake which was consumed elsewhere is estimated as follows. It is assumed that there are 300 days of fishing in a year and there is a production of 2.5 tonnes per day, the annual production coming to 750 tonnes. The total had been distributed over months according to the percentage distribution of the available data for Wadi Halfa and Atbara over months in a year. From the records the amount of wet-salted fish had been estimated as 50 tonnes live weight (conversion factor 1) in both the years. This has been distributed over months in the monthly percentage distribution of production of " Kas " and "Qawara" which are the main species in the wet-salted fish.

The monthly species break down has been obtained based on the percentage catch composition in the different months at the observed stations in 1980. ( in 1979 data were collected only for Wadi Halfa public sector, hence this catch composition was not used).

The fishing efforts in terms of boat-days and fisherman - day are estimated as follows. The no. of boats and fishermen working at the observed station during the month is obtained from the records. By multiplying the no. of boats and fishermen by the no. of days in the month, boat-days and fisherman-days during the month are obtained. Monthly production and the corresponding effort in terms of boat-days and fisherman-days are prepared for each station where data have been collected.

Based on the combined production and effort statistics at the different observed stations, productions per unit effort have been calculated for the different months. The total monthly production for the whole sector of the Nile and El Nuba Lake is divided by the corresponding catch per unit effort based on all the observed stations to give the estimated total fishing effort for the month. Effort statistics have been calculated for the Nile and El Nuba Lake for 1980 only.

Due to insufficient data the fishing efforts for 1979 have not been attempted.

### 3.1.2 The Blue Nile

During 1980 and 1979 data have been collected at Damazin and Medani markets. But the statistics at the other Stations Singa, El Souki and Sennar have not been collected. In the absence of these data for 1980 and 1979, the available recorded production data for the previous split year July to June (1978-79) have been used.

Apart from the production passing through the five markets, the production consumed elsewhere is estimated as follows:

It is assumed that there are 300 fishing days in a year and every day there is a production of one ton. The annual production not passing through the five markets is therefore 300 tonnes. From the records the amount of wet salted fish had been estimated as 100 tonnes live weight (conversion factor 1), while the amount of sundry fish came to 2 100 tonnes live weight (conversion factor 3). The total amount of sundry fish was distributed over months in the monthly percentage distribution of production of "Bulti" which is the main species in the sun dried fish. The other break-downs over months have been done in the same way as described under item 3.1.1

The monthly species break down has been obtained based on the percentage catch composition in the different months at the observed stations during 1980 and 1979.

Fishing efforts in terms of boat - days and fisherman - days have been done in the same way as given under item 3.1.1

### 3.1.3 The White Nile

Data have been collected at all the stations - Kosti, Ed Dueim and Khartoum during 1980 and 1979. In Khartoum there are two markets - North El Khazan and South El Khazan, both have been covered. Apart from the production passing through these four markets the annual production consumed elsewhere is estimated as follows. It is assumed that there are 300 fishing days in a year; daily production at Jabal al Awliya area is 1 tonne while in the Renk area it is 1.5 tonnes. The total annual production which is consumed elsewhere is therefore 750 tonnes. From the records the amounts of wet salted and sundry fish are estimated as 559 tonnes and 1650 tonnes respectively.

The distribution of production over months and species break down have been arrived at as described earlier. The fishing efforts also have been estimated in the same way as furnished above.

### 3.1.4 Atbara river

Monthly data were collected at El Gedaref in 1979. These data are repeated in 1980 as well. No attempt has been made to estimate the production passing through other markets and areas. Data on catch composition and effort have not been collected.

### 3.1.5 Southern region

This is the most productive region. Unfortunately no system exists for collection of the statistical data relating to production and other associated information. Anderson( undated ) put the production figure as only 3.000 tonnes. But taking into account the vast water areas and the rough estimate of the amount of processed fishes which are exported to Uganda and Congo and also the amount which comes

to the Khartoum markets the annual production from the southern region may perhaps be taken as 12,000 tonnes.

Any information on species break down and effort statistics could not be procured.

### 3.2 Marine Waters:

At the Port Sudan market the daily ( excepting Fridays and holidays) quantity of fish by varieties passing through the market is recorded by a field enumerator. It is believed that one half of the fish consumed in the Port Sudan area passes through the market; in the other areas of the Red Sea coast it is assumed that there are fishing for 300 days in a year and the daily production comes to one tonne. To arrive at the estimate of the annual marine fish production in Sudan the quantity of fish recorded at the Port Sudan market is multiplied by a factor of 2; and the resultant product is added to 300 tonnes. Other details of marine fishery statistics in Sudan have been given by Chakraborty (1983). The species break down and the distribution of production over months are based on the proportions as obtained from the recorded productions at the Port Sudan market.

## 4. Results and discussions

### 4.1 Fresh Waters

It is seen from Tables 1 and 14 that the total production from the Nile and Nuba Lake, the Blue Nile, the White Nile and Atbara river during 1980 and 1979 came to 13,287 tonnes and 15,890 tonnes respectively, thus showing a decrease of about 20% during 1980 as compared to the previous year. The contribution of different water areas in absolute magnitude in tonnes and percentages during 1980 and 1979 are given below:

Water areas	1980		1979	
	Production ( tonnes )	% to total	production ( tonnes )	% to total
Nile and Nuba lake	1,823	7.2	1,589	5.7
Blue Nile	3,839	15.2	3,811	13.7
White Nile	7,441	29.4	10,306	36.9
Atbara river	184	0.7	184	0.7
Sub Total	13,287	52.5	15,890	57.0
Southern region	12,000	47.5	12,000	43.0
T O T A L	25,287	100.0	27,890	100.0

It is seen that the production of the Nile and El Nuba Lake, the Blue Nile, the White Nile and the Atbara river constituted 53% and 57% of the total production from the fresh waters during 1980 and 1979 respectively. The production of the Nile and El Nuba Lake and the Blue Nile showed some increase but this was offset by the significant decrease in the production of the White Nile in 1980 as compared to 1979, thus registering an over all decrease in the production during 1980.

It is seen from Tables 1 and 14 that during 1980, 67% of the total production was consumed fresh, 5% as wet salted and 28% as sundry; the corresponding percentages during 1979 were 73,4 and 23 respectively.

The mode of disposal of the production in the different water areas is presented below:



( Figures in tonnes )

Water areas	1980				1979			
	Fresh	Wet salted	Sun dry	Total	Fresh	Wet salted	Sun dry	Total
Nile & Nuba Lake	1,773	50	--	1,823	1,539	50	--	1,589
Blue Nile	1,639	100	2,100	3,839	1,611	100	2,100	3,811
White Nile	5,232	559	1,650	7,441	8,196	460	1,650	10,306
Atbara	184	--	---	184		184	---	184
Southern region	NOT KNOWN							
T O T A L	8,828	709	3,750	13,287	11,530	610	3,750	15,890

It is seen that in the Blue Nile the majority of the fish is sundred while this method of preservation is not used in the Nile and El Nuba Lake. More than 70% of the production from the White Nile is consumed fresh.

The Tables 2 and 15 furnishes the consolidated species break ups over months of 1980 and 1979 of the production from the Nile and El Nuba Lake, the Blue Nile and the White Nile. It is seen that " Bulti " is the most predominant species which accounts for about 46% of the total production. This is followed by the productions of " Debs," Gargour " and " Egl " whose percentage contribution ranges from 7% to 15% in course of the two years under review.

#### Bulti

The total production of " Bulti " in 1980 showed a decrease of 16% as compared to the previous year. The monthly production in 1980 ranged from 1055 tonnes ( in November ) to 145 tonnes ( in January ) while during 1979 it varied from 1037 tonnes ( in April ) to 240 tonnes ( in November ). The average monthly productions were 502.19 tonnes with standard error of 63.42 tonnes and 599.49 tonnes with standard error of 60.34 tonnes during 1980 and 1979 respectively.

The Fig 1. shows the cumulative percentage distribution of the production over months during 1980 and 1979. It is seen that during January to July 1980 about 51% of the total annual production of " Bulti" was registered, while during the same period of 1979, 71 % of the annual production took place.

#### Debs

During 1980 the monthly production of " Debs" varied from 402 tonnes ( in November ) to 26 tonnes ( in July) and in 1979 it ranged from 324 tonnes ( in May ) to 37 tonnes ( in July ). The average monthly production during 1980 was 162.37 tonnes with standard error of 33.31 tonnes ; in 1979 it was calculated as 168.96 tonnes with standard error of 29.40 tonnes.

The Fig 1 shows the cumulative percentage distribution of production over months during 1980 and 1979. It is seen that during January to July 1980 only 45% of the annual production took place, while in the same period in 1979, as high as 79% of the total production was recorded. The last quarter of 1980 showed improved production.

#### Gargour

The total production of Gargour in 1980 decreased by 35% as compared to 1979.

In 1980 the maximum and the minimum monthly productions were recorded as 169 tonnes ( in December ) and 13 tonnes ( in May) the corresponding figures in 1979 were 291 tonnes ( in February) and 55 tonnes ( in April). The average monthly productions during 1980 and 1979 were 79.59 tonnes with standard error of 14.97 tonnes and 122.25 tonnes with standard error of 18.52 tonnes respectively.

The Fig 2 presents the cumulative percentage distribution of production overmonths during 1980 and 1979. It is interesting to note that during the period January to April, about 40% of the annual production took place. In 1980 the production was poor from May to September; while the last quarter showed improvement.

Egl

The production of " Egl" during 1980 registered a decrease by 22% as compared to 1979. In 1980 the monthly production varied from 161 tonnes ( in January ) to 29 tonnes ( in August ); in 1979 the range was recorded as 154 tonnes to 81 tonnes, the maximum and the minimum being recorded in October and September respectively. The average monthly production worked out to be 80.02 tonnes with standard error of 11.82 tonnes and 103.24 tonnes with standard error of 6.90 tonnes.

#### 4.1.1 The Nile and El Nuba Lake

It is seen from Tables 3 and 16 that during 1980 the highest production (190 tonnes , 10.4% of the annual production ) was recorded in February.

This was followed by the production ( 182 tonnes) in September. In 1979 the highest production ( 207 tonnes) was noticed in September, the second highest ( 186 tonnes) was registered in October. The lowest productions recorded were 110 tonnes ( in October ) and 84 tonnes ( in July), during 1980 and 1979 respectively.

During both 1980 and 1979; 97% of the total production was consumed fresh while only 3% was wet salted.

It is seen from Tables 4 and 17 that " Bulti" is the most predominant species in the Nile and El Nuba Lake. It accounts for 63% of the total production. This is followed by the production of " Egl " ( 14% of the total "Binnij " ( 8% of the total), " Debs" ( 5-6% of the total) and " Kiddan" ( 6% of the total). Thus the production of these five varieties of fish constitutes 97% of the total production.

##### Bulti

In 1980 the production of " Bulti" increased by 14% as compared to 1979.

During 1980 the monthly production of " Bulti" ranged from 141 tonnes ( in August ) to 13 tonnes ( in January ), in 1979 it varied from 155 tonnes ( in September) to 11 tonnes in January ). The average monthly production of " Bulti" worked out to be 94.99 tonnes with standard error of 10.15 tonnes and 83.18 tonnes with standard error of 11.06 tonnes in 1980 and 1979 respectively.

The Fig 3 shows the cumulative percentage distribution of production over months during 1980 and 1979. It is seen from the graphs that during the first six months of 1980, 44% of the total production took place, while in the same period of 1979, 38% of the annual production of " Bulti" was registered.

#### Egl

As compared to 1979 the total production of " Egl" decreased by 13% in 1980.

During 1980 the monthly production of Egl varied from 46 tonnes ( in January ) to 6 tonnes ( in May); in 1979 it ranged from 37 tonnes ( in January ) to 4 tonnes ( in May). The average monthly productions worked out as 20.96 tonnes with standard error of 3.45 tonnes and 18.49 tonnes with standard error of 3.10 tonnes in 1980 and 1979 respectively.

The Fig 4 shows the cumulative percentage distribution of production of " Egl " over months during 1980 and 1979. It is noticed that up to August only around 50 - 57% of the total annual landings take place; November to December was the most productive period and it extended till January.

#### Binnij

The total production of " Binnij" in 1980 increased by 20% as compared to the previous year. The maximum production was recorded in January while the minimum in August. The average monthly production worked out to be 11.96 tonnes with standard error of 3.47 tonnes and 9.98 tonnes with standard error of 2.80 tonnes in 1980 and 1979 respectively.

Fig 4 shows the cumulative percentage distribution of production of " Binnij" over months during 1980 and 1979. It is seen from the graphs that during the first two months ( January - February ) of the year more than 50% of the production was registered.

## Debs

A minor increase in total production of "Debs" was observed in 1980 as compared to 1979. The average monthly productions worked out to be 7.76 tonnes with standard error of 1.32 and 7.24 tonnes with standard error of 1.28 in 1980 and 1979 respectively.

Fig 5 presents the cumulative percentage distribution of production of "Debs" over months during 1980 and 1979. It is noticed that up to August less than 50% of the total production was recorded; increased landings were registered during September to December and the trend extended till January.

## Kaddan

The production of "Kaddan" also showed a minor decrease in 1980 as compared to the previous year. The highest production was recorded in January. The average monthly productions in 1980 and 1979 were 8.97 tonnes with standard error of 2.21 tonnes and 7.63 tonnes with standard error of 1.79 tonnes.

Fig 5 furnishes the cumulative percentage distribution of production of "Kaddan" over months during 1980 and 1979. It is seen that in 1980 as high as 48% of the total production took place in the first quarter, while during the same period of 1979, 45 % of the total production was registered. The months of November and December were also productive when about 26% of the total production was witnessed.

## Production per unit fishing effort.

It is seen from Table 5 that data on fishing effort were available during January to July 80. During this period the highest production per unit boat-day ( 129.16Kg) was recorded in June. The production per unit boat - day, fisherman - day in 1980 worked out to be 89.69 Kg. and 16.69 Kg. respectively.

#### 4.1.2 The Blue Nile

During 1980 the highest production ( 561 tonnes) was recorded in April ( 14.6% of the annual production) while in 1979 the peak(at 550 tonnes) was attained in February ( 14.4% of the annual production) ( Table 6 and 18). In both the years the lowest production ( 86 tonnes in 1980, 128 tonnes in 1979) was registered in November. During the first six months of 1980, 62.4% of the annual production was recorded and in the corresponding period of 1979, 67.2% of the production took place.

During 1980, 55% of the total production was consumed Sundry, 43% as fresh and only 2% of the production was consumed as wet salted.

It is seen from Tables 7 and 19 that " Bulti" and " Debs" are the predominant species accounting for around 70% of the total annual production. This is followed by the production of " Gargour" ( 8 % of the total). Thus the three species " Bulti", " Debs" and "Gargour " form the bulk of the production in the Blue Nile.

##### Bulti

It is seen from Tables 7 and 19 that November and December are the lean months for Bulti. The production in other months during 1980 ranged from 85 tonnes to 326 tonnes, the highest being recorded in July ( the second highest 215 tonnes in August), while in the corresponding period of 1979 it varied from 91 tonnes to 269 tonnes, the highest was registered in February ( the second highest 241 tonnes in January ). During 1980 and 1979 the average monthly productions of " Bulti" were 155.09 tonnes with standard error of 27.49 tonnes and 139.28 tonnes with standard error of 19.55 tonnes respectively.

The Fig 6. shows the cumulative percentage distribution of production over months during 1980 and 1979. It is seen that 90% of the production of " Bulti" is registered by September in both the years, more than 70% being attained by July.

#### Debs

During 1980 a low production ( 1-3 tonnes ) of " Debs" was recorded in May, July and October and in the other months production ranged from 162 tonnes ( in April) to 18 tonnes ( in September). In 1979 the low production ( 1-2 tonnes) was observed in July and August while in other months it varied from 191 tonnes ( in April) to 14 tonnes ( in September). The average monthly productions were calculated as 67.26 tonnes with standard error of 16.73 tonnes and 88.99 tonnes with standard error of 19.10 tonnes in 1980 and 1979 respectively.

The Fig 6 shows the cumulative percentage distribution of production of " Debs" over months during 1980 and 1979. It shows that 80% of the annual production took place by June in both the years.

#### Gargour

During 1980 the production of " Gargour" ranged from 61 tonnes ( in April ) to 2 tonnes ( in July), while in 1979 it varied from 87 tonnes ( in February) to 1 tonne ( in August). The average monthly productions were recorded as 24.10 tonnes with standard error of 5.69 and 28.31 tonnes with standard error of 7.19 tonnes in 1980 and 1979 respectively.

#### Production per unit fishing effort.

It is seen from Tables 8 and 20 that during 1980 the highest productions per unit boat - day ( 12.28 Kg.) and per unit fisherman - day ( 8.76 Kg.) were recorded in April, while in 1979 the highest productions per unit boat - day ( 8.59 Kg) and fisherman - day ( 6.13 kg) were registered in February. The productions per boat - day in 1980 and 1979 worked out as 3.7 Kg. and 4.4 Kg respectively. The corresponding figures for production per fisherman-day were 2.9 Kg. and 3.3 Kg., thus a decrease in production per unit was witnessed in 1980.



The Fig 7 presents the Lorenz curves based on the cumulative percentage of production and fishing effort in terms of boat - days during the different months of 1980 and 1979. The Lorenz curve brings out the relative deviation from the curve of equal distribution which is given by the diagonal joining zero and hundred. The curves show that in both the years 50% of the fishing effort produced about 75% of the total production ( instead of 50% for the case of equal production ). During 1980, 10% of the fishing effort brought 16% of the production while in 1979 the same percentage of the annual fishing effort produced 13% of the annual production.

The average monthly production of " Bulti" worked out to be 252.11 tonnes with standard error of 75.61 tonnes and 376.97 tonnes with standard error of 52.63 tonnes in 1980 and 1979 respectively.

The Fig 8 shows the cumulative percentage distribution of production over months during 1980 and 1979. It is seen from the graph that in 1980 only 53% of the total annual production of " Bulti" took place during the period of January to October, while in the same period of 1979 as high as 93% of the annual production was registered, 76% being attained by July 1979.

#### Debs

During 1980 the monthly production of "Debs" varied from 361 tonnes ( in November ) to 3 tonnes ( in August), while in 1979 it ranged from 21 tonnes to 133 tonnes, the maximum and minimum being registered in May and September. The average monthly productions were recorded as 87.35 tonnes with standard error of 33.55 tonnes and 72.73 tonnes with standard error of 11.88 tonnes in 1980 and 1979 respectively.

The Fig 9 shows the cumulative percentage distribution of production of " Debs" over months during 1980 and 1979. It is noticed that in 1980 only 39% of the total production of "Debs" was registered during January to October, while in the corresponding period of 1979, 93% of the annual production took place, 77% being recorded during the first six months.

#### Gargour

In 1980 the maximum and the minimum monthly productions were 155 tonnes ( December ) and 3 tonnes ( May, June); the corresponding figures during 1979 were 202 tonnes ( February) and 19 tonnes ( March). The average monthly production of " Gargour" worked out to be 52.43 tonnes with standard error of 15.72 tonnes in 1980; and in 1979

#### 4.1.3 The White Nile

During 1980 the highest production ( 2,159 tonnes, 29% of the annual production) was recorded in November, while in 1979 the peak ( 1,389 tonnes, 13.5% of the annual production) was in April, ( Tables 9 and 21 ). It is interesting to note that during October to December<sup>80</sup>, 4,367 tonnes ( 58.7% of the total) of fish were produced while during the corresponding period of 1979, only 1540 tonnes ( 14.9% of the total) were registered. On the other hand in 1979 good productions, 4834 tonnes ( 46.9% of the total) were noticed during February to May. It may be mentioned that during May to September, 1980 fish was forbidden to be brought to Khartoum market by a Governorate decree and therefore , the percentage productions were low and ranged from 1.5 to 3.2. In the following months, however, improved productions were recorded.

During 1980, 70% of the total production was consumed fresh, 22% of the production as sundry and 8% as wet salted; the corresponding figures during 1979 were 80%, 16% and 4% respectively.

It is seen from Tables 10 and 22 that " Bulti" is the most predominant species in the White Nile accounting for 41% and 44% of the total production during 1980 and 1979 respectively. It is followed by species, " Debs" "Gargour" and " Egl"; their percentage contribution to the total production range from 8% to 11%. These four species account for about 71% of the annual production from the White Nile.

##### Bulti

In 1980 the monthly production of " Bulti" ranged from 30 to 965 tonnes, the maximum and the minimum being reached in November and January respectively, in 1979 it varied from 135 to 800 tonnes, the maximum and the minimum were in April and September.

it came to 91.37 tonnes with standard error of 16.16 tonnes.

The Fig 9 presents the cumulative percentage distribution of production over months during 1980 and 1979. It is seen that only 35% of the total production was registered during January to September 1980, while in the same period of 1979, 83% of the annual production took place.

#### Egl

During 1980 the monthly production of " Egl" varied from 5 tonnes (in September) to 111 tonnes (in January ); in 1979 the range was recorded as 37 to 108 tonnes, the minimum and the maximum being in January and October. The average monthly production worked out to be 46.63 tonnes with standard error of 9.68 tonnes and 75.60 tonnes with standard error of 5.98 tonnes in 1980 and 1979 respectively.

The Fig 10 shows the cumulative percentage distribution of the production over months during 1980 and 1979. It is noticed that during the first four months ( Jan - April) of 1980 , 58% of the annual production was registered while in the same period of 1979 only 28% of the total production was recorded. The last three months of both the years ( specially of 1979) were quite productive.

#### Production per unit fishing effort

It is seen from Tables 11 and 23 that during 1980 the highest production per unit boat- day ( 36.67 Kg) and fisherman - day(10.44 Kg) were recorded in November while in 1979 the highest production per unit boat - day ( 30.75 Kg.) and fisherman - day ( 8.77 Kg) were registered in April.

The productions per boat - day in 1980 and 1979 were calculated as 17.17 Kg. and 18.96 Kg. respectively, the corresponding figures for production per fisherman - day were 4.88 Kg. and 5.40 Kg. Thus there was no significant difference in respect of production per unit effort in 1980 and 1979.

The Fig 10 furnishes the Lorenz curves based on the cumulative percentage of production and fishing effort in terms of boat - days during the different months of 1980 and 1979. The curves show that in 1980, 50% of the fishing effort produced only 32% of the total production, while in 1979 the same percentage of the fishing effort registered 65% of the annual production.

It is interesting to note that in 1980 any specific percentage of fishing effort accounted for a lower percentage in respect of the total production showing a concave Lorenz curve; on the other hand in 1979 any specific percentage of fishing effort recorded a higher percentage of the total production producing a convex curve.

#### Marine Waters.

It is seen from Tables 13 and 25 that the total marine fish production in 1980 showed an increase of 26% over the previous year. During 1980 the monthly production ranged from 111 tonnes ( in June ) to 61 tonnes ( in July ), while in 1979 the maximum ( 97 tonnes ) and the minimum ( 25 tonnes ) were registered in March and January respectively. The average monthly production during 1980 and 1979 were 83.25 tonnes with standard error of 4.22 tonnes and 66.03 tonnes with standard error of 5.92 tonnes.

It is noticed from the tables stated above that about 33% of the total production is accounted for by the production of " Kushar", " Bohar" and " Shaor". This is followed by shark, " Nagil", and " Arabi" and jack, whose percentage contribution of the total varies from 6% to 4% in 1980, the corresponding range in 1979 being 9% to 3%.

#### Kushar

The production of " Kushar" increased by 42% during 1980 as compared to that in 1979. During 1980 the monthly production varied from 26 tonnes ( in June ) to 5 tonnes ( in October ) the average being 9.96 tonnes with standard error of 1.62 tonnes.

In 1979 the monthly production ranged from 9 tonnes ( in April ) to 3 tonnes ( in January ), the average worked out to be 7 tonnes with standard error of 0.54 tonnes.

The fig 11 presents the cumulative percentage distribution of production of " Kushar" over months during 1980 and 1979. It is seen that during the first six months of 1980, 70% of the annual production took place while in the same period in 1979 only 50% of the annual production was recorded. In 1979, however, the monthly productions were more consistent than in 1980.

### Bohar

The total production of "Bohar" recorded a decrease by 22% in 1980 as compared to that in 1979. During 1980 the maximum monthly production ( 14 tonnes) was registered in September, the minimum ( 2 tonnes) in January. In 1979 the monthly production ranged from 26 tonnes ( in March) to 1 tonne ( in January). The average monthly productions during 1980 and 1979 were 7.14 tonnes with standard error of 1.07 tonnes and 9.12 tonnes with standard error of 1.82 tonnes.

The fig 11 shows the cumulative percentage distribution of the monthly production during 1980 and 1979. The graphs show that due to high production recorded in March 79 during the first three months of 1979, 30% of the annual production was registered while in the same period in 1980, only 19% of the annual production took place. The distribution over other months did not show wide variations in course of the two years under study.

### Shaor

During 1980 the total production of Shaor increased by 59% as compared to that in 1979. In 1980 the monthly production ranged from 13 tonnes ( in February, March) to 6 tonnes ( in September), the average being 9.88 tonnes with standard error of 0.69 tonnes. In 1979 the monthly production varied from 12 tonnes ( in November ) to 3 tonnes ( in January) and the average worked out as 6.21 tonnes with standard error of 0.75 tonnes.

5. Conclusions

The total fish production in Sudan during 1980 and 1979 were registered as 26,283 tonnes and 28,682 tonnes respectively thus showing a decrease in production in 1980 by 8% as compared to 1979. It may be noticed that the production from the marine water - sector recorded an increase of 26% in 1980 as compared to the previous year. But this was offset by the reduced production in 1980 in the fresh water sector.

In Sudan the fresh water fish productions constitute 96 - 97% of the total fish production in the country, the rest being accounted for by the production from the marine sector.

It may be emphasised that the fishery data incorporated in this report are mostly based on observations and recordings at a few selected places and many subjective judgements have been made to build the estimates. It is, therefore, an urgent need of the country to build up a statistical system based on objective methods to cover the entire fisheries sector: Fresh waters - Nile and its tributaries including the southern region and the marine waters - the Red Sea.

6. References

- |                           |  |
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Table 1. Production from the Northern Region by River Systems in 1980

( in tonnes)

Months	Nile & Nuba Lake			Blue Nile				White Nile				Total				Atbara	Grand Total				
	Fresh	Wet Salted	Sub Total	Fresh	Wet Salted	Sundry	Sub Total	Fresh	Wet Salted	Sundry	Sub Total	Fresh	Wet Salted	Sundry	Sub Total	Fresh	Fresh	Wet Salted	Sundry	Total	%
Jan.	157.5	4.4	161.9	104.3	4.7	172.2	281.2	381.9	32.4	13.2	427.5	643.7	41.5	185.4	870.6	33.8	677.5	41.0	185.4	904.4	6.8
Feb.	132.9	3.7	136.6	124.2	4.9	281.4	410.5	392.9	46.4	115.5	554.8	650.0	55.0	396.9	1101.9	27.7	677.7	55.0	396.9	1129.6	8.5
Mar.	184.9	5.2	190.1	162.3	22.7	285.6	470.6	435.2	18.5	174.9	628.6	782.4	46.4	450.5	1289.3	24.1	806.5	46.4	460.5	1313.4	9.9
Apr.	136.1	3.8	139.9	237.0	44.2	279.3	561.1	404.6	20.1	141.9	566.6	778.3	68.1	421.2	1267.5	21.9	800.2	68.1	421.2	1289.5	9.7
May	135.0	3.8	138.8	186.3	1.4	197.4	385.1	212.5	8.4	16.5	237.4	533.8	13.6	213.9	761.3	13.1	546.9	13.6	213.9	774.4	5.8
June	128.9	3.7	132.6	114.2	9.2	165.9	289.3	171.2	14.5	18.1	203.8	414.3	27.4	184.0	625.7	9.2	423.5	27.4	184.0	634.9	4.8
July	147.7	4.2	151.9	158.3	0.5	222.6	381.4	163.3	9.5	9.9	182.7	469.3	14.2	232.5	716.0	0	469.3	14.2	232.5	716.0	5.4
Aug.	159.4	4.5	163.9	119.6	3.1	245.7	368.4	133.7	5.6	21.4	160.7	412.7	13.2	267.1	693.0	0	412.7	13.2	267.1	693.0	5.2
Sept.	177.4	5.0	182.4	107.1	2.0	138.6	247.7	85.1	5.0	21.4	111.5	369.6	12.0	160.0	541.6	0	369.6	12.0	160.0	541.6	4.1
Oct.	106.6	3.0	109.6	146.3	0.1	48.3	194.7	675.7	52.0	259.1	986.8	328.6	55.1	307.4	1291.1	8.3	936.9	55.1	307.4	1299.4	9.8
Nov.	159.2	4.5	163.7	65.7	3.7	16.8	86.2	1386.8	248.8	523.1	2158.7	1611.7	257.0	539.9	2408.6	17.9	1629.6	257.0	539.9	2426.5	18.2
Dec.	147.4	4.2	151.6	113.4	3.5	46.2	163.1	789.0	97.8	335.0	1221.8	1049.6	105.5	381.2	1536.5	28.0	1077.8	105.5	381.2	1564.5	11.8
Total	1773.0	50.0	1823.0	1639.3	100.0	2100.0	3839.3	5231.9	559.0	1650.0	7440.9	8644.2	709.0	3750.0	13103.2	184.0	8828.2	709.0	3750.0	13287.2	100.0
%																	66.5	5.3	28.2	100	

Table 2 Production from the Northern region by months and fish varieties in 1980

(in tonnes)

Fish \ Months	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct	Nov	Dec	Total	%
Egl	161.2	120.6	95.9	112.8	43.9	38.0	51.3	29.2	30.9	87.5	118.8	70.0	960.2	7.3
Kabarose	48.0	31.3	35.2	28.2	17.2	21.1	9.5	5.1	4.7	46.7	45.6	39.9	332.5	2.5
Jack	32.7	27.2	30.1	25.1	18.6	18.2	11.9	15.0	5.3	57.5	36.5	31.0	309.1	2.4
Bulfi	144.9	474.9	660.1	594.8	474.8	223.8	490.0	443.4	348.1	562.6	1054.8	554.0	6026.3	46.0
Debs	153.4	161.3	185.6	187.1	26.9	126.8	25.5	48.7	65.7	206.6	401.8	359.0	1948.4	15.0
Kaddan	37.5	22.1	16.1	18.9	3.4	11.6	6.9	6.1	10.8	5.8	19.1	25.7	184.0	1.4
Binnij	56.0	37.4	18.6	21.0	21.7	23.8	14.0	9.3	13.5	34.9	65.9	13.1	329.2	2.5
Kashbanat	12.2	13.4	25.3	14.5	28.0	23.3	14.4	7.1	4.3	12.1	9.0	23.8	187.4	1.4
Karsha	13.8	12.5	14.5	15.8	24.9	21.4	16.7	6.2	3.3	4.9	82.1	15.9	232.0	1.8
Bitkoya	--	2.2	0.6	0.6	--	--	--	--	--	--	--	2.4	5.8	0.0
Gargour	112.6	94.1	79.5	96.9	12.7	33.0	8.7	63.8	16.1	115.2	153.4	169.1	955.1	7.3
Qarmut	14.4	12.1	17.9	20.1	21.9	16.8	15.4	12.5	9.3	22.6	13.4	20.9	197.3	1.5
Kas	20.4	16.8	17.9	35.5	13.8	16.4	10.5	8.2	7.0	25.3	148.2	33.3	353.3	2.7
Qawara	24.2	36.7	30.7	38.2	6.2	14.8	16.0	8.9	3.1	10.3	87.8	65.6	342.5	2.6
Silbai	12.7	13.4	20.5	20.7	1.1	7.5	0.4	4.7	2.0	6.9	48.8	10.4	149.1	1.1
Others	26.6	25.9	40.8	37.2	46.2	29.2	24.8	24.8	17.5	92.2	123.4	102.4	591.0	4.5
Total	870.0	1101.9	1289.3	1267.6	761.3	625.7	716.0	693.0	541.6	1291.1	2408.6	1536.5	13103.2	100

Table 3. Production from the Nile and El Nuba Lake during 1980  
( in tonnes)

Type of Processing	Fresh						Wet Salted	Total	%
	1/	1/							
Locations	Atbara	Wadi Halfa	Wadi Halfa ( private)	Wadi Halfa (Public)	Others	Sub Total			
January	31.9	9.2	8.4	41.2	66.8	157.5	4.4	161.9	8.9
February	14.1	3.4	18.7	40.4	56.3	132.9	3.7	136.6	7.5
March	20.5	3.4	49.6	33.4	78.0	184.9	5.2	190.1	10.4
April	24.2	5.1	32.0	17.0	57.8	136.1	3.8	139.9	7.7
May	25.9	5.1	35.1	11.9 *	57.0	135.0	3.8	138.8	7.6
June	22.7	5.1	39.8	6.7	54.6	128.9	3.7	132.6	7.3
July	22.2	4.5	50.9	7.8	62.3	147.7	4.2	151.9	8.3
August	19.9	8.8	57.6	5.6 *	67.5	159.4	4.5	163.9	9.0
September	12.3	8.8	77.9	3.4	75.0	177.4	5.0	182.4	10.0
October	22.3	8.8	28.1	2.4	45.0	106.6	3.0	109.6	6.0
November	35.6	3.0	43.4	9.7	67.5	159.2	4.5	163.7	9.0
December	23.9	2.0	51.6	7.7	62.2	147.4	4.2	151.6	8.3
Total	275.5	67.2	493.1	187.2	750.0	1,773.0	50.0	1,823.0	100.0
%						97.3	2.7	100.0	

1/ Based on records on previous year (1978 - 79 )

\* Estimated: Mean of adjacent months production.

Table 4: Production from the Nile and El Nuba Lake by months and fish variety during 1980

( in tonnes)

Fish \ Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	%
Egl	46.0	18.9	27.0	11.8	6.2	12.3	13.1	8.7	17.5	18.4	35.5	36.1	251.5	13.8
Kabarose	11.5	4.1	4.0	3.5	1.7	1.9	1.4	0.1	0.2	0.3	0.2	0.3	29.2	1.6
Jack	0.0	0.5	--	0.8	0.4	0.1	--	--	--	0.1	--	--	2.7	0.1
Bulti.	13.3	58.7	134.4	107.8	102.4	90.5	114.8	141.0	136.6	70.3	84.3	85.8	1139.9	62.5
Debs	9.7	4.4	0.4	1.1	12.1	5.4	7.0	5.1	10.6	12.0	16.7	8.6	93.1	5.1
Kaddan	29.6	14.5	7.0	3.2	2.6	5.3	4.2	2.8	7.5	2.8	14.4	13.7	107.6	5.9
Binnij	45.3	29.4	8.2	6.4	6.8	11.6	6.1	3.7	7.6	3.4	10.0	5.0	143.5	7.9
Kashmbanat	0.3	1.0	0.4	0.4	2.4	1.3	0.3	0.5	0.4	0.5	0.3	0.3	8.1	0.5
Karsha	--	--	--	--	--	--	2.1	--	--	--	--	--	2.1	0.1
Bitkoya	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gargour	4.9	3.3	4.0	4.5	4.2	4.2	1.7	2.0	2.0	1.8	2.3	1.8	36.7	2.0
Qarmut	0.5	1.8	4.7	0.4	--	--	1.2	--	--	--	--	--	8.6	0.5
Kas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Qawara	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silbai	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Others	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	161.9	136.0	190.1	139.9	138.8	132.6	151.9	163.9	182.0	109.6	163.7	151.6	1,823.0	100
%	8.9	7.5	10.4	7.7	7.6	7.3	8.3	9.0	10.0	6.0	9.0	8.3	100.	

Table 5 Estimation of fishing Effort in the Nile and El Nuba Lake during 1980

Location	Wadi Halfa (Private)			Wadi Halfa (Public)			Combined					Total Production (tonnes)	Estimated effort	
	Production (tonnes)	Boat-days	Fisher-man-days	Production (tonnes)	Boat-days	Fisher-man-days	Production =P (tonnes)	Boat-days =B	Fisher-man-days=F	P/B (Kg)	P/F Kg		Boat-days	Fisher-man-days
January				41.2	558	4216	41.2	585	4216	73.83	9.77	161.9	2,192	16,571
February				40.4	667	3944	40.4	667	3944	60.57	10.24	136.6	2,255	13,340
March	49.6	186	620	33.4	527	2666	83.0	723	3286	114.80	25.20	190.1	1,656	7,526
April	32.0	180	780	17.0	510	2700	49.0	690	3480	71.01	14.08	139.9	1,970	9,936
May	35.1	279	1085	--	--	--	35.1	279	1085	125.81	32.35	138.8	1,103	4,291
June	39.8	270	1050	6.7	90	570	46.5	360	1620	129.16	28.70	132.6	1,027	4,620
July	50.9	496	2046	7.8	93	558	58.7	589	2604	99.66	22.54	151.9	1,524	6,739
August				--			--	--	--	--	--	163.9	1,827*	9,821*
Sept.												182.4	2,034*	10,929*
October												109.6	1,222*	6,567*
November												163.7	1,825*	9,809*
December												151.6	1,690*	9,084*
Total												1,823.0	20,325	109,233

\* Due to insufficient data estimates are based on average production per unit during Jan- July

Table 6 Production from the Blue Nile during 1980

( in tonnes)

Type of Processing	F R E S H						Wet salted	Sun / <sup>2</sup> dry	Total	%	
	1/ Dama zin	1/ Singa	1/ El Souki	1/ Sennar	Medani	Others					Sub total
January	20.7	17.6	8.0	13.9	25.0	19.1	104.3	4.7	172.2	281.2	7.3
February	29.3	22.2	8.0	12.0	30.0	22.7	124.2	4.9	281.4	410.5	10.7
March	28.9	29.4	13.9	7.4	53.0	29.7	162.3	22.7	285.6	470.6	12.3
April	29.8	54.1	15.7	10.5	84.0	43.5	237.6	44.2	279.3	561.1	14.6
May	23.3	27.9	21.5	19.0	60.5	34.1	186.3	1.4	197.4	385.1	10.0
June	17.6	16.2	13.0	9.5	37.0	20.9	114.2	9.2	165.9	289.3	7.5
July	25.0	16.4	8.0	17.4	62.5	29.0	158.3	0.5	222.6	381.4	9.9
Aug.	26.8	19.9	8.0	32.1	10.9	21.9	119.6	3.1	245.7	368.4	9.6
Sept.	15.8	9.0	8.0	51.3	3.4	19.6	107.1	2.0	138.6	247.7	6.5
Oct.	6.5	8.2	8.0	66.8	30.0	26.8	146.3	0.1	48.3	194.7	5.1
Nov.	7.3	14.1	8.0	7.5	16.8	12.0	65.7	3.7	16.8	86.2	2.2
Dec.	9.1	27.5	8.0	13.4	34.7	20.7	113.4	3.5	46.2	163.1	4.3
Total	240.1	262.5	128.1	260.8	447.8	300.0	1639.3	100.0	2100.0	3839.3	100.0
%							42.7	2.6	54.7	100.0	

(-) - NIL

1/ Substituted from records of previous years ( 1978 - 1979)

2/ 1979 figure substituted

Table 7. Production (by months and fish variety) during 1980 from the Blue Mile  
( in tonnes)

Fish	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	%
Egl	4.5	5.7	10.4	39.3	15.4	6.3	18.3	13.3	8.9	14.8	7.7	4.6	149.2	3.9
Kabarose	10.4	11.1	15.5	20.2	7.7	10.7	5.0	4.0	3.5	1.0	8.7	12.7	110.5	2.9
Jack	3.3	4.5	4.3	4.5	8.5	3.4	6.8	3.3	3.0	4.1	4.1	4.1	53.9	1.4
Bulti	102.1	186.0	158.6	133.5	316.1	84.8	326.1	215.1	172.2	140.0	5.6	21.0	1861.1	48.5
Debs	99.2	126.4	150.6	162.2	2.7	112.0	1.5	40.9	17.6	1.2	24.6	68.2	807.1	21.0
Kaddan	7.9	7.0	8.5	14.6	0.8	6.1	2.3	3.3	3.2	--	4.7	10.8	69.2	1.8
Binnij	3.9	4.1	6.8	9.5	2.3	4.1	1.5	3.7	4.0	1.9	1.9	3.2	46.7	1.2
Kashbanat	2.5	4.1	4.2	6.7	1.2	2.9	1.5	2.2	1.2	1.7	2.2	6.4	36.8	1.0
Karsha	0.6	0.8	1.9	3.9	0.4	1.2	--	0.4	0.2	--	0.1	--	9.5	0.3
Bitkoya	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gargour	27.3	35.3	35.3	61.2	5.4	25.7	2.3	59.7	12.4	3.6	8.6	12.1	289.2	7.5
Qarmut	6.2	7.0	9.4	13.5	7.7	7.8	7.6	7.4	7.2	12.8	4.8	5.0	96.4	2.5
Kas	2.0	2.9	12.2	21.9	1.1	4.6	0.8	3.7	4.5	0.6	1.4	2.8	58.6	1.5
Qawara	4.5	4.5	16.9	26.9	3.8	6.4	0.8	2.6	1.2	0.4	1.5	0.8	70.3	1.8
Silbai	2.0	2.9	15.5	19.6	1.1	7.5	0.4	1.8	1.7	1.0	1.3	1.8	56.6	1.5
Others	4.8	8.2	20.7	23.6	10.8	5.8	6.5	7.0	6.9	11.3	9.0	9.6	124.2	3.2
Total	281.2	410.5	470.6	561.1	385.1	289.3	381.4	368.4	247.7	194.7	86.2	163.1	3,839.3	100.0
%	7.3	10.7	12.3	14.6	10.0	7.5	9.9	9.6	6.5	5.1	2.2	4.3	100.0	

Table 8. Estimation of fishing effort in the Blue Nile during 1980

Location	Damazin & Medani					Total production (tonnes)	Estimated Effort	
	Production (tonnes)	Boat-days (B)	Fisher- man days (F)	P/B (Kg.)	P/F (K.g)		Boat- days	Fisher- man days
January	45.7 (P)	95 48	13,392	4.79	3.41	281.2	58,706	82,463
February	59.6	89 32	12,528	6.67	4.76	410.5	61,544	86,239
March	81.4	95 48	13,392	8.53	6.08	470.6	55,170	77,401
April	113.5	92 40	12,960	12.28	8.76	561.1	45,692	64,053
May <sup>1/</sup>	23.3	77 50	8,618	3.01	2.70	385.1	127,940	142,630
June	54.2	92 40	12,960	5.87	4.18	289.3	49,284	69,211
July <sup>1/</sup>	25.0	77 50	8,618	3.23	2.91	381.4	118,080	131,065
August	40.7	95 48	13,392	4.26	3.04	368.4	86,479	121,184
September	19.2	92 40	12,960	2.08	1.48	247.7	119,087	167,365
October	6.5	77 50	8,618	0.84	0.75	194.7	231,789	259,600
November	24.1	92 40	12,960	2.61	1.86	86.2	33,027	46,344
December	33.8	95 48	13,392	3.54	2.53	163.1	46,073	64,466
Total						3839.3	1032,871	1312,021

1/ For Damazin only



Table 9: production from the White Nile during 1980  
( in tonnes)

Type of Processing	F R E S H					Sub Total	wet salted	Sundry	Total	%	
	Locations	Kosti	Ed Dueim	K h a r t o u m							Others
				North El Khazan	South El Khazan						
Jan.	74.2	14.9	75.4	162.6	54.8	381.9	32.4	13.2	427.5	5.7	
Feb.	51.4	21.8	87.3	176.2	56.2	392.9	46.4	115.5	554.8	7.5	
March	64.1	28.0	52.0	228.9	62.2	435.2	18.5	174.9	628.6	8.4	
April	94.3	52.3	44.2	156.1	57.7	404.6	20.1	141.9	566.6	7.6	
May	129.7	52.1	*	*	30.7	212.5	8.4	16.5	237.4	3.2	
June	128.3	18.1	*	*	24.8	171.2	14.5	18.1	203.8	2.7	
July	119.1	21.0	*	*	23.2	163.3	9.5	9.9	182.7	2.5	
August	73.0	41.2	*	*	19.5	133.7	5.6	21.4	160.7	2.2	
Sept.	48.0	25.1	*	*	12.0	85.1	5.0	21.4	111.5	1.5	
Oct.	56.9	13.0	215.9	293.1	96.8	675.7	52.0	259.1	986.8	13.3	
Nov.	70.8	5.5	248.5	863.2	198.8	1386.8	248.8	523.1	2158.7	29.0	
Dec.	86.2	6.1	207.5	375.9	113.3	789.0	97.8	335.0	1221.8	16.4	
Total	996.0	299.1	930.8	2,256.0	750.0	5231.9	559.0	1,650.0	7,440.9	100.0	
%						70.3	7.5	22.2			

\* Fish was not allowed to be brought to Khartoum market by Govt decree  
1/ 1979 figure substituted.

Table 10 Production from the White Nile by months and fish variety during 1980 ( in tonnes)

Fish	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	%
Egl	110.7	96.0	58.5	61.8	22.3	19.4	19.9	7.2	4.5	54.3	75.6	29.3	559.5	7.5
Kabarose	26.1	16.1	15.7	4.5	7.8	8.5	3.1	1.0	1.0	45.4	36.7	26.9	192.8	2.6
Jack	28.6	22.2	25.8	19.8	9.7	14.7	5.1	11.7	2.3	53.3	32.4	26.9	252.5	3.4
Bulti	29.5	230.2	367.1	353.6	56.3	48.5	49.1	87.3	39.3	352.3	964.9	447.2	3025.3	40.7
Debs	44.5	30.5	34.6	23.8	12.1	9.4	17.0	2.7	37.5	193.4	360.5	282.2	1048.2	14.1
Kaddan	-	0.6	0.6	1.1	--	0.2	0.4	--	0.1	3.0	0	1.2	7.2	0.1
Binnij	6.8	3.9	3.8	5.1	12.6	8.1	6.4	1.9	1.9	29.6	54.0	4.9	139.0	1.9
Kashmbanat	9.4	8.3	20.7	7.4	24.4	19.1	12.6	4.4	2.7	9.9	6.5	17.1	142.5	1.9
Karsha	13.2	11.7	12.6	11.9	24.5	20.2	14.6	5.8	3.1	4.9	82.0	15.9	220.4	3.0
Bitkoya	--	2.2	0.6	0.6	--	--	--	--	--	--	--	2.4	5.8	0.1
Gargour	80.4	55.5	40.2	31.2	3.1	3.1	4.7	2.1	1.7	109.5	142.5	155.2	629.2	8.4
Qarmut	7.7	3.3	3.8	6.2	14.2	9.0	6.6	5.1	2.1	9.8	8.6	15.9	92.3	1.2
Kas	18.4	13.9	5.7	13.6	12.6	11.8	9.7	4.5	2.5	24.7	146.8	30.5	294.7	4.0
Qawara	19.7	32.2	13.8	11.3	2.4	8.4	15.2	6.3	1.9	9.9	86.3	64.8	272.2	3.6
Silbai	10.7	10.5	5.0	1.1	--	--	--	2.9	0.3	5.9	47.5	8.6	92.5	1.2
Others	21.8	17.7	20.1	13.6	35.4	23.4	18.3	17.8	10.6	80.9	114.4	92.8	466.8	6.3
Total	427.5	554.8	628.6	566.6	237.4	203.8	182.7	160.7	111.5	986.8	2158.7	1221.8	7440.9	100.0
%	5.7	7.5	8.4	7.6	3.2	2.7	2.5	2.2	1.5	13.3	29.0	16.4	100.0	

Table 11 Estimation of fishing effort in the White Nile during 1980

Location	Kosti, Ed Dueim and Khartoum					Total Production tonnes	Estimated effort	
	Production ( tonnes )	Boatdays (B)	Fishermen- days (F)	P/B (Kg.)	P/F (Kg.)		Boat-days	Fisherman- days
January	327.1	33,480	117,583	9.77	2.78	427.5	43,756	153,777
February	336.7	31,320	109,997	10.75	3.06	554.8	51,609	181,307
March	373.0	33,480	117,583	11.14	3.17	628.6	56,427	198,297
Arpil	346.9	32,400	113,790	10.71	3.05	566.6	52,904	185,770
May 1/	181.8					237.4	13,827*	48,579*
June 1/	146.4					203.8	11,870*	41,695*
July 1/	140.1					182.7	10,641*	37,378*
August 1/	114.2					160.7	9,359*	32,877*
Sept. 1/	73.1					111.5	6,494*	22,811*
October	578.9	33,480	117,583	17.29	4.92	986.8	57,073	200,569
November	1188.0	32,400	113,790	36.67	10.44	2158.7	58,868	206,772
December	675.7	33,480	117,583	20.18	5.75	1221.8	60,545	212,487
Total	4481.9					7440.9	433,373	1522,319

\* Estimates are based on average production per unit  
 1/ Fish was not allowed to Khartoum by Govt. Decree, no effort data available.

Table 12 : Production from Atbara river during 1980 ( in tonnes)

Type of Processing	Fresh 1
Location	Gedraf
January	33.8
February	27.7
March	24.1
April	21.9
May	13.1
June	9.2
July	0.0
August	0.0
September	0.0
October	8.3
November	17.9
December	28.0
TOTAL	184.0
%	

1 1979 figures substituted.

Table 13. Marine Fish Production by varieties and months during 1980 ( in tonnes)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	%
Kushar	11.7	10.3	11.6	10.8	13.6	25.8	7.8	6.7	7.0	4.8	5.3	4.1	119.5	12.0
Bohar	2.2	4.8	9.1	8.0	10.5	12.0	4.1	10.3	13.6	3.9	3.4	3.8	85.7	8.6
Shaoor	12.9	13.2	13.2	10.8	7.6	7.6	7.6	8.0	6.3	8.9	11.2	11.2	118.5	11.9
Shark	9.9	5.6	4.9	4.1	4.3	8.1	2.2	5.0	4.4	2.1	6.0	5.2	61.8	6.2
Arabi	4.1	1.8	0.8	0.2	1.2	2.8	6.1	4.6	4.6	5.4	8.2	4.0	43.8	4.4
Jack	4.2	4.5	5.6	2.7	5.6	2.0	2.5	1.7	1.4	2.2	1.9	3.5	37.8	3.8
Nagil	0.6	3.0	4.0	1.9	4.0	5.3	3.6	7.1	9.5	5.2	3.5	4.1	51.8	5.2
Asmoot	0.4	0.7	2.1	2.2	1.9	4.1	0.9	4.4	2.0	1.2	1.1	0.9	21.9	2.2
Abnkarn	2.8	1.1	0.1	0.2	--	--	--	1.4	--	--	--	1.4	7.0	0.7
Faris	0.4	2.1	5.6	1.3	1.9	5.8	1.7	3.8	3.5	1.0	2.8	2.0	31.9	3.2
Others	30.3	35.9	51.6	45.6	41.9	37.5	24.6	28.6	31.2	33.7	30.3	25.1	416.3	41.8
Total	79.5	83.0	108.6	87.8	92.5	111.0	61.1	81.6	83.5	68.4	73.7	65.3	996.0	100.0
%	8.0	8.3	10.9	8.8	9.3	11.1	6.1	8.2	8.4	6.9	7.4	6.6	100.0	

Table 14 Production from the Northern Region by River Systems in 1979 (in tonnes)

Months	Nile & Nuba Lake			Blue Nile				White Nile				Total				Atbara		Grand Total				%
	Fresh	Wet Salted	Sub Total	Fresh	Wet Salted	Sundry	Sub Total	Fresh	Wet Salted	Sundry	Sub Total	Fresh	Wet Salted	Sundry	Sub Total	Fresh	Fresh	Wet Salted	Sundry	Total		
Jan.	126.3	4.1	130.4	106.5	2.1	279.3	387.5	694.7	59.8	112.2	866.7	927.5	66.0	391.5	1385.0	33.8	961.3	66.0	391.5	1418.8	8.9	
Feb.	110.8	3.6	114.4	143.0	16.2	390.6	549.8	851.3	51.0	170.0	1072.3	1105.1	70.8	560.6	1736.5	27.7	132.8	70.8	560.6	1764.2	11.1	
Mar.	126.3	4.1	130.4	147.7	17.5	220.5	385.7	868.4	41.9	183.1	1093.4	1142.4	63.5	403.6	1609.5	24.1	1166.5	63.5	403.6	1633.6	10.3	
Apr.	107.6	3.5	111.1	194.7	8.7	247.8	451.2	1096.9	39.5	252.5	1388.9	1399.2	51.7	500.3	1951.2	21.9	1421.1	51.7	500.3	1973.1	12.4	
May	84.5	2.8	87.3	172.3	9.5	258.3	440.1	1000.5	75.9	203.0	1279.4	1257.3	88.2	461.3	1806.8	13.1	1270.4	88.2	461.3	1819.9	11.5	
June	104.6	3.4	84.0	143.7	26.9	189.0	359.6	761.1	55.7	173.2	990.8	1010.2	86.0	362.2	1458.4	9.2	1019.4	86.0	362.2	1467.6	9.2	
July	81.5	2.5	84.0	152.6	0.8	73.5	226.5	695.0	39.1	145.2	879.3	929.1	42.4	218.7	1190.2	0	929.1	42.4	218.7	1190.2	7.5	
Aug.	160.4	5.2	165.6	109.4	0.2	69.3	178.9	666.3	15.6	133.6	815.5	936.1	21.0	202.9	1160.0	0	936.1	21.0	202.9	1160.0	7.3	
Sept.	200.2	6.5	206.7	103.3	1.7	86.1	191.1	288.9	46.0	44.6	379.5	592.4	54.2	130.7	777.3	0	592.4	54.2	130.7	777.3	4.9	
Oct.	179.8	5.9	185.7	150.2	3.3	132.3	285.8	481.5	15.2	102.3	599.0	811.5	24.4	234.6	1070.5	8.3	819.8	24.4	234.6	1078.8	6.8	
Nov.	126.5	4.1	130.6	77.5	5.9	44.1	127.5	374.8	8.3	61.0	444.1	578.8	18.3	105.1	702.2	17.9	596.7	18.3	105.1	720.1	4.5	
Dec.	130.9	4.3	135.2	110.2	7.2	109.2	226.6	415.6	12.0	69.3	496.9	656.7	23.5	178.5	858.7	28.0	684.7	23.5	178.5	886.7	5.6	
Total	1539.4	50.0	1589.4	1611.1	100.0	2100.0	3811.1	8195.8	460.0	1650.0	10305.8	11346.3	610.0	3750.0	15706.3	184.0	11530.3	610.0	3750.0	15890.3		
																4	72.6	3.8	23.6		100	

Table 15 production from the Northern Region by months and fish varieties in 1979 ( in tonnes)

Fish	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	%
Egl	82.1	79.6	86.1	108.2	100.9	82.2	104.3	92.3	81.4	153.9	130.4	137.5	1238.9	7.9
Kabarose	66.7	59.9	29.2	45.1	44.7	27.9	12.0	12.5	20.4	42.6	52.6	26.4	440.0	2.8
Jack	33.5	37.0	24.6	36.7	47.3	36.8	46.5	33.2	30.0	30.8	20.1	21.9	398.4	2.5
Bulti	538.0	754.0	702.1	1036.7	773.6	641.6	651.4	644.7	399.6	490.4	240.3	321.8	7194.2	45.8
Debs	166.2	247.2	265.0	317.2	324.2	241.8	36.5	59.0	46.5	120.0	72.5	131.4	2027.5	12.9
Kaddan	29.9	24.7	13.9	19.0	11.8	13.0	9.2	6.9	11.1	9.7	16.1	20.9	186.2	1.2
Binnij	52.5	42.3	24.8	25.4	25.3	26.3	11.3	26.3	16.3	18.7	16.1	10.5	295.8	1.9
Kashmbanat	23.0	14.3	14.1	19.2	17.4	21.3	56.3	12.0	6.7	12.0	6.1	11.3	213.7	1.4
Karsha	18.1	16.1	226.3	53.2	52.5	39.7	4.0	44.0	24.3	11.0	5.7	11.1	506.0	3.2
Bitkoya	-	-	29.6	5.6	1.3	1.0	0.0	0.0	1.1	0.6	0.4	1.0	40.6	0.3
Gargour	185.1	291.3	64.5	54.9	170.3	127.2	108.3	132.3	70.4	91.3	82.5	88.8	1466.9	9.3
Qarmut	31.9	22.5	51.0	45.6	27.9	19.8	35.6	31.9	19.0	20.5	18.8	18.0	342.5	2.2
Kas	46.1	53.9	29.6	47.5	55.1	37.6	31.1	17.5	8.4	13.4	6.4	12.2	358.8	2.3
Qawara	44.2	36.0	13.5	28.1	69.7	67.3	34.6	5.7	9.5	12.5	7.9	10.4	339.4	2.2
Shilbai	11.6	7.6	1.9	33.1	8.2	10.8	3.4	2.5	8.1	15.5	7.9	8.3	118.9	0.7
Others	56.1	50.1	33.3	75.5	76.6	64.1	45.7	39.2	24.5	27.6	18.4	27.2	538.5	3.4
Total	1385.0	1736.5	1609.5	1951.2	1806.8	1458.4	1190.2	1160.0	777.3	1070.5	702.2	858.7	15706.3	100
%														

Table 16 Production from the Nile and El Nuba Lake during 1979

( in tonnes)

Type of Processing	F R E S H					Wet Salted	Total	%	
	1/	1/			Others				Sub Total
Locations	Atbara	Wadi Halfa	Wadi Halfa (Private)	Wadi Halfa (public)					
January	31.9	9.2	8.4	15.3	61.5	126.3	4.1	130.4	8.2
February	41.1	3.4	18.7	20.6	54.0	110.8	3.6	114.4	7.2
March	20.5	3.4	23.8	17.1	61.5	126.3	4.1	130.4	8.2
April	24.2	5.1	10.0	15.8	52.5	107.6	3.5	111.1	7.0
May	25.9	5.1	2.2	10.1	41.2	84.5	2.8	87.3	5.5
June	22.7	5.1	5.0	20.8	51.0	104.6	3.4	108.0	6.8
July	22.2	4.5	7.0	8.1	39.7	81.5	2.5	84.0	5.3
August	19.9	8.8	4.0	49.7	78.0	160.4	5.2	165.6	10.4
Sept.	12.3	8.8	7.0	74.6	97.5	200.2	6.5	206.7	13.0
Oct.	22.3	8.8	9.0	51.9	87.8	179.8	5.9	185.7	11.7
Nov.	35.6	3.0	1.4	25.0	61.5	126.5	4.1	130.6	8.2
Dec.	23.9	2.0	1.0	40.2	63.8	130.9	4.3	135.2	8.5
Total	275.5	67.2	97.5	349.2	750.0	1,539.4	50.0	1,589.4	100.0
%						96.9	3.1	100.0	

1/ Based on recordings on previous years ( 1978 - 79)

Efforts not estimated due to insufficient data



Table 17 Production from the Nile and El Nuba Lake (by months and fish varieties) during 1979 (in tonnes)

Fish	Months												Total	%
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Egl	37.0	15.8	18.5	9.3	3.9	10.0	7.2	8.8	19.8	31.2	28.3	32.1	221.9	14
Kabarose	9.3	3.4	2.7	2.8	1.0	1.5	0.7	0.2	0.2	0.6	0.1	0.3	22.8	1.4
Jack	0.6	0.5	0.0	0.7	0.3	0.1	0.0	--	--	0.2	0.0	--	2.4	0.2
Bulti	10.7	49.2	92.2	85.5	64.4	73.7	63.5	142.4	154.8	119.0	67.3	76.5	999.2	62.9
Debs	7.8	3.7	0.3	0.9	7.6	4.4	3.9	5.1	12.0	20.2	13.3	7.7	86.9	5.5
Kaddan	23.9	12.1	4.8	2.6	1.7	4.3	2.3	2.8	8.5	4.8	11.5	12.2	91.5	5.7
Binnij	36.5	24.6	5.6	5.1	4.3	9.4	3.4	3.8	8.7	5.8	8.0	4.5	119.7	7.5
Kashmbanat	0.3	0.8	0.3	0.3	1.5	1.1	0.2	0.5	0.4	0.9	0.3	0.3	6.9	0.4
Karsha	0.0	0.0	--	--	0.0	--	1.2	--	--	--	--	--	1.2	0.1
Bitkoya	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gargour	3.9	2.8	2.7	3.6	2.6	3.5	0.9	2.0	2.3	3.0	1.8	1.6	30.7	1.9
Qarmut	0.4	1.5	3.3	0.3	0.0	--	0.7	--	--	--	--	--	6.2	0.4
Kas	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Qawara	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silbai	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Others	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	130.4	114.4	130.4	111.1	87.3	108.0	84.0	165.6	206.7	185.7	130.6	135.2	1589.4	
%	8.2	7.2	8.2	7.0	5.5	6.8	5.3	10.4	13.0	11.7	8.2	8.5		100

Based on 1980 % composition

Table 18 Production from the Blue Nile during 1979 ( in tonnes)

Type of Processing	F R E S H							Wet Salted	Sun dry	Total	%
	Damazın	Singa	El Souki	Bannar	Medani	Others	Sub total				
Januray	21.9	17.6	8.0	13.9	25.3	19.8	106.5	2.1	279.3	387.9	10.2
February	16.2	22.2	8.0	12.0	57.9	26.7	143.0	16.2	390.6	549.8	14.4
March	25.9	29.4	13.9	7.4	43.5	27.6	147.7	17.5	220.5	385.7	10.1
April	26.8	54.1	15.7	10.5	51.3	36.3	194.7	8.7	247.8	451.2	11.8
May	27.7	27.9	21.5	19.0	44.1	32.1	172.3	9.5	258.3	440.1	11.5
June	20.1	16.2	13.0	9.5	58.2	26.7	143.7	26.9	189.0	359.6	9.4
July	19.8	16.4	8.0	17.4	62.5	28.5	152.6	0.8	73.5	226.9	6.0
August	8.5	19.9	8.0	32.1	20.5	20.4	109.4	0.2	69.3	178.9	4.7
September	7.3	9.0	8.0	51.3	8.5	19.2	103.3	1.7	86.1	191.1	5.0
October	9.5	8.2	8.0	66.8	29.8	27.9	150.2	3.3	132.3	285.8	7.5
November	4.3	14.1	8.0	7.5	29.2	14.4	77.5	5.9	44.1	127.5	3.4
December	14.0	27.5	8.0	13.4	26.9	20.4	110.2	7.2	109.2	226.6	6.0
T O T A L	202.0	262.5	128.1	260.8	457.7	300.0	1611.1	100.0	2,100.0	3,811.1	100.0
%							42.3	2.6	55.1	100.0	

1/ Substituted from records of previous years ( 1978 - 79 )

Table 19 Production from the Blue Nile (by months and fish varieties) during 1979 (in tonnes)

Fish \ Months	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	%
Egl	7.8	3.8	4.2	8.6	6.2	5.8	13.6	9.3	16.8	14.9	8.8	10.0	109.8	2.9
Kabarose	17.5	9.3	4.6	9.0	9.2	8.6	1.6	0.9	13.4	30.0	23.2	10.7	138.0	3.6
Jack	11.2	3.3	2.7	4.1	3.5	4.0	6.1	3.8	2.7	3.7	2.3	4.5	51.9	1.4
Bulti	241.3	269.4	128.8	151.2	164.2	91.3	179.0	153.3	109.7	101.8	18.0	63.4	167.4	43.8
Debs	68.3	133.1	155.4	191.3	183.5	133.4	1.8	0.9	14.0	66.9	34.8	84.5	1067.9	28.0
Kaddan	4.3	10.4	6.9	9.5	8.8	4.7	0.7	--	1.5	4.9	4.6	8.2	64.5	1.7
Binniij	0.4	3.8	3.9	5.0	4.4	5.0	0.9	0.5	1.1	5.1	3.2	2.5	35.8	0.9
Kashmbanat	5.4	2.8	6.2	3.6	3.1	4.3	2.5	0.9	2.1	6.3	2.3	3.6	43.1	1.1
Karsha	0.8	--	--	0.4	1.3	1.1	0.2	-	0.4	1.4	0.8	0.7	7.1	0.2
Bitkoya	--	--	7.7	--	--	--	--	-	--	--	--	--	7.7	0.2
Gargour	3.5	86.9	43.2	22.1	29.5	66.2	4.5	1.4	15.7	31.4	16.7	18.6	339.7	8.9
Qarmut	8.1	3.8	7.3	5.5	6.2	5.0	4.1	3.4	5.7	10.9	5.9	6.1	71.5	1.9
Kas	1.9	11.0	6.6	3.1	2.6	7.9	1.2	0.4	1.2	1.4	1.1	2.3	40.7	1.1
Qawara	--	2.8	5.8	3.1	4.4	7.9	1.2	--	1.5	1.7	1.7	2.9	33.0	0.9
Silbai	4.6	2.2	0.8	27.5	4.4	6.8	1.6	0.9	1.7	1.7	1.7	2.3	56.2	1.5
Others	12.8	7.2	1.6	7.7	8.8	7.6	7.9	3.2	3.6	3.7	2.4	6.3	72.8	1.9
Total	387.9	549.8	385.7	451.2	440.1	359.6	226.9	178.9	191.1	285.8	127.5	226.6	3,811.1	100.0
%	10.2	14.4	10.1	11.8	11.6	9.4	6.0	4.7	5.0	7.5	3.3	6.0	100.0	

Table 20. Estimation of fishing effort in the Blue Nile during 1979

Location	Damazin & Medani					Estimated effort		
	Production ( tonnes ) (P)	Boat- days (B)	Fisherman- days (F)	P/B (Kg)	P/F (Kg)	Total Production ( tonnes)	Boatdays	Fisherman- days
January	47.2	9,548	13,392	4.94	3.52	387.9	78,522	110,199
February	74.1	8,624	12,096	8.59	6.13	549.8	64,005	89,690
March	69.4	9,548	13,392	7.27	5.18	385.7	53,054	74,459
April	78.1	9,240	12,960	8.45	6.03	451.2	53,396	74,826
May	71.8	9,548	13,392	7.52	5.36	440.1	58,524	82,108
June	78.3	9,240	12,960	8.47	6.04	359.6	42,456	59,536
July 1/	19.8	7,750	8,897	2.55	2.22	226.9	88,980	102,207
August 1/	8.5	7,750	8,897	1.10	0.96	178.9	162,636	186,354
September	15.8	9,240	12,960	1.71	1.22	191.1	111,754	156,639
October	39.3	9,548	13,392	4.12	2.93	285.8	69,369	97,543
November	33.5	9,240	12,960	3.63	2.58	127.5	35,124	49,419
December	40.9	9,548	13,392	4.28	3.05	226.6	52,944	74,295
T O T A L	576.7					3,811.1	870,764	1157,275

1/ Relates to Damazin only.

Table 21 Production from the White Nile during 1979 ( in tonnes)

Type of Processing							Wet Salted	Sun Dry	Total	%
Locations	Kosti	Ed Dneim	K H A R T O U M		Others	Sub total				
			North E1 Khazan	South E1 Khazan						
January	116.3	14.9	82.6	417.1	63.8	694.7	59.8	112.2	866.7	8.4
February	95.0	21.8	102.4	554.1	78.0	851.3	51.0	170.0	1072.3	10.4
March	82.8	28.0	90.5	587.6	79.5	868.4	41.9	183.1	1093.4	10.6
April	165.5	52.3	122.4	656.2	100.5	1096.9	39.5	252.5	1388.9	13.5
May	166.2	25.1	142.4	575.3	91.5	1000.5	75.9	203.0	1279.4	12.4
June	139.0	18.1	98.8	436.2	69.8	761.9	55.7	173.2	990.8	9.6
July	111.0	21.0	138.7	360.5	63.8	695.0	39.1	145.2	879.3	8.5
August	72.8	16.0	126.6	390.2	60.7	666.3	15.6	133.6	815.5	8.0
September	48.5	11.8	61.6	140.8	26.2	288.9	46.0	44.6	379.5	3.7
October	38.3	13.0	85.7	300.3	44.2	481.5	15.2	102.3	599.0	5.8
November	45.5	5.5	77.2	212.1	34.5	374.8	8.3	61.0	444.1	4.3
December	64.2	6.1	65.4	242.4	37.5	415.6	12.0	69.3	496.9	4.8
T O T A L	1145.1	233.6	1194.3	4,872.8	750.0	8,195.8	460.0	1650.0	10305.8	100.0
%						79.5	4.5	16.0	100.0	

Table 22 Production from the White Nile (by months and fish varieties) during 1979 ( in tonnes)

Fish	Months												Total	%
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Egl	37.3	60.0	63.4	90.3	90.8	66.4	83.5	74.2	44.8	107.8	93.3	95.4	907.2	8.8
Kabarose	39.9	47.2	21.9	33.3	34.5	17.8	9.7	11.4	6.8	12.0	29.3	15.4	279.2	2.7
Jack	21.7	33.2	21.9	31.9	43.5	32.7	40.4	29.4	27.3	26.0	17.8	17.4	344.1	3.3
Bulti	286.0	435.4	481.1	800.0	545.0	476.6	408.9	349.0	135.1	269.6	155.0	181.9	4523.6	43.9
Debs	90.1	110.4	109.3	125.0	133.1	104.0	30.8	53.0	20.5	32.9	24.4	39.2	872.7	8.5
Kaddan	1.7	2.2	2.2	6.9	1.3	4.0	6.2	4.1	1.1	--	0.0	0.5	30.2	0.3
Binnij	15.6	13.9	15.3	15.3	16.6	11.9	7.0	22.0	6.5	7.8	4.9	3.5	140.3	1.4
Kashmbanat	17.3	10.7	7.6	15.3	12.8	15.9	53.6	10.6	4.2	4.8	3.5	7.4	163.7	1.6
Karsha	17.3	16.1	226.3	52.8	51.2	38.6	2.6	44.0	23.9	9.6	4.9	10.4	497.7	4.8
Bitkoya	0.0	0.0	21.9	5.6	1.3	1.0	0.0	0.0	1.1	0.6	0.4	1.0	32.9	0.3
Gargour	177.7	201.6	18.6	29.2	138.2	57.5	102.9	128.9	52.4	56.9	64.0	68.6	1096.5	10.6
Qarmut	23.4	17.2	40.4	40.3	21.7	14.8	30.8	28.5	13.3	9.6	12.9	11.9	264.8	2.6
Kas	44.2	42.9	23.0	44.4	52.5	29.7	29.9	17.1	7.2	12.0	5.3	9.9	318.1	3.1
Qawara	44.2	33.2	7.7	25.0	65.3	59.4	33.4	5.7	8.0	10.8	6.2	7.5	306.4	3.0
Silbai	7.0	5.4	1.1	5.6	3.8	4.0	1.8	1.6	6.4	13.8	6.2	6.0	62.7	0.6
Others	43.3	42.9	31.7	68.0	67.8	56.5	37.8	35.0	20.9	23.9	16.0	20.9	465.7	4.5
Total	866.7	1072.3	1093.4	1388.9	1279.4	990.8	879.3	816.5	379.5	599.0	444.1	496.9	10,305.8	100
%	8.4	10.4	10.6	13.5	12.4	9.6	8.5	8.0	3.7	5.8	4.3	4.8		100

Table 23 : Estimation of fishing effort in the White Nile during 1979

Location	Kosti, Ed Dueim and Khartoum					Total Production ( tonnes )	Estimated effort	
	Production ( tonnes ) ( P )	Boat-days ( B )	Fisherman- days ( F )	P/B ( Kg )	P/F ( Kg )		Boat-days	Fisherman- days
January	630.9	33,480	117,583	18.84	5.37	866.7	46,003	161,397
February	773.3	30,240	106,204	25.57	7.28	1072.3	41,936	147,294
March	788.9	33,480	117,583	23.56	6.71	1093.4	46,409	162,951
April	996.4	32,400	113,790	30.75	8.77	1388.9	45,167	158,369
May	909.0	33,480	117,583	27.15	7.73	1279.4	47,123	165,511
June	692.1	32,400	113,790	21.36	6.08	990.8	46,386	162,961
July	631.2	33,480	117,583	18.85	5.37	879.3	46,647	163,743
August	605.6	33,480	117,583	18.09	5.15	815.5	45,080	158,350
September	262.7	32,400	113,790	8.11	2.31	379.5	46,794	164,286
October	437.3	33,480	117,583	13.06	3.72	599.0	45,865	161,022
November	340.3	32,400	113,790	10.51	2.99	444.1	42,255	148,528
December	378.1	33,480	117,583	11.29	3.22	496.9	44,012	154,317
T O T A L	7445.8					10,305.8	543,677	1908,729

Table 24: Production from Atbara river during 1979 ( in tonnes)

Type of Processing	Fresh
Location	Gedraf
January	33.8
February	27.7
March	24.1
April	21.9
May	13.1
June	9.2
July	0.0
August	0.0
September	0.0
October	8.3
November	17.9
December	28.0
TOTAL	184.0
%	



Table 25 : Marine fish Production by months and varieties during 1979 ( in tonnes)

Fish	Months												Total	%
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
Kushar	2.8	7.5	9.0	9.2	8.1	5.9	6.6	4.7	8.7	8.8	5.6	7.1	84.0	10.6
Bohar	1.2	6.6	25.5	10.6	11.1	14.0	5.4	5.6	9.5	13.2	4.4	2.3	109.4	13.8
Shaaor	2.5	5.6	8.6	4.3	5.9	3.9	4.4	4.3	8.8	6.4	12.3	7.5	74.5	9.4
Shark	2.7	4.4	5.5	4.8	9.9	4.1	10.5	4.8	6.2	6.4	2.8	6.0	68.1	8.6
Arabi	1.9	1.7	1.3	2.1	4.2	4.9	6.8	4.4	5.5	6.5	10.1	4.5	53.9	6.8
Jack	0.9	2.1	2.0	0.7	4.7	2.7	3.0	3.2	3.8	3.1	3.2	2.6	31.7	4.0
Nagil	0.8	0.8	1.0	1.4	1.3	1.9	0.7	1.2	3.7	3.2	2.7	1.1	19.8	2.5
Asmoot	0.8	1.7	3.5	3.3	2.3	3.3	2.4	0.7	1.1	2.1	0.6	0.4	22.2	2.8
Abukarn	0.2	0.1	1.8	0.9	-	0.2	0.5	2.2	5.8	3.0	0.9	0.2	15.8	2.0
Faris	0.5	0.6	0.5	0.4	1.7	2.3	4.6	1.2	0.9	0.4	0.8	0.4	14.3	1.8
Others	11.0	13.7	38.7	25.8	30.6	18.0	27.1	19.3	40.7	35.1	17.2	21.5	298.7	37.7
Total	25.3	44.8	97.4	63.5	79.5	61.2	72.0	51.6	94.7	88.2	60.6	53.6	792.4	100.0
%	3.2	5.7	12.3	8.0	10.0	7.7	9.1	6.5	12.0	11.1	7.6	6.8	100.0	

Table 26 Local, Scientific and English names of the fish varieties

Local name	Scientific name	English name
<u>Fresh Waters</u>		
Egl	<u>Lates niloticus</u>	Nile perch
Kabarose	<u>Bagrus</u> sp.	Forskals catfish
Bayad	<u>Bagrus</u> sp.	Forskals catfish
Bulti	<u>Tilapia</u> sp.	Perch
Debs	<u>Labeo</u> sp.	Nile carp
Kaddan	<u>Labeo cobie</u>	Nile carp
Binnij	<u>Barbas</u> sp.	Barbel
Kashmbanat	<u>Mormyrus</u> sp.	Elephant snout
Karsha	<u>Distichodus</u> sp.	Roughcast fish
Bitkoya	<u>Citharinus</u> sp.	Moon fish
Gargour	<u>Synodontis</u> sp.	Shield head catfish
Qarmut	<u>Clarias</u> sp.	Eel catfish
Kas	<u>Hydrocyon</u> sp.	Tiger fish
Qawara	<u>Alestes</u> sp.	Pebbly fish
Silbai	<u>Schilbe</u> sp.	Butterfish
<u>Marine waters</u>		
Kushar	<u>Epenephelus</u> spp.	Grouper
Bohar	Lutjanidae	Snapper
Shaoor	Lethrinidae	Emperor
Shark	Elasmobranchia	Gursh
Arabi	Mugilidae	Grey mullets
Jack	Carangidae	Jacks
Nagil	<u>Plectropomus</u> sp.	Grouper
ASmoot	<u>Lutjanus</u> sp.	Snapper
Abu karn	<u>Naso</u> sp.	Unicornfish
Faris	Lutjanidae	Snapper

Fig 1 The Northern region - the Nile.

The cumulative percentage distribution of production:

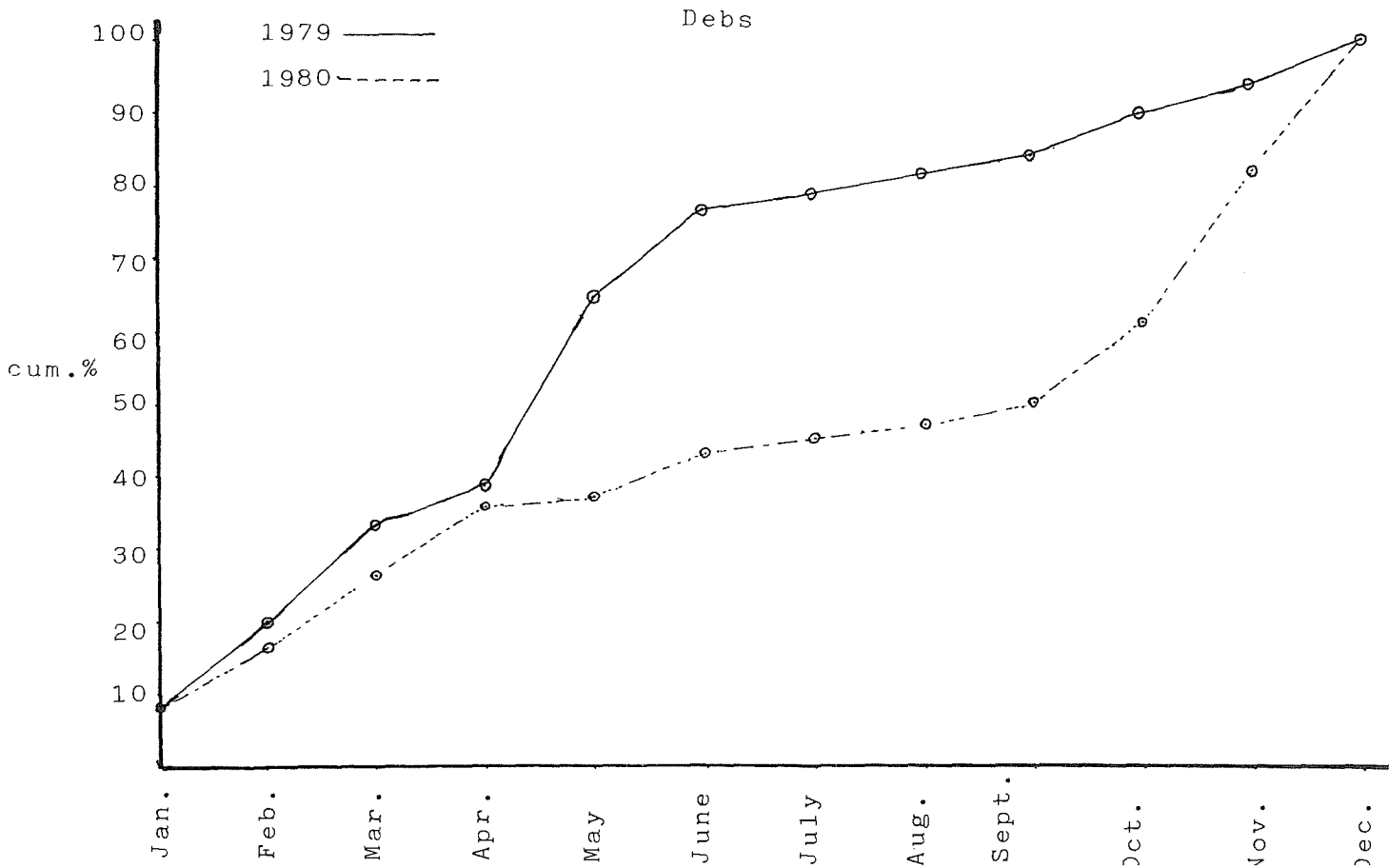
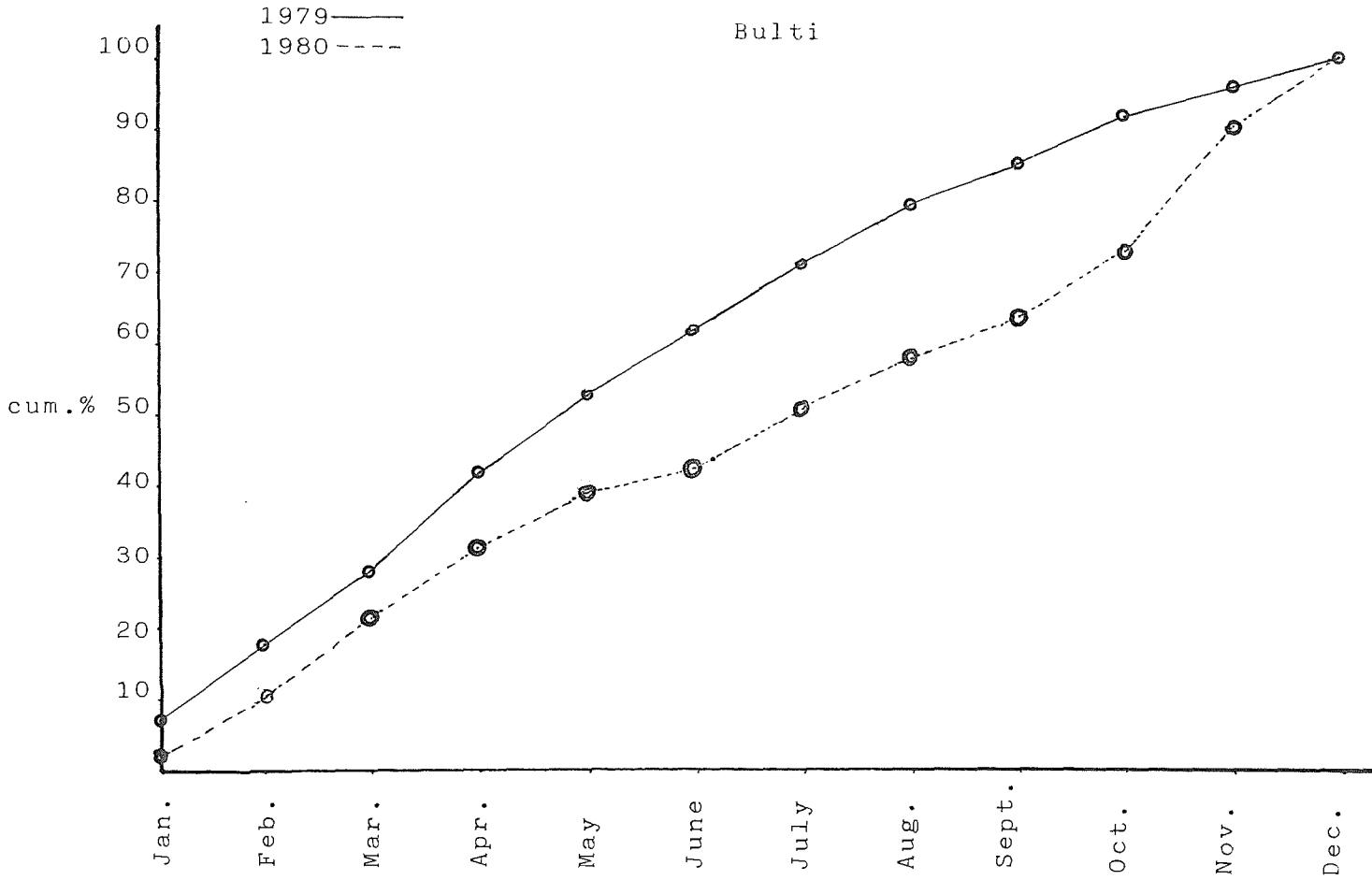


Fig 2 The Northern region - the Nile  
The cumulative percentage distribution of Production

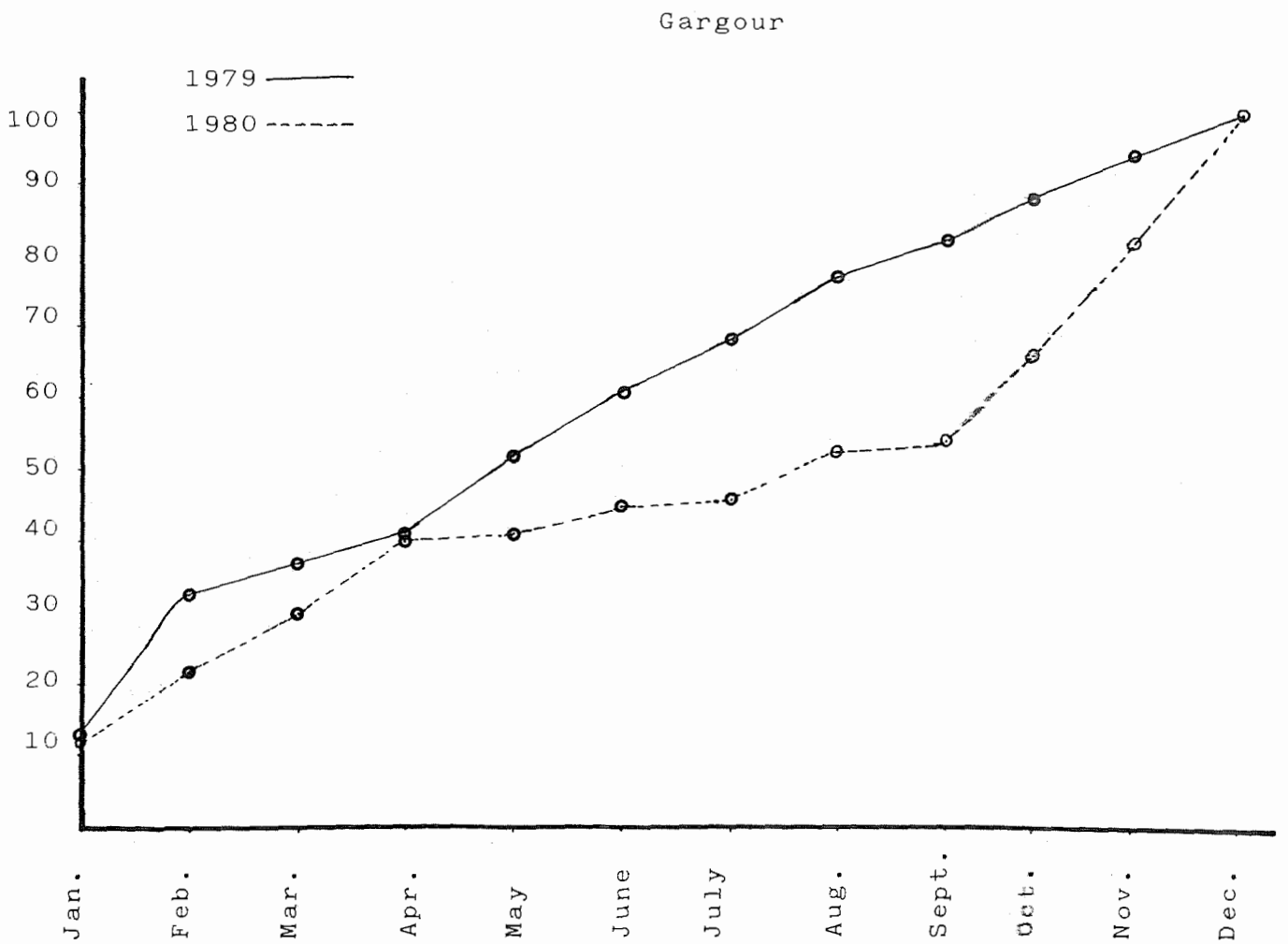


Fig. 3 The Nile & El Nuba Lake  
The cumulative percentage distribution of production

Bulti

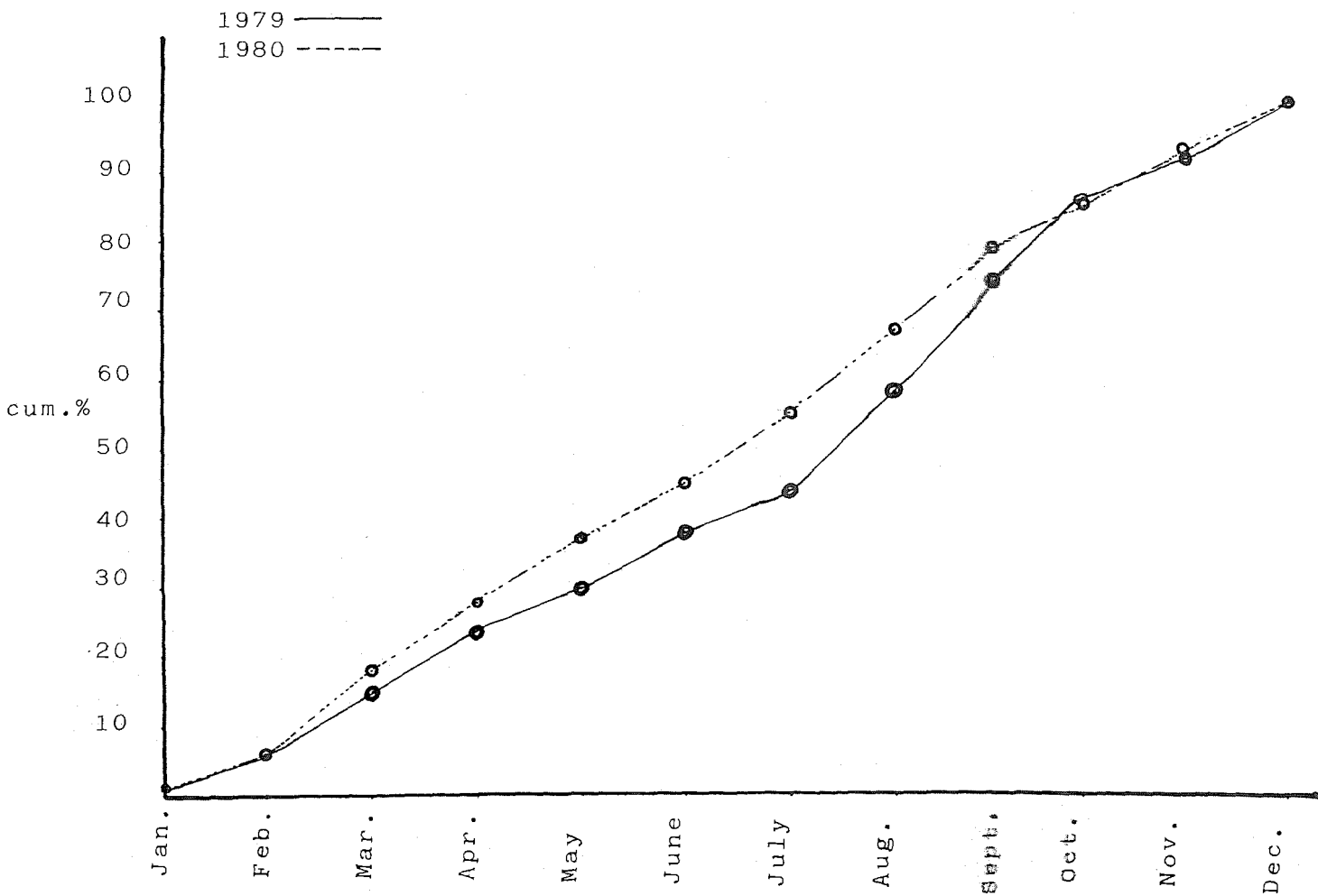


Fig 4 the Nile & El Nuba Lake  
The cumulative percentage distribution of production

Egl

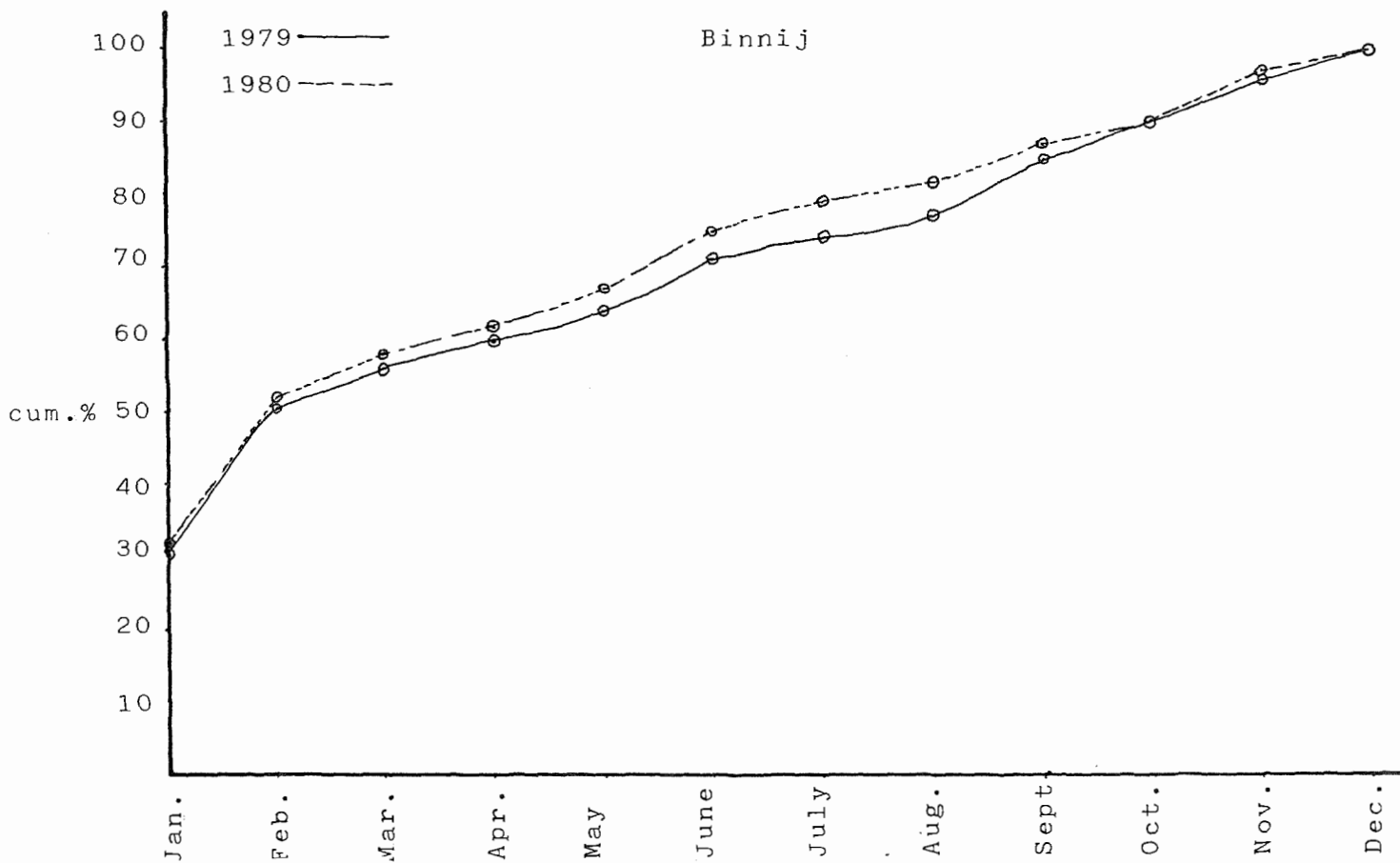
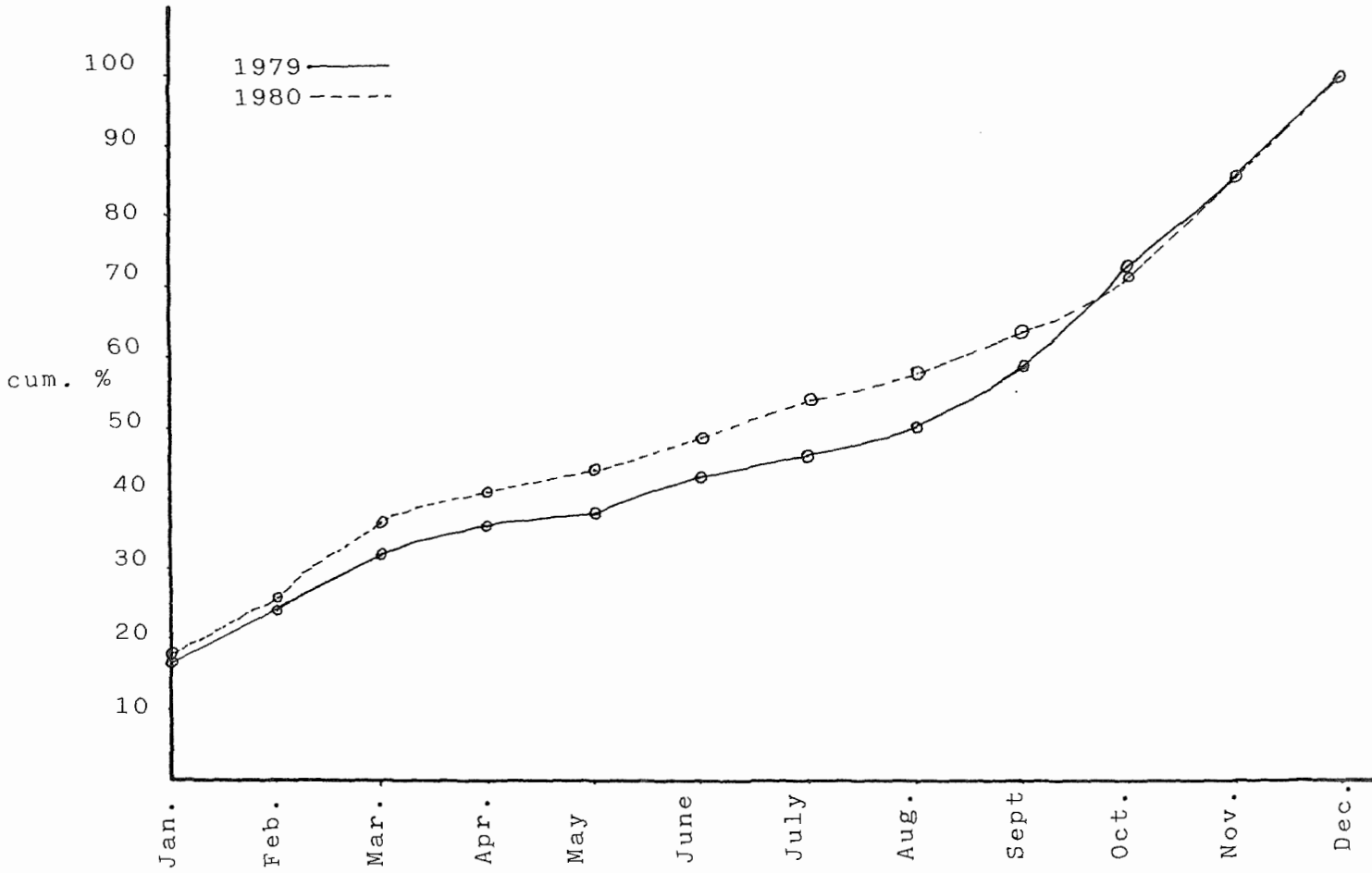


Fig 5 The Nile & El Nuba Lake  
The cumulative percentage distribution of Production

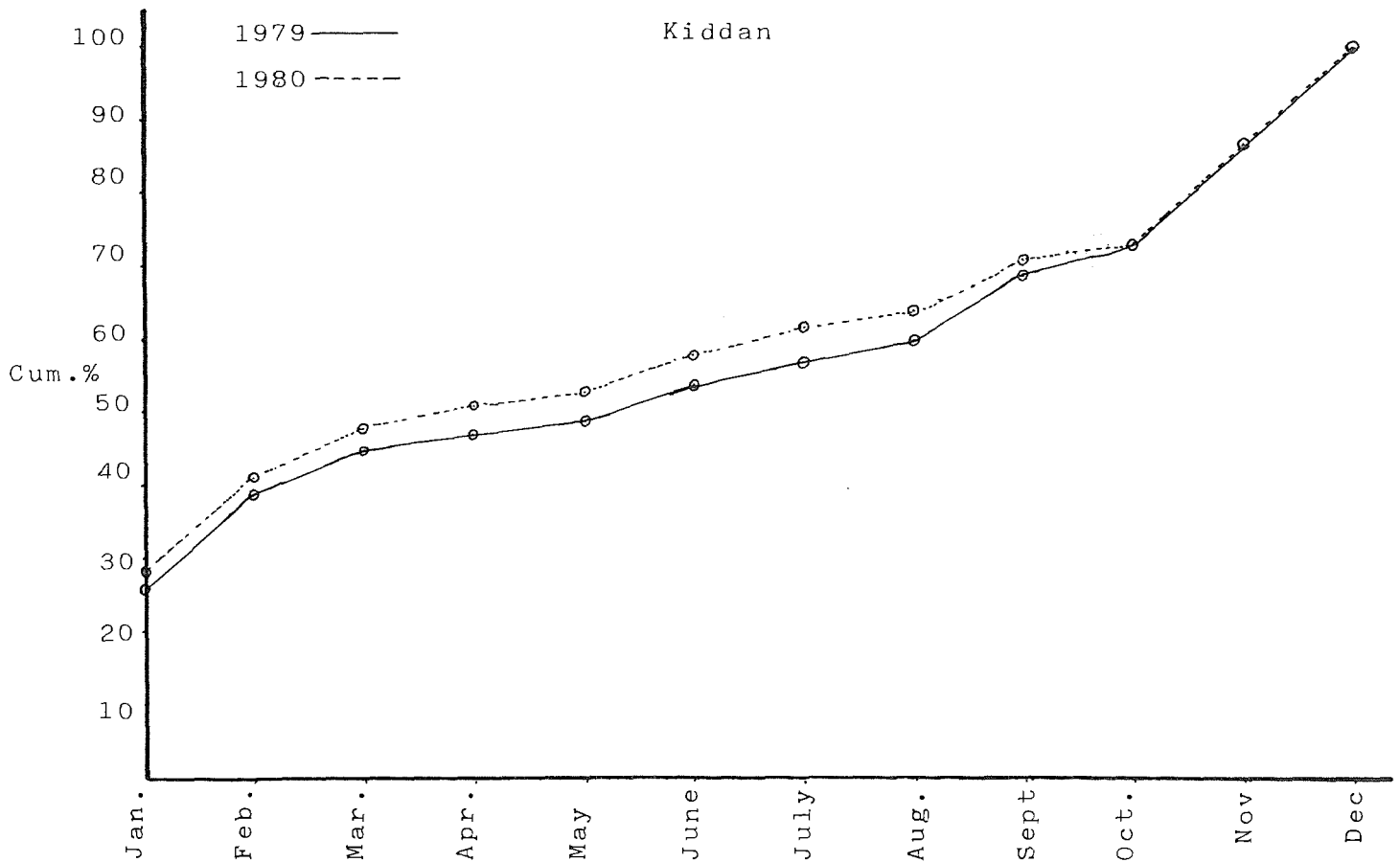
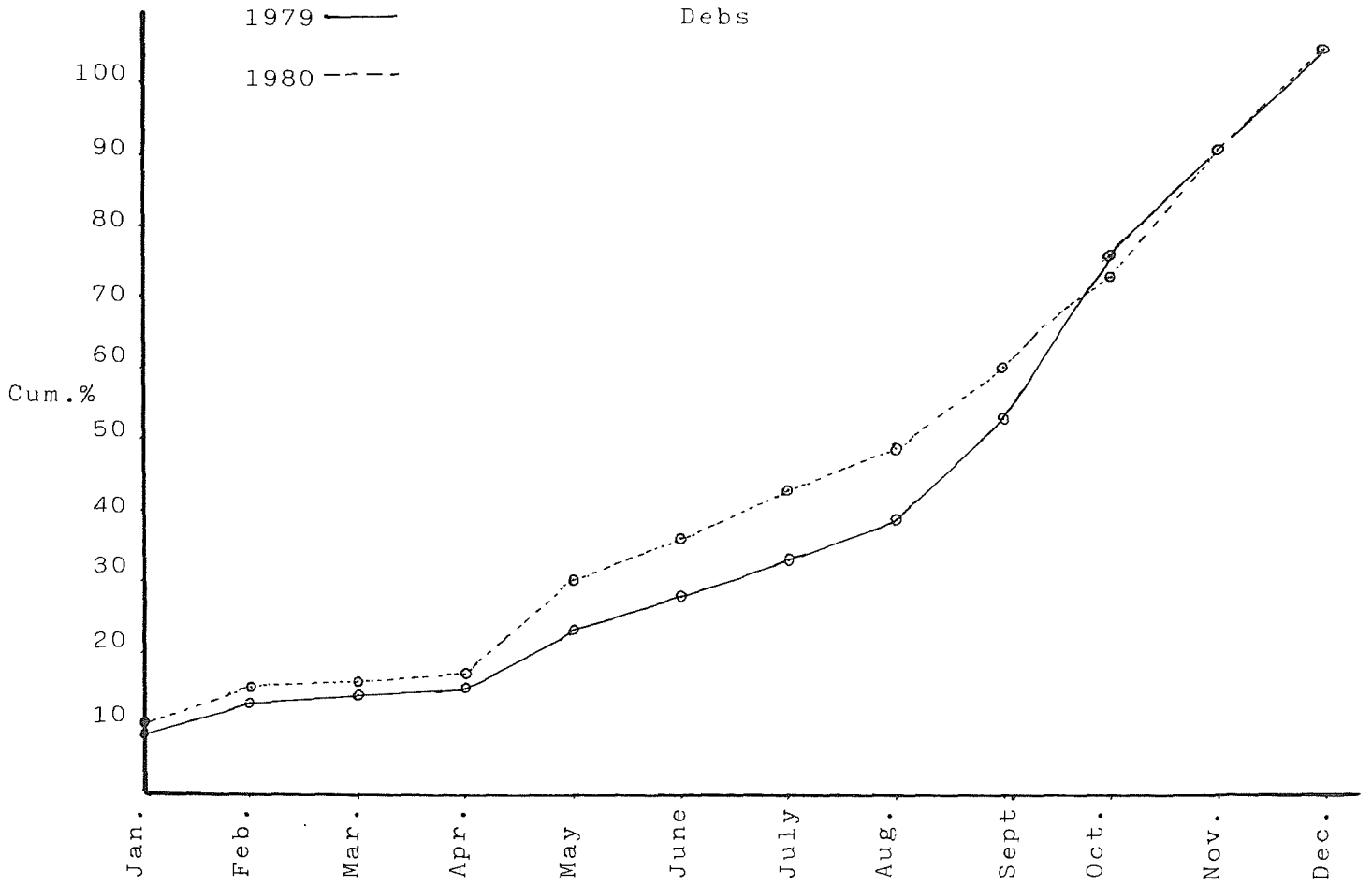
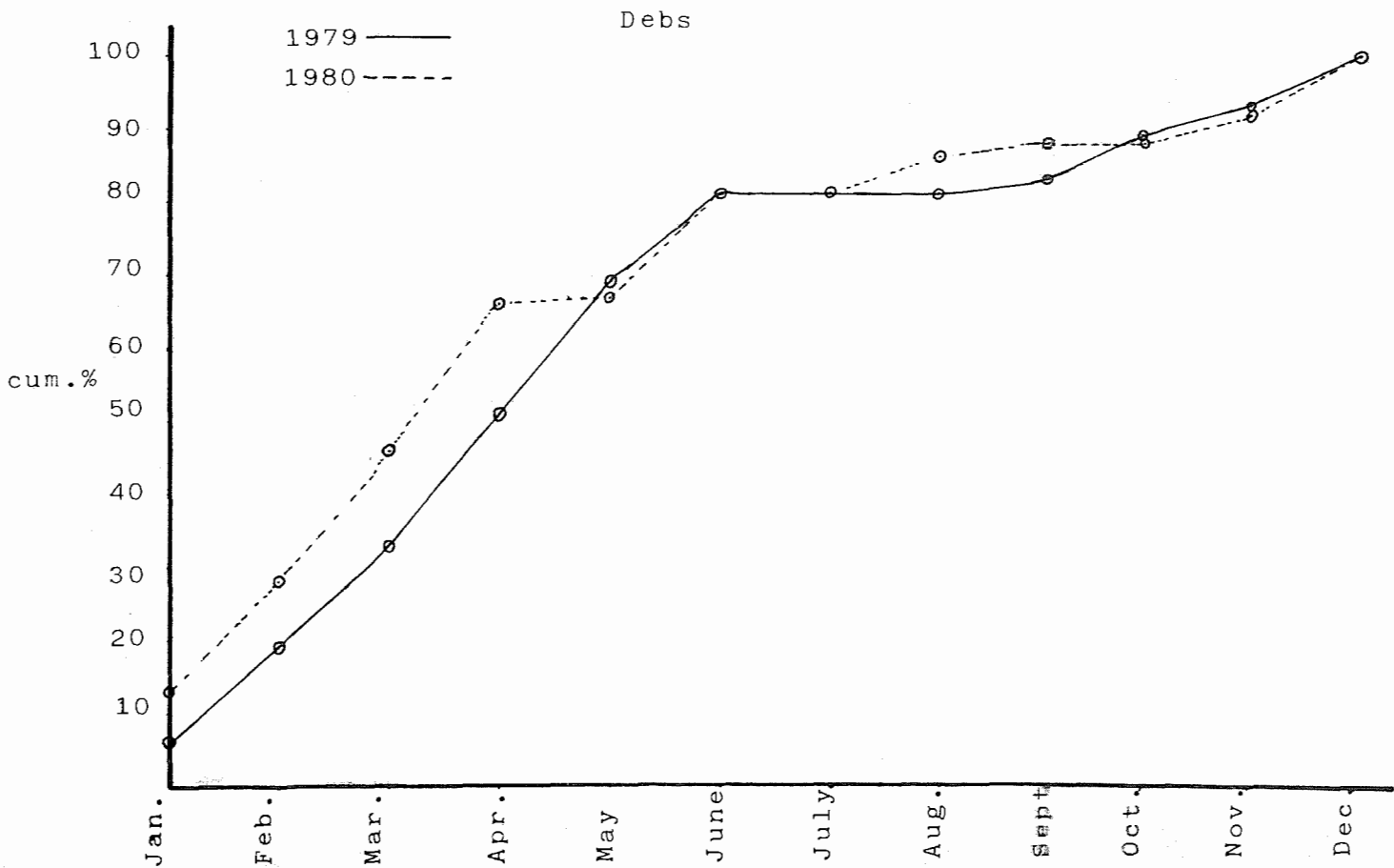
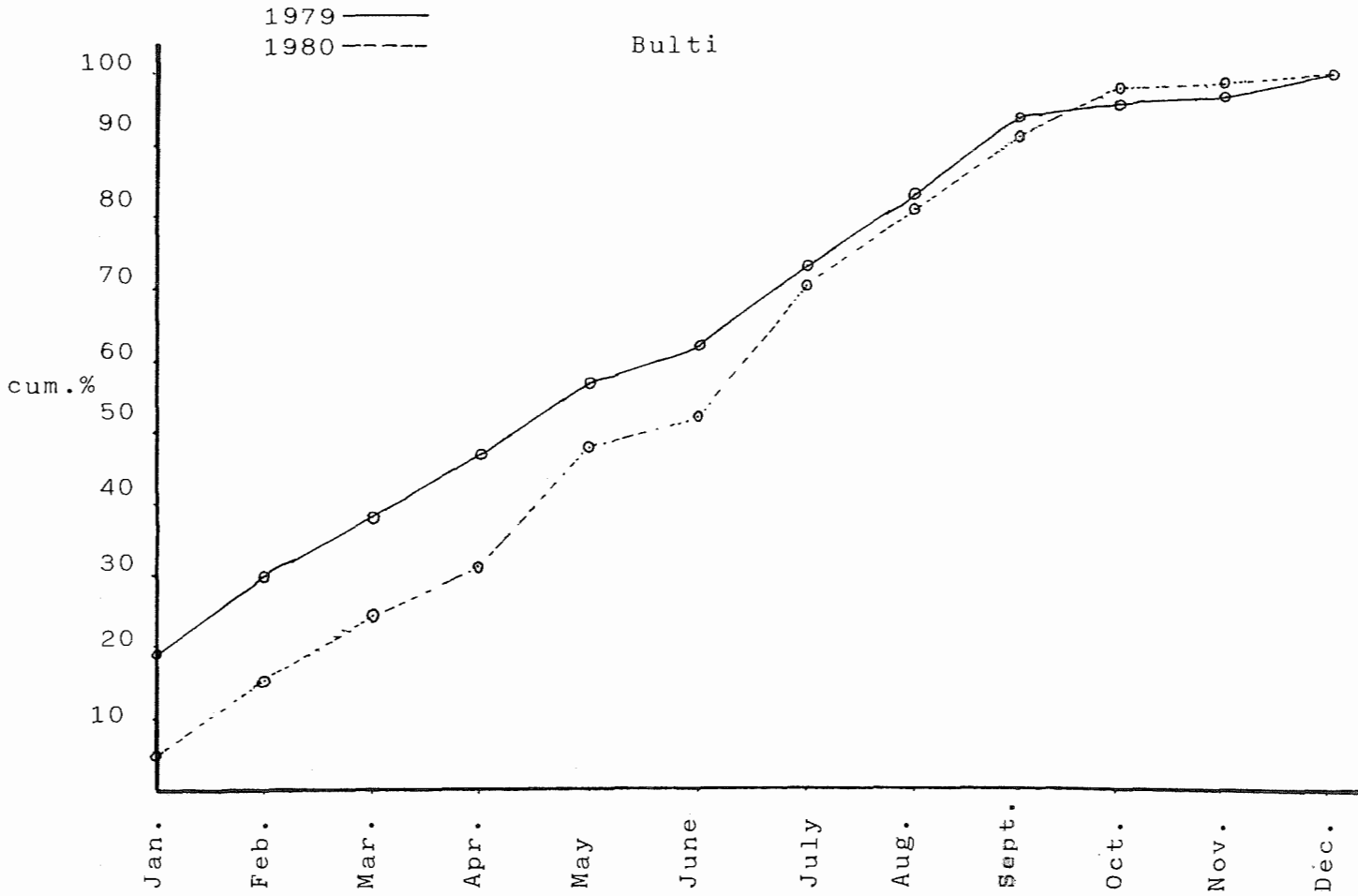


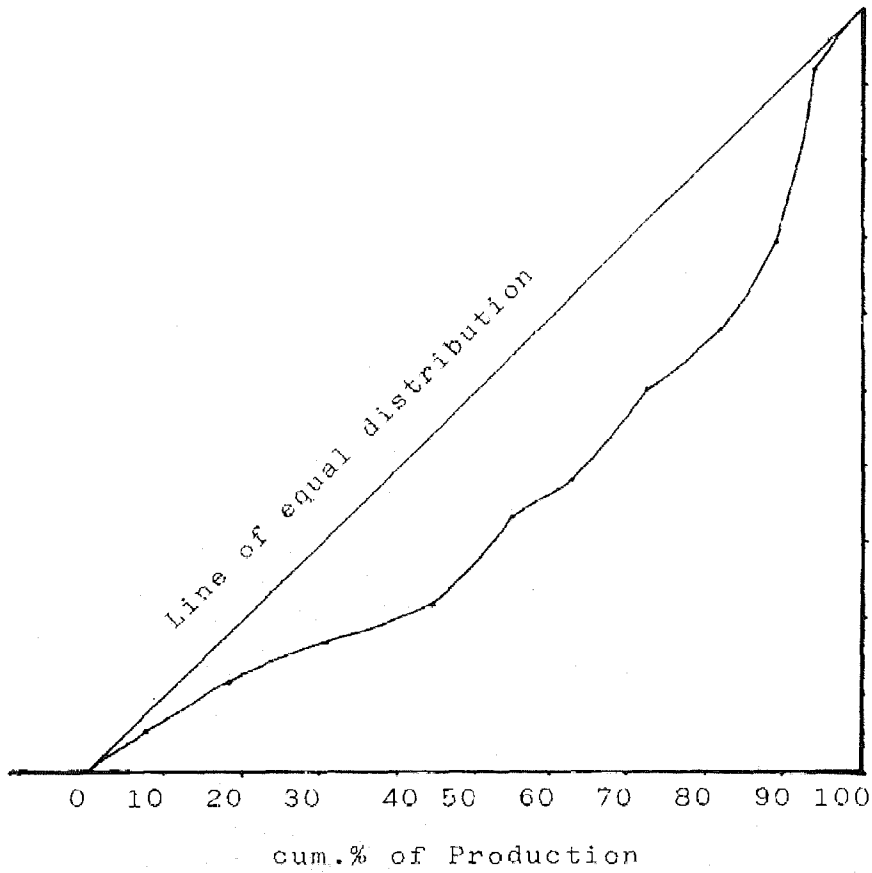
Fig 6 The Blue Nile  
The cumulative percentage distribution of Production





The Blue Nile  
Fig 7 Lorenz Curves

1980-----



1979-----

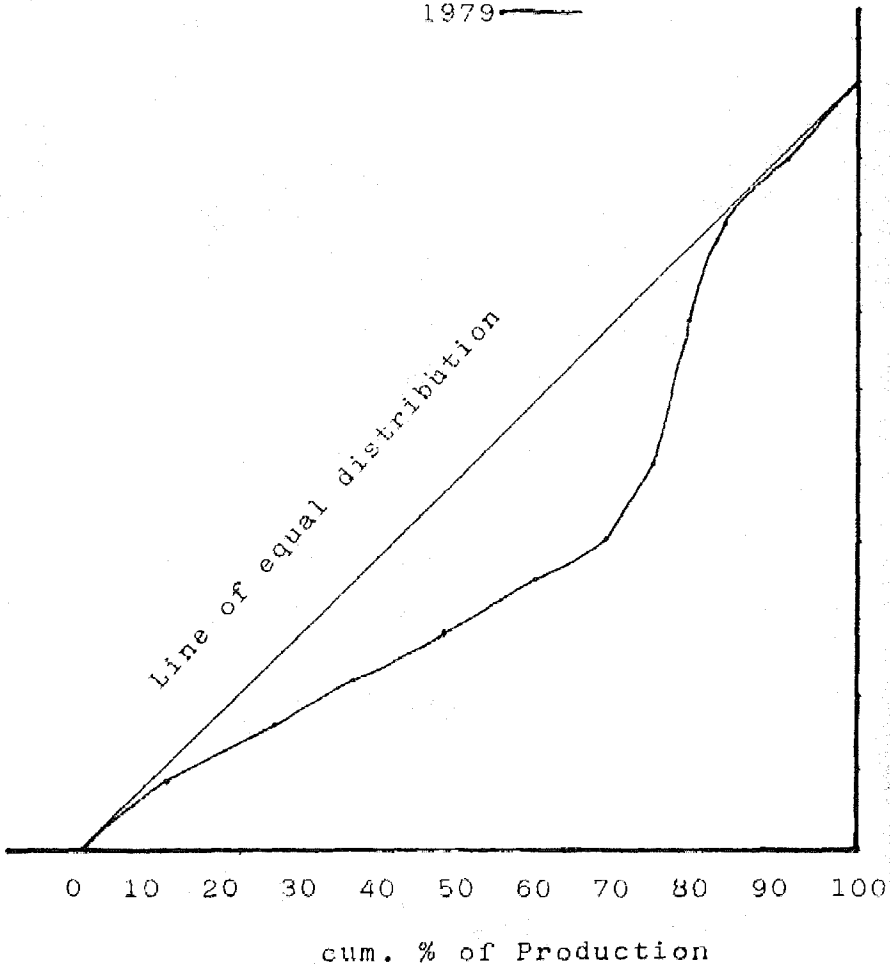


Fig 8 the White Nile  
The cumulative percentage distribution of Production

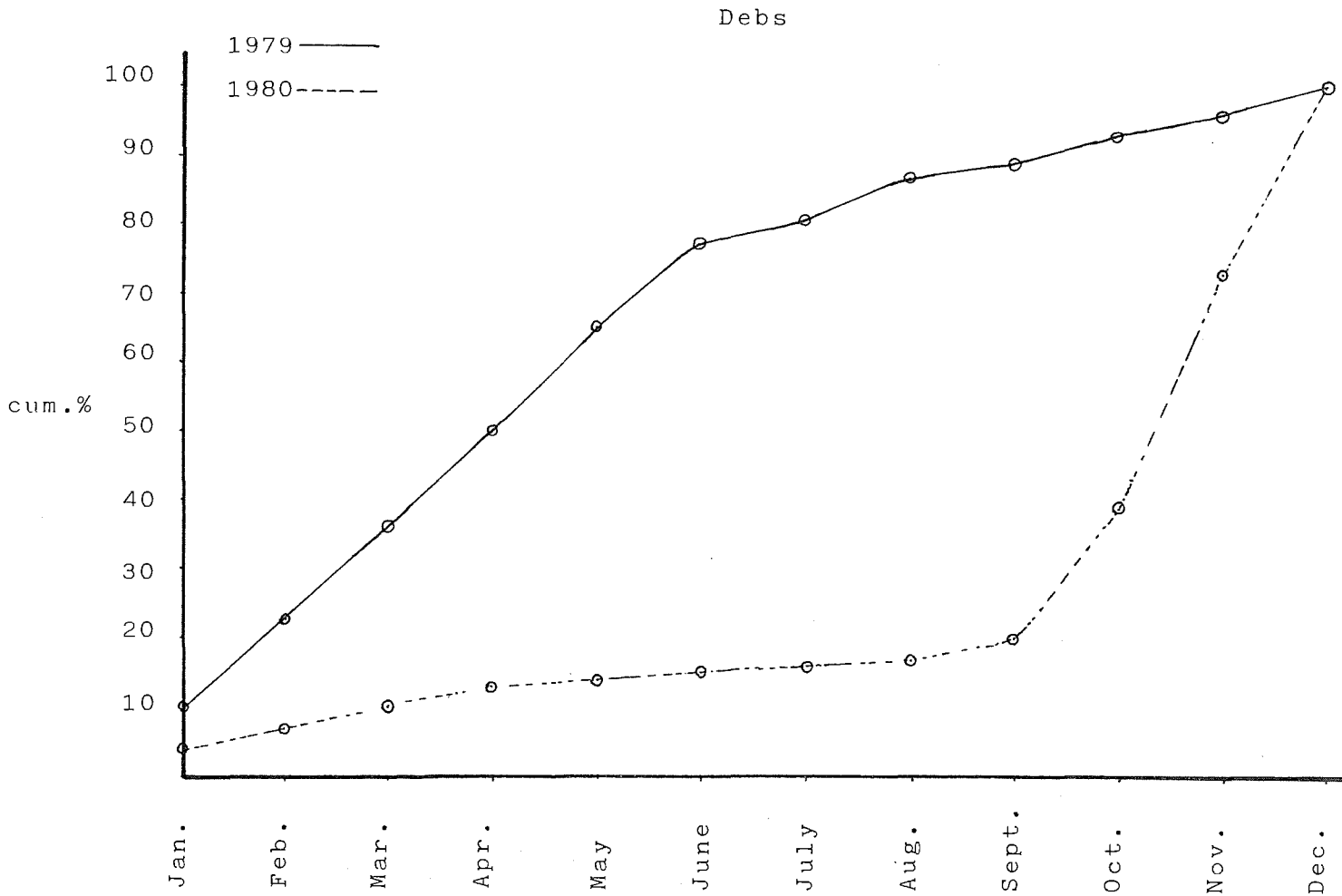
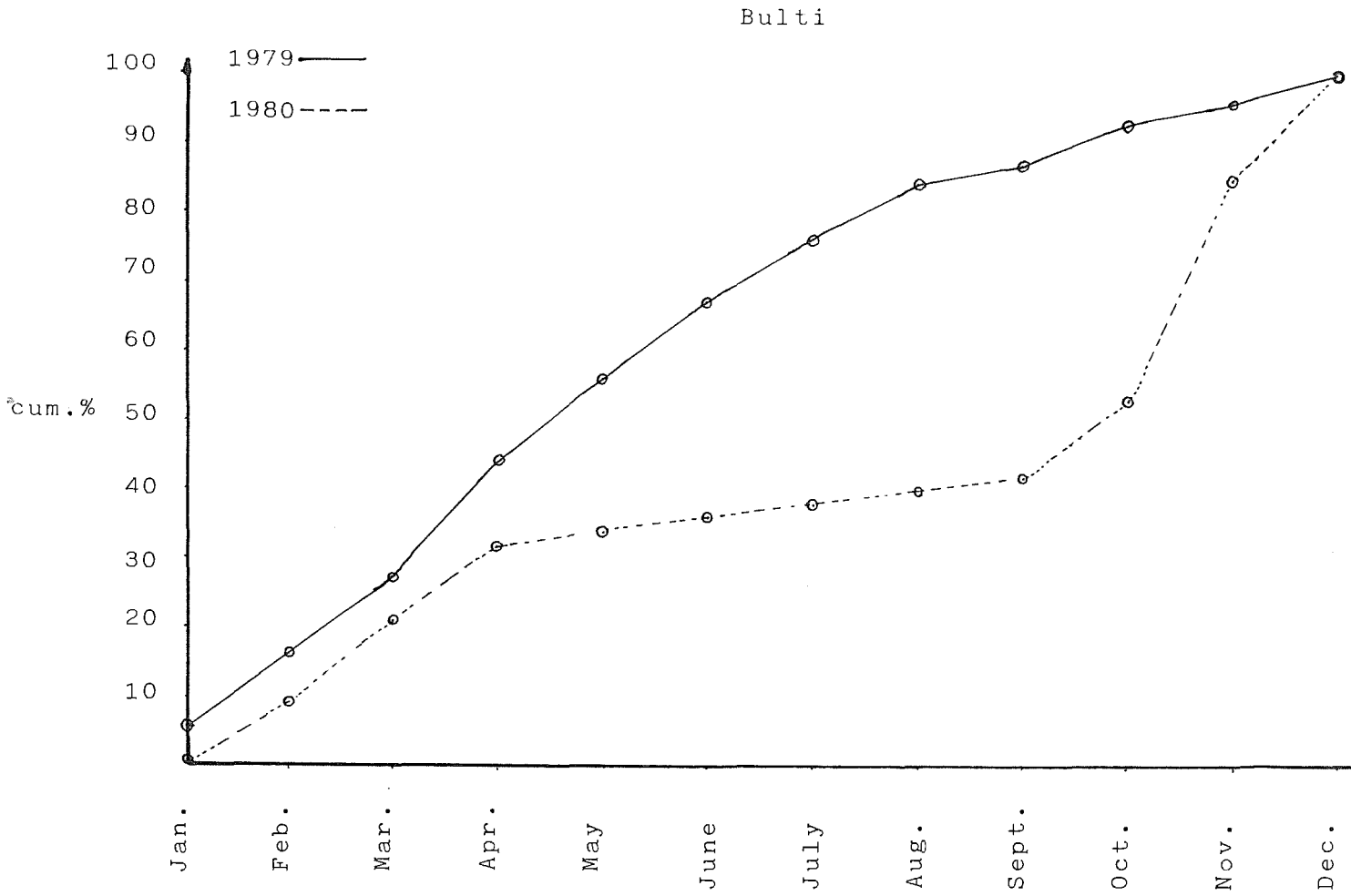


Fig 9 the White Nile  
The cumulative percentage distribution of Production

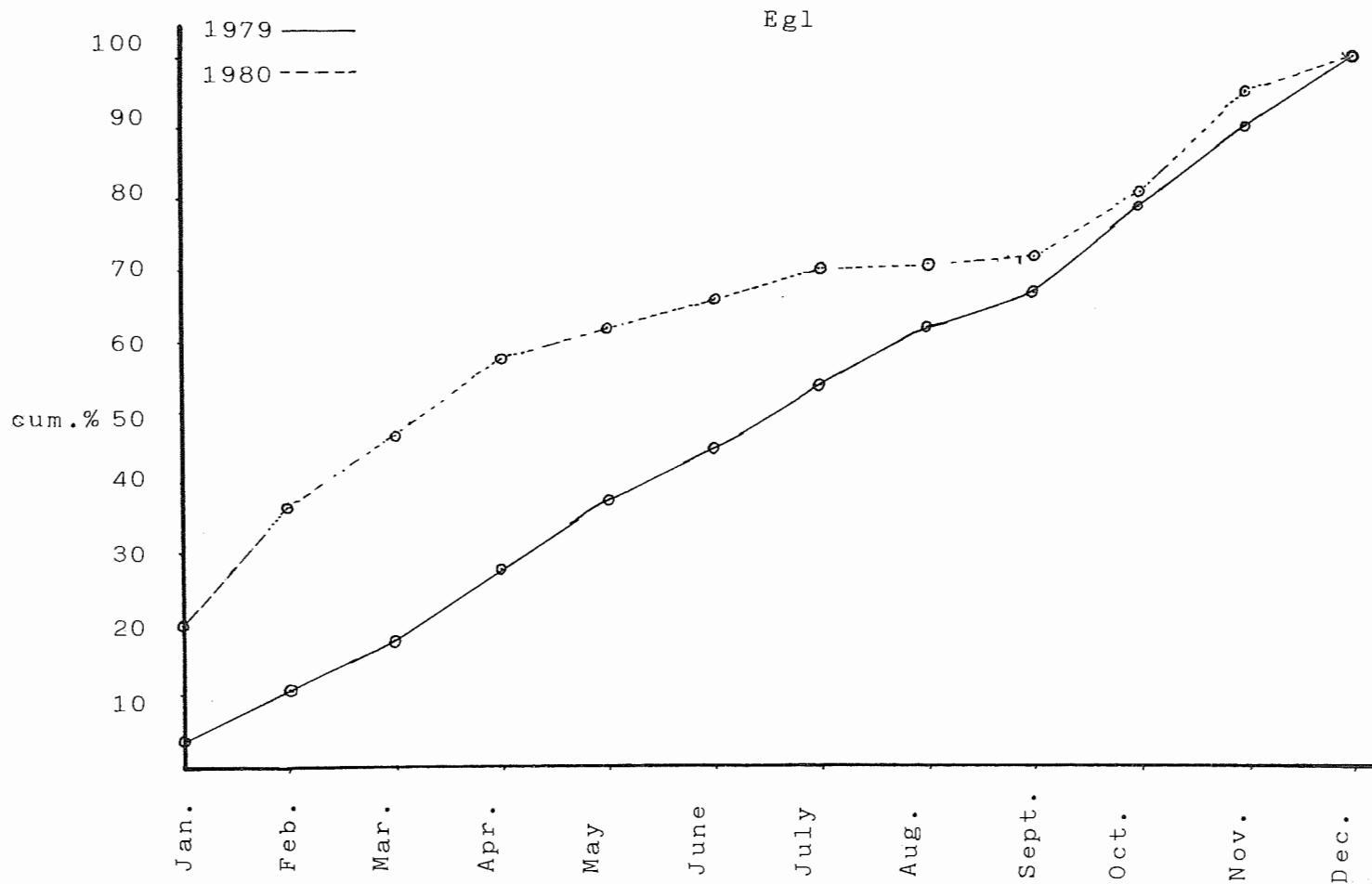
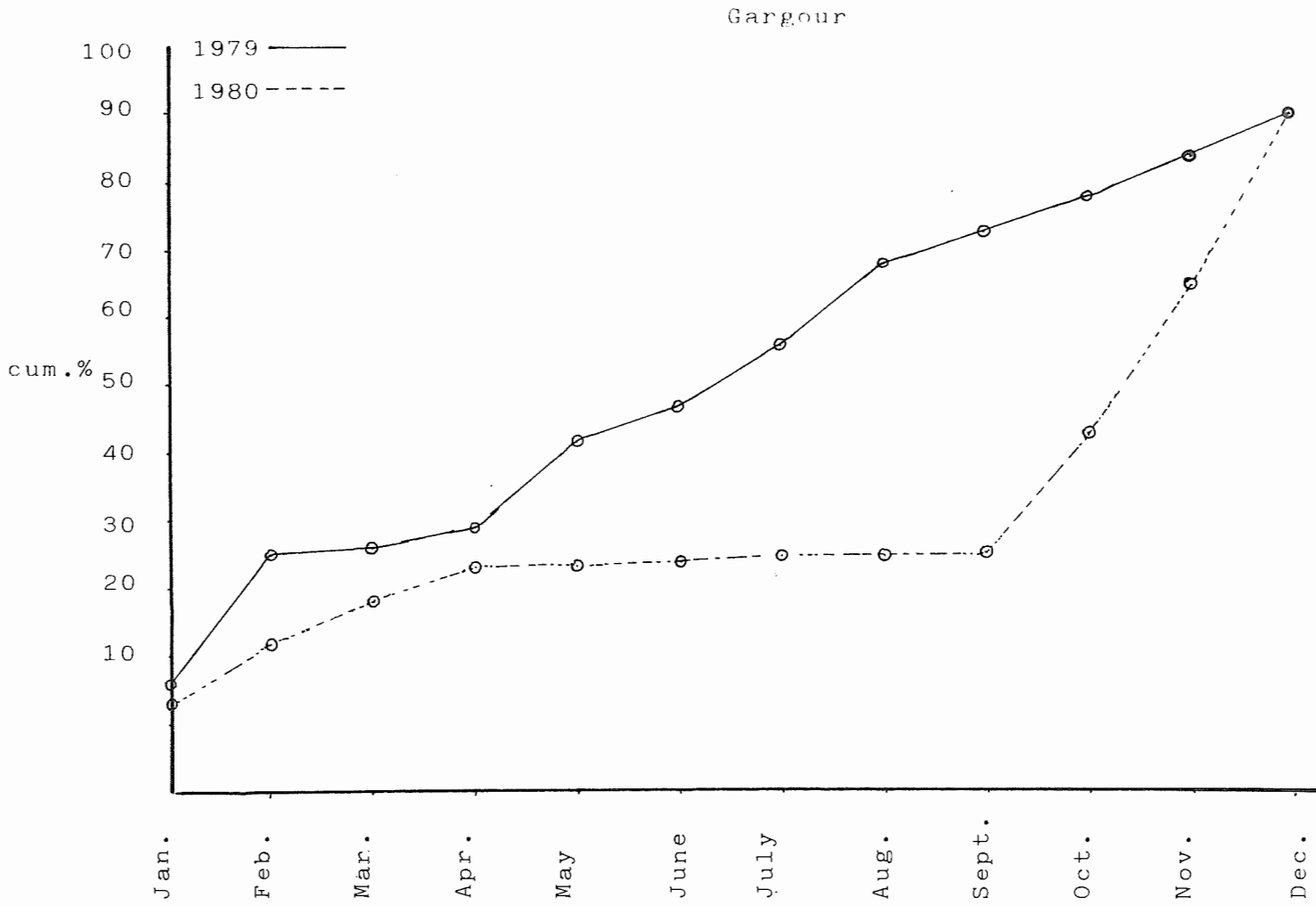


Fig 10 The White Nile  
Lorenz curves

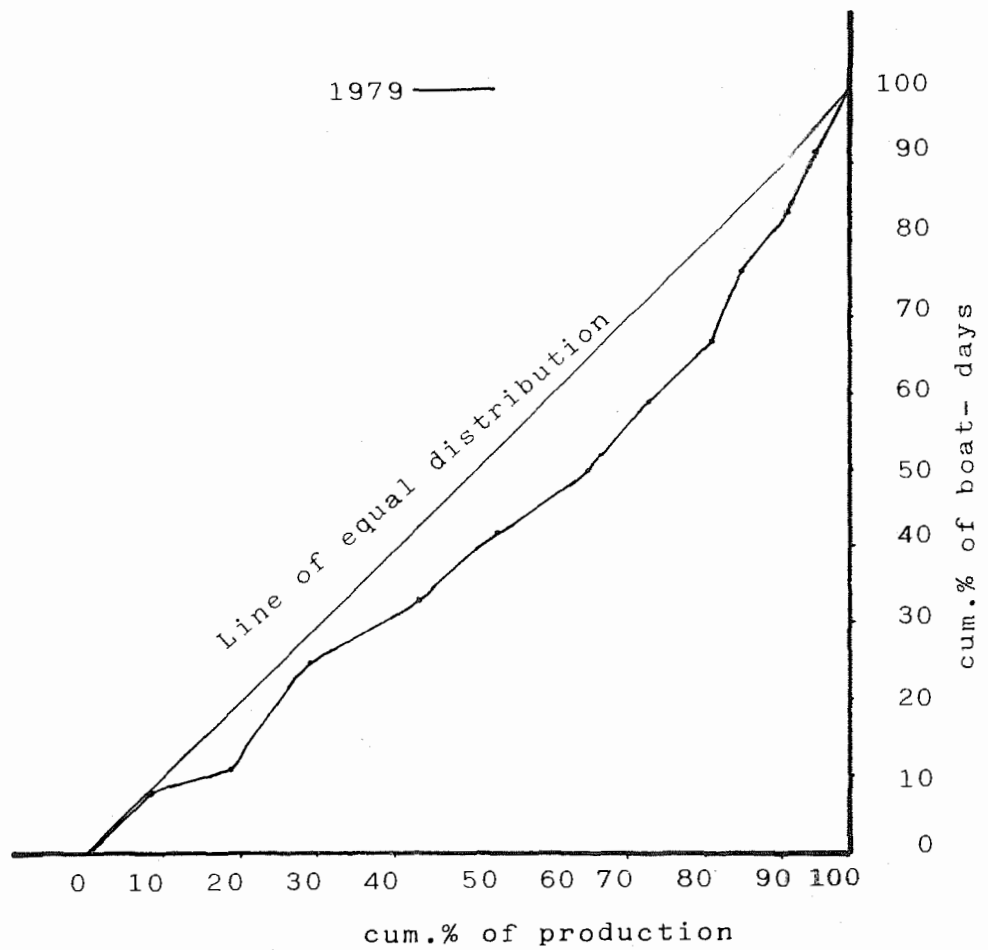
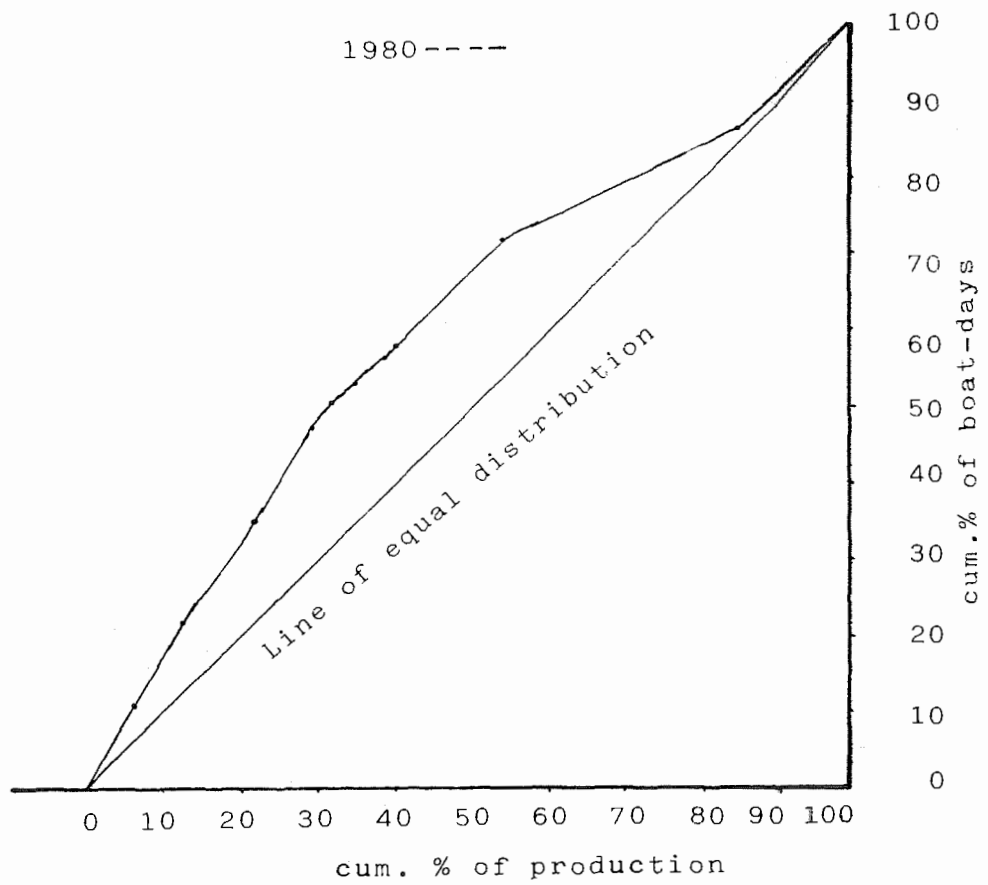


Fig 11 the Marine Waters  
The cumulative percentage distribution of production

