

THE SOUTHERN SUDAN
A STUDY IN RURAL LAND USE DEVELOPMENT

By

Dr. ZEIN EL DIN ABD EL MAKSOU

ABSTRACT

The paper attempts to throw some lights on the potentialities of rural land use development in the Southern Sudan. It is a virgin area although nature has granted it various rich resources. I tried through the analysis of the geographical environment and the problems which face the development to evaluate the possibilities of rural land use development and draw a new plan for such a development.

INTRODUCTION :

Rural development is a very matter in our present world, which suffers from shortage of food. Many hundreds of millions of people suffer from malnutrition and hunger and face the danger of death. Hence, rural development has become very urgent to ensure producing more food.

The South represents a virgin area, which can with its great potentialities play a great role in solving the problem of food shortage locally and universally. The South occupies 250,215 sq. miles (nearly 150 million feddans). It lies between, latitude 3° 36' N. at Nimule and latitude 11°45' N. at Renk. It includes three provinces⁽¹⁾ Upper Nile Province⁽²⁾ with an area 94, 119 sq. miles, Bahr el Ghazal Province with an area 85 590 sq. miles and Equatoria province with an area 70,566 sq. miles⁽³⁾.

1) The Sudan is divided into 10 Provinces.

2) Abbreviations used : U.N.P. Upper Nile Province
B.G.P. Bahr el Ghazal Province
Eq. P. Equatoria Province

3) Report on natural resources and development potential in the Southern Provinces of the Sudan Khartoum 1954, p.1

According to the 1955/56 population census, the total population of the Sudan was 10.263.00 from which 2.753.000 live in the south.⁽¹⁾ From the total population of Sudan which is estimated in 1973 at 16.500.00, the South includes 4.012.000⁽²⁾.

Regarding its economy, the South is still largely dependent on subsistence economy ranging from the migratory and pastoral economy of the Nilotic and Nilo-Hamitic⁽³⁾ tribes, to the economy of those who are dependent almost a new period of development (Rural Revolution) in response to the new government policy after the Addis Ababa Agreement of 1972, which lasted nearly 17 years.

Physical Environment :

The South as a whole forms a major part of an irregular shaped basin surrounded by elevated lands. The water which is drained into the River Nile breaks into the basin by river Sobat, Bahr el Ghazal which are the main tributaries of the River Nile in the Southern Sudan.

The South may be divided into three various physical regions :

1^o) **The Central rainland region :** This region occupies the Northern part of the South. It is a flat plain with some sand dunes around the white Nile. The average slope is very gentle towards the North as indicated by gradients of the white Nile North of Malakal.

Regarding its climate the region, as the other regions, lies wholly within the tropical region. The monthly temperature averages are not less than 18°C, for example in Malakal the coolest month (January) has a mean temperature of 27,2°C (81° f.) and the hottest month (May) is 32,2°C (90 f.)⁽⁴⁾ The mean annual rainfall varies from 500 to 800 mm., in a rainy season varies from 5 to 6 months. The percentage probability of receiving less than 500mm⁽⁵⁾ of rainfall annually reaches 5% only. This means that rain cultivation may be practised with a reasonable degree of certainty.⁽⁶⁾

(1) تعداد السكان الأول في السودان ١٩٥٦/٥٥ عشرون حقيقة وحقيقة ص ١٥

(2) A new outlook in Agricultural, Forestry and Animal wealth in the Southern Region. p. 3.

3) Nilotics include Dinka, Nuer, Shilluk and Anuak but Nilo-Hamitics includes the Murle, Boya, Toposa and Iatuka.

(4) Barbour K.M., The Republic of the Sudan, p. 49.

(5) Mr. Allan a former director of the department of irrigation in the Sudan believes that a total annual rainfall of 500 mm may be regarded as sufficient for rain cultivation (Mahdi el Tom, The Reliability of rainfall over the Sudan, p. 29)

(6) Ibid P. 30

TABLE I. Rainfall at some stations⁽¹⁾

A. — RENK 11° 45' N. (mm)												
J	F	M	A	M	J	J	A	S	O	N	D	Year
Tr	Tr	1	3	28	74	117	155	95	54	1	Tr	528

B. — MALAKAL 9° 33' N. (mm)												
Tr	Tr	7	21	102	109	149	167	144	82	6	Tr	787

The natural vegetation is tall annual grass alternating with thorn woodland. The Soil being alluvial heavy alkaline clays and loams which crack during the dry season. The nutrient status is high and erosion is practically absent.

- 2^o) **The flood region :** This region includes the rest of U.N.P., the eastern and north-eastern parts of B.G.P. and parts of north-eastern parts of Eq. P. It is a very flat plain, the average slope is very gentle as indicated by the gradients of Bahr el Gebel. For example the average gradient is 27.3 cm/Km from Rejof to Mongalla and 5.5 cm/Km from Jonglu to Zerof. The Sudd⁽²⁾ covers a great area of this region which varies from 8.300 to 12.000sq. Km. The river Nile loses in this region more than 14 million cub metre annually⁽³⁾

Regarding its climate, the region receives annually rainfall varies from 750 to 1000 mm. in a rainy season varies from 5 to 7 months.

The percentage of probability of receiving less than 500 mm. reaches zero.

TABLE 2. Raifall at Bor⁽⁴⁾

J	F	M	A	M	J	J	A	S	O	N	N	D	Year
5	6	36	79	107	120	142	132	143	119	31	4	905	

1) Rainfall average (1941-1970) Sudan Meteoroligcal Department 1973, P. 1

2) The Sudd means permanent or semi-permanent s:amps °here papyrus pre-dominate

3) صلاح الدين الشامى - السودان دراسة جغرافية ، ١٩٧٣ - ص ١١٦

4) Rainfall averages. Ibid, p. 2.

Natural vegetation varies from open grass land with some areas of Acacia woodland to papyrus which grows in the Sudd areas.

Soil is also alluvial heavy alkaline clay and loams, but most of it is Flooded.

3°) **The Equatoria region** : It includes the highland areas which occupy the southern parts especially in the Eq. P. The general elevation varies from 300 to 1000 metr. It includes the ironstone Plateau, the Green belt, Acholi mounts and the south eastern hills and mountains⁽¹⁾. Regarding its climate the mean temperature in the hottest months, February and March being 29°C (86°f.) and in the coolest month (August) being 25.3°C (77,5f.) at Juba⁽²⁾.

The mean annual rainfall varies from 900 to 2000 mm. and in some places as Gilo in Imatong mountain, it reaches 2261 mm.⁽³⁾ in a rainy season varies from 7 to 11 months.

TABLE 3. Rainfall at some stations⁽⁴⁾

Wau 7°42' N. (mm)												
J	F	M	A	M	J	J	A	S	O	N	D	Year
I	5	21	75	141	172	205	229	171	141	14	Tr.	1175
Nzara 4° 39' N. mm.												
10	22	97	164	190	178	173	210	214	177	73	1	1510
Miridi 4° 55' N. mm.												
11	12	75	155	224	199	181	270	168	147	67	19	1540

1) Report on natural resources, op. cit., p. 3

2) Barbour K.M., op. cit., p. 51

3) A ne° outlook, op. cit., p. 5

4) Rainfall averages, op. cit., pp. 1-2

Regarding the natural vegetation the luxuriant broad leaved woodlands with gallery forest predominates in this region.

The soils are lateric. These soils are being usually acidic and in many parts erosion is serious. Hence it is poor and is characterised by free drainage⁽¹⁾. A large area of this region is infested by the tsé-tsé fly which causes trypanosomiasis (sleeping sickness). This disease renders it impossible for livestock to survive there⁽²⁾

From the foregoing show, we see that South possesses various natural resources which encourage the rural development.

The present rural land use and its problems :

The Southern Sudan is still virgin and primitive. The livelihood sources of the population are agriculture, cattlerearing, fishing and forestry. Generally this rural land use can be described as a subsistence use where a family grow no more than its demand of food.

1 — AGRICULTURE :

Agriculture is the main occupation. Shifting and Harig cultivation are the main agricultural practises in the Southern Sudan. Shifting cultivation is the common method of crop growing all over the South especially in western Eq. P. and in most of B.G.D. This migratory system is a good response of the poor soil of these areas, but erosion is common.

Harig cultivation is practiced mainly in grassland areas especially in shilluk area ³⁾. It is an expensive means of crop production and is useful because pests and insects are killed by fire and the ashes which return to the soil provide nutrients for the crops.

In recent years mechanised forming is used in some areas as governmental schemes

1) A New out look, op, cit., p. 15.

2) Torayah A.S., A geographical assestment of health problems and disease in the Sudan, p.2

3) Barbour K.M., op. cit., p. 240

4) A new outlook, op, cti., p. 17

Owing to these systems, food crops (cereals and roots) predominate. The cereals include dura (Sorghem Vulgara), eleusine, maize and some rice. The root crops include cassava, sweet potato and yam. All these crops are grown for domestic consumption. Dura is the most important. It is the staple food for the most inhabitants of the South except the Zande among whom Cassava and eleusine predominate. Dura is grown mainly in the Central rainland especially in the Renk district in which 250.000 feddans have been developed under dura in the season 1973/1974⁽¹⁾. It is also grown in separated patches in Eq. P. and B.G.P.

Euleusine Coracana which is known as finger Millet grows by Jur around Wau and along the North-east margin of the Ironstone plateau and in Zande area. It tends to replace Sorghum in damper condition ⁽²⁾.

Maize represents the major diet in the Green Belt. It is also grown extensively on the river banks and toiches⁽³⁾ especially along Bahr el Ghazal between Juba and Bor and is also the common crop of Sobat river rain Nuers.

Rice is the less cultivated crop. It is grown in small quantities in the Green Belt, Zande, Yei, Maridi and in Toiches at Malakal-Nasr-Wang.

Root crops are very important in the lateric soil zone where rain is heavy especially in the Green Belt and Zande area.

Cassava⁽⁴⁾ is grown all over the Eq. P especially in Maridi area, where it forms the major part of the diet.

Sweet potato is grown all over the Eq. P. especially in Maridi area, where it forms the major part of the diet.

Yam is also grown well in small quantities in most of the Equatorial region.

Beside these food crops, the inhabitants cultivate oil seed crops, especially ground nut which flourish mainly in Eq. P. and B.G.P. (light soils) but sesame grows well in the Central hills especially in Morue area.

1) Ibid, p. 26

2) Davies H.R.J. Tropical Africa, an atlas for rural development 1972, p.38

3) Toiches mean the flood plains of rivers and watercourses and exposes by the fluctuations in water-levels.

4) Cassava was introduced in Africa from Brazil by Portuguese about 1600. (Davies H.R. Ibid, p. 45 p. (annex)

As the civil war ended, the government set a programme for increasing the production of food to face the present shortage and hence the cultivated areas in 1973/74 are estimated as follows :

**TABLE 4. The estimated cultivated areas during 1973/74
(in feddan)**

Province	Dura	Maize	Cassava	Eleusine (finger- millet)	Ground nut	Sesame
Eq/P.	170000	36000	68150	92000	85000	—
B.G.P.	120000	6800	14500	300	33000	26500
U.N.P.	347000	1030	—	—	—	32500
Total	637450	44430	82650	92300	118000	59000

Cash crops sector plays a minor role in the economy of the south, although the natural environment is suitable for producing a variety of such crops. This state is caused mainly by the shortage of Capital and the remoteness of the South. This sector which is still in the experimental stage includes cotton, coffee, Kenaf, tobacco, tea, sugar, Cane and pine-apple.

Cotton is the only non-food crop which is grown in a small scale holders. It is grown in three areas :

- a) The plains around the white Nile which are irrigated by the pumping system.
- b) Zande scheme which started in 1945-46 in Yambio and Maridi districts.

The cultivated area reached 30,788 feddans in the season 1961/62, but the production is completely stopped in 1964/65 owing to the civil strife. But after May Revolution (1969), the scheme is restored and the cultivated area in 1971/72 was about 2500 feddans.

c) The East bank of Bahr el Gebel at Mongalla and Torit.⁽¹⁾

Coffee is grown in small areas by local inhabitants under the supervision of Haggar Compagny. The introduction of coffee cultivation to the South started in 1935, but it was not until 1939 that expansion in production occurred. This was due to the replacement of Arabia coffee by Robusta species⁽²⁾.

The amount of coffee produced reached 180 tons in 1954. But the setback which occurred in 1955 for security reason cause a collapse in the production which reached only 2 tons in 1969⁽³⁾ The production began to flourish again after 1969 and reached 62 tons in 1972/73 and is estimated to reach 70 tons in 1973/74⁽⁴⁾.

Attempts to grow tobacco and tea succeeded but production virtually stopped from 1964.

Beside these crops there are some tropical fruits like mango, pineapple, banana which grow wildy and widely in the Green Belt at Yambio, Maridi and Yei districts and also in B.G.P. especially around Wau⁽⁵⁾.

From the foregoing survey, we see that the South can produce many different cash crops. The areas cultivated however are very limited and in some cases the production has stopped. Great opportunities for Commercial production can be exploited if transport and capital problems are solved.

2 — ANIMALS USE :

Grazing represents the second main occupation next to agriculture. Domestic livestock, their dearest possession, are kept by almost all the inhabitants of the South (75%) except those living in areas infested by the tsé-tsé fly. The livestock population is estimated in 1970 approximately at 4.362.000 of cattle, which constitute most of the animal wealth. More than half of the cattle is concentraed in B.G.P. (2.240.000) and more of he third in U.N.P. (1.584.000) and the rest is in Eq. P.

1) A new outlook, op cit., P. 66.

2) Robusta Coffe grows wildly in some areas in the South as in Lotti and Talanga forests in Acholi area. Report on natural resources. Op. cit., p. 97)

3) Mirghani A. Mirghani, A note on horticulture development in the Southern Sudan, p. 3

4) Progress report on agricultural development. p. 4

5) Mirghani A. Mirghani, op. cit., pp. 3-4

As a whole cattle production is low, for example Nilotic cow gives only around 1 to 5 lbs of milk per day and calf mortality is high

Beside the cattle there are 1.845.00 sheep and 2.837.00 goat⁽¹⁾.

However the South possesses these great numbers, livestock plays only a minor role in the economy of the South. This is due to some factors; firstly the bribesmen tend to keep large numbers of cattle as a sign of prestige. Cattles are reared for their own sake and numbers count for more than quality of beast.

It is said that a Nilotic Dinka's way of spending a pleasant afternoon is to sit and watch his favorite cow.⁽²⁾

Secondly it is used as a substitute for money in martial and legal dealings. Cash is still of no great importance in an economy which is largely one of subsistence. The reluctance of the inhabitants to sell their cows is at present a factor which limits the cattle trade and causing overgrazing. Therefore the number of cattle is increasing at a high rate, while neither the area of grazing land increased nor the quality of the pasture is improved. We know that the value of the Savanna grass for grazing is high only during the early part of the wet season, but this value of the season. At the same time animal management is based on a migratory system, which is determined by environmental factors such as the degree of flooding, the scarcity of dry season grazing the water supplies and the prevalence of the tsé-tsé and other biting flies. For example the Dinkas graze their animals during the rains in the open grassland adjacent to their villages, and move towards the riverian toiches in the dry season and utilize them until the onset of next rain⁽³⁾. The blood and milk from their cattle are the basic elements in their diet⁽⁴⁾.

At the same time fisheries resources in the South are considerable and in many areas fish is of vital importance in the subsistence economy of the inhabitants and at the same time, it is considered as one of the best potentials for a quick economic development.

Fishing is practised in all the water courses, but the most important fishing areas located in the Sudd area. It is not a specialized craft but is widely practised by men, women and children. There are many species, but the principal species available in large quantities and suitable for curing

1) A new outlook, op cit., p. 87

2) Davies H.R.J. op. cit., p. 30

3) Report on natural resources, op. cit., pp. 17-20

4) Davies H.R.J. op. cit., p. 30

include *Tilapia spp* (Bulti) and *Hererotis niloticus* (Nok). The South produces nearly 75.000 tons (1970) annually which represent 75% of total production of the Sudan. Crocodile are also caught from Bahr el Arab and Bahr el Ghazal⁽¹⁾.

The first attempt to commercialize fishing was in 1951 at Juba which was the beginning of trade with Zairé in sundried salted fish. The high prices paid for sundried salted fishes has stimulated the expansion of this trade. The exported tonnage in 1963 reached in 1964, the production dropped sharply to 200 to 300 tons annually⁽²⁾

3 — FORESTRY USE :

The first attempt to commercialize fishing was in 1951 at Juba which world. The Sudan possesses nearly two-thirds of the forest resources of the Arab World and the South possesses nearly 90% of the Sudan's forest. The majority of the resources is found mainly in Eq. P. and B.G.P. These resources which are still underdeveloped include a number of valuable species but these are mixed and widely dispersed over considerable tracts of land. This nature beside the difficulty of transport represent the main problems which face the proper use of these resources. At present they are used on a small scale for producing railway sleepers, firewood and charcoal as in U.N.P. They also produce some mahogany and ibony wood of good quality as in Es. P. B.G.P.⁽³⁾

Afforestation is very limited as shown in table 5, and most of these areas were destroyed during the Civil strife.

TABLE 5. Forest Plantation by Feddans⁽⁴⁾

Year	Eq. P	B.G.P.	U.N.P.
1938	92	20	75
1948	502	149	180
1958	1258	439	654
1962	3084	677	1030
1966	—	468	410
1970	49	644	303

1) Report on natural resources, op cit., p. 21

2) A ne° outlook, op. cit., pp. 75-77

3) Report on natural resources, op.cit., pp. 22-23

4) A ne° outlook, op. cit., pp. 121

Among the minor produce are honey, lulu oil and palm oil. Bees survive in most of the South. Lulu oil is the well known shea-butter of commerce and is obtained from lulu tree in Eq. and B.G.P. The bark and leaves of some indigenous trees provide the bulk of fibres used locally in many minor industries. This include building fencing, rope for beds and chairs, for well mat and basket making. The rope industry is an important native occupation in Bor area⁽¹⁾.

THE PROBLEMS :

From the foregoing survey, it appears clearly that the rural land use is still limited and primitive and that most of land is still unused. This state is due to many problems.

Firstly is the political problem. The South was completely neglected before and after independence until 1972. This state is due to the policy of British before the independence and the civil strife which checked any programme of development. Now this unrest has disappeared owing to Addis Ababa agreement (1972) and a new period of development is expected.

Secondly, the South suffers from inaccessibility of the area and the low standard of efficiencies of the present system of communication. Almost all the roads are not paved and are rarely suitable for transport especially during the raining season where they become muddy and sticky⁽²⁾. The South passes the rainy season in complete isolation and therefore the Southerners describe it as a dead season⁽³⁾.

Regarding railways, there is only one railway track which links the South from Wau (1962) with the North and Port Sudan. At present the trains which work on this track are so slow that take usually one week and take more than this during the rainy season. We know that the shortest distance between the South and Port Sudan is 1300 Km., while here are many areas of great potentialities for development are over 300 Km. ⁽⁴⁾. Therefore transport problems impose a severe obstacle in the way of development especially transporting cash crops. To develop the South, the main roads must be paved and other new roads must be constructed. A new railway track to join Juba with Roseries is very important especially after carrying out the Jonglei Canal Scheme.

1) Rudolph Ibrahim Samuel, Economic structure of the Southern Sudan, a regional survey, p. 12

2) The Civil strife is a black spot in the history of rural development.

3) Progress report, op. cit., p. 5

4) Report on natural resources, op.cit., p. 27

Thirdly, the South also suffers from the shortage of manpower both in number and skill. The inhabitants here suffer from poor education, malnutrition and poor medical and public health services. More over, the traditional social life at the same time deepens this problems.

Fourthly, the lack of adequate capital also represent sharp problem. We know that the Capital is the masterkey to most of the problems. It is essential to finance the economic schemes and the social, medical and educational services.

Beside these human problems, there are some physical problems.

Firstly, the harmful insects especially mosquitos and biting flies, especially tsé-tsé.

Secondly, the shortage of water resources in some areas in the dry seasons, and the unrestricted flooding ovar vast areas espically in U.N.P.

Thirdly, the natural vegetation is not of good quality. Most of the grasses are coarse, unplatable and of low nutrient value which decreases the economic value of livestock. At the same time, the forest are not easily exploited because they are so mixed and unaccessible in many regions.

Generally speaking almost all these problems can be talked and solved by proper planning through suitable education technical training, improving public health, Constructing good roads and planting new species of grasses and trees.

NEW PERIOD IN RURAL LAND USE DEVELOPMENT :

With the help of World Bank, IDA, UNDP, FAO, other developed countries and through the peace and security after Addis Ababa Agreement, the Sudan began to carry out in the South a new policy for rural land use development. This policy put stress in the first stage on producing food-stuffs and encouraging pilot schemes for cash crops. Following this policy an institute for training agricultural technicians was established with the help of FAO and UNDP at Yambio. At the same time, a new variety of dura was imported from Uganda and tried in some areas at Torit, Yei, Maridi, Yambio and Yirol Beside maturing in a shorter period than the local variety, it produces a yield of 2 tons per feddan which is three times higher. To spread up the expansion of dura production mechanised farming was introduced in good crops schemes, namely the Malakel livelihood scheme which started in the season 1970/71 with a proposed area of 10000 feddans, the Ngousulugu food crop 16 miles (26Km.) west of Wau and many other

1) The Agricultural development programme, op. cit., pp. 7-10

livelihood schemes. Therefore the dura area expands rapidly so that an area of 450,00 feddans is proposed for the season 1974/75 in all the South excluding Renk district⁽¹⁾

The government has also imported new variety of Yam seeds from Nigeria (100 tons) and 25 feddans were grown in the Seed Multiplication Farm of Yei in 1974⁽²⁾.

It has also imported from Uganda Banana shoots (Plantain) which give high good quality production

It began to encourage rice production by financing some schemes such as the Jonglei rice scheme situated 3 miles (5 Km.) from Malakal. It covered an area of 500 feddans in 1974/75. Egypt has promised to provide Egyptian fellahins to teach the inhabitants how to grow rice. At the same time experiments on swamp rice carried out under the control of Chinese expert at Yirol, Shambe, Aweil and the results were encouraging. At Aweil they began a scheme of 22000 feddan of which nearly 5202 feddans were cultivated in the season 1971/72 and other 5000 were cultivated in 1972/73.

Upland rice as in Central Africa and Zaire Republics is the most suitable to the Green Belt. Trials conducted at Kagolu, Maridi and Zande gave a yield of more than one ton per feddans⁽²⁾.

At the same time the government gives some attention to cash crops such as coffee, tobacco, tea, sugar-cane, Kenaf and pineapple. Efforts are now being made to introduce and promote the production of these crops.

For rapid expansion of coffee plantation⁽³⁾, 20 feddans have been allocated at nurseries in nine centres to raise enough seedlings of coffee to meet the demand for use in the present schemes⁽⁴⁾ and for starting new ones. These nurseries have half million seedlings. The policy of the government aims also to encouraging production by small holders and so it supplies them with seedlings at only P.T. 1 per one. At the same time the government started a state farm in 1970/71 in Moridi district for the resettlement of large number of returners and for teaching the local peasants the use of technical methods in planting, this farm covers an area of 700 feddans of which an area of 130 feddans is already planted.

The local coffee growers sell their coffee beans to the Coffee Marketing Board⁽⁵⁾. The following figures (Table 6) show the anticipated acreage and the production of small holder :

- 1) Progress report, op. cit., pp. 28-32
- 2) A new outlook op. cit., P. 13
- 3) The Sudan imports 14.000 tons of coffee annually 1970, Ibid, p. 32.
- 4) The old schemes were patchy with uneven lands population
- 5) Ibid P. 46.

TABLE 6. The anticipated acreage and production⁽¹⁾

	1974/75	1975/76	1976/77
The area (feddan)	1000	1200	1630
Yield (mile ton)	680	820	1100

Tobacco is another cash crop which receives great attention⁽²⁾. Tobacco was introduced at Keripi (1953/54) and obtained. At present government is trying to revive tobacco plantation which were destroyed during the local troubles. Attempts to grow tobacco in the districts of Rumbek and Gara are also promising and the cultivated area is expected to be 500 feddans in 1974/75.

Tea⁽³⁾ can also grow in some parts of Eq. P. especially at Gilo, Katire and Iwatoka (Aloma plateau). The environmental conditions in these areas are favourable for tea growing⁽⁴⁾. Haggard's private enterprise of tea at Iwatoka has proved successful and the results indicate that the yield may reach 1000 pounds of tea per feddan.

Kenaf as a plant fibre, is an important crop for sack, ropes and twines. A pilot scheme at Toni (1960/64) has proved that the Kenaf can be grown economically. Hence the government gave a concession to an Italian Company (Gardella) to cultivate the kenaf and produce its fibres. The Company cultivated on area of 200 feddans at Tonij in 1973/74 for seed bulking. Another new Kenaf project will be carried out at Malakal.

The cotton has also received great attention. The government began to revive the Zande Cotton scheme with the return of more Zande from bush and Zaire. It is also planned to expand cotton growing on the Eastern bank of Bahr el Gebel at Mongalla and Torit⁽⁵⁾. The expected area of cotton in Zande and the eastern bank is as follow :

-
- 1) Porgres report, op. cit., p. 15
 - 2) Tobacco is very important in this period, because it can give quick income in the resettlement areas owing to its quick yielding.
 - 3) Sudan imports 42.5 million pounds of tea annually (1970)
 - 4) Tea requires 1500 mm of rainfall and well drained acid soil
 - 5) A new outlook op. cit., PP. 46 and 70-71

TABLE 7. The expected cotton's area⁽¹⁾

Place	1974/75	1975/76	1976/77
Zande scheme	10,000	15,000	20,000
The East bank	4,000	7,000	10,000

Sugar cane cultivation and sugar industry are being introduced in the South for the first time. An area of 25,000 feddans at Gumeza have already been surveyed at Mongalla and the crushing operation is expected to start in 1978 with an estimated sugar production of 12,000 tons, which is expected to raise to 50,000 tons by 1985. There is also another new-cane project at Malut on the white Nile North of Malakal.

Attempts are also made to cultivate pine-apple. Pilot schemes have already begun and covered an area of 20 feddans at Maridi, 20 feddans at Yei, 20 feddans at Yambio and 20 feddans at Abbou⁽²⁾.

Regarding animal use, the government also began to carry out some schemes to improve animal utilization. It established stockmen's technical training instituraining institute at Malakal to improve heir traditional methods and for creating field staffs. A fattening station was established at Kapoeta as an experimental station for sheep fattening. With the financing help of the World Bank, a pilot ranching scheme was established at Marial Bai, near Wau. This Scheme will improve the management of grazing areas.

For animal health the government with the help of German technical assistance, began to control reinderpest and Bovine, Pleuso-Pneumonia diseases. This programe will improve the animal's production and reduce mortality rate of the cattle considerably⁽³⁾.

As poultry meat and eggs play an improtant role as protein supplement in the human diet, much more producing farms for commercial production must be established. The present poultry centres at Juba, Wau and Malakal which run by the departement of animal production must be specialized as nurseries for providing the farms by itsneeds⁽⁴⁾.

1) Progress report, op. cit., p. 13

2) A new outlook, op. cit., P. 70.

3) The Agriculture development, op. cit., pp. 2-3

4) Progress report, op. cit., p. 22

Jonglei Canal which will be carried out in the South, will improve the natural environment and reclaim great area. The Canal will begin at Jonglei on Atem river and end South of Malakal for a distance nearly 175 miles (280 Km.). The canal will save nearly 14 million cub metre which are now lost in the Sudd area. In its first stage, it will save about 4½ million cub.metre. But the direct efect of these scheme for he South, is the opening of a large irrigable ara estimated at more than 4 million feddans. This reclaimed land can be planned for mixed farming schemes and rice cultivation.

At the same time, this scheme will reduce the areas suitable for mosquitos⁽¹⁾ and will also save the South from the destructive floods such as the flood of 1961/62 which flooded all the low and alluvial lands and caused human and animal loses⁽²⁾.

The canal will also facilitate the navigation between the south and the North and shorten the riverian distance between Juba and Kosti for about 187½ miles (300 Km.)⁽³⁾

Regarding forstry development, the government began to establish nurseries for producin good seedlings for cultivation in selected areas. In Eq. P. 37 feddans of nurseries produced just under one million seedlings. In U.N.P. 31.600 seedlings were raised in nurseries. Afforestation with teak had succeeded in B.G.P. Therefore the areas of nurseries for teak seedling production have increased from 32 feddans in 1971/72 to 71 feddans in 1973/74

At the same time Imatong monutains posses excellent conditions for producing softwood timber. Therefore the World Bank had financed a forest scheme at Itamong. About 1300 feddans of exotic softwood had been planted and a sawmill was constructed at Itibol with an initial capacity of 4000 m³ of lumber per annum and over the four pears prior of the project the sawmill will produce some 16.000 m³ of sawn lumber.

Another sawmill was also constructed at Wau in 1974 and there are plans for constructing more mills⁽⁴⁾. Timber sawing is very important for it is a source of employment in rural areas and has a good effect in putting up the standard of linving in the backward areas⁽⁵⁾.

(1) دراسة مستوفاه للخطوط العريضة لمشروع تقليل الفاقد في منطقتى بحر الجبل والزراف بين الحاضر والماضى ص ٣ .

(2) دراسة استطلاعية للاحوال المعيشية للسكان في منطقة جونجلي ص ١٢

(3) السيد يحيى عبد المجيد . مشروع جونجلي حقايقه وابعاده ص ٢٤ .

4) Progress report, op. cit., pp. 28-30

5) Rudoph Ibrahim Samuel, op. cit., p. 11

CONCLUSION :

Through the new policy of the government and the great potentialities, the rural land use development proceeds rapidly. However, proper and complete plans for the best utilization of all the available resources are still required and urgent. We saw that the South is divided generally into two different regions, the low and the high land. Therefore the planning will differ in each region.

In the first region which includes the lowlands, the planning should put a stress on food grains especially dura and rearing animals through mixed farming. This system is very suitable here because the majority of the population are herder and cultivators. At the same time, it may help in solving many problems which inhibit the development at the present time. For example, this mixed farming will encourage the settlement which considers the first step towards the development. We know that the settlement will help in controlling animal diseases through veterinary services, improving animal types and creating good pasture through cultivation.

Animal must be in the first place beef cattle and beef sheep. Fattening stations is very important to commercialize the production. At the same time it must put a stress to increase the supply of milk for the urban communities through establishing larger dairies with juba, Wau and Malakal.

In this region the plan must also put a stress on cultivating paddy rice especially in the reclaimed area of the Sudd and increase the areas of sugarcane and cotton.

Mechanization or even partial mechanization is required to increase rapidly the cultivated areas and the output per labour unit.

The planning in the second region must put a stress mainly on horticulture crops such as coffee, tobacco, tea Kenaf and pine-apple. These tree crops are very important to protect the soils from erosion which is common in this region and at the same time to cover the local consumption of the Sudan in the first stage and the Arab World needs later. These crops have proved success through the experimental pilot schemes which have been carried in the South in the few last years.

At the same time the natural conditions prevailing in this region make forestry as one of the main land use tenure, especially the world now suffers from the lack of forest products.

The forestry is the safest form of land use owing to the nature of the soils which being lateritic, acid and shallow in the main. Annual cropping in such a form of soil is dangerous as it depletes the soil and leads to many form of erosion. Planning must also put a stress on the construction of good roads, new factories to prepare the agricultural products for consumption and export, expansion of technical education and improvement of health and veterinary services. As Capital and technology are very urgent at this stage for rapid development, the Sudan must open the South for the foreign Capitals especially the Arabian capital, to carry out the Commercial schemes on base of charing with the government.

To conclude this essay, I hope through a proper plan to develop the rural land use in the Southern to take its role in the world production, and share in solving the lack of food in the world.

المراجع العربية

أولاً - الكتب :

- ١ - د . صلاح الدين الشامي : السودان دراسة جغرافية الطبعة الثانية الاسكندرية ١٩٧٣ .
- ٢ - دراسة وافية للخطوط العريضة لمشروع تقليل الفاقد في منطقتي بحري دراسة في الوضع الطبيعي والكيان البشري والتناء الاقصادى القاقره ١٩٦٦ .
- ٣ - يحيى عبد المجيد مشروع جونجلى حقائقه وابعاده الخرطوم ١٩٧٤ .

ثانياً - تقارير وابحاث :

- ١ - دراسة استطلاعية لسكان منطقة جونجلى مصلحة الشئون الاجتماعية .
- ٢ - دراسة وافية للخطوط العريضة لمشروع تقليل الفاقد في منطقتي بحري الجبل والزراف بين الحاضر والماضى الهيئة المصرية العامة لمياه النيل « بدون سند الكتابة » .
- ٣ - عشرون حقيقة وحقيقة من السودانين من واقع تعداد السكان الاولى فى السودان ٥٦/٥٥ ترجمة احمد عثمان اسحق . الخرطوم ١٩٦٠ .

BIGLIOGRAPHY

Firstly : Books :

- 1^o) Barbour K.M., The Republic of the Sudan, a regional geography, London 1964
- 2^o) Libon, Land use in the Sudan, London 1965

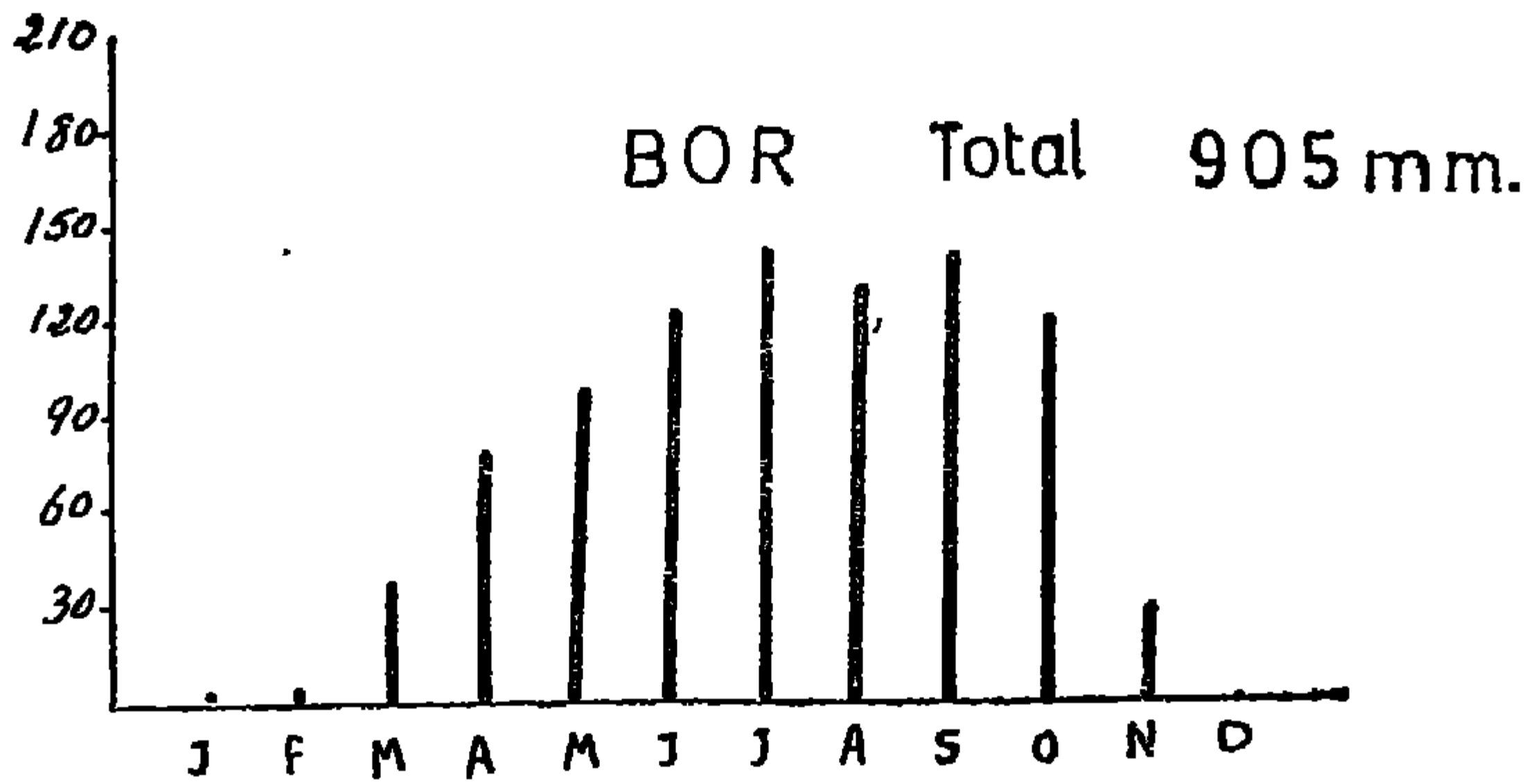
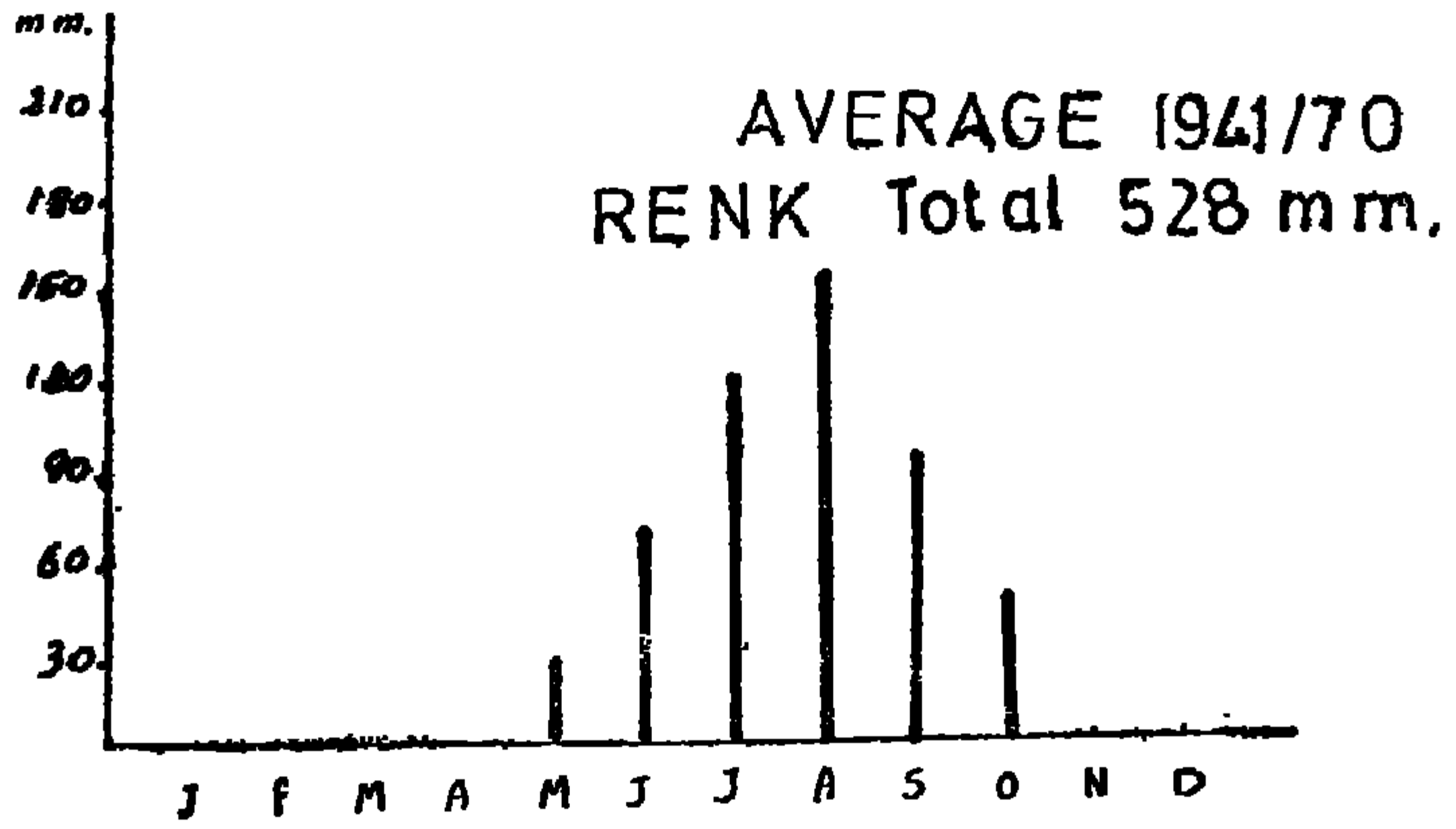
- 3°) Davies H.R.J., Tropical Africa, an atlas for rural development, Cardiff, 1973

Secondly : Researchs :

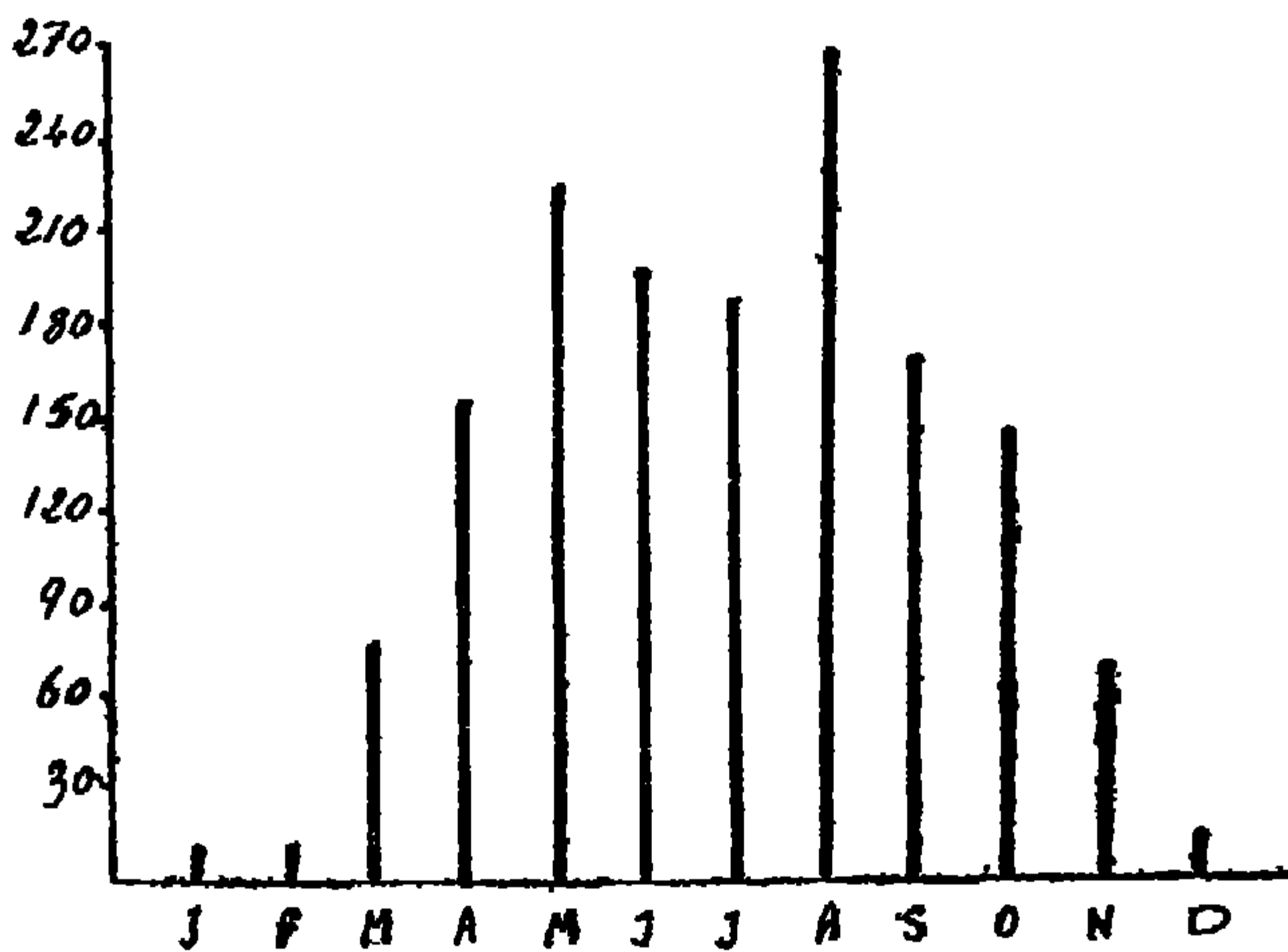
- 2°) Galal el Din el Tayeb, Forestry and Land use in the Sudan Uni. of Khartoum, 1972
- 2°) Mahdi Amin el Tom, The Reliability of rainfall over the Sdan, Geografiska Annaler Vol. 54, Ser. A, 1972
- 3°) Mirghani Abdall Mirghani, A note on horticultural development in Southern Sudan, 5th Erkoit. Conference in uba, 1971
- 4°) Rudolph Ibrahim Samuel, Economic Structure of the Southern Sudan, a regional survey, 5th Erkoit Conference in Ju'ba, 1971
- 5°) Torayah A S., A geographical assessment of health problems and diseases incidence in the Sudan, Uni of Khartoum, 1971

Thirdly : Reports :

- 1°) The Agricultural development programme 1974/1975-76/77 Regional Ministry of Agriculture, Juba 1974
- 2°) A new outlook in the Agricultural forestry and animal wealth in the Southern Region, Juba 1973
- 3°) Natural resources and development potential in the Southern provinces of the Sudan. Khartoum, 1954
- 4°) Progress report on Agricultural development 1973/74 (R.M.A.) Juba, 1974
- 5°) Rainfall average 1941/70 — Pamphlet No. 1 Sudan Meterological department, Khartoum 1973



MARIDI Total 1540 mm.



RAINFALL STATIONS

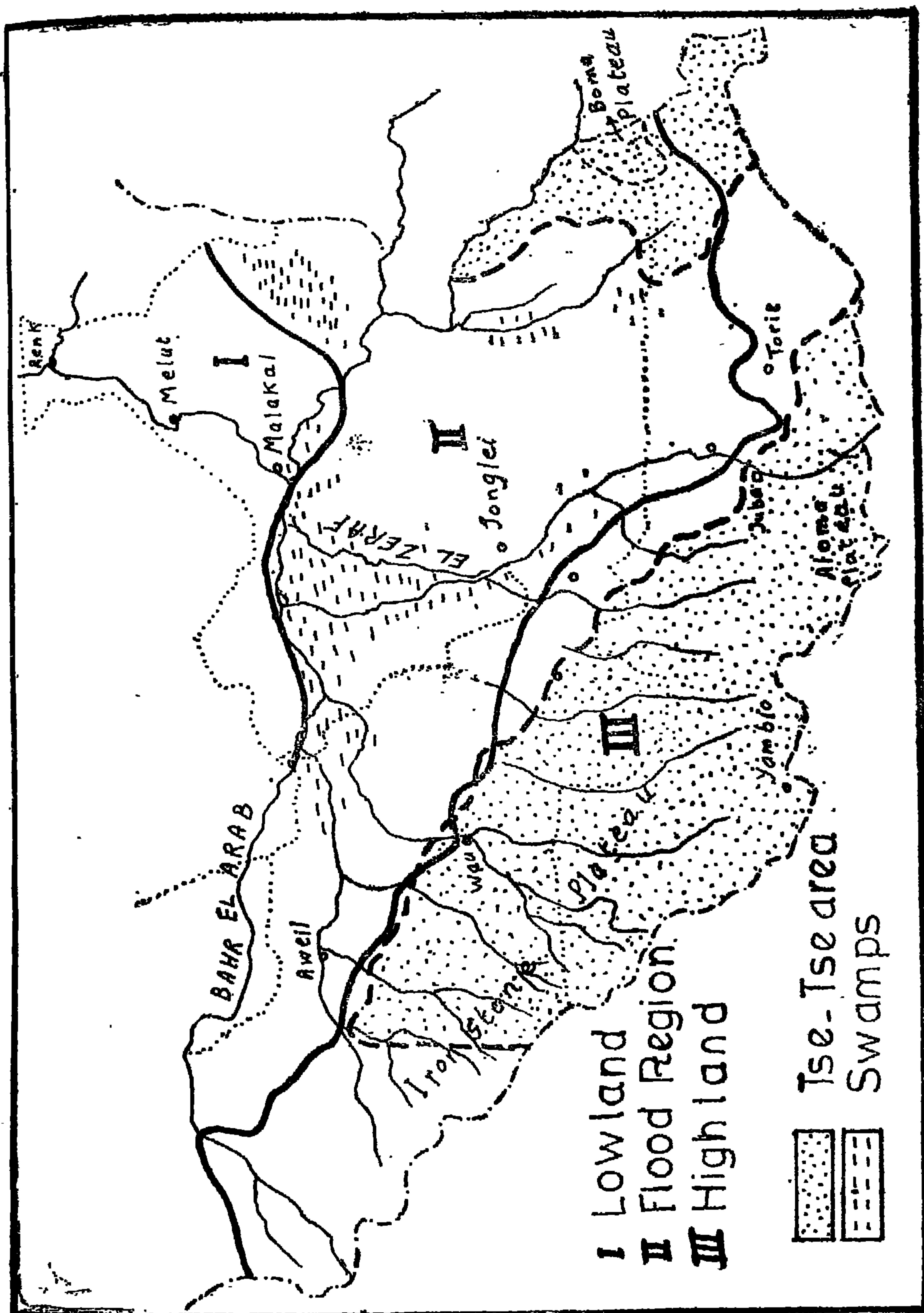


figure 1
PHYSICAL REGIONS

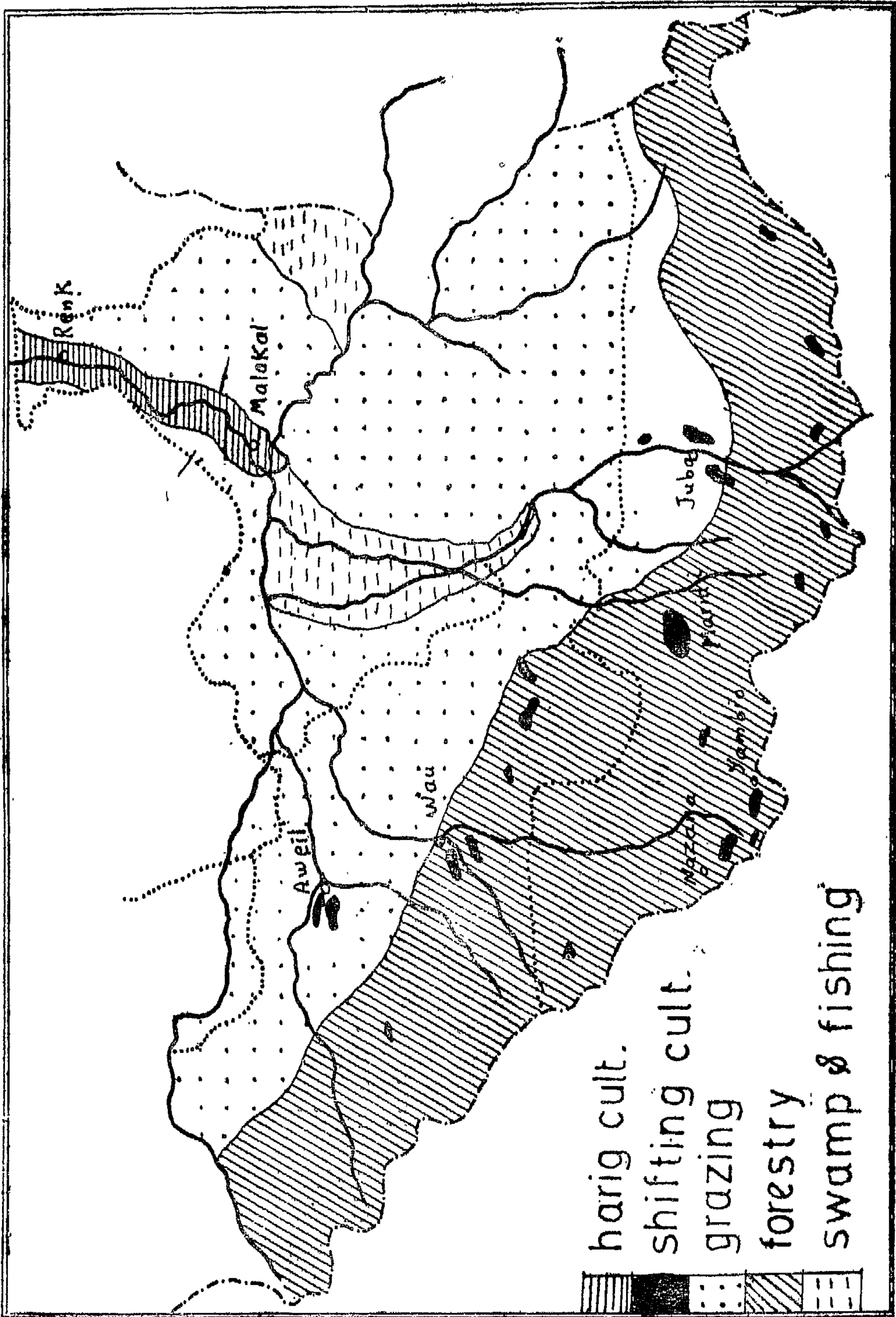


figure 2
RURAL LAND USE

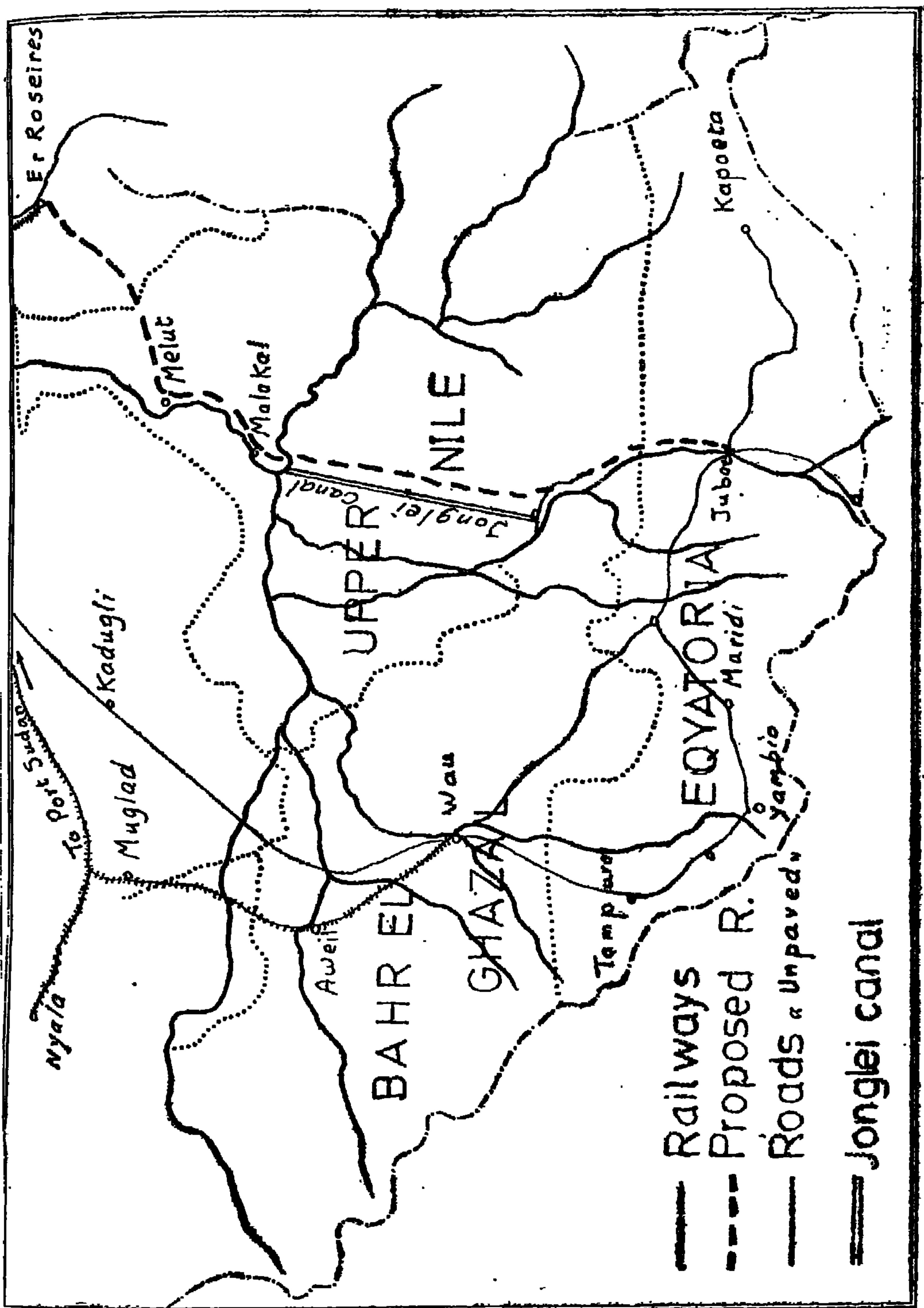


figure 3
MEANS OF TRANSPORT

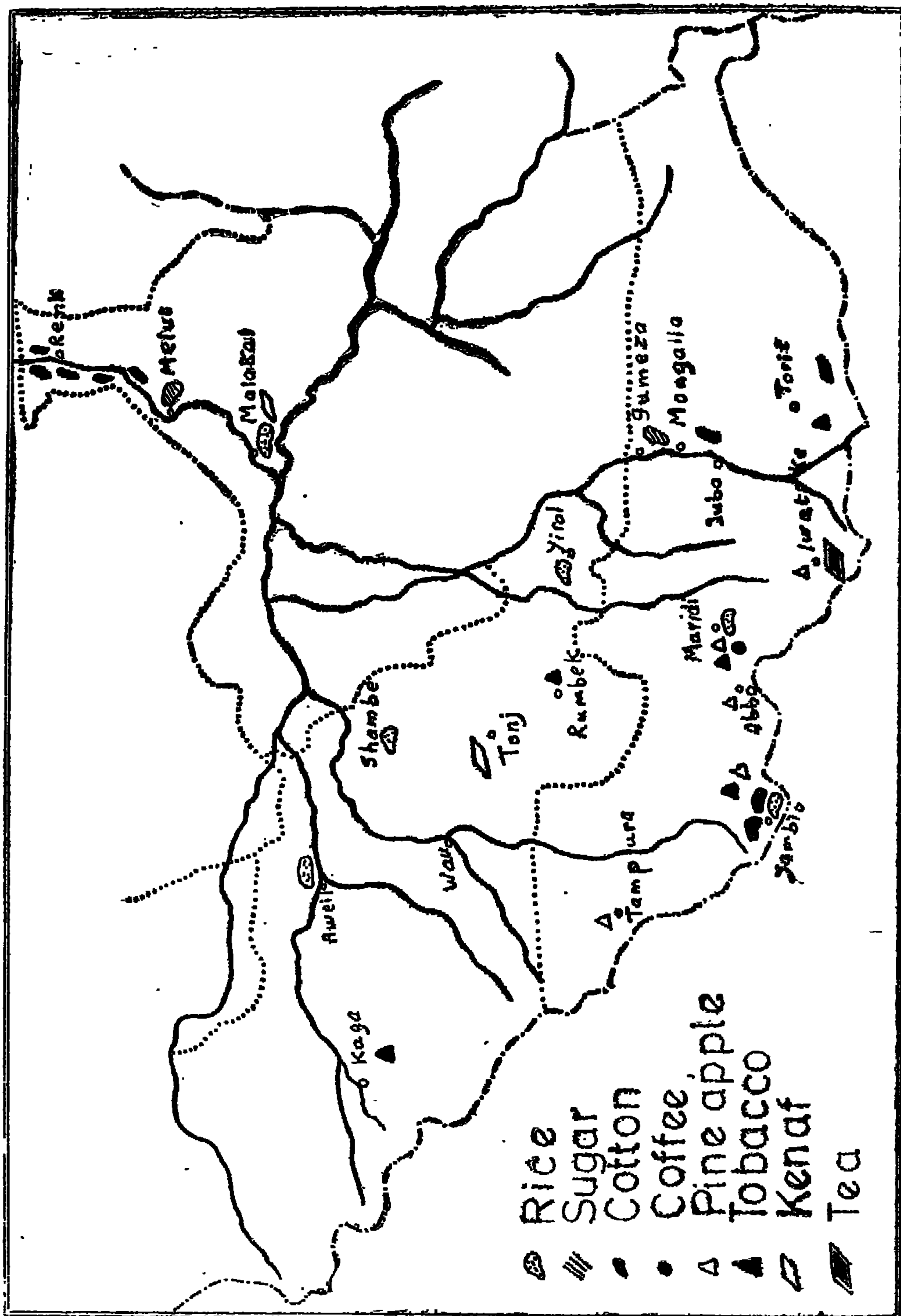


figure 4

PILOT SCHEMES & CASH CROPS