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THE LAND USE PATTERNS AND RURAL  
SETTLEMENT IN THE BENGHAZI PLAIN  
BY

SALEM A. HAJJAJI

VOLUME; II

THESIS SUBMITTED FOR THE DEGREE OF Ph.D OF THE  
UNIVERSITY OF DURHAM

JUNE, 1969

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FIGURES



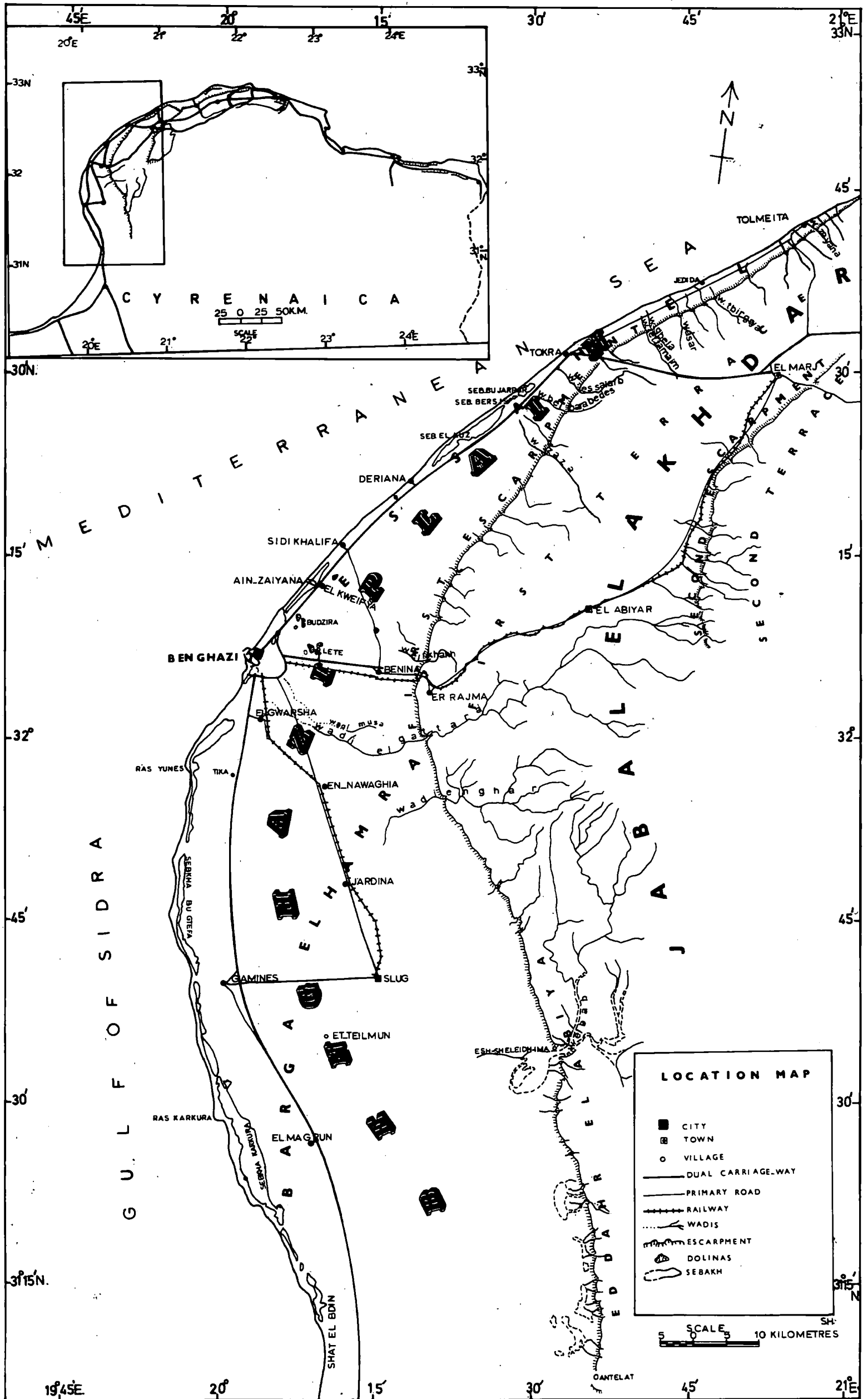


Fig.1

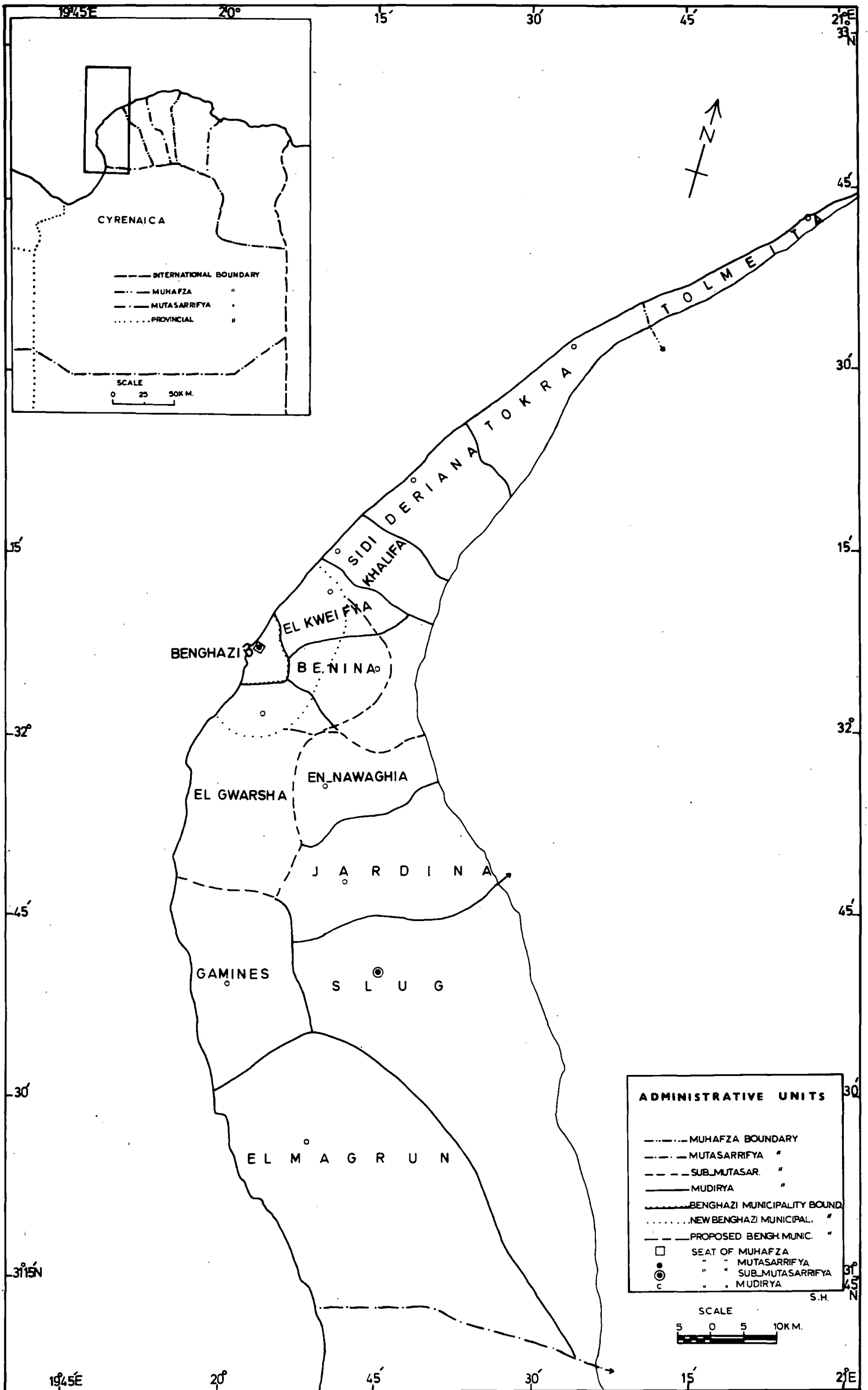


Fig.2.

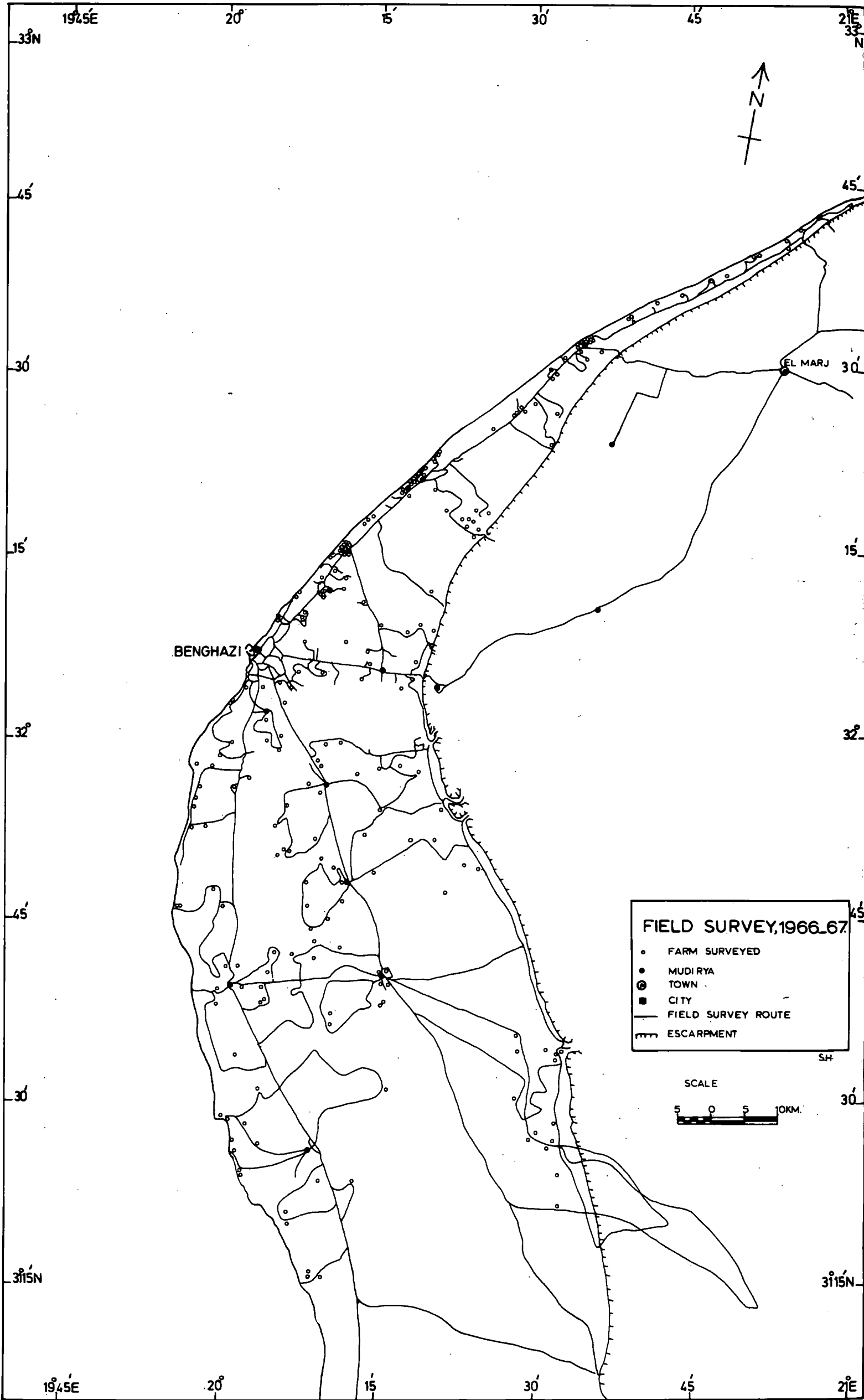


Fig.3.

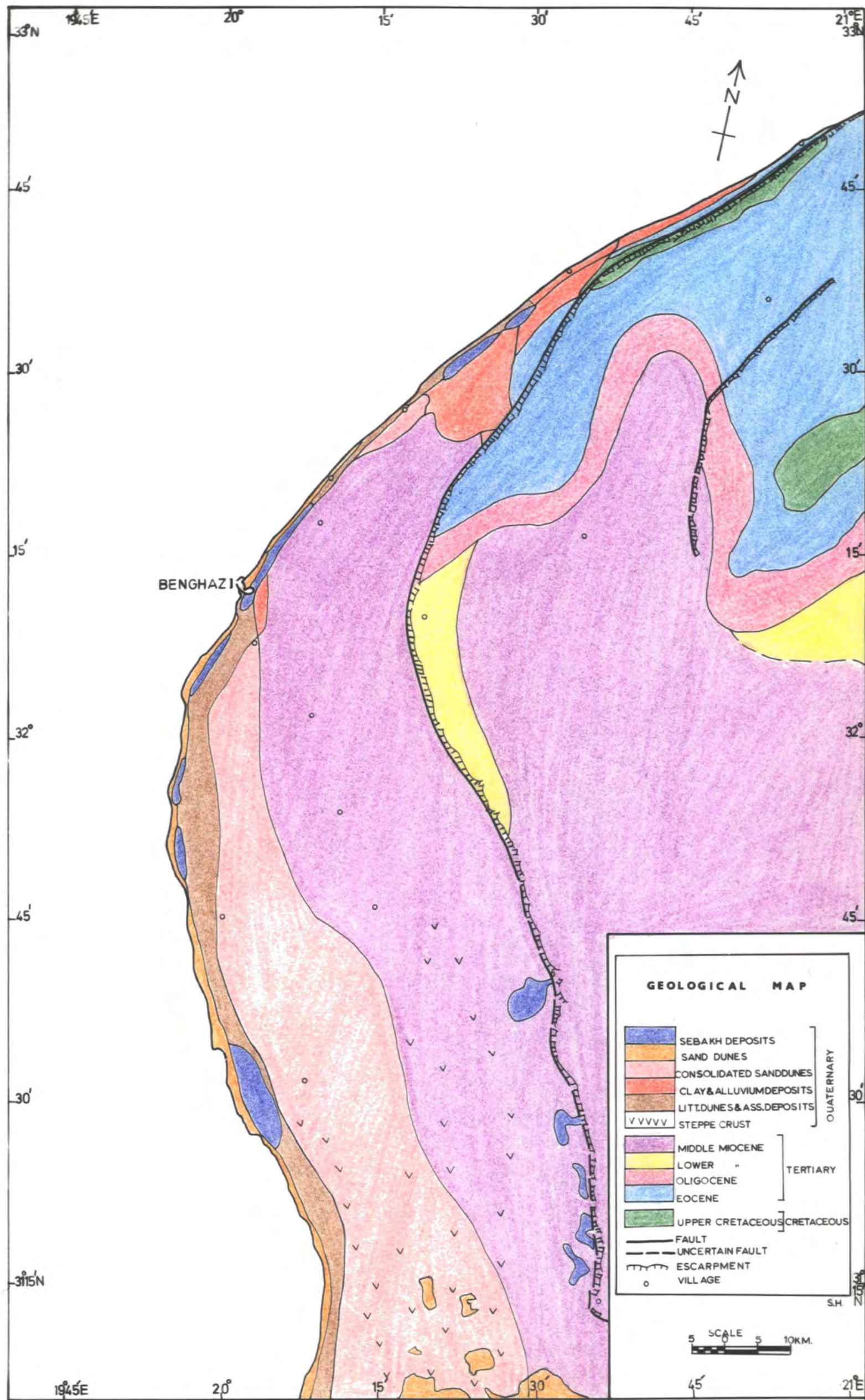
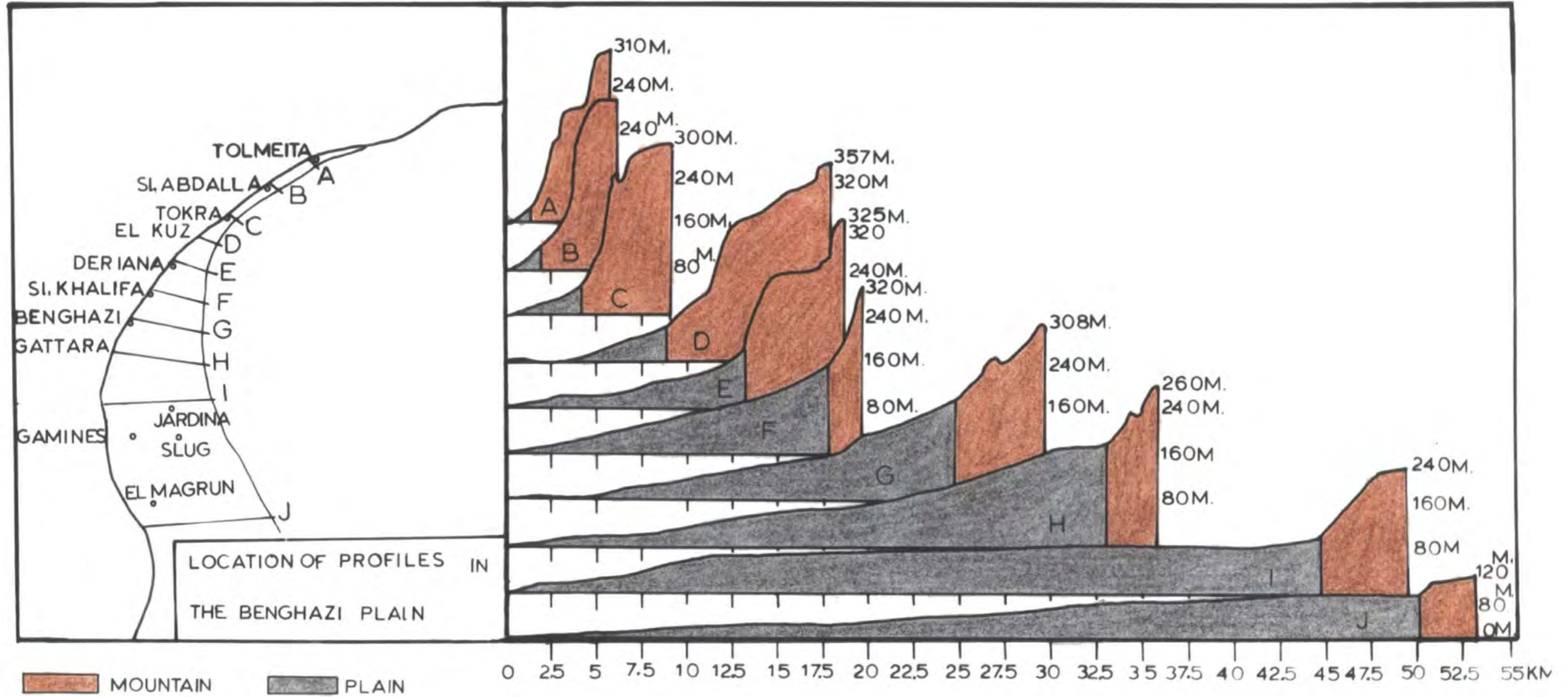


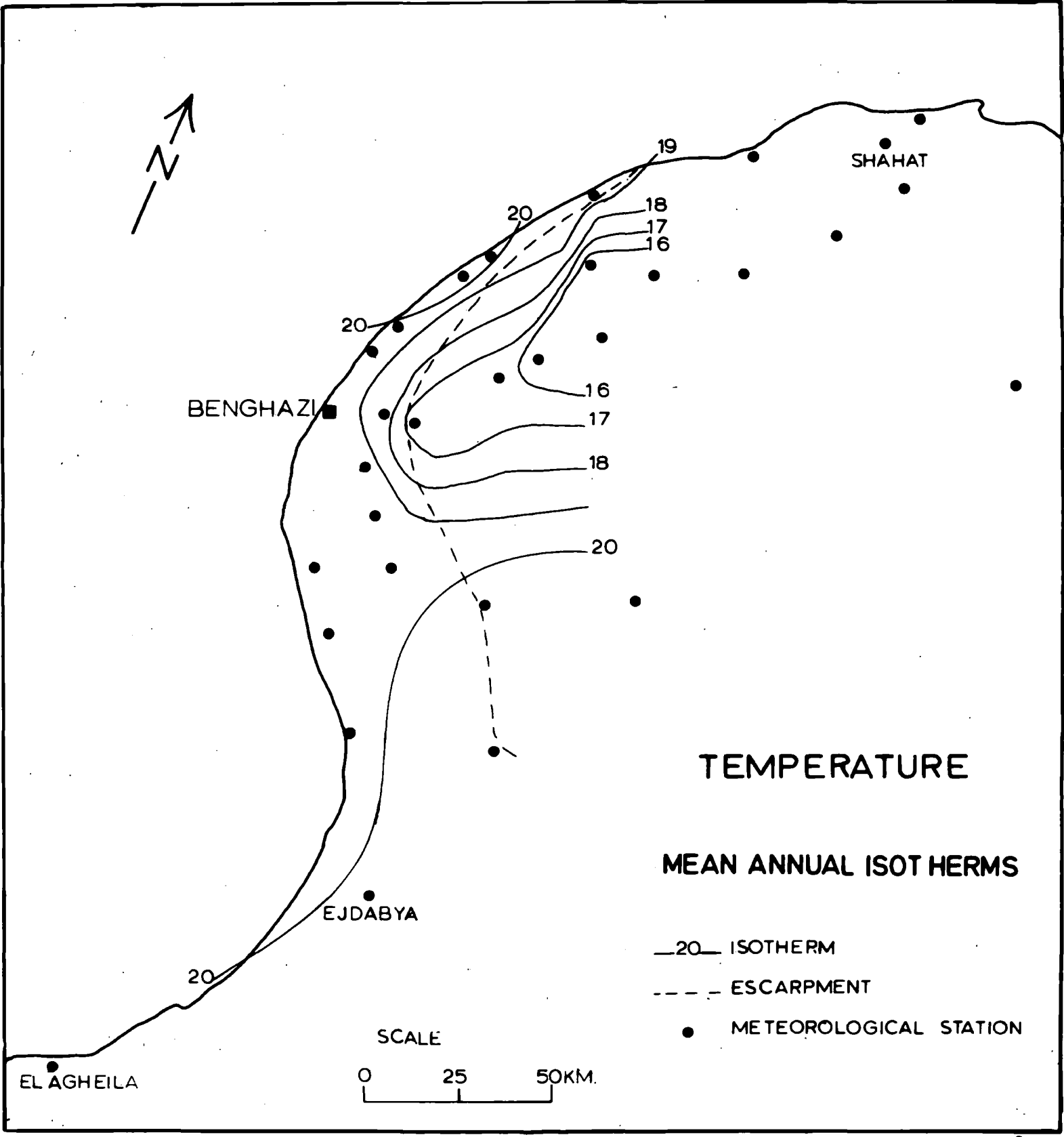
Fig.1.1

# SLOPE PROFILES IN THE BENGHAZI PLAIN

FIG. 1.2

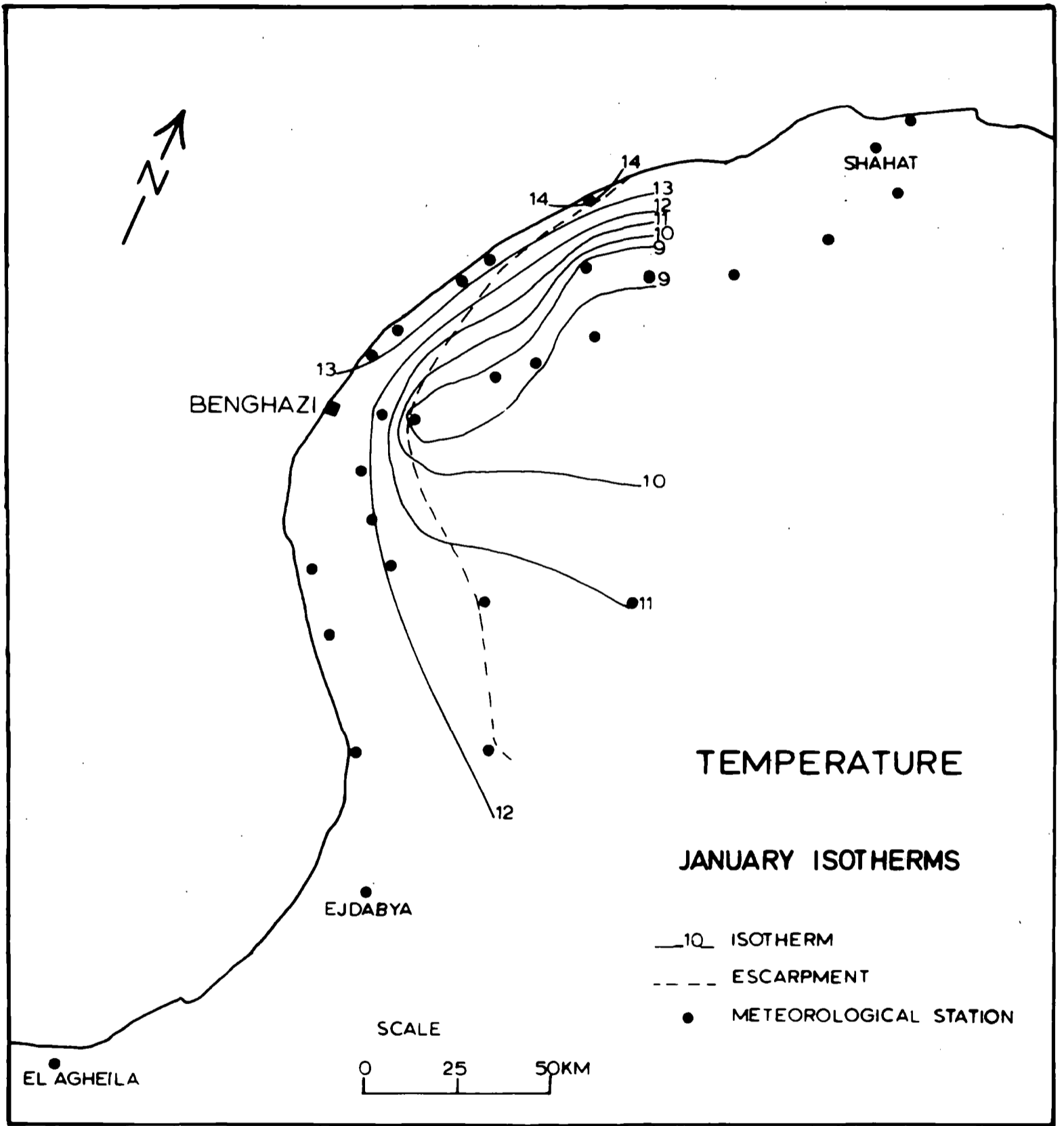






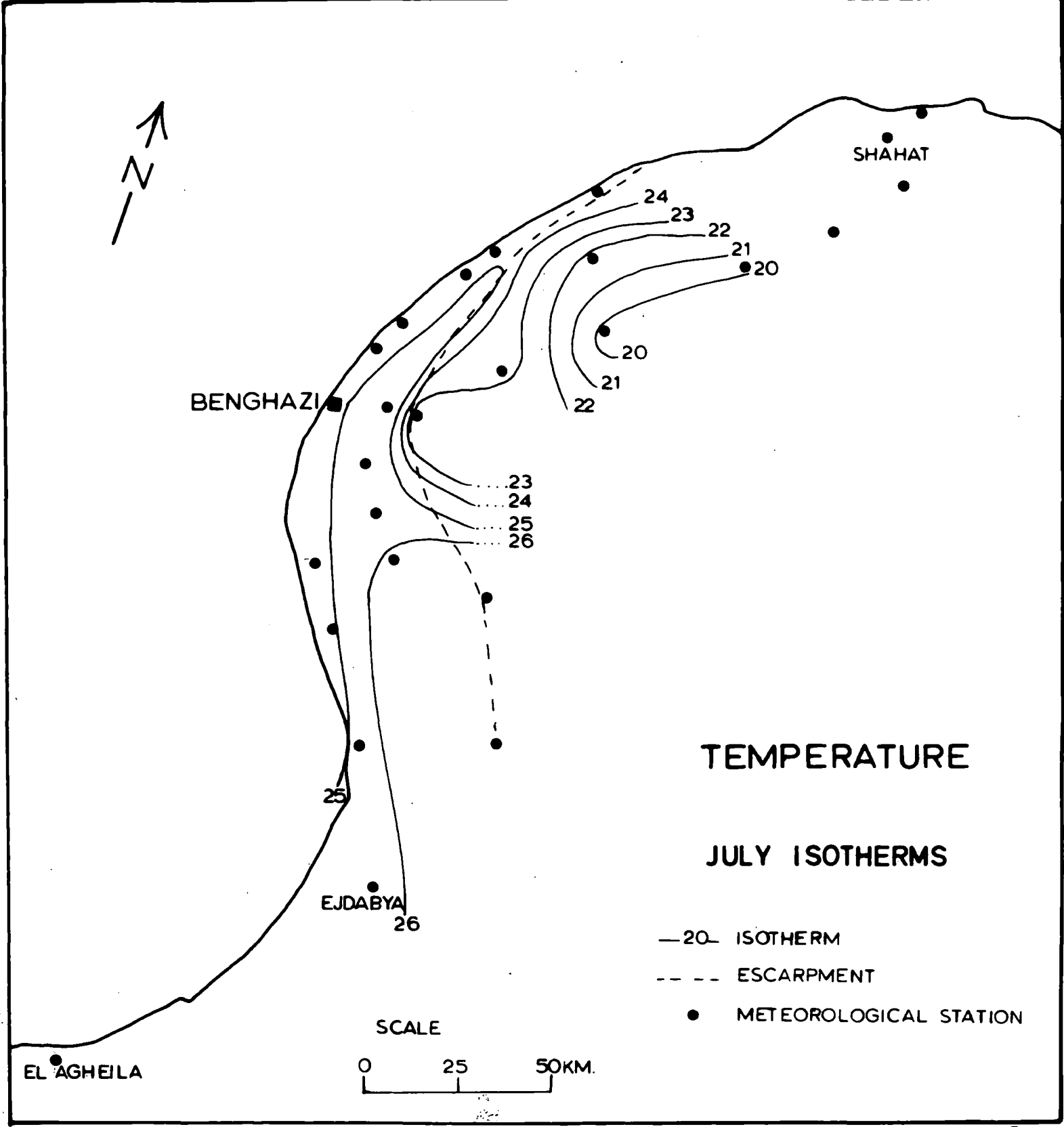
SH.

Fig.2.1.



SH

Fig.2.2.



SH.

Fig.2.3.

MEAN, MAXIMUM & MINIMUM MONTHLY TEMPERATURE IN THE BENGHAZI PLAIN & THE ADJACENT AREAS

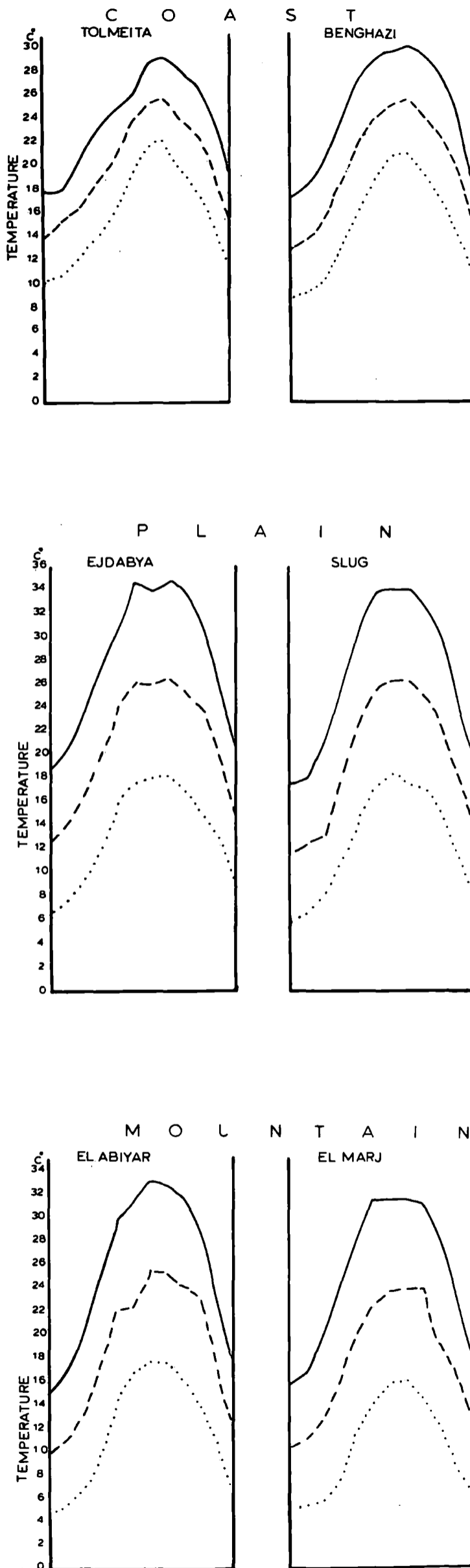
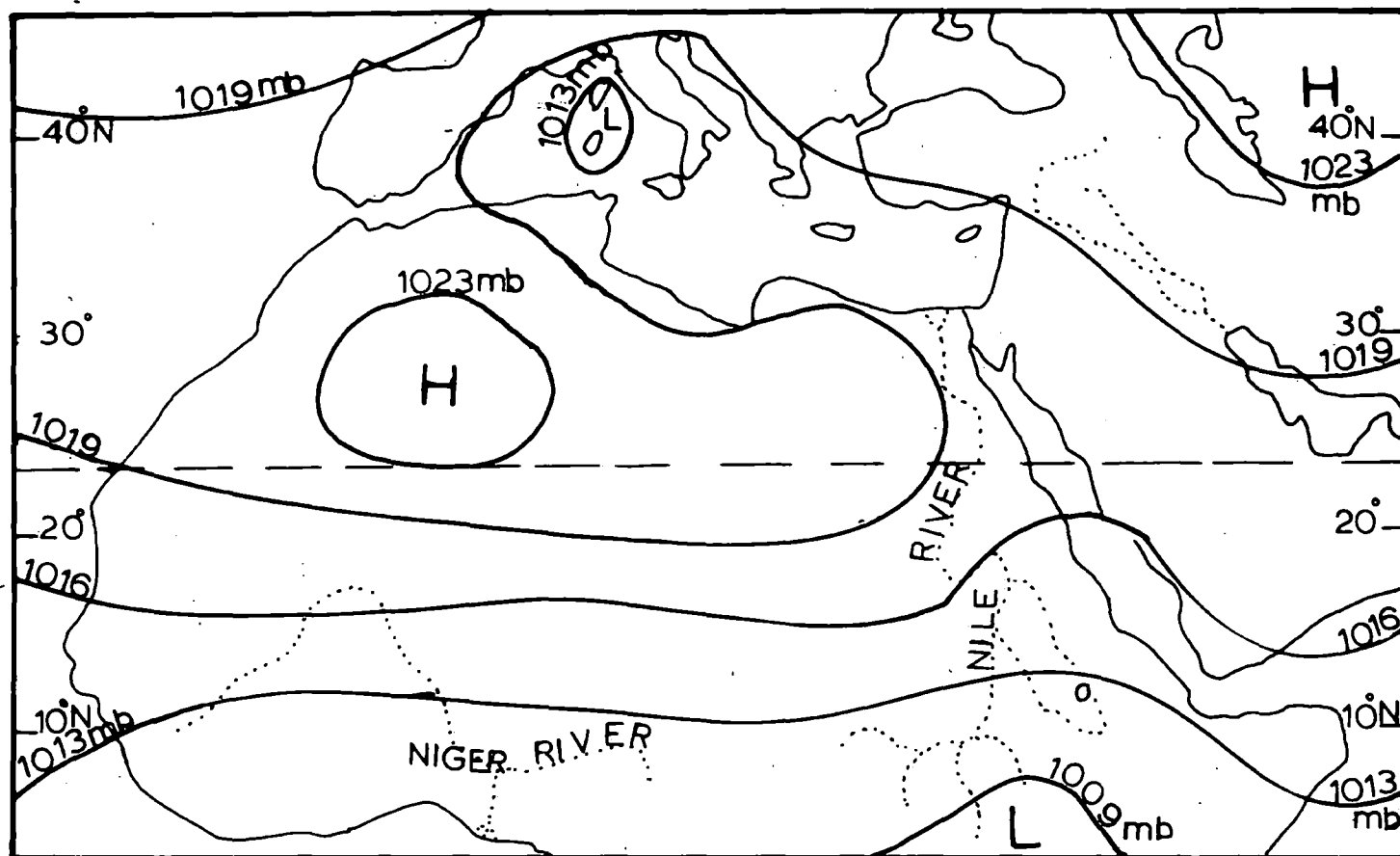


Fig.2.4.

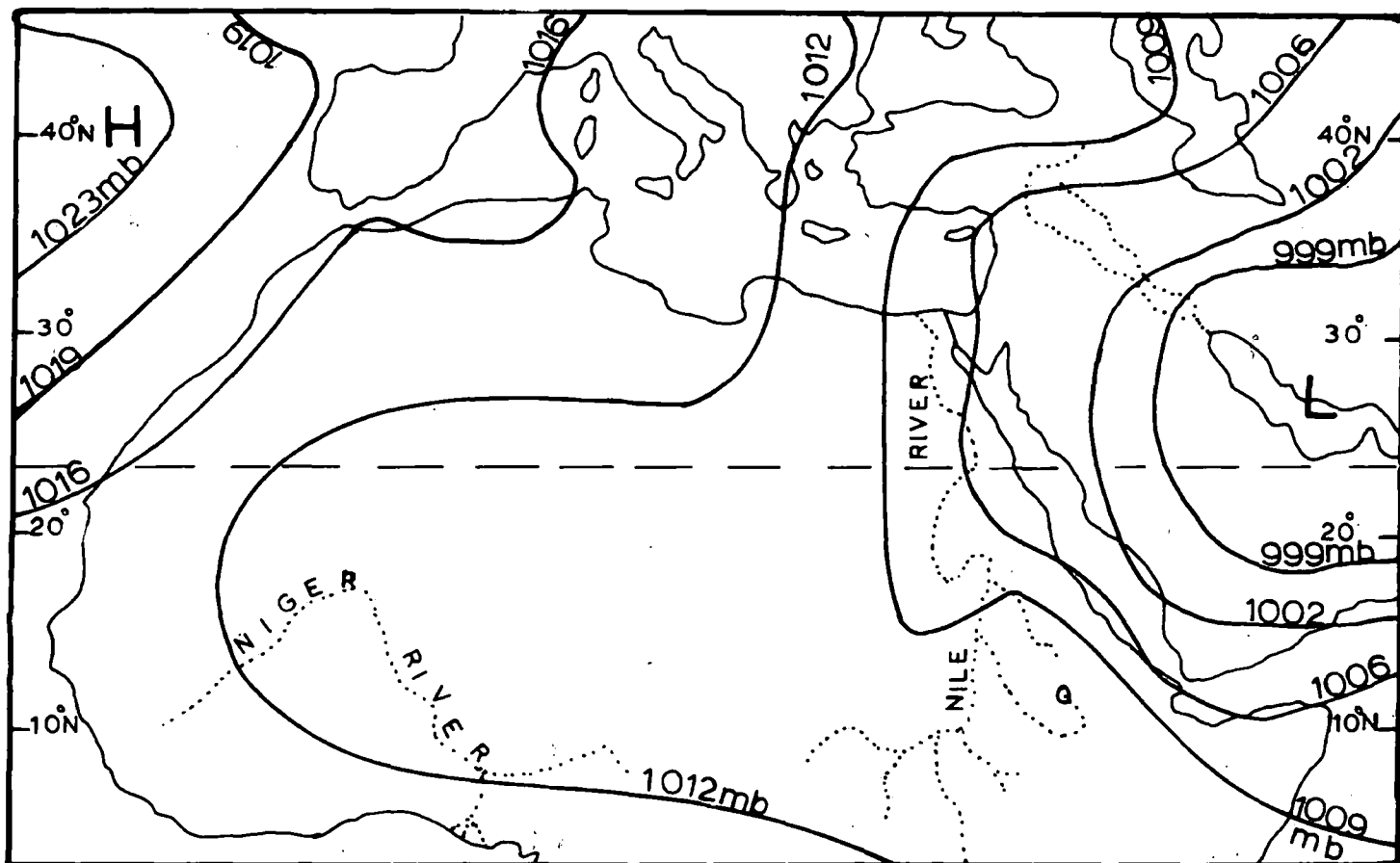
# ATMOSPHERIC PRESSURE OVER THE MEDITERRANEAN & NORTH AFRICA DURING WINTER



SOURCE: TORAYAH SHARAF, A., O.P.C.I.T., P.187.

Fig.2.5A

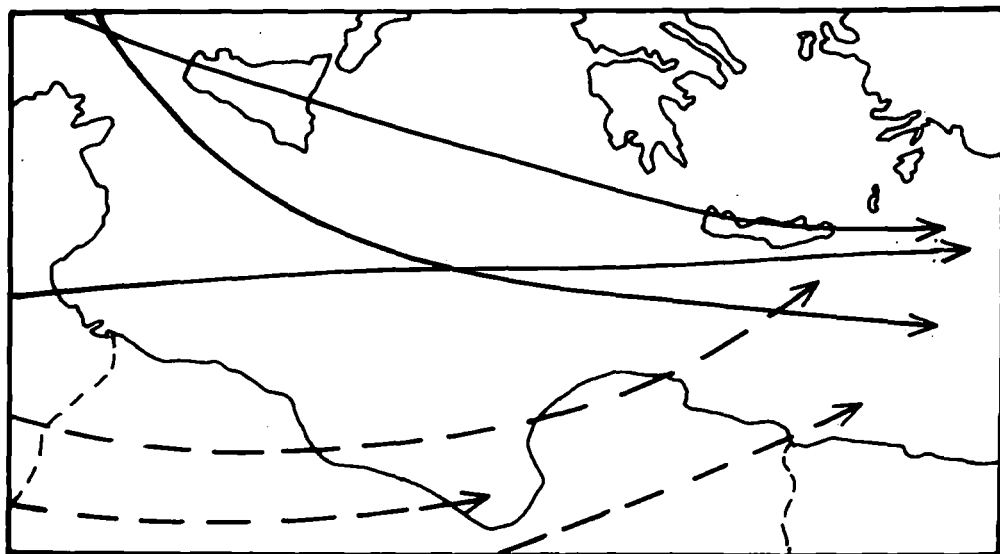
# ATMOSPHERIC PRESSURE OVER THE MEDITERRANEAN & NORTH AFRICA DURING SUMMER



SOURCE: TORAYAH SHARAF, A., THE GEOGRAPHY OF LIBYA ALEXANDRIA, 1963. P.187.

Fig.2.5B

MAIN TRACKS OF THE CYCLONIC DEPRESSIONS  
OVER THE MEDITERRANEAN & NORTHERN LIBYA

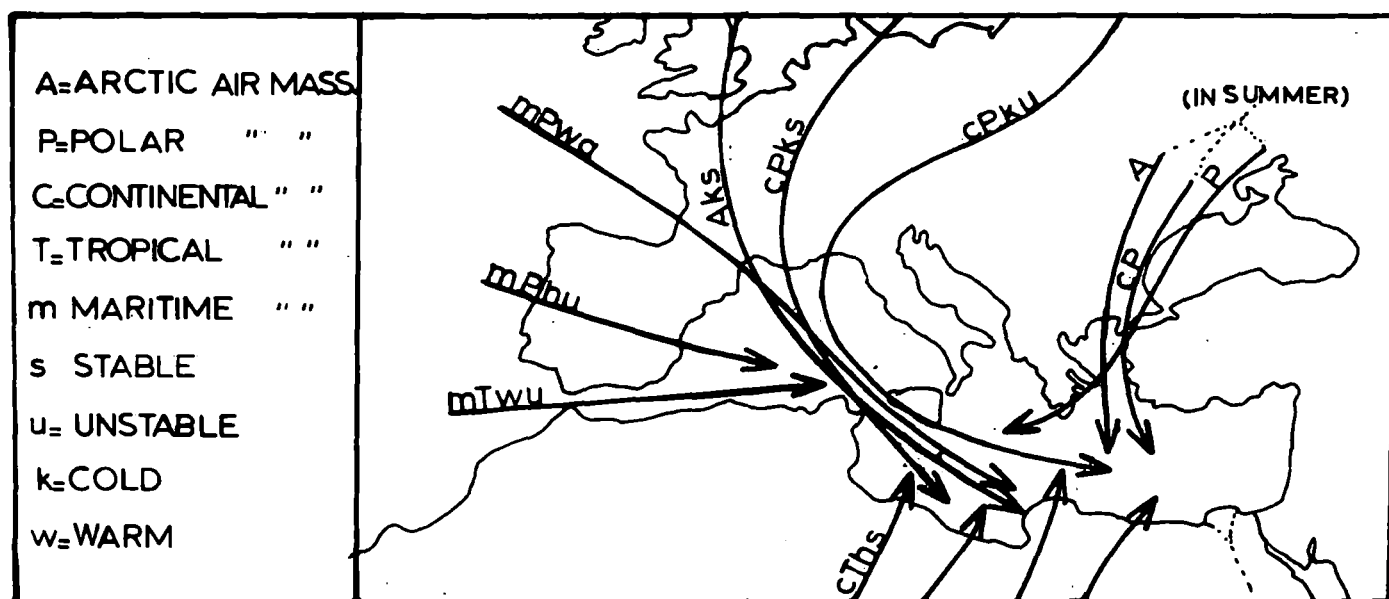


—→ WINTER TRACKS  
- - -→ SPRING & EARLY SUMMER "

SOURCE: TORAYAH-SHARAF, A, OP.CIT, P.189

Fig. 2.6 Fig.2.6

MAIN TRACKS OF AIR MASSES OVER THE  
MEDITERRANEAN & NORTHERN LIBYA



SOURCE: H.M.S.O. METEOROLOGICAL OFFICE, "WEATHER IN THE MEDITERRANEAN"  
VOL. I, LONDON, 1937.

Fig.2.7

# WIND ROSE AT BENGHAZI

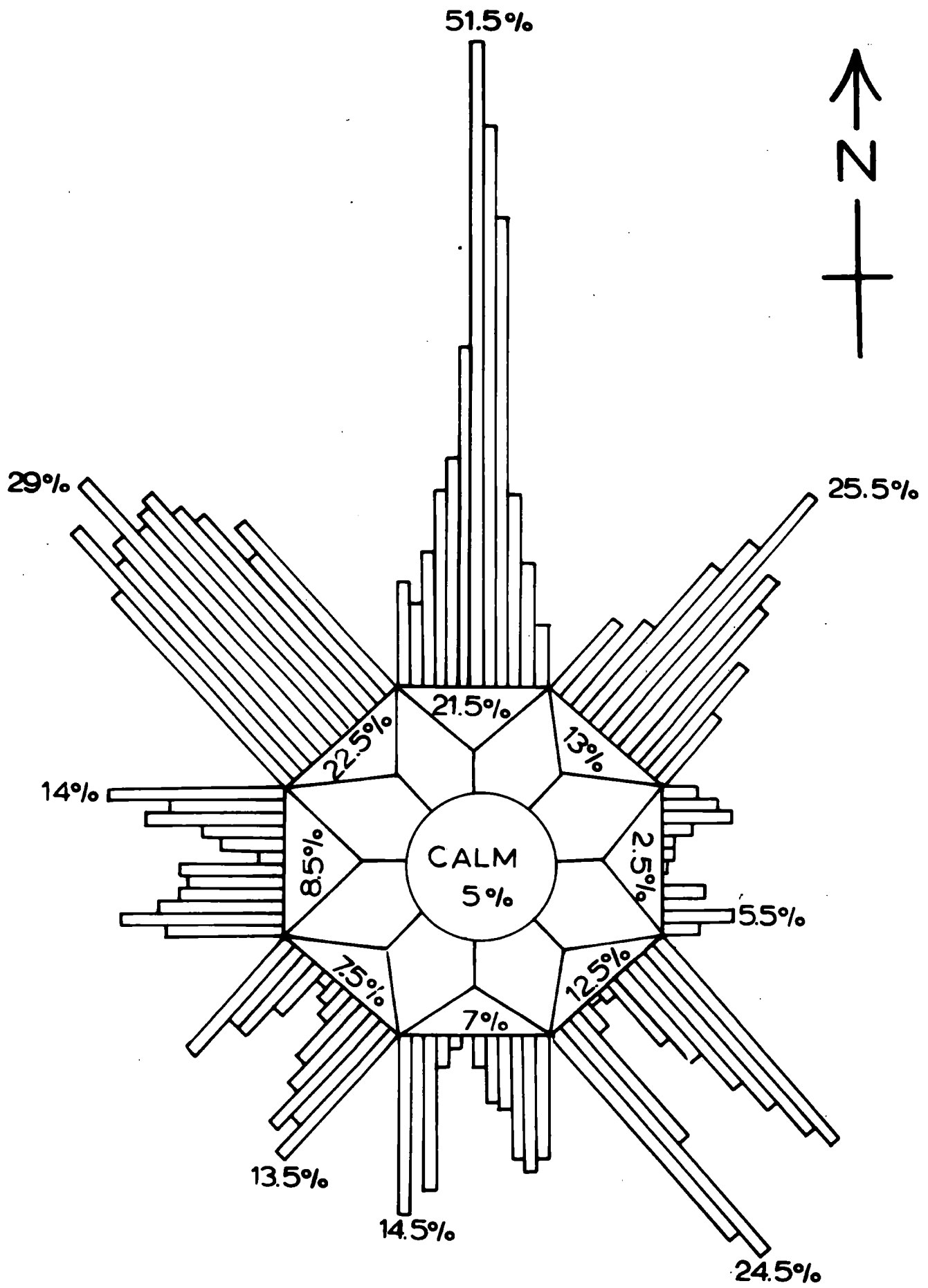
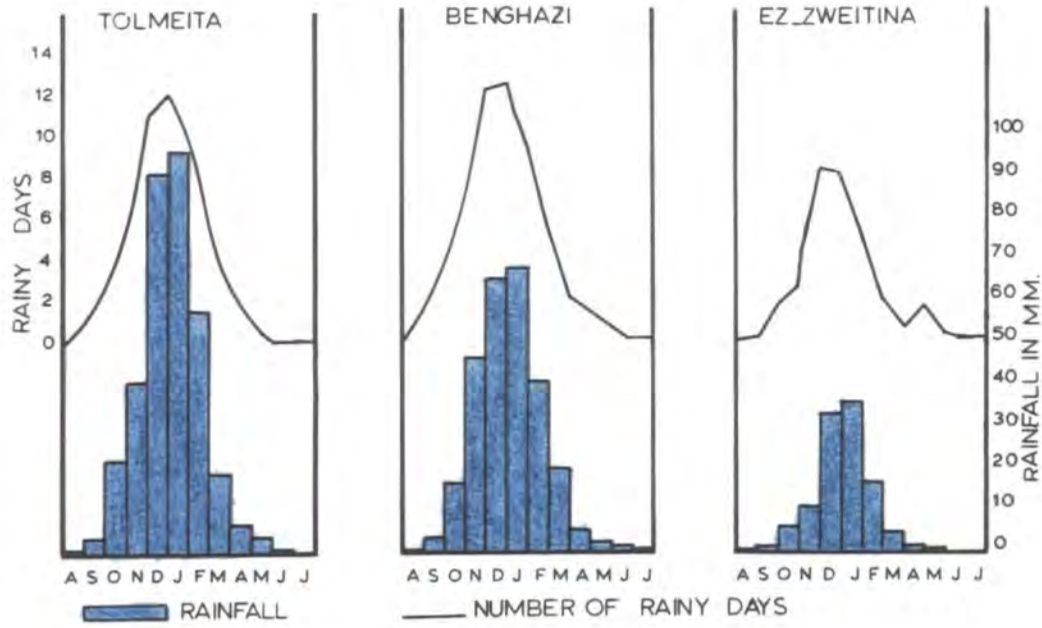


Fig.2.8.

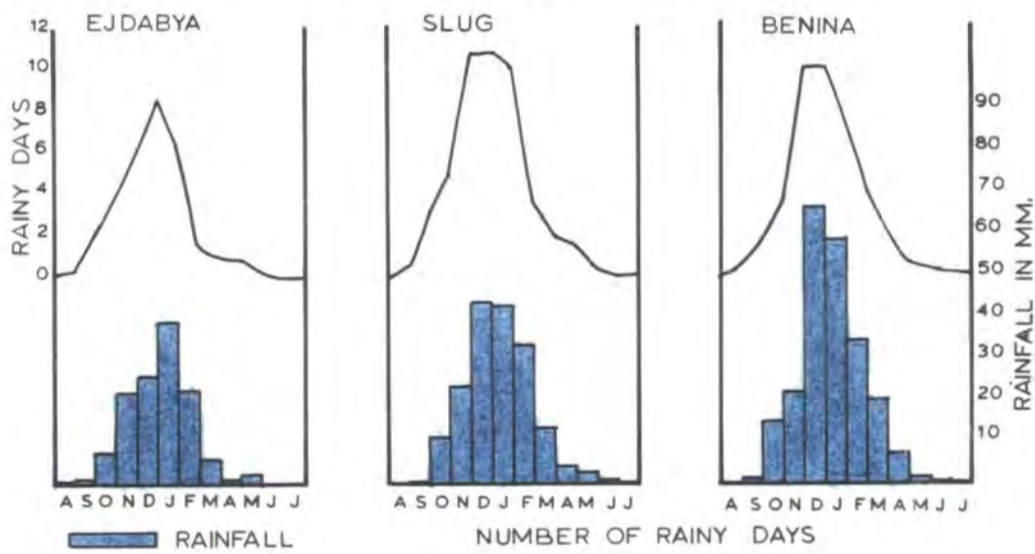
DIAGRAMS TO SHOW DIFFERENCES IN FREQUENCY & MEAN MONTHLY RAINFALL IN THE B. PLAIN & THE ADJACENT AREAS

C O A S T



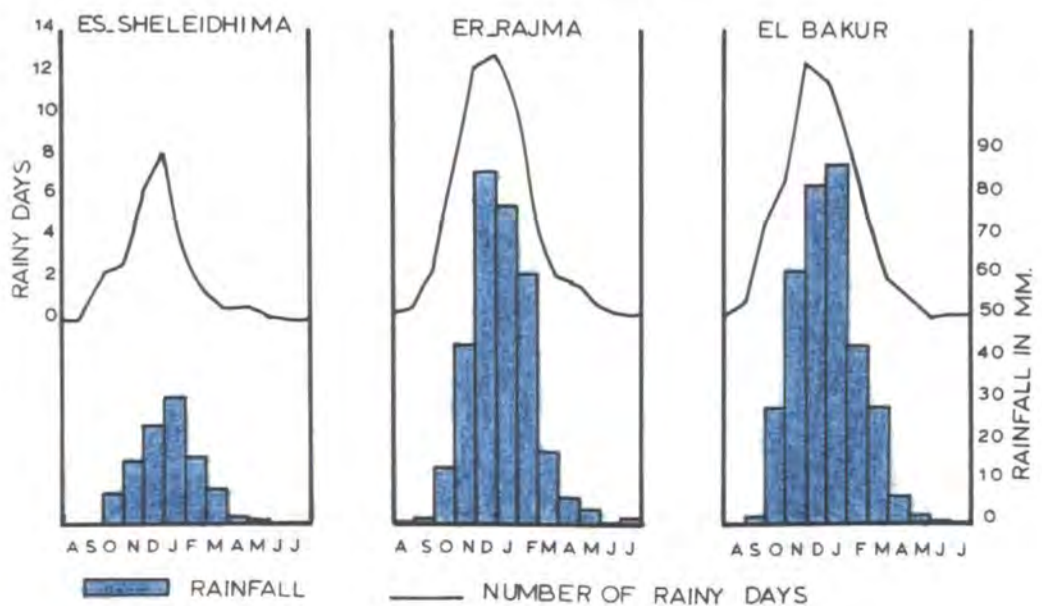
A

P L A I N



B

M O U N T A I N



C

Fig.2.9.



# RAINFALL PROFILES IN RELATION TO RELIEF

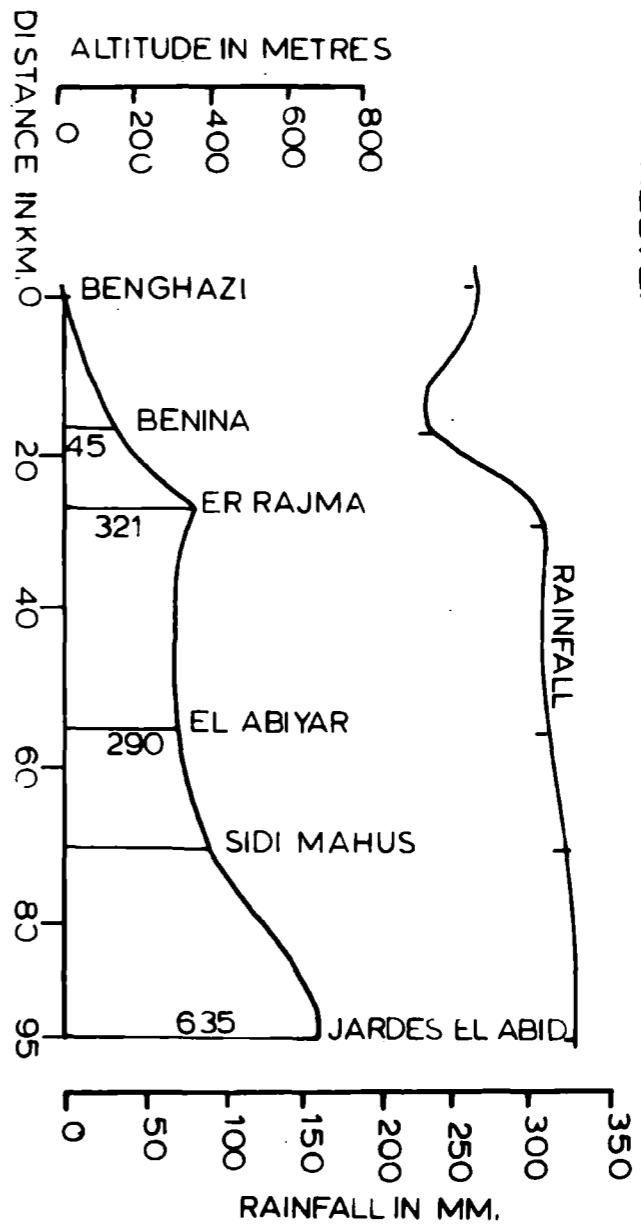
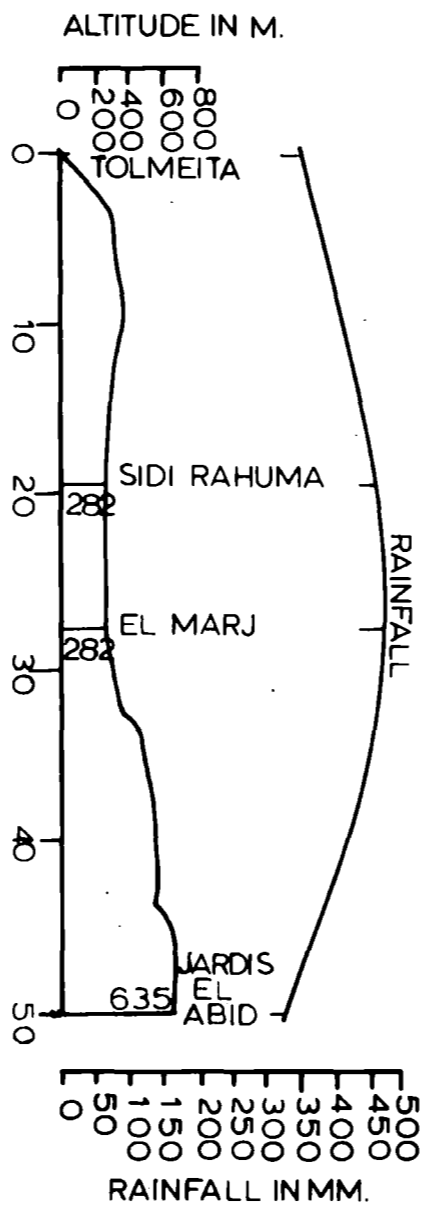
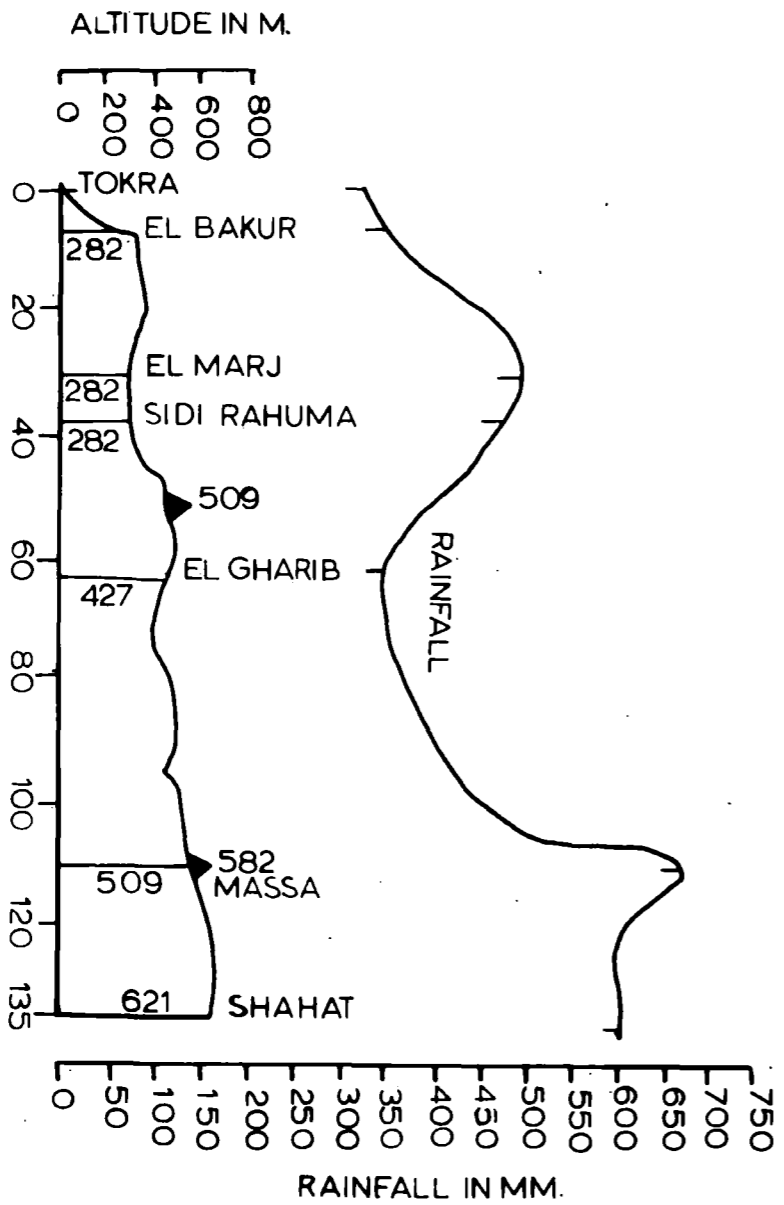


Fig. 2.10.

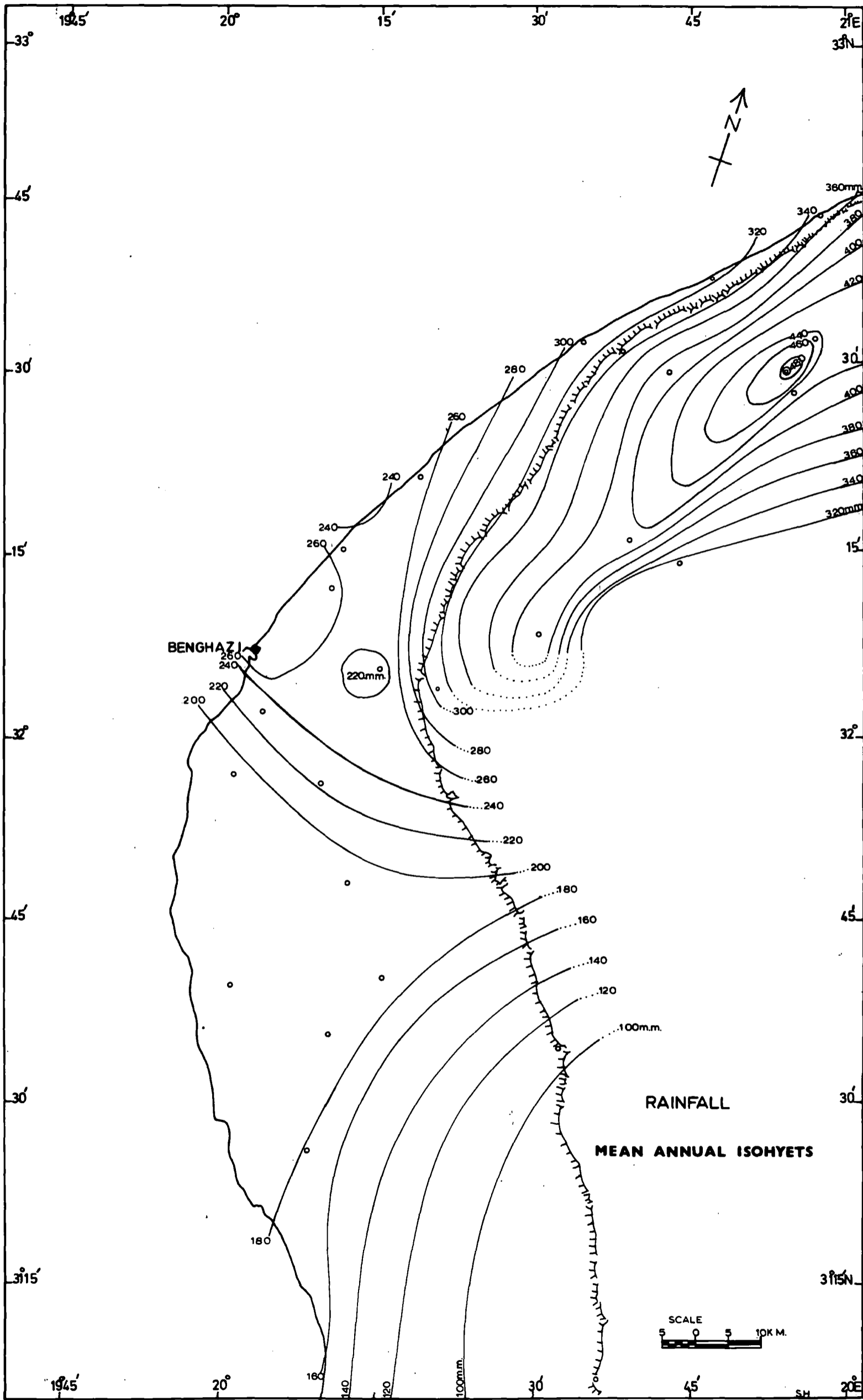


Fig.2.11.

# RAINY & DROUGHT YEARS IN THE BENGHAZI PLAIN & THE ADJACENT AREAS

Fig. 2.12.

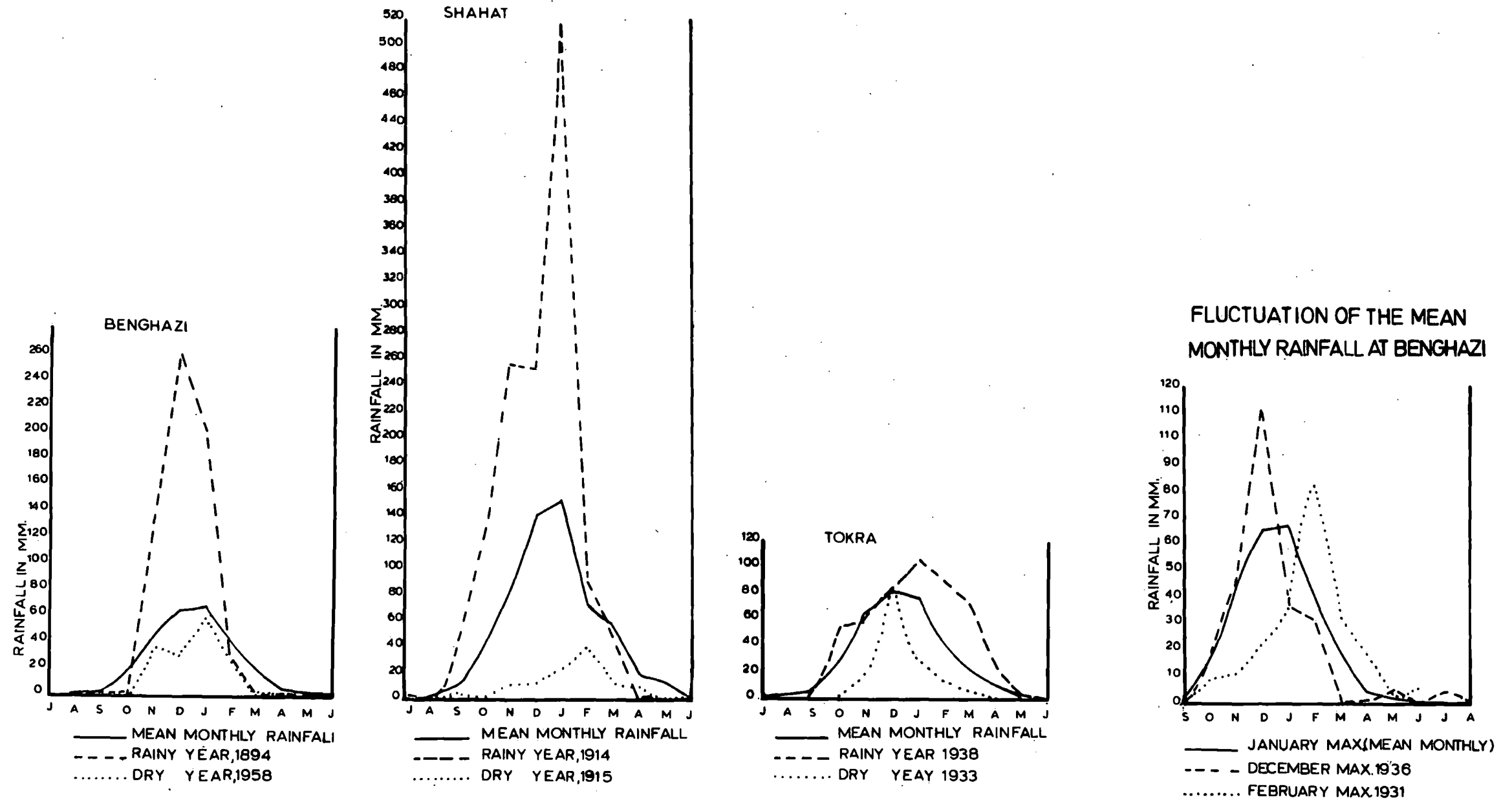
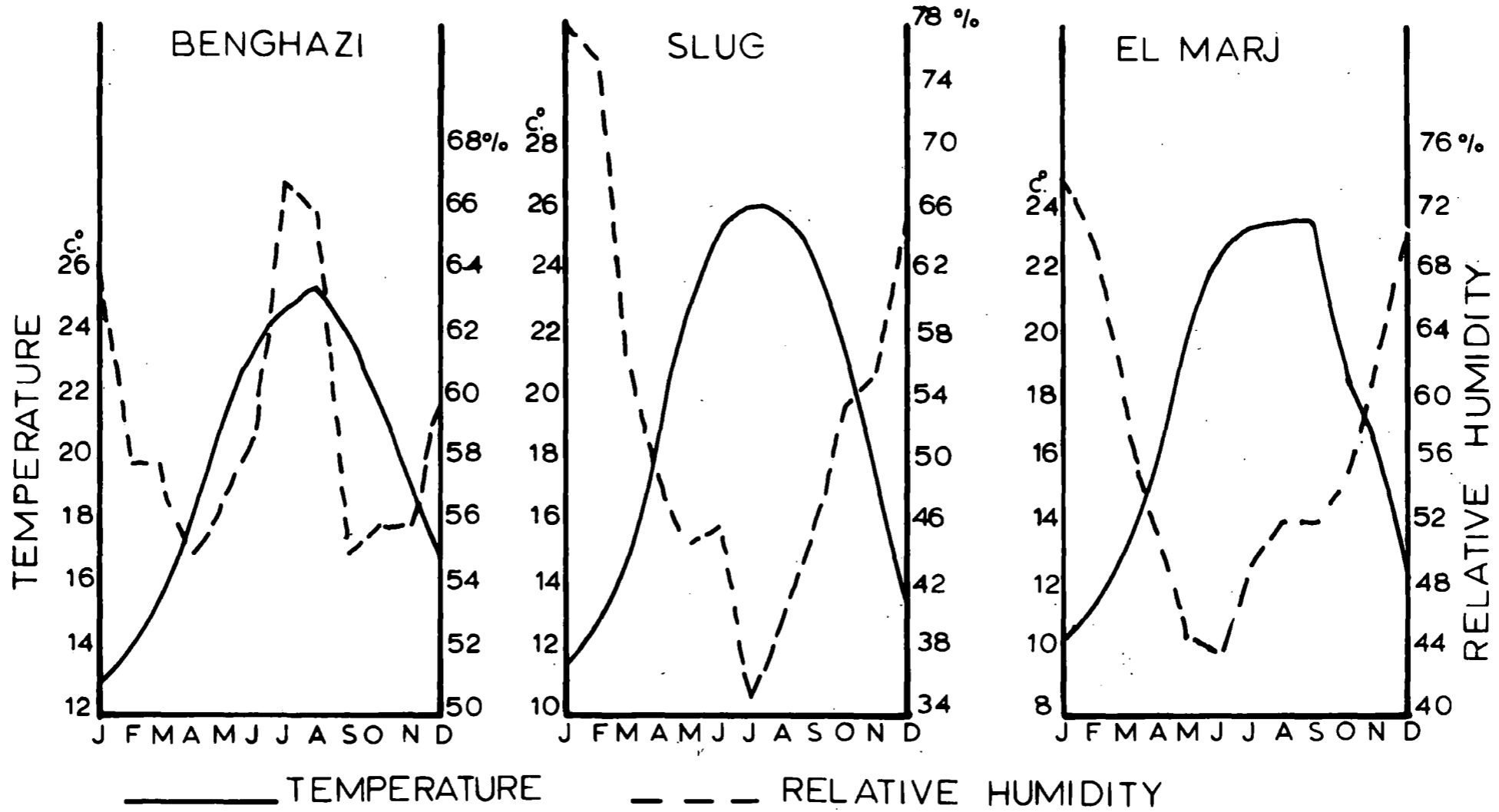


Fig. 2.12

FIG. 2.13.

# RELATIONSHIP BETWEEN TEMPERATURE & RELATIVE HUMIDITY IN THE BENGHAZI PLAIN & THE ADJACENT AREAS



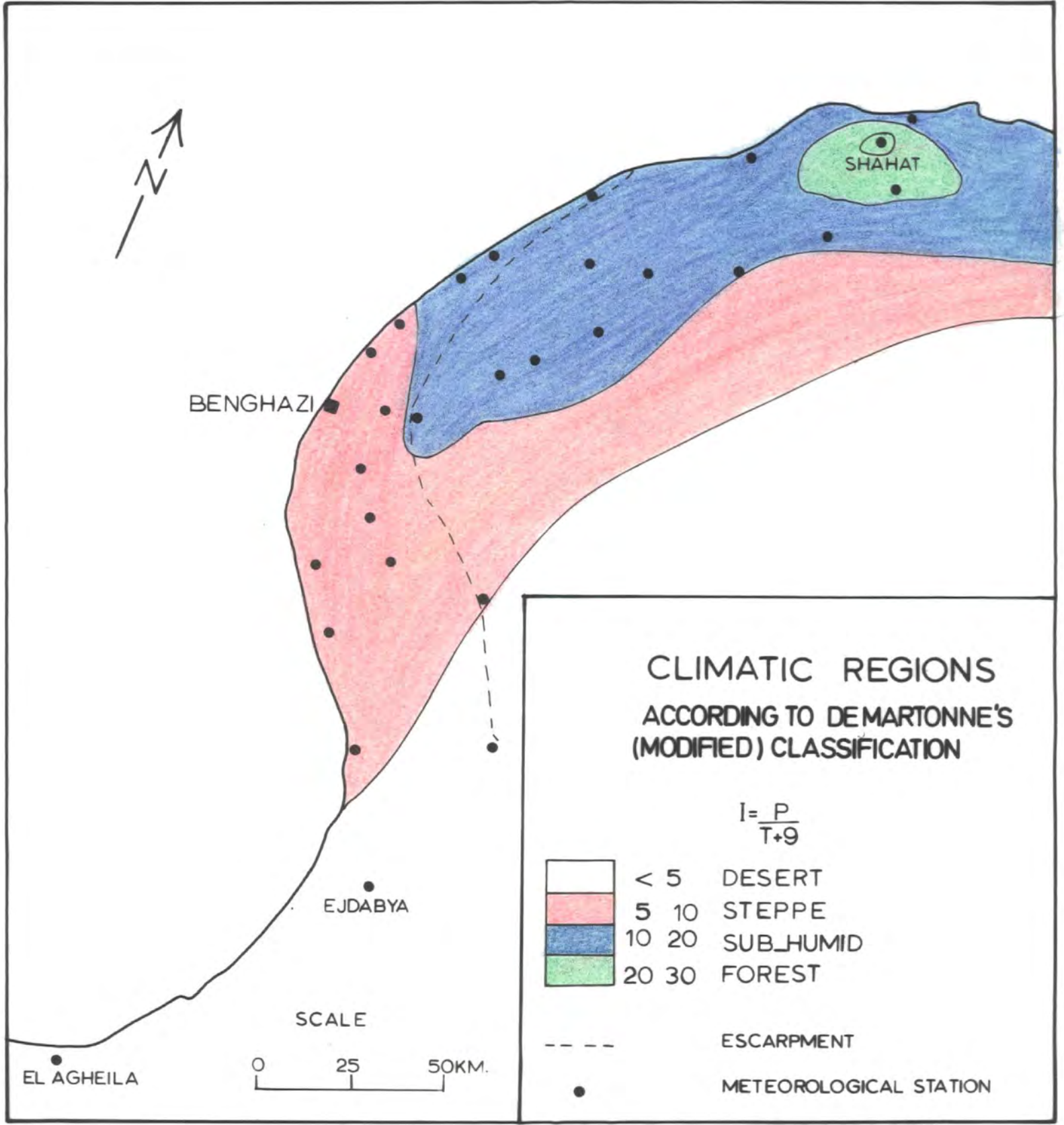


Fig.2.14.

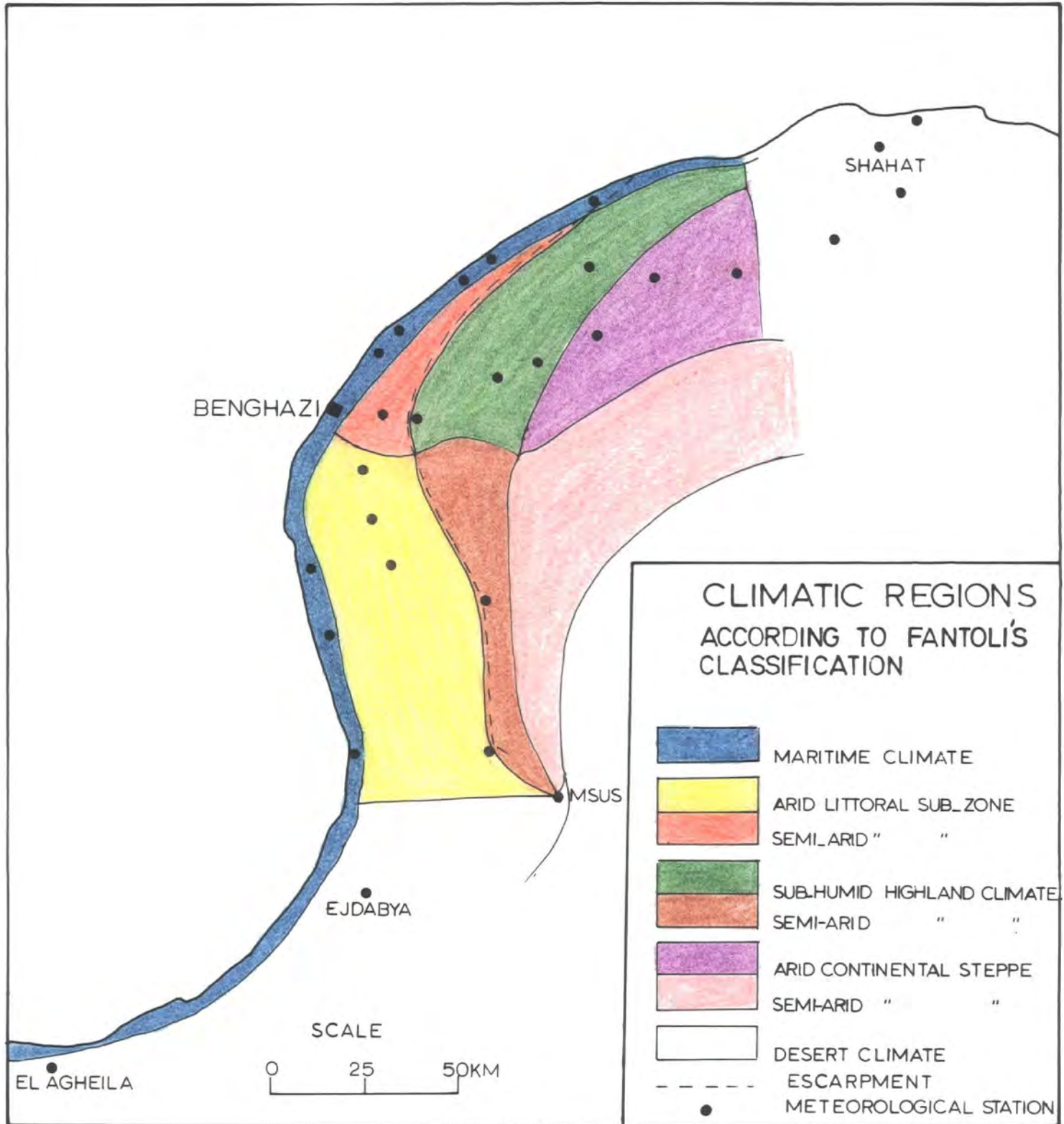


Fig.2.15.

## DEPTH TO WATER FROM LAND SURFACE

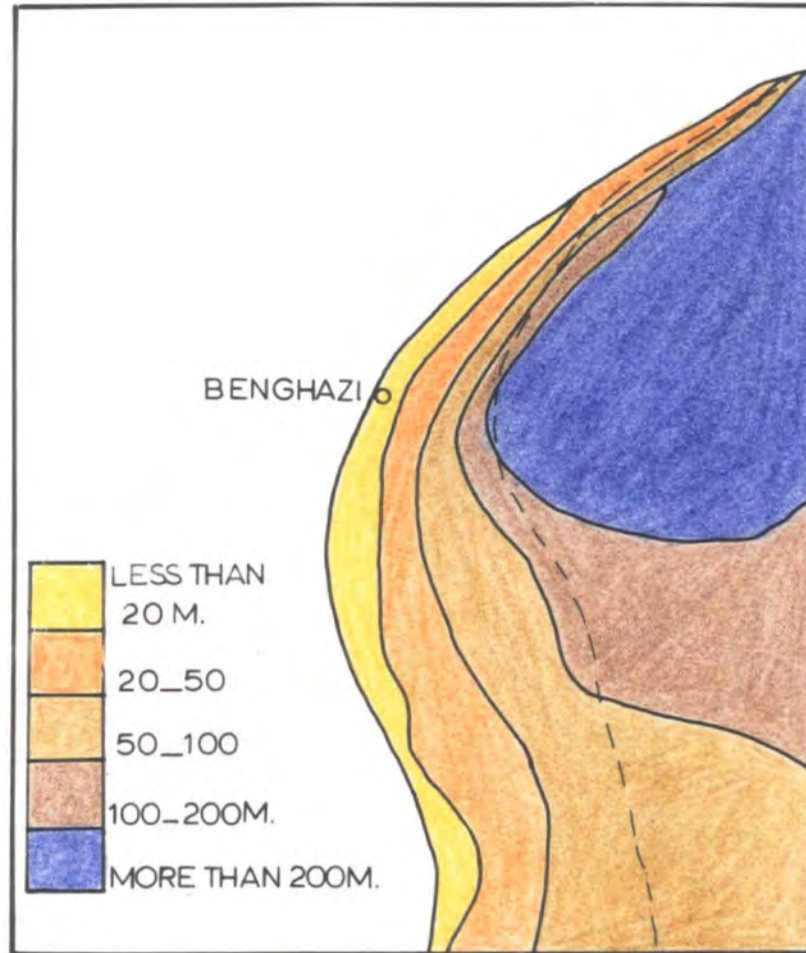


Fig.3.1.

## DEPTH OF WATER-LEVEL FROM LAND SURFACE

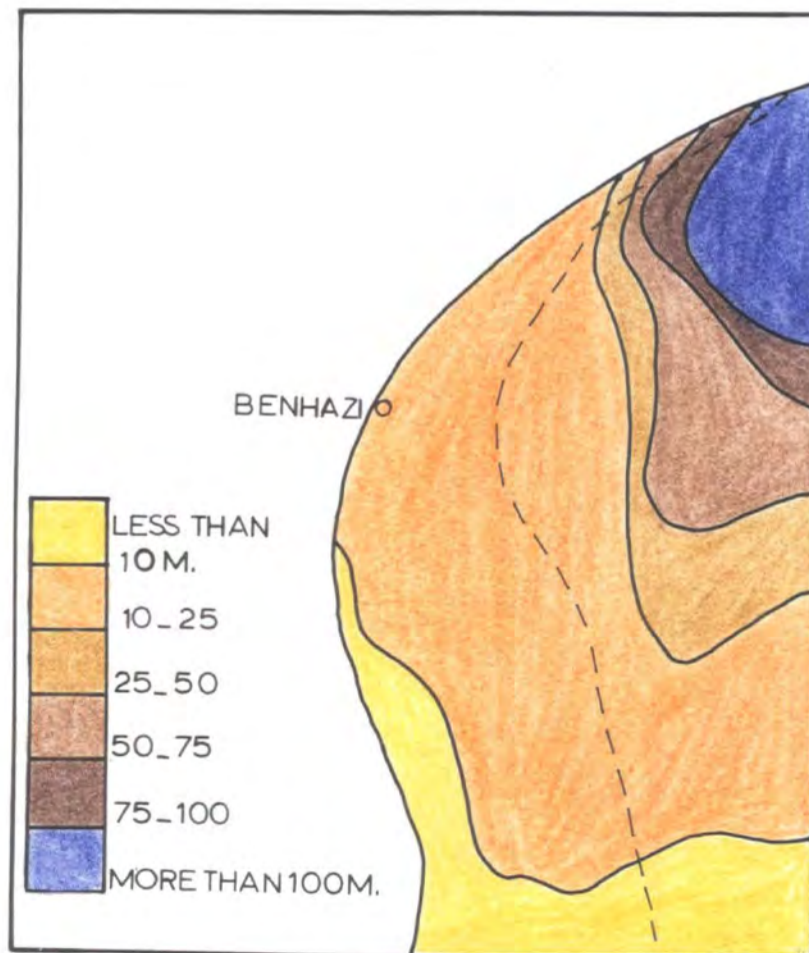
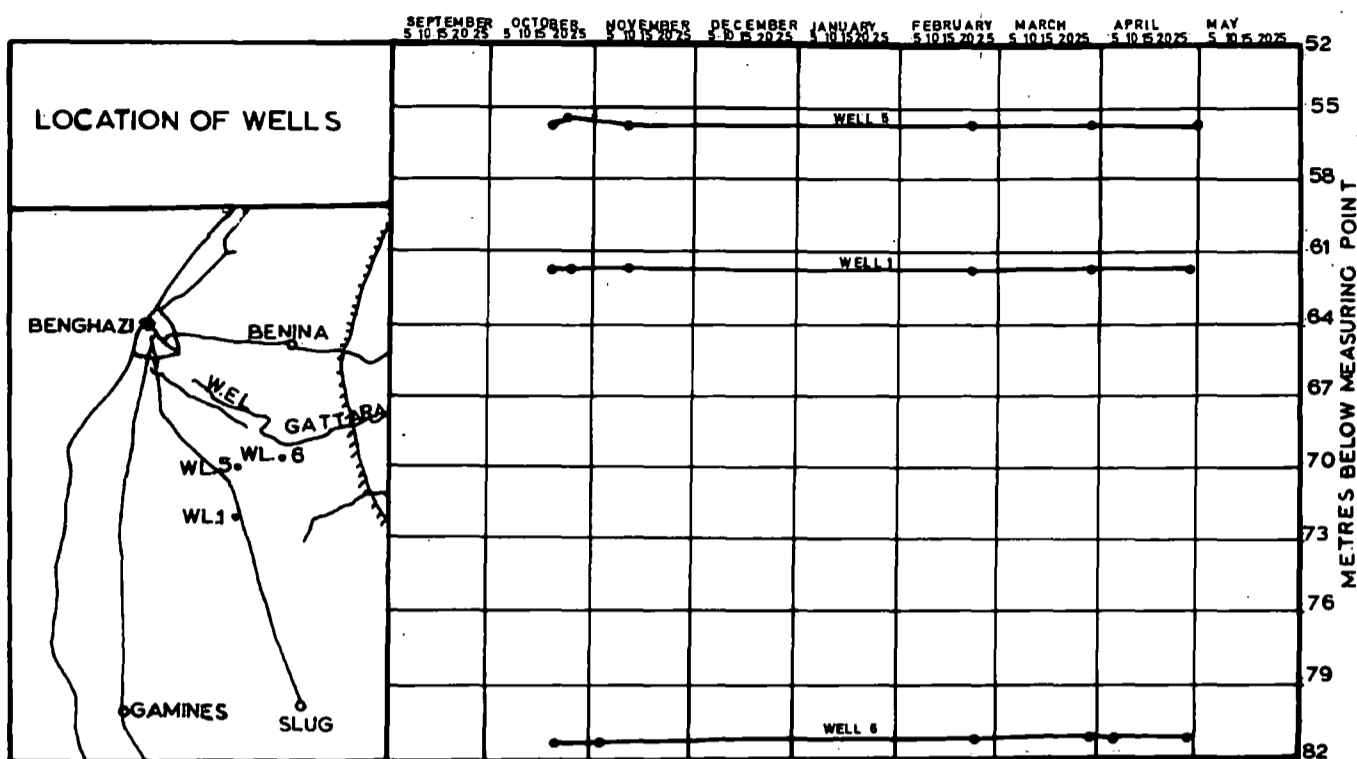


Fig.3.2

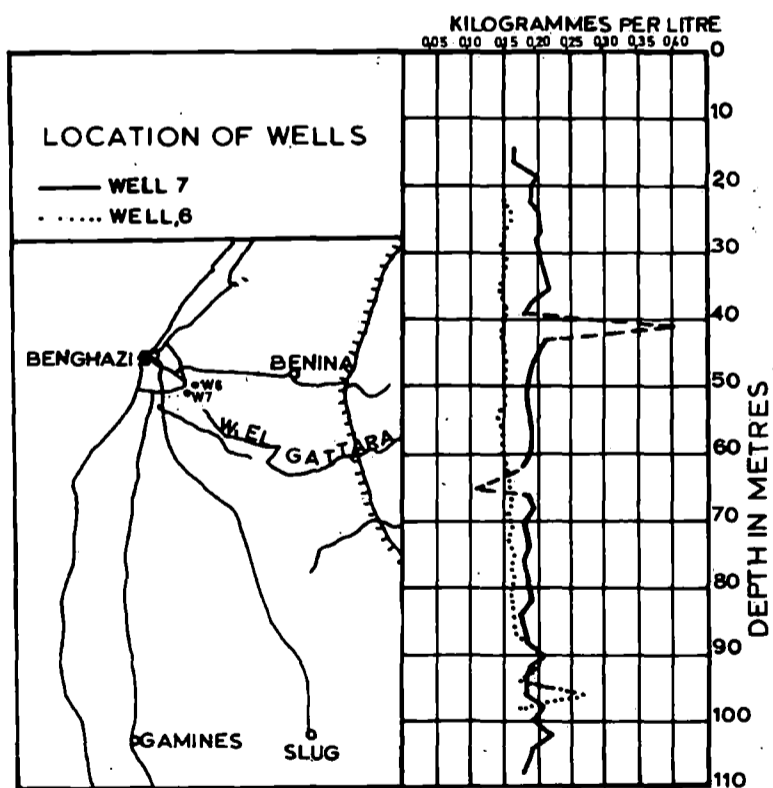
### WATER LEVEL FLUCTUATION, 1957



SOURCE: DOYEL, W.W. & MAGUIRE, F. J., "RESULTS OF WATER INVESTIGATIONS BENGHAZI AREA", LIBYA, 1959

Fig. 3.3.

### CHANGES IN THE SALINITY BY DEPTH



SOURCE: MARCHETTI, M., IDROLOGIA CIRENAICA ITAL. COL. AGR. INST., FLORENCE, 1938, P. 240

Fig. 3.4



# CHEMICAL QUALITY OF GROUND WATER

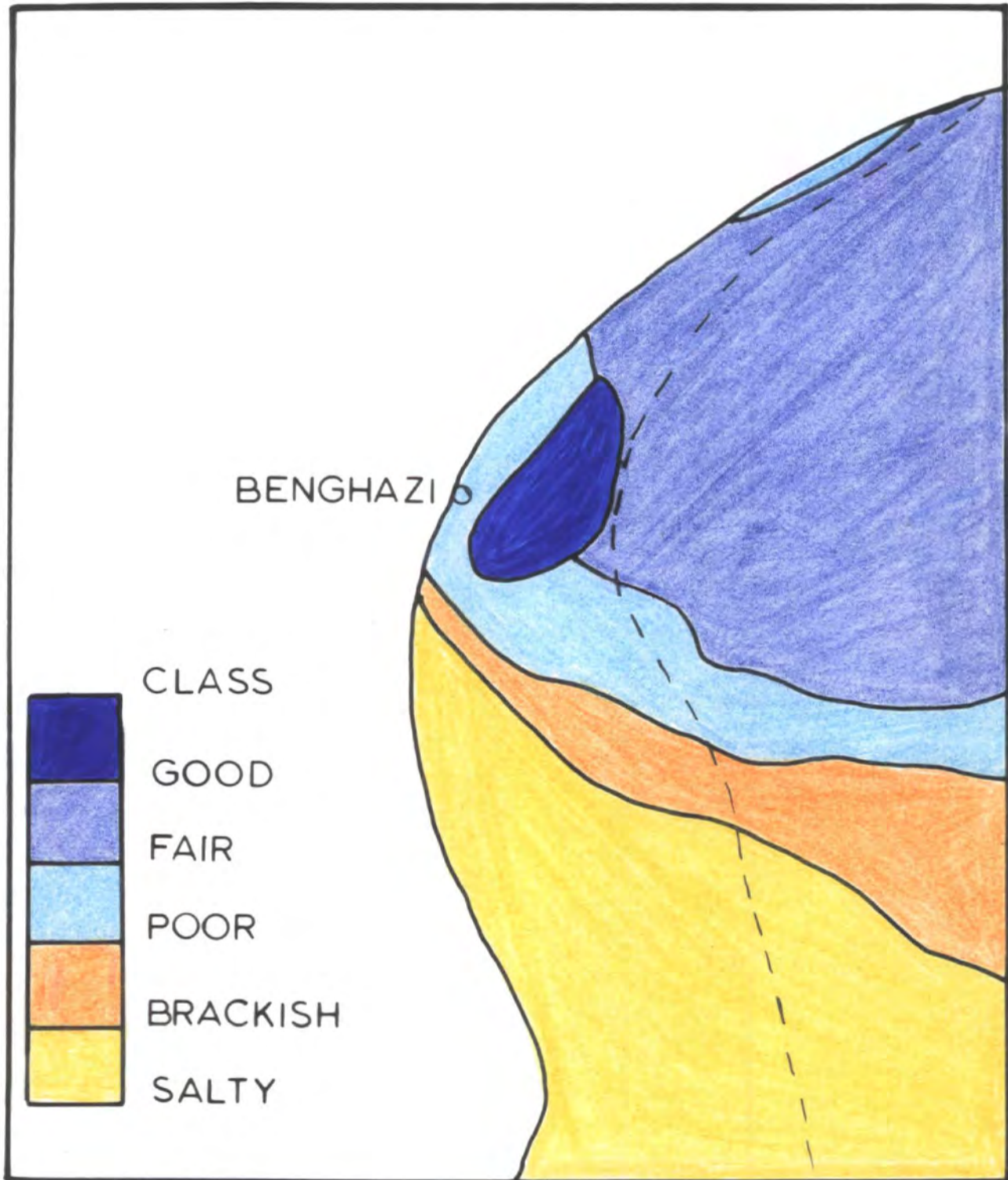


Fig.3.5

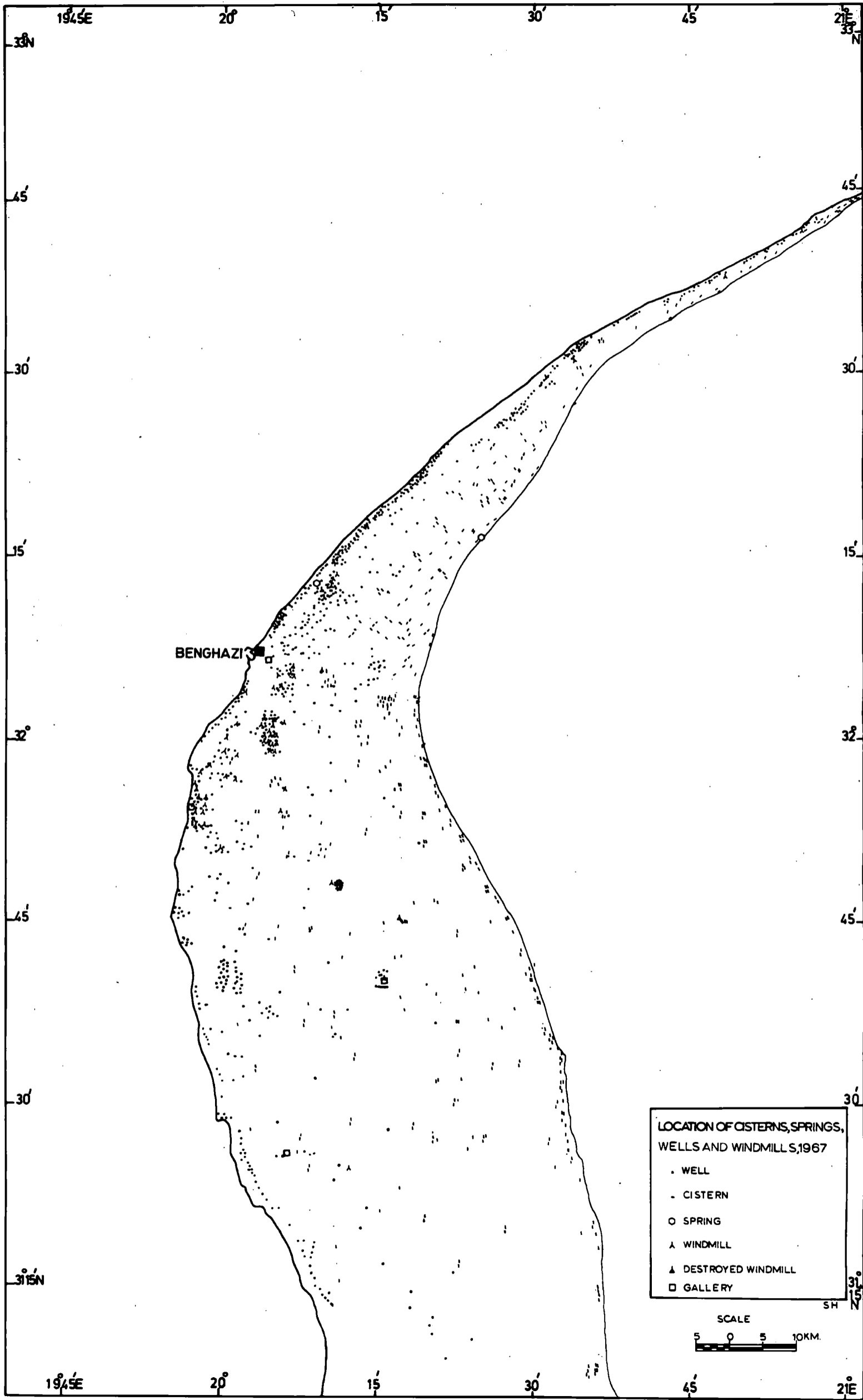


Fig.3.6

# AVAILABILITY OF ADDITIONAL GROUND WATER

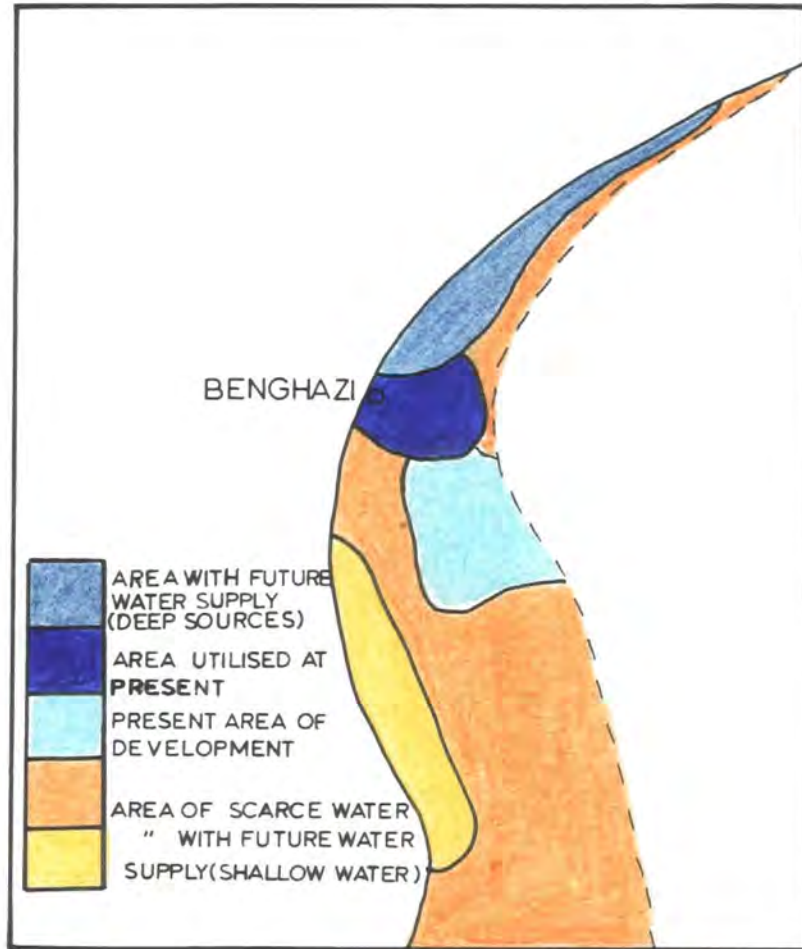


Fig.3.7

# AREA OF WATER-LEVEL DECLINE SALT WATER CONTAMINATION

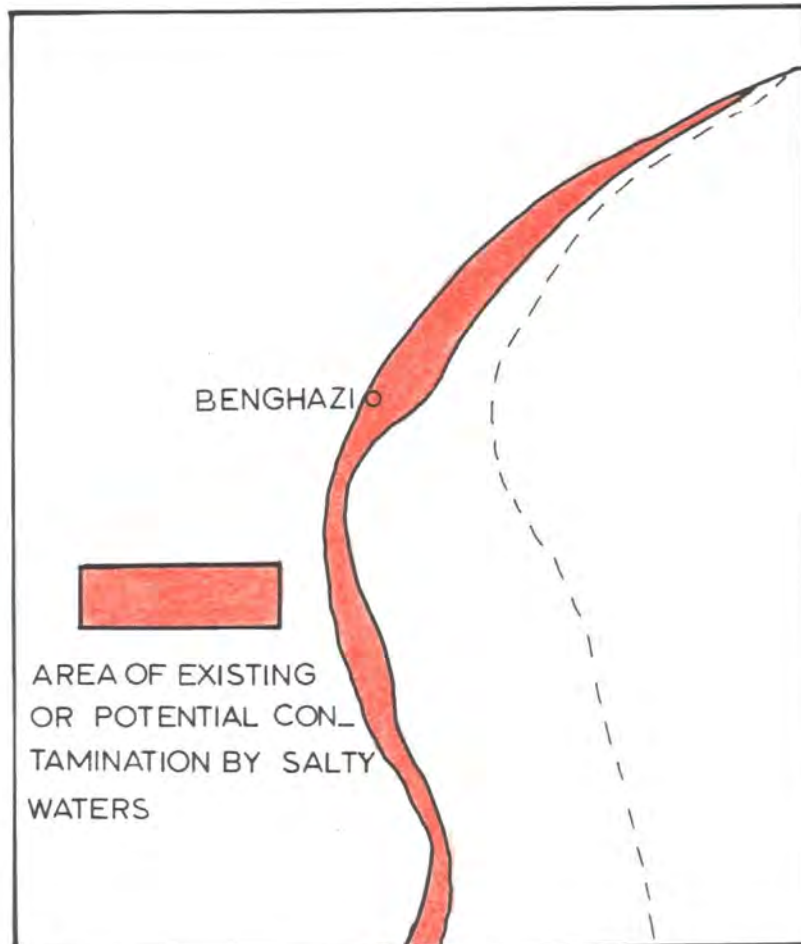


Fig.3.8

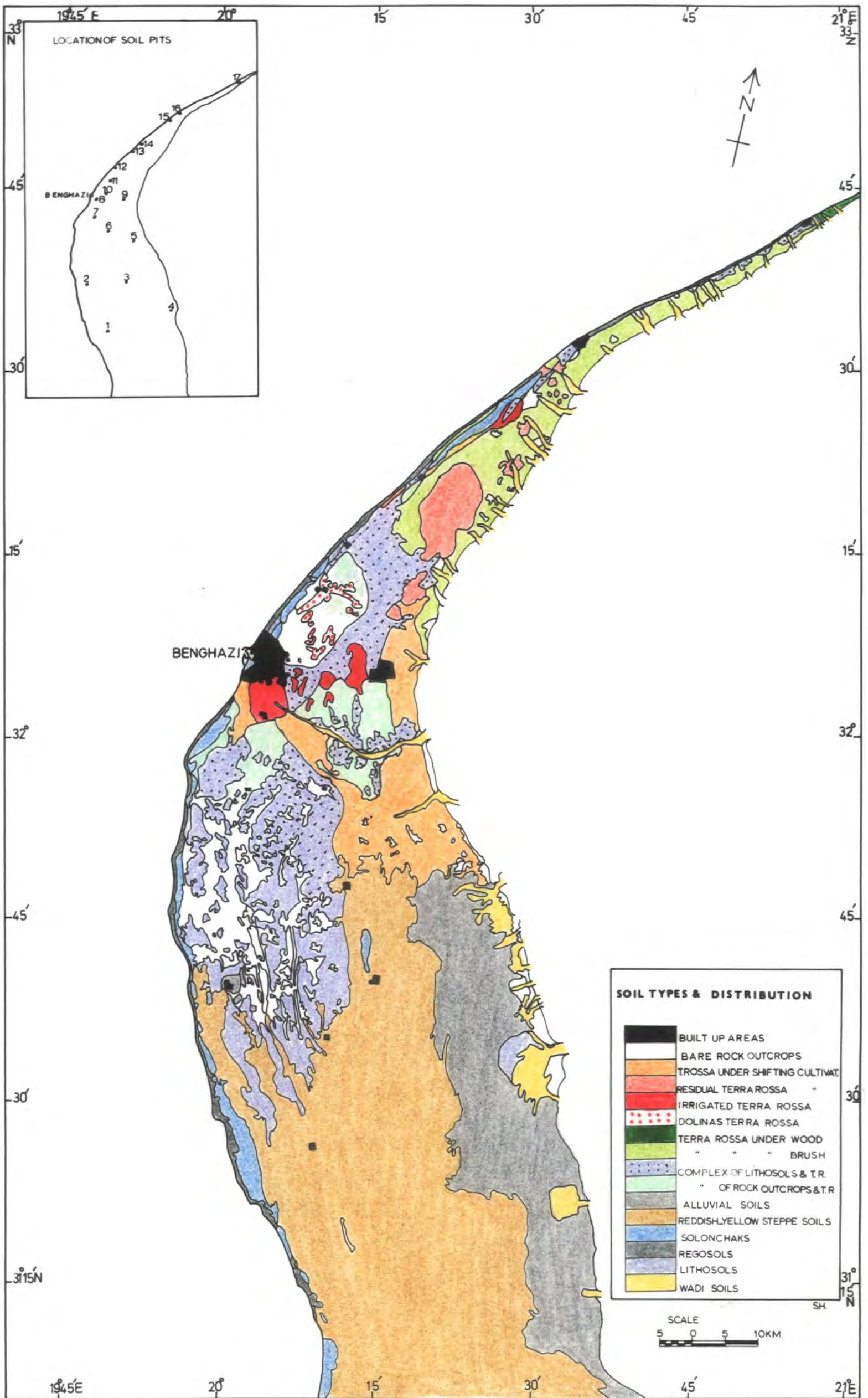


Fig.4.1.

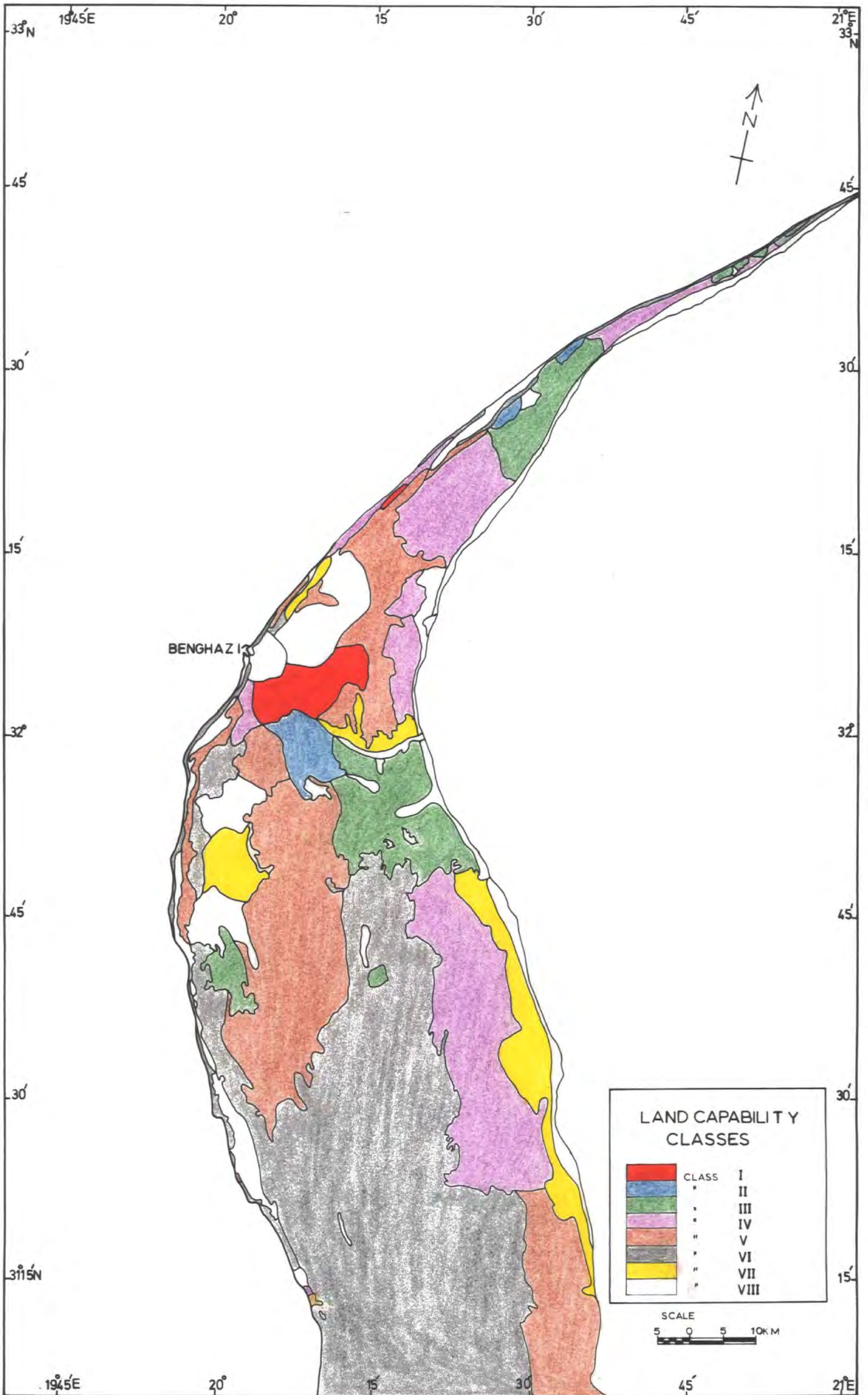


Fig.4.2.

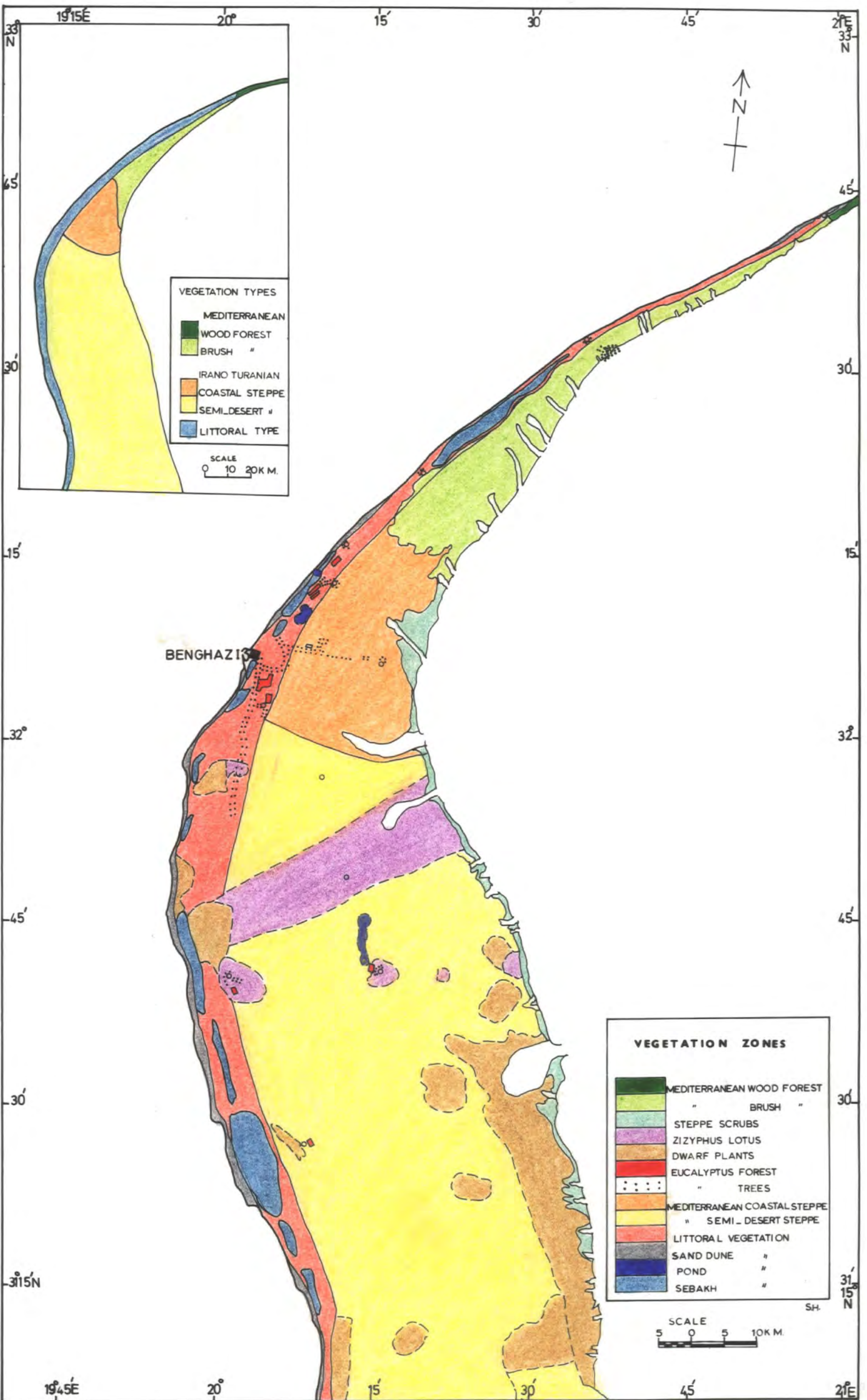


Fig. 4.3

Fig. 4.3.

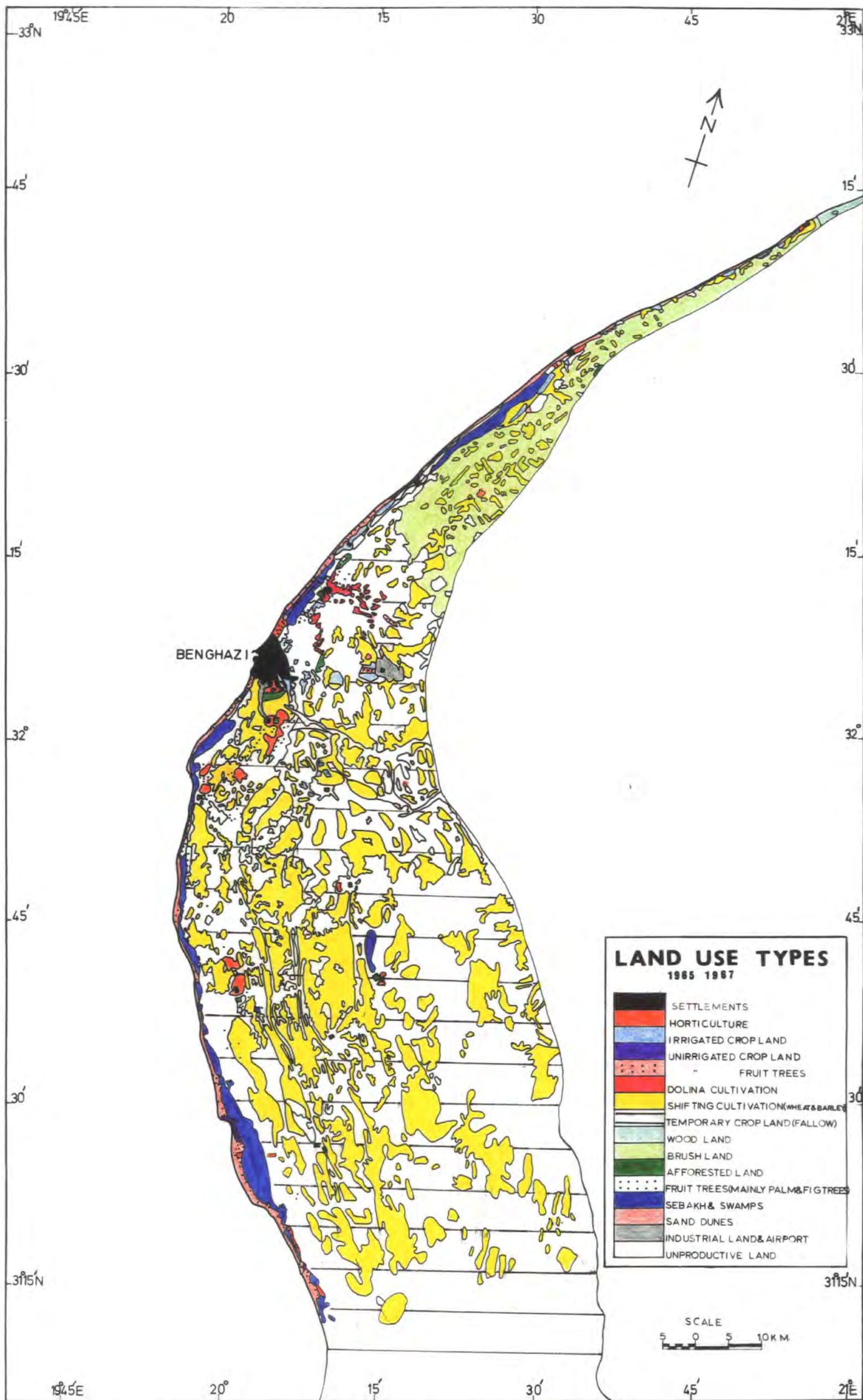


Fig.5.1.

Fig.5.2.

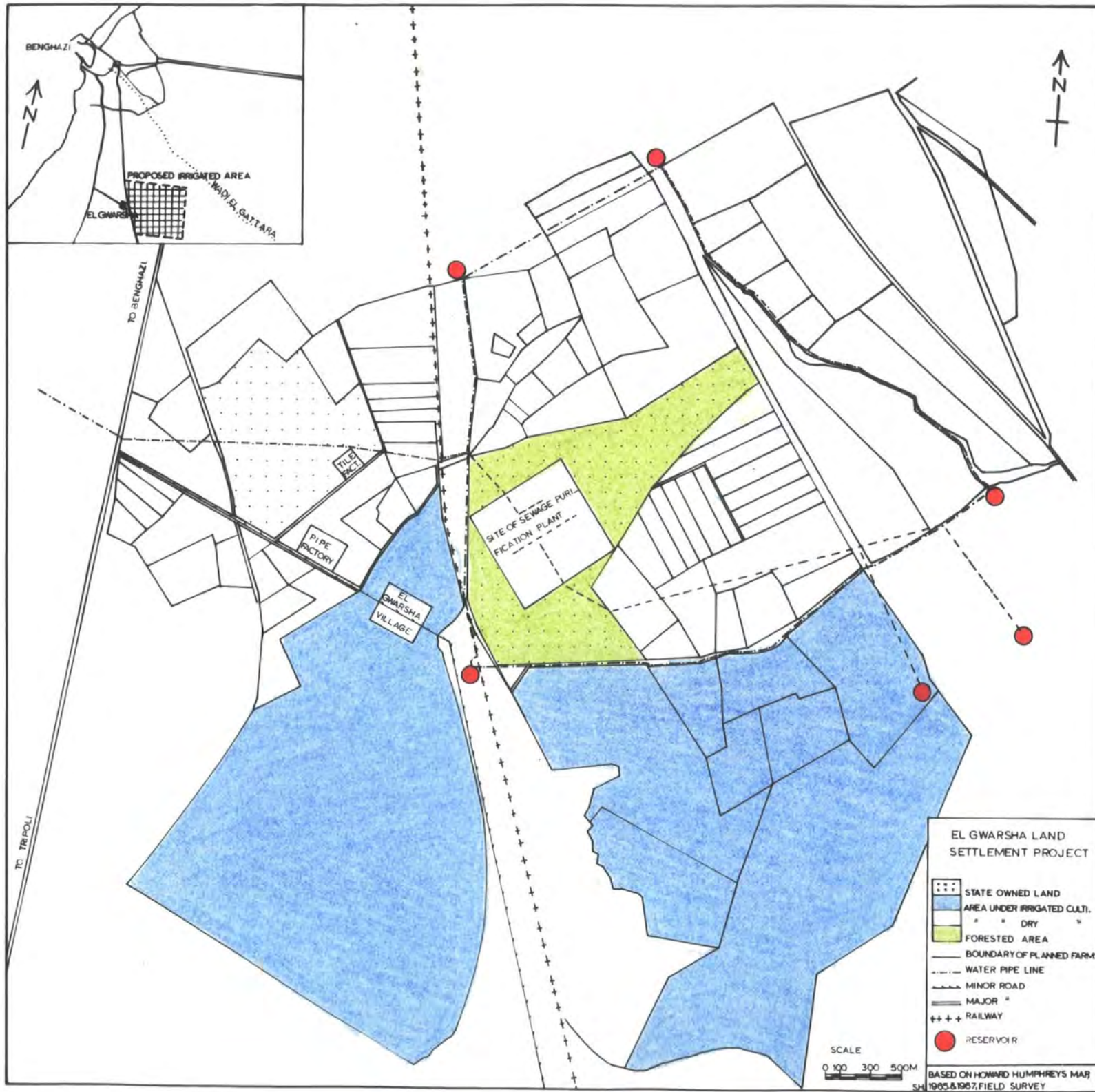




Fig. 5.3.

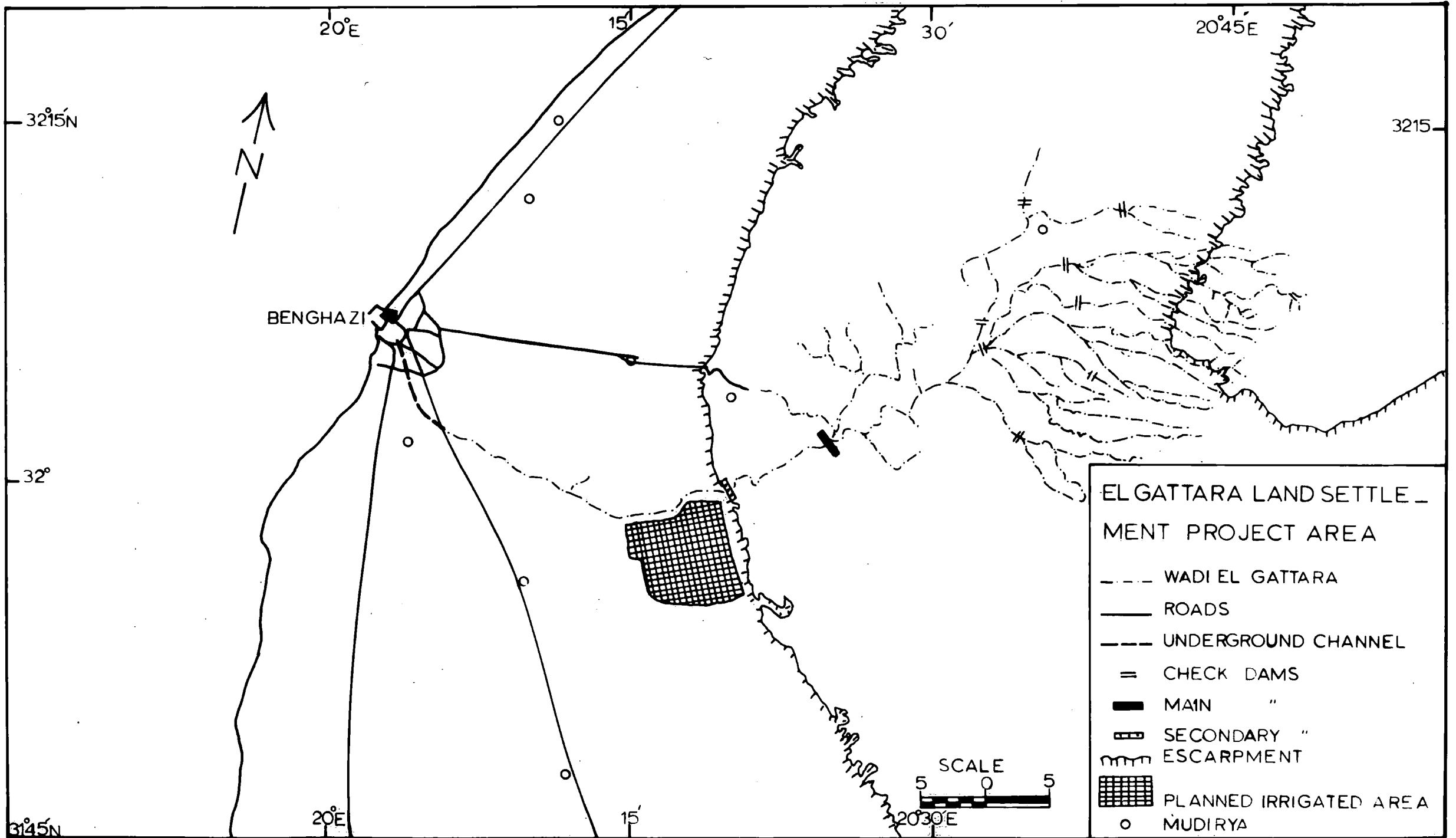


Fig. 5.3

## FLUCTUATION OF CEREAL PRODUCTION IN BENGHAZI MUTASARRIFYA, 1954-66

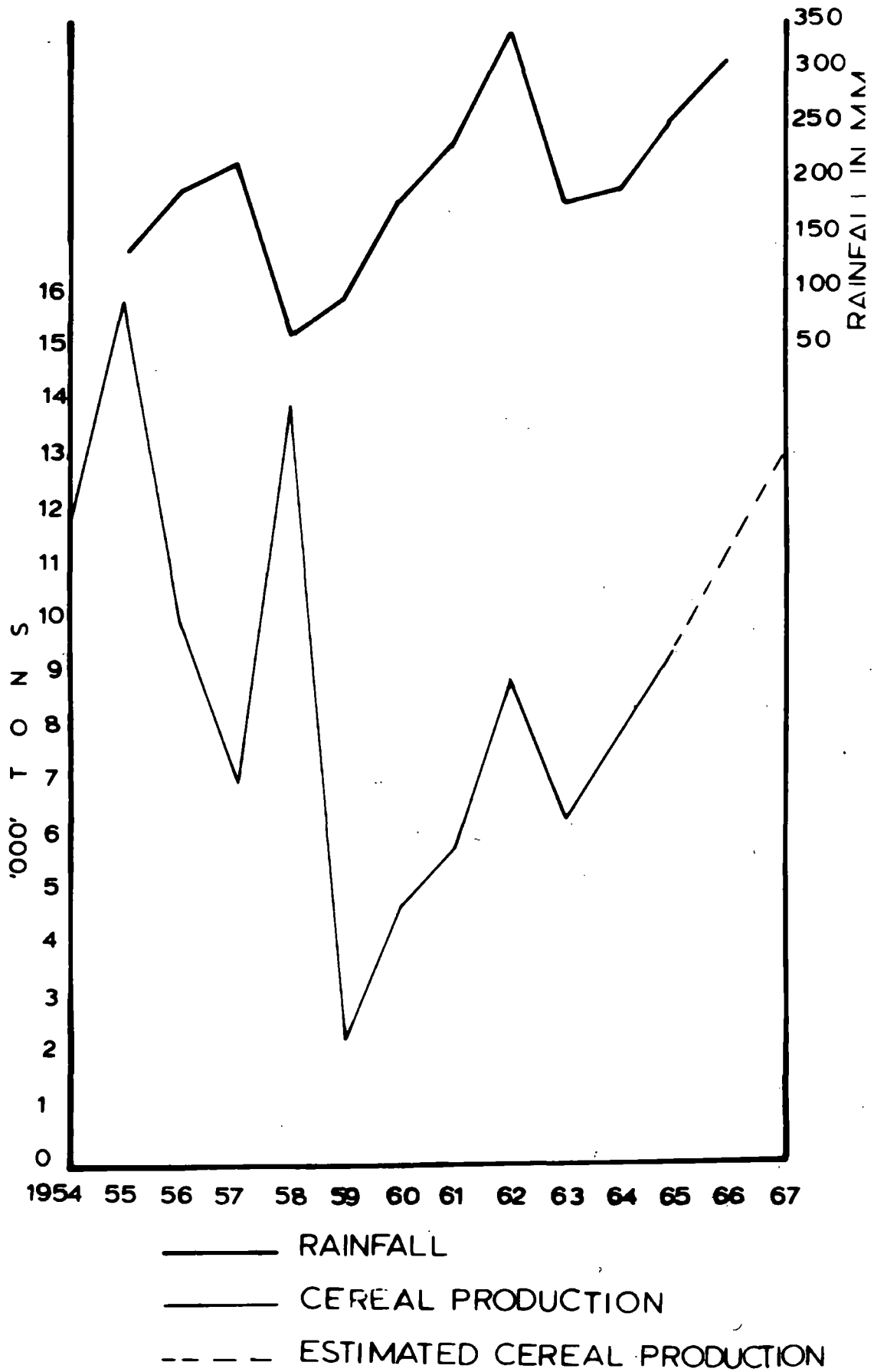


Fig.6.1.

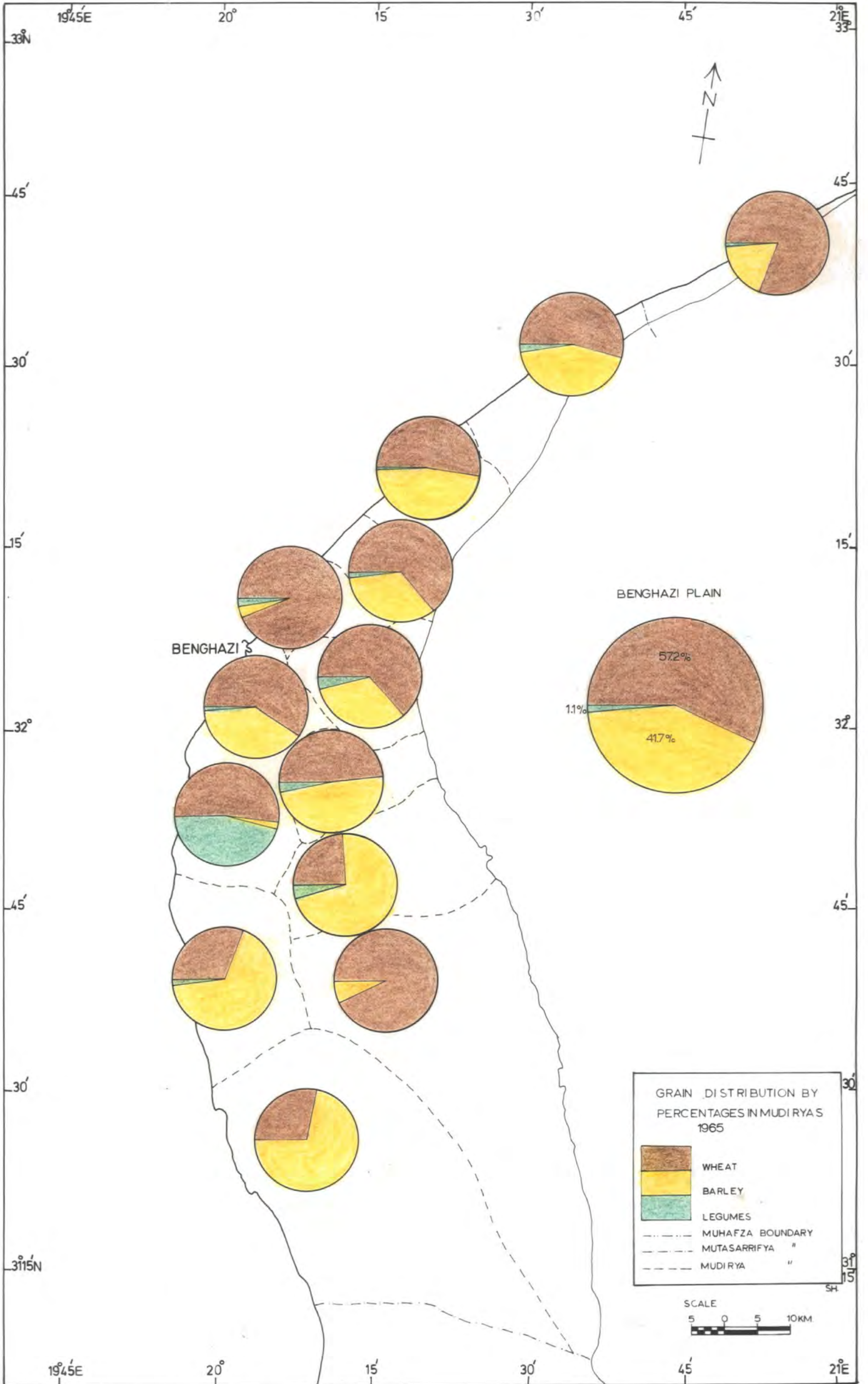
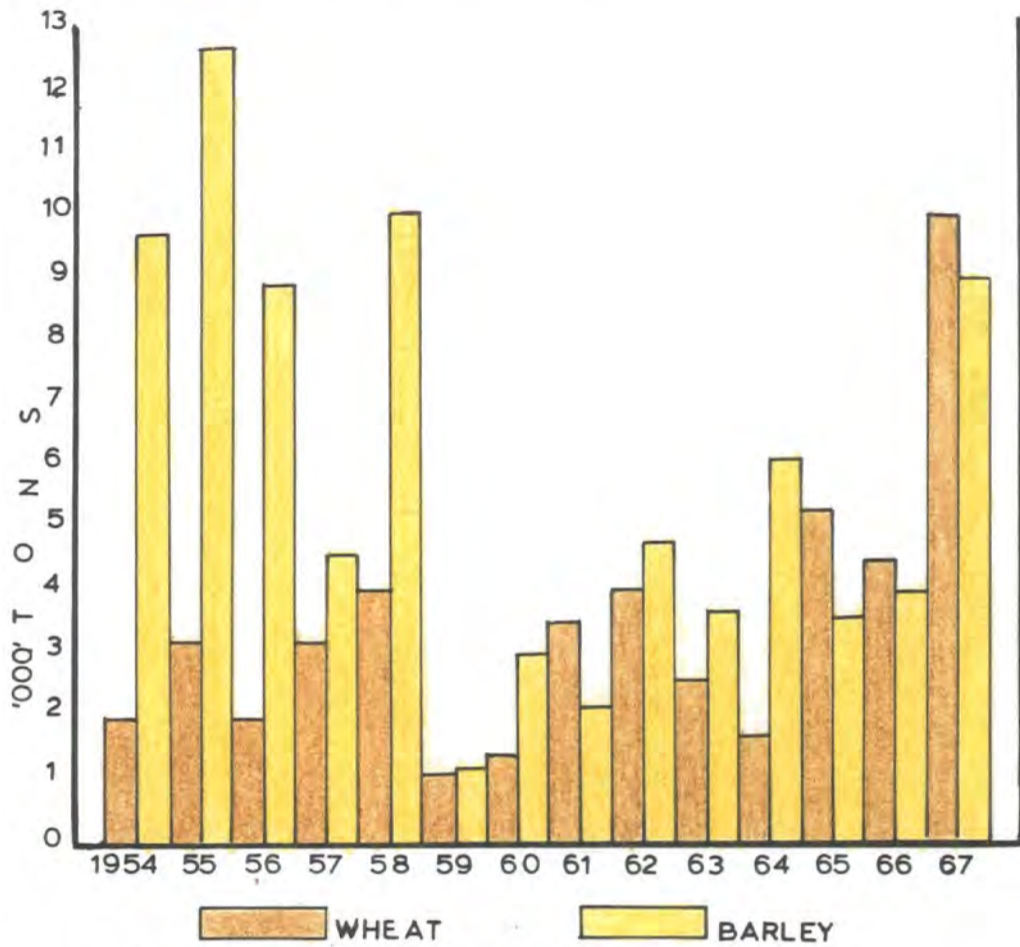


Fig.6.2

### PRODUCTION OF WHEAT & BARLEY IN BENGHAZI MUTASARRIFYA, 1954-67



1966-67, STATISTICS ARE ESTIMATED

Fig.6.3.

### FLUCTUATION OF OLIVE PRODUCTION, 1955-1965.

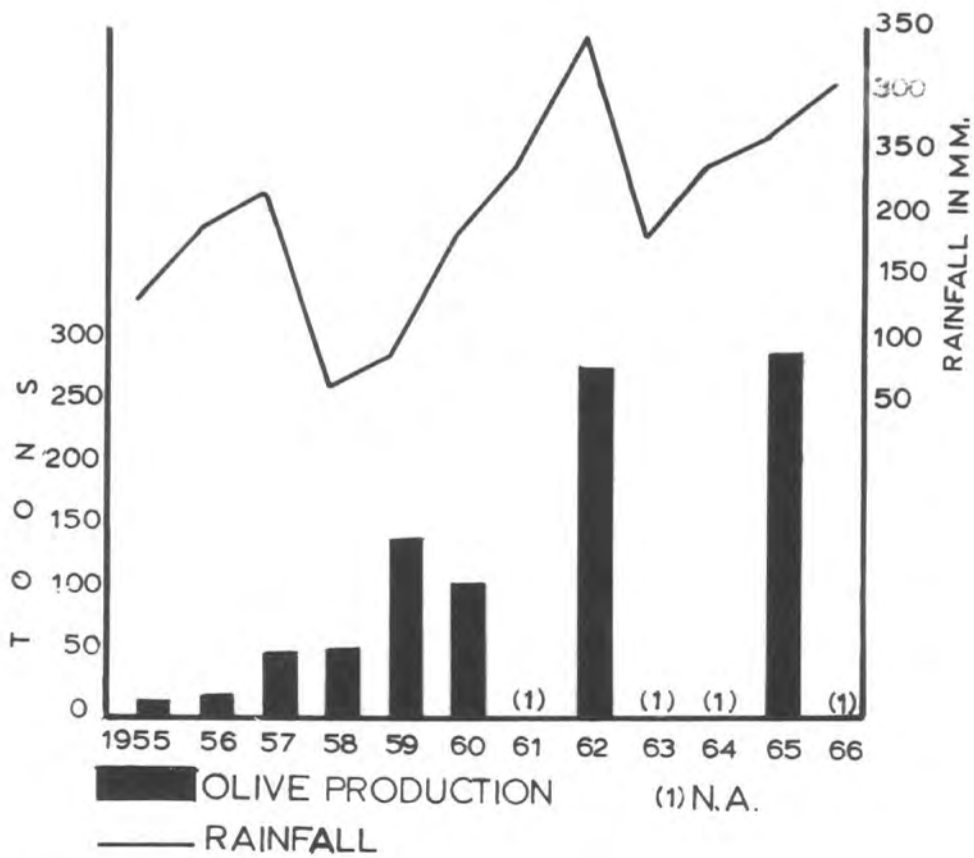


Fig.6.4.

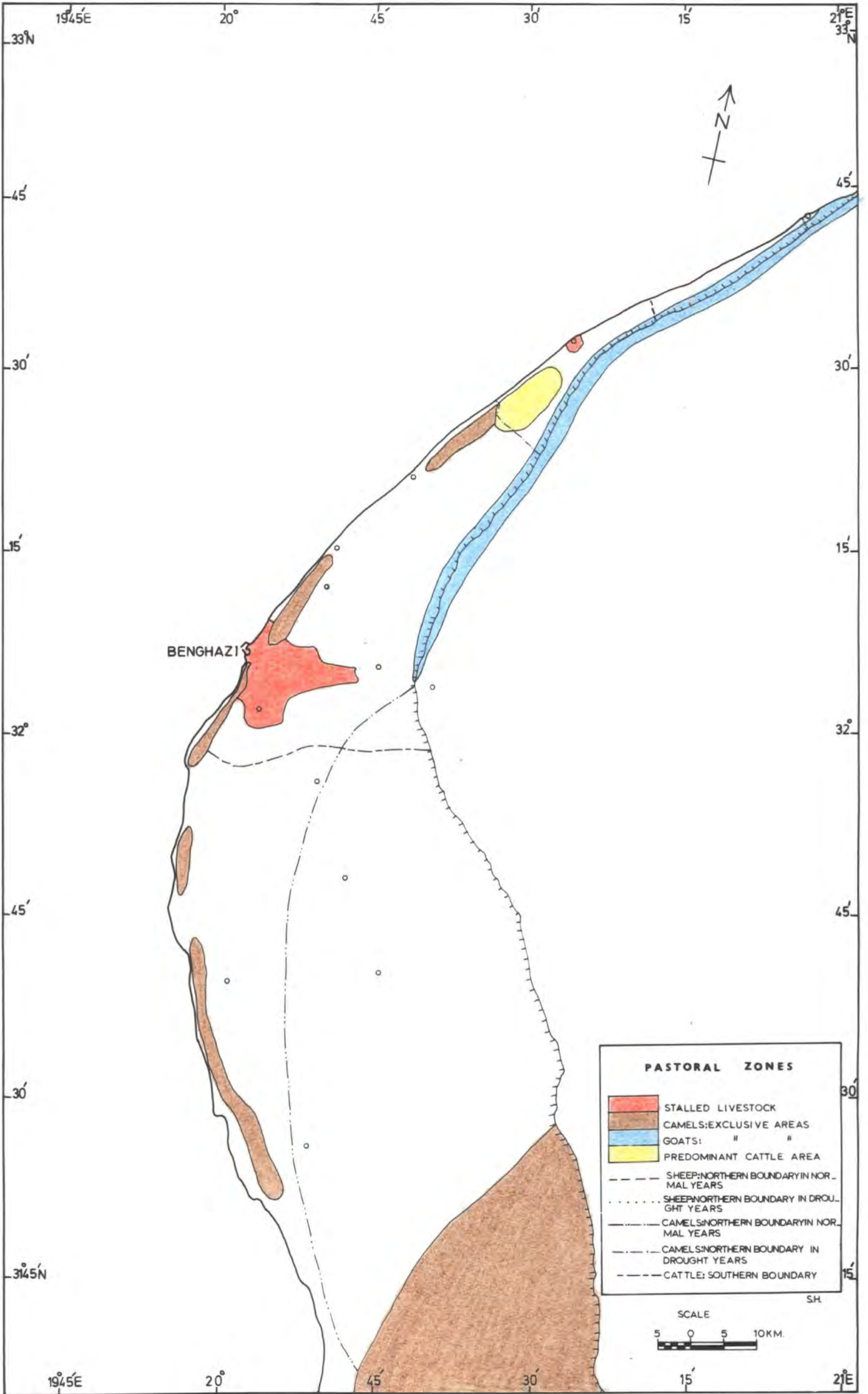


Fig.8.1

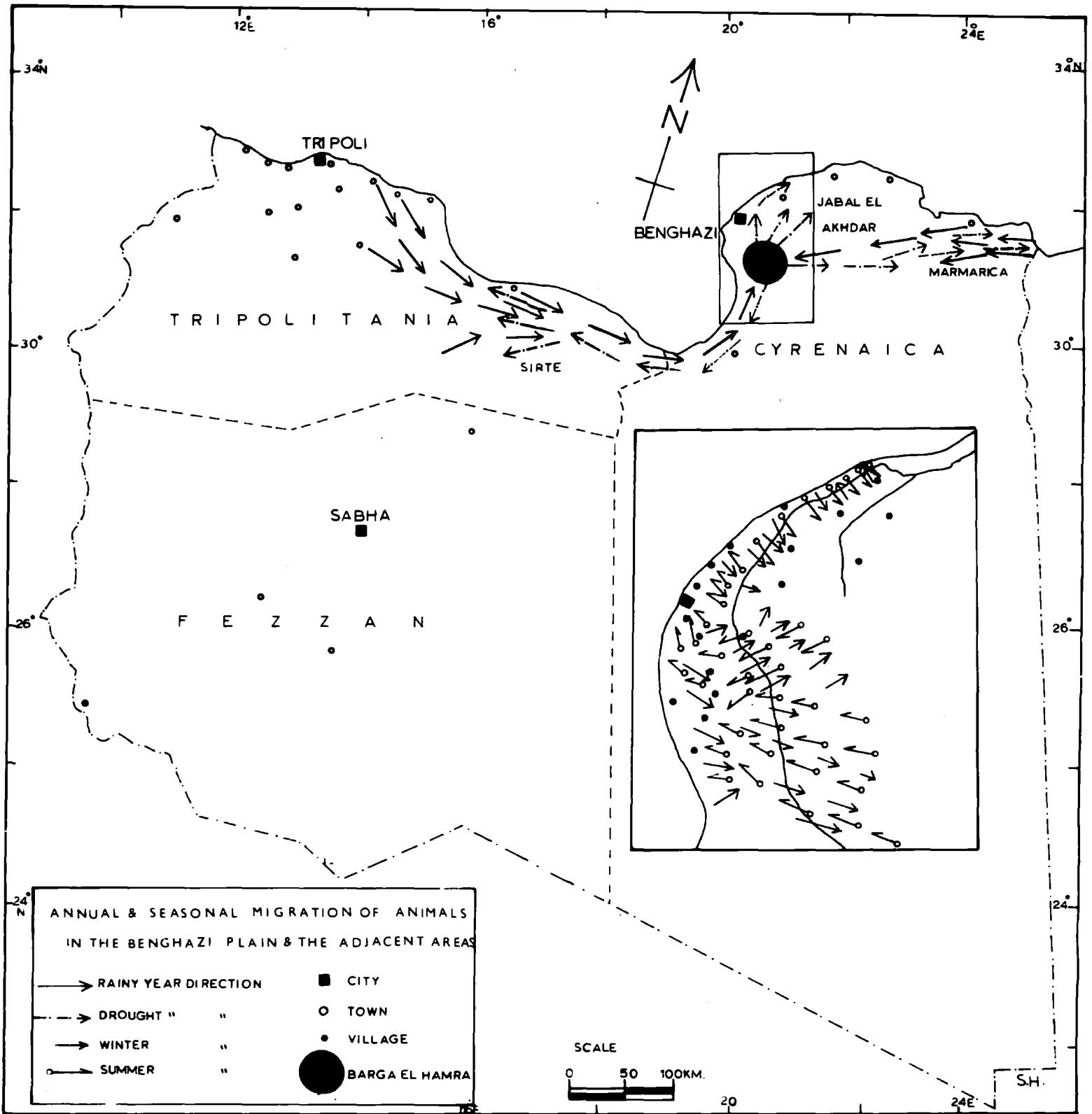


Fig.8.2.

### LIVESTOCK FLUCTUATION, 1957-1966

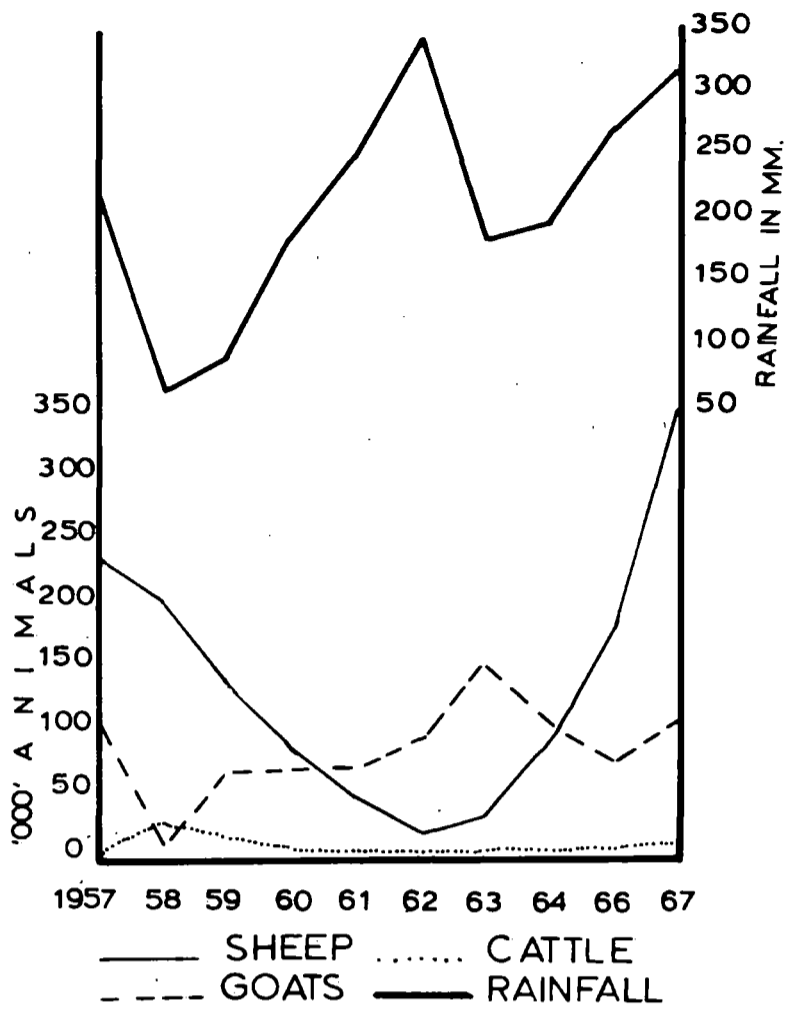


Fig.8.3.

### DRAUGHT ANIMAL FLUCTUATION, 1957-1966.

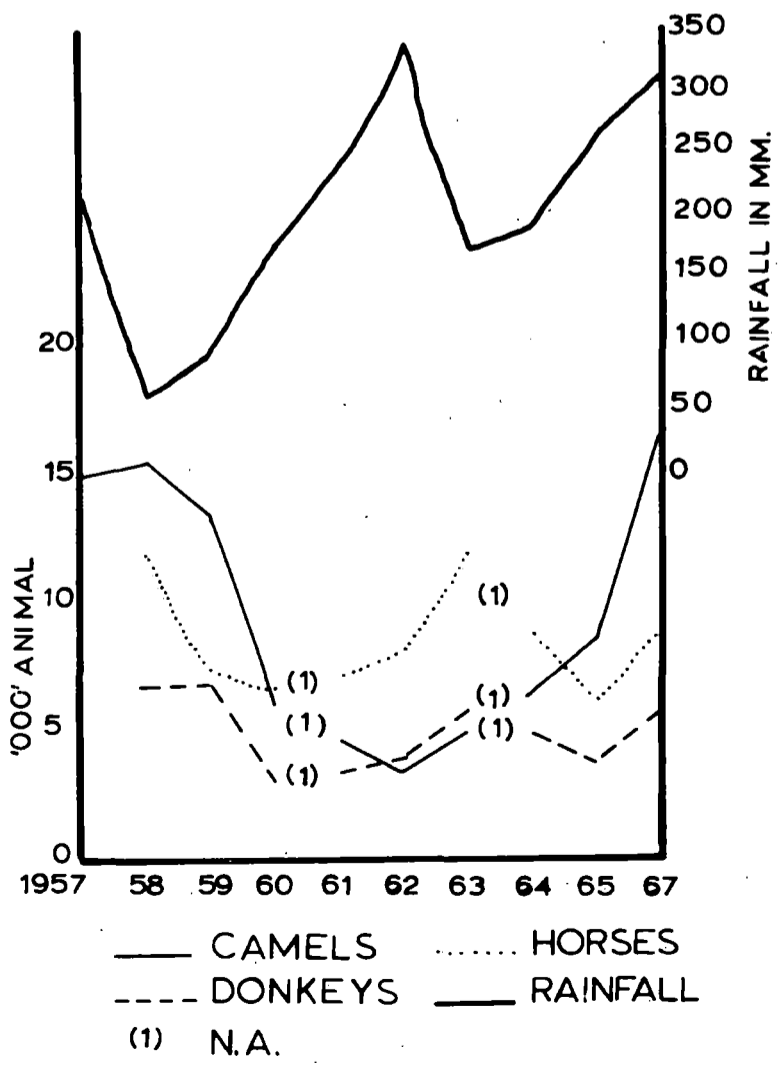


Fig.8.4.

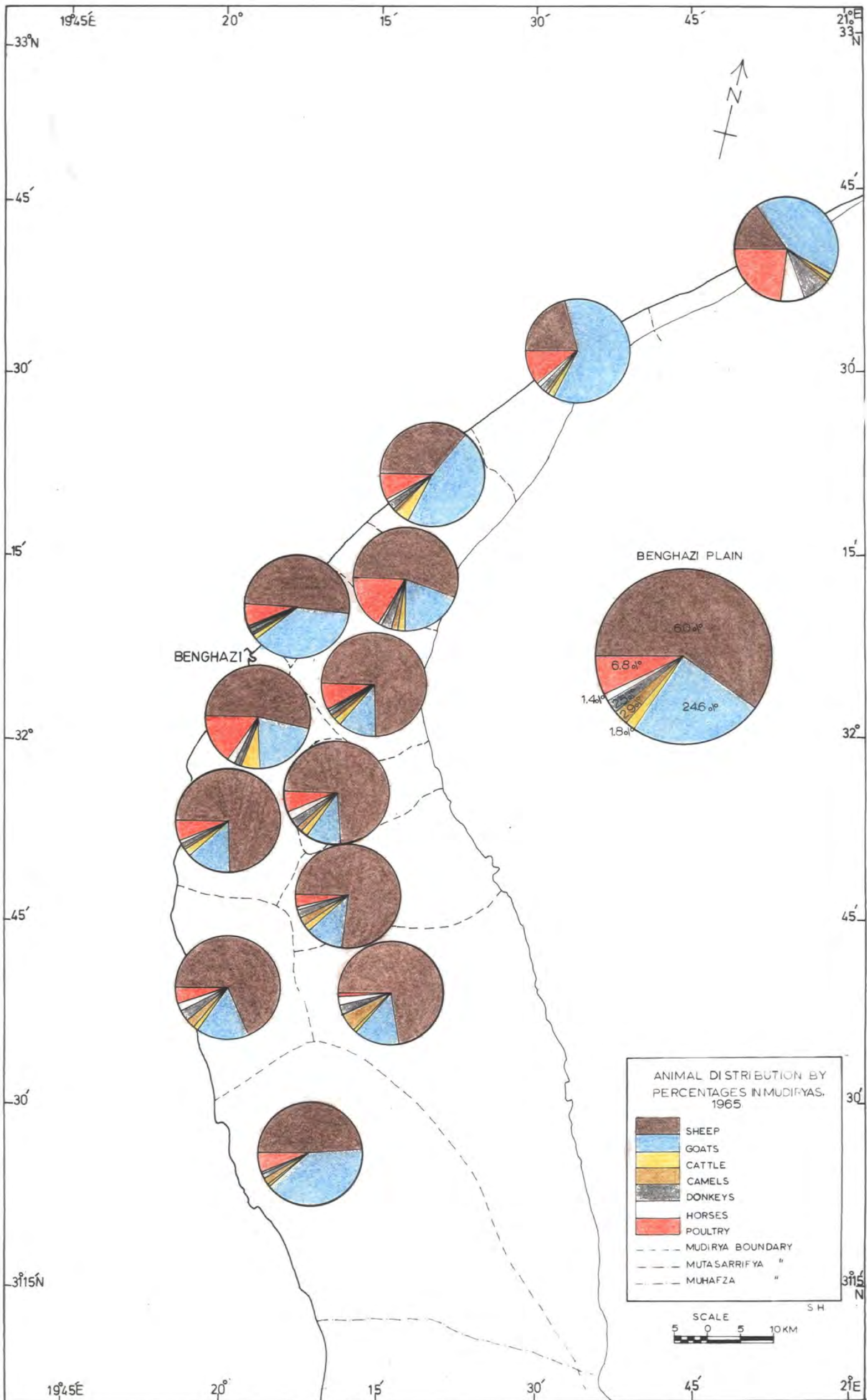


Fig.8.5.



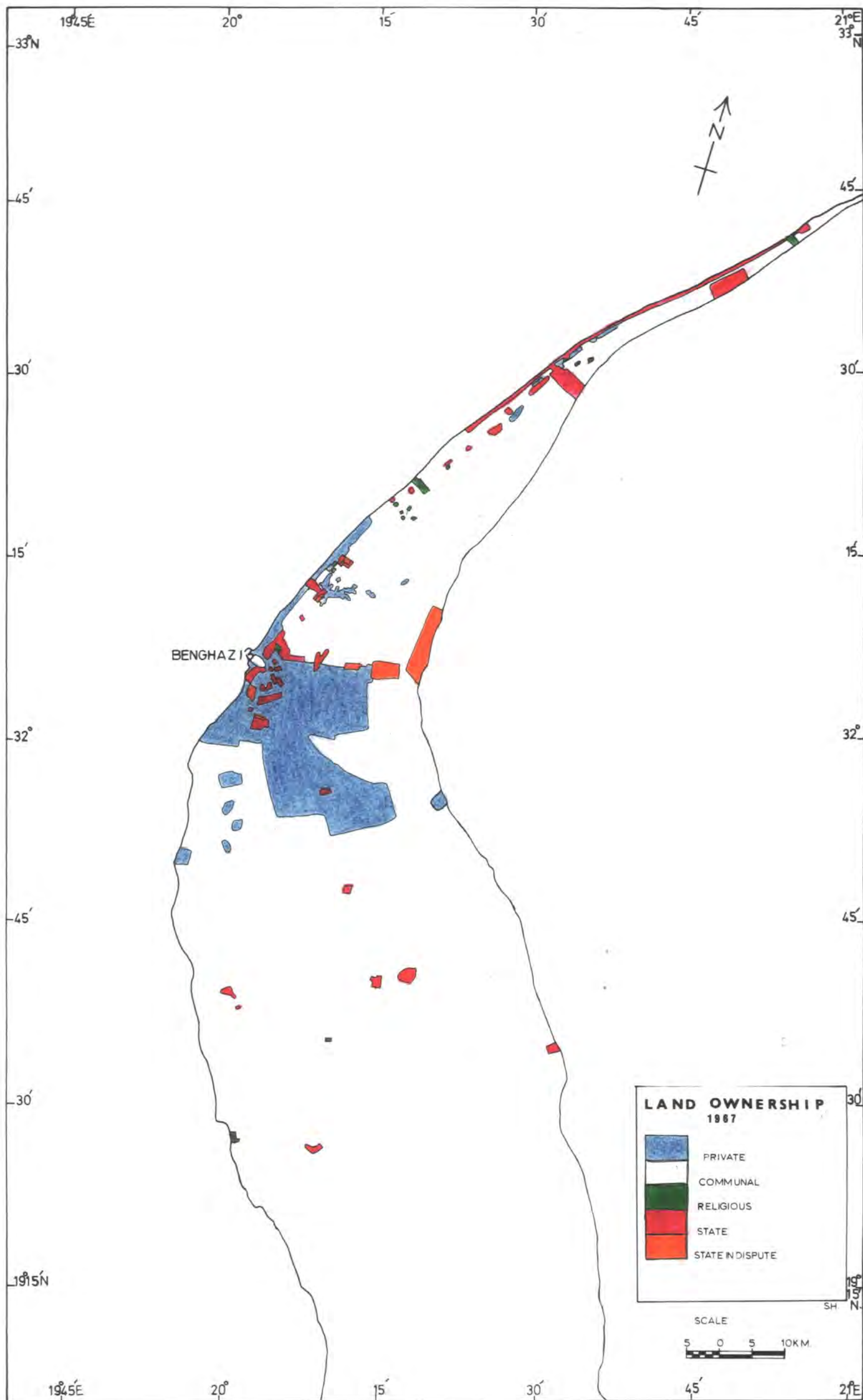
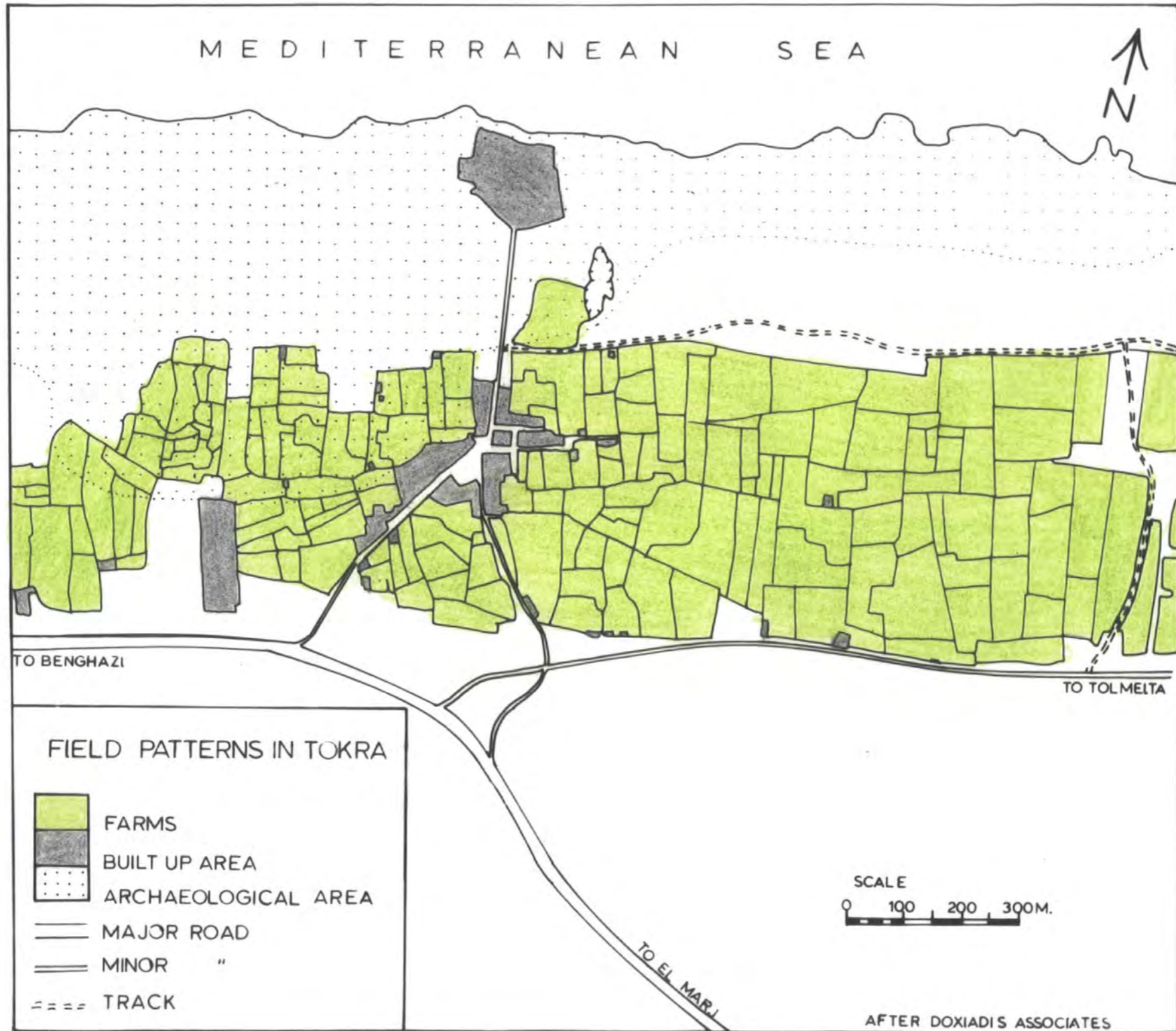


Fig.9.1.

Fig. 9.2.



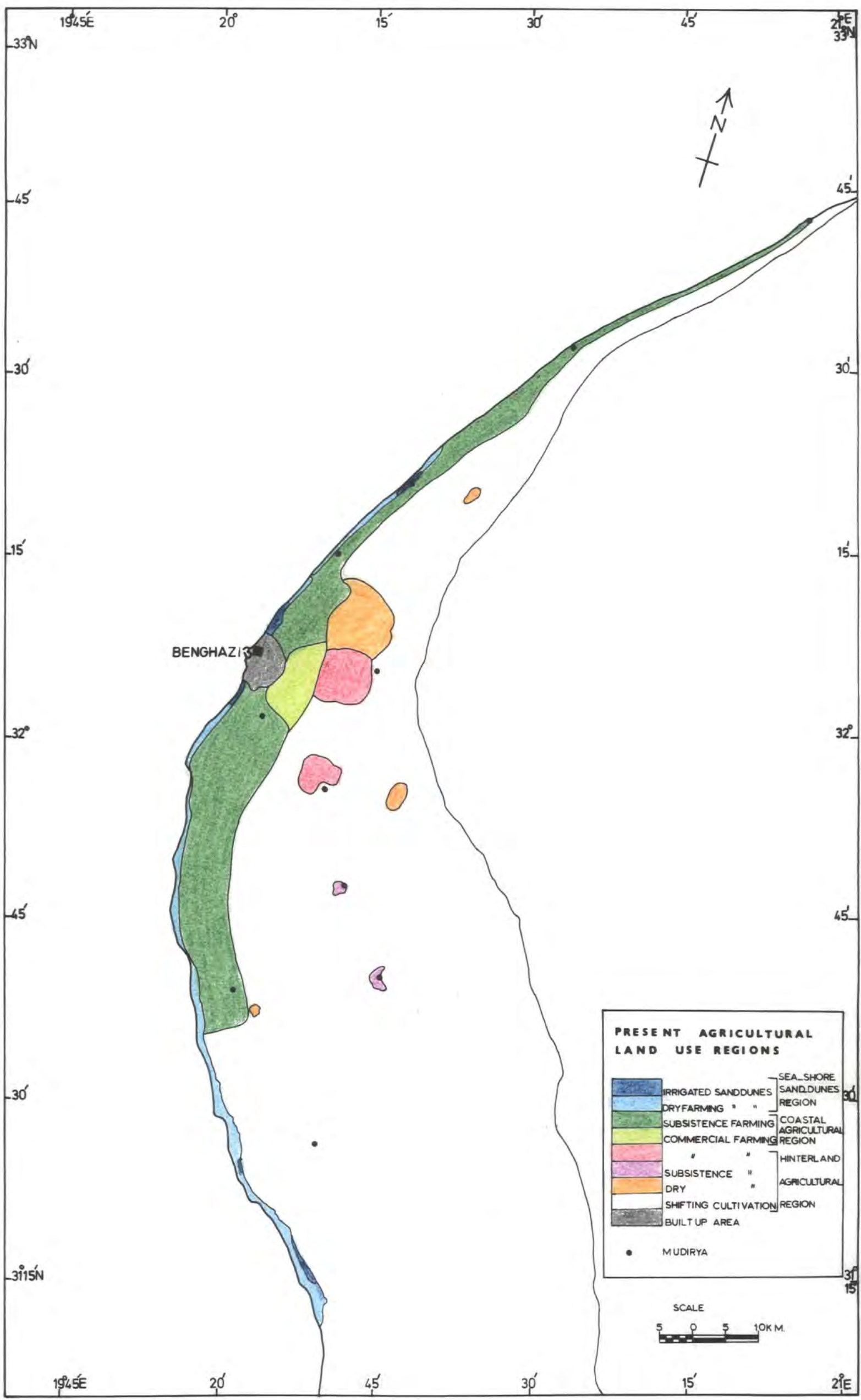
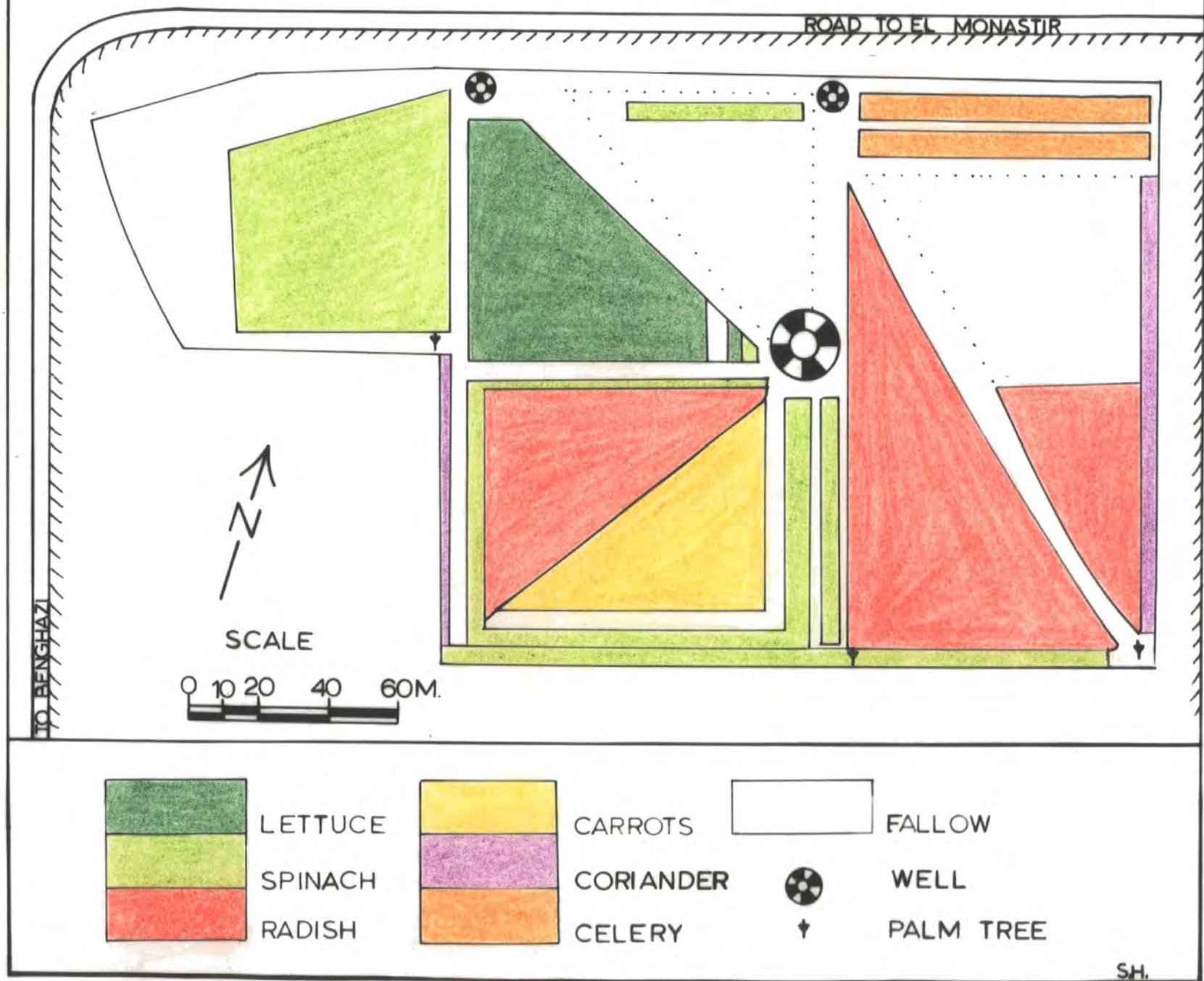


Fig. 9.3.

Fig. 9.4.

# CROPPING TYPES: EL THAMA, WINTER, 1967



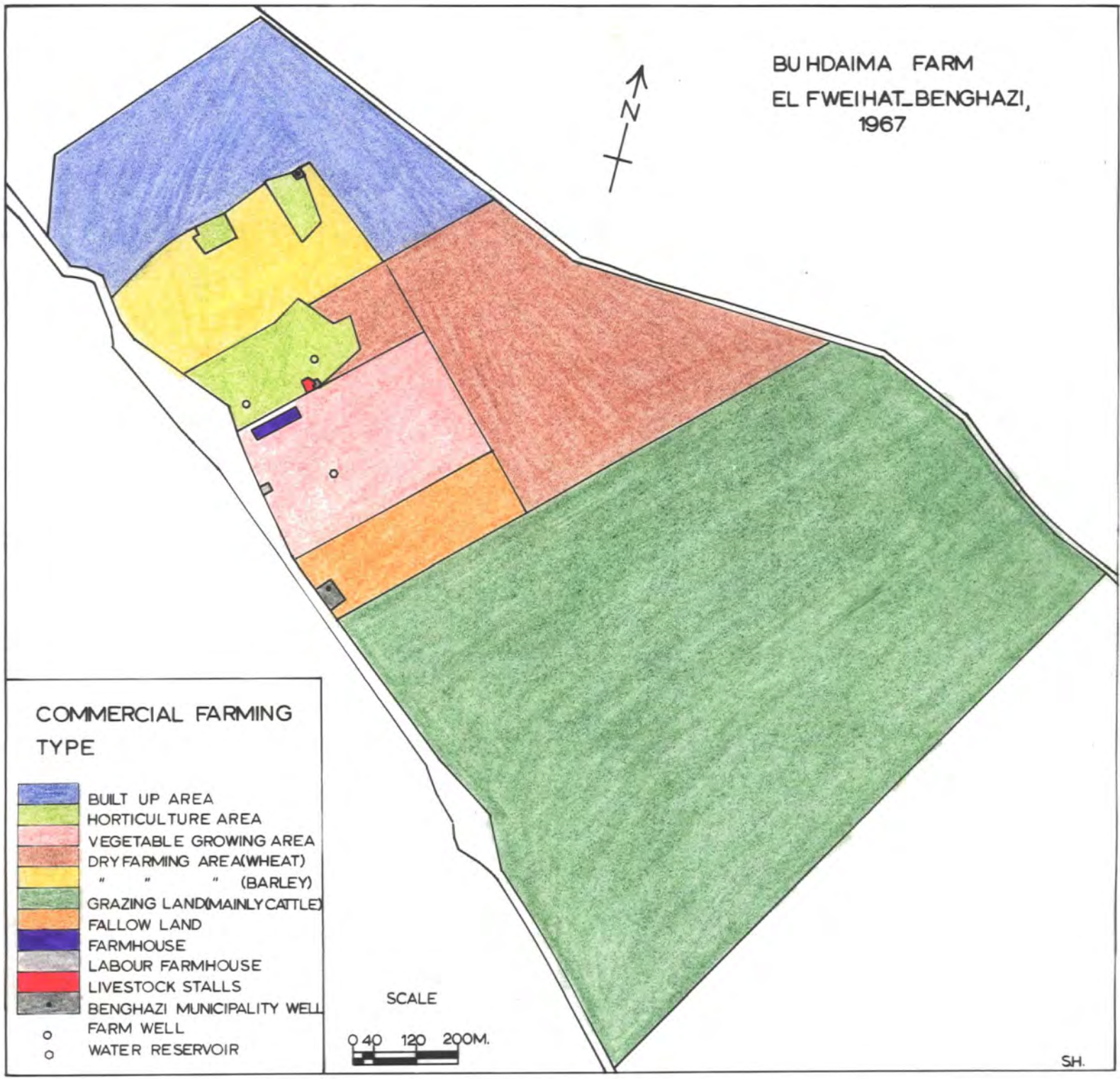
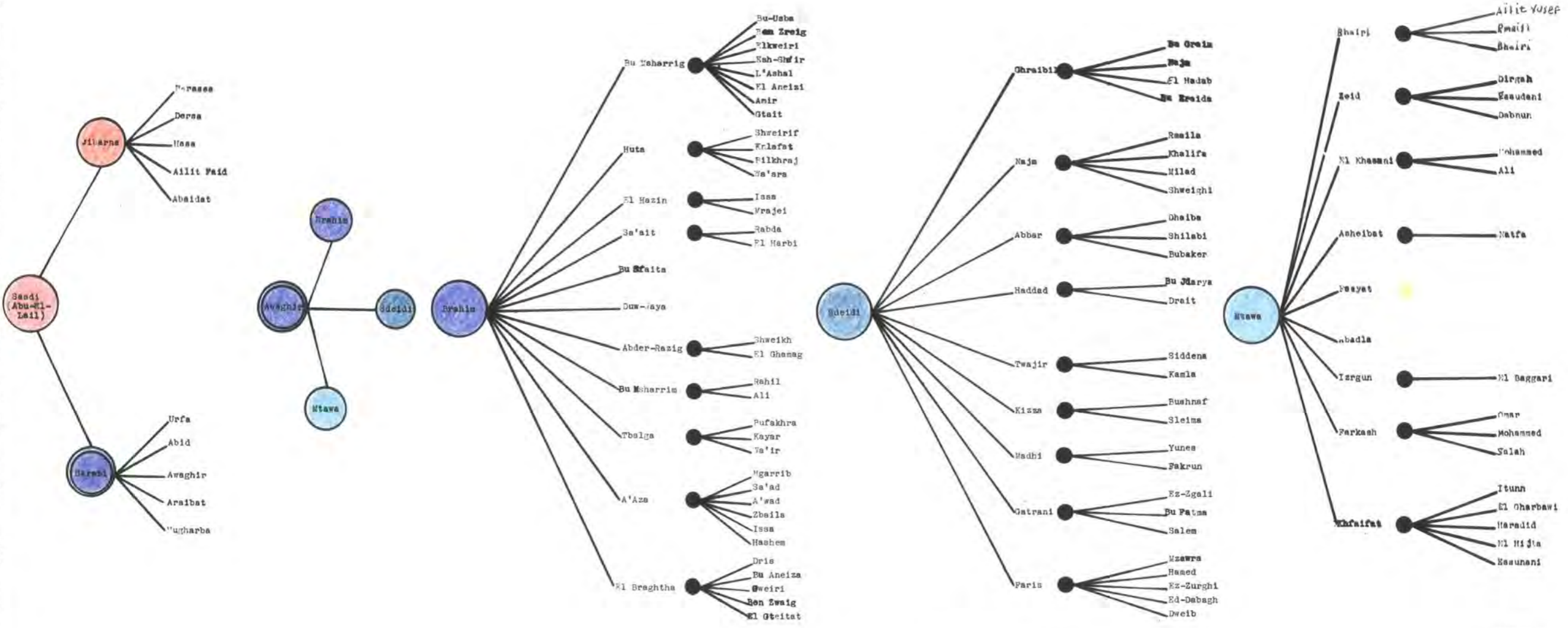


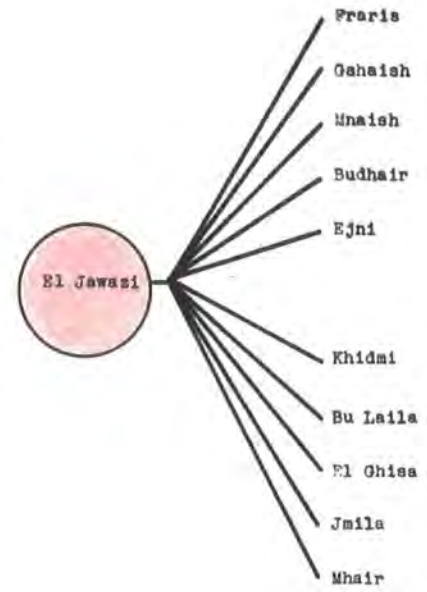
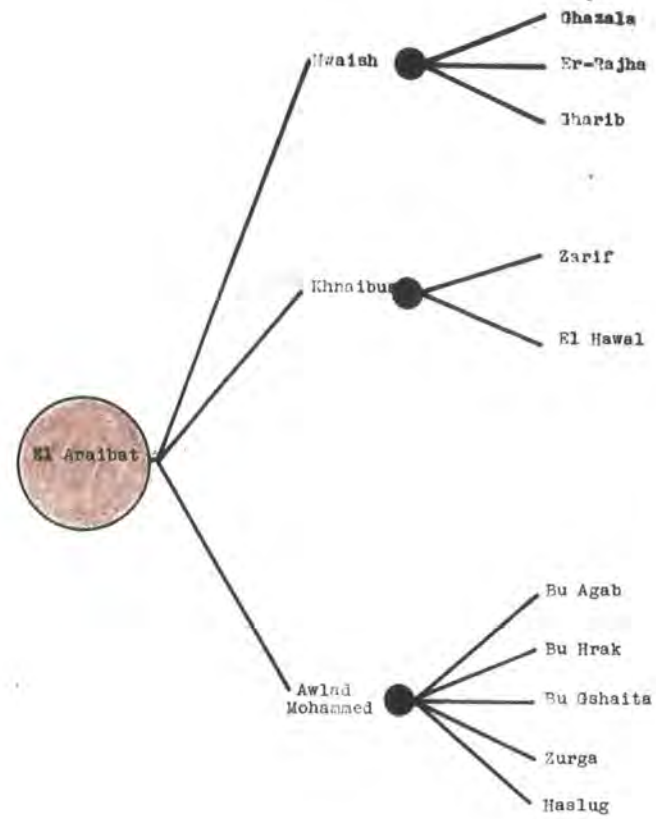
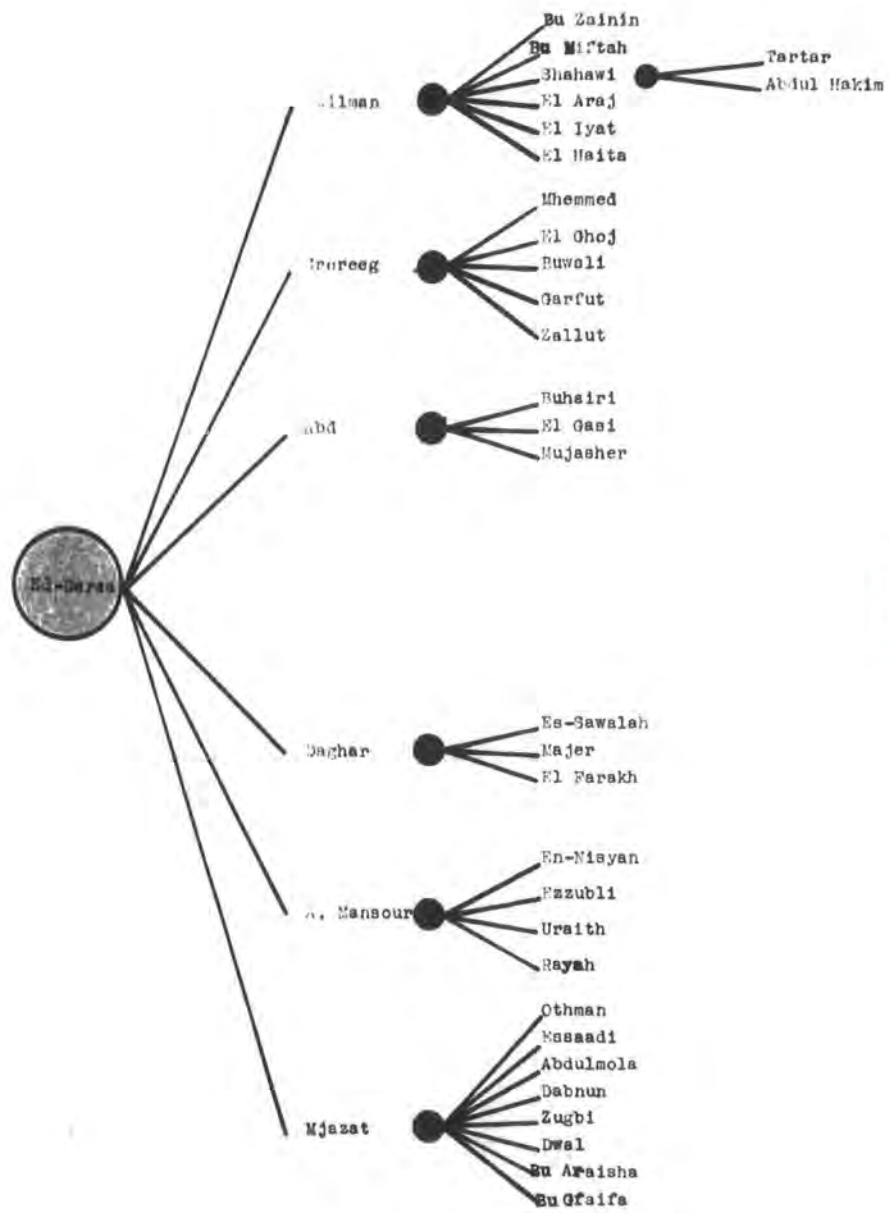
Fig.9.5.

Fig. 11.1 The distribution of the tribes of Cyrenaica with particular reference to the Benghazi Plain.

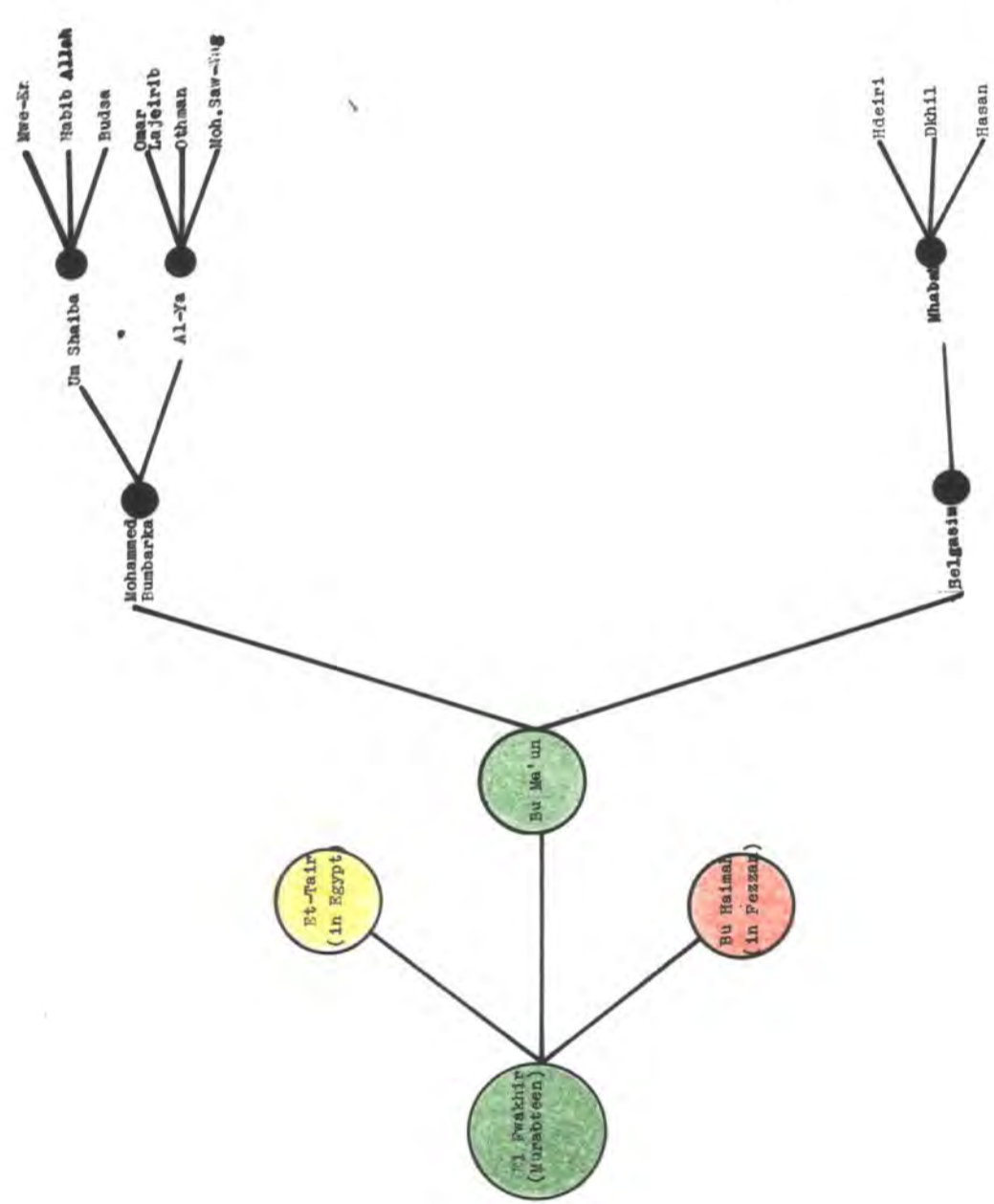


Source: Based on the 1966-67 field investigation.

(Cont'd.)



(Cont'd)





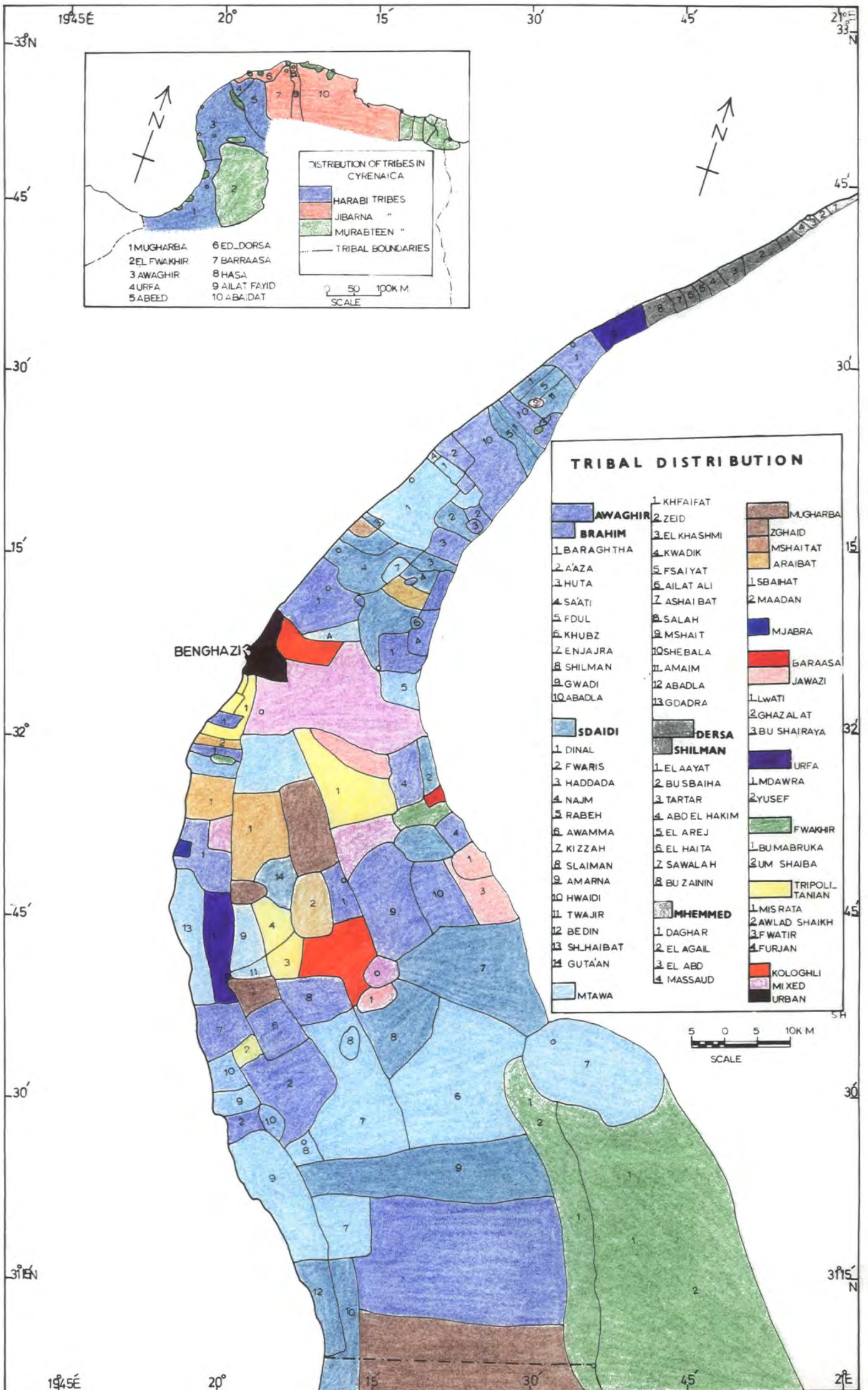


Fig.11.2.

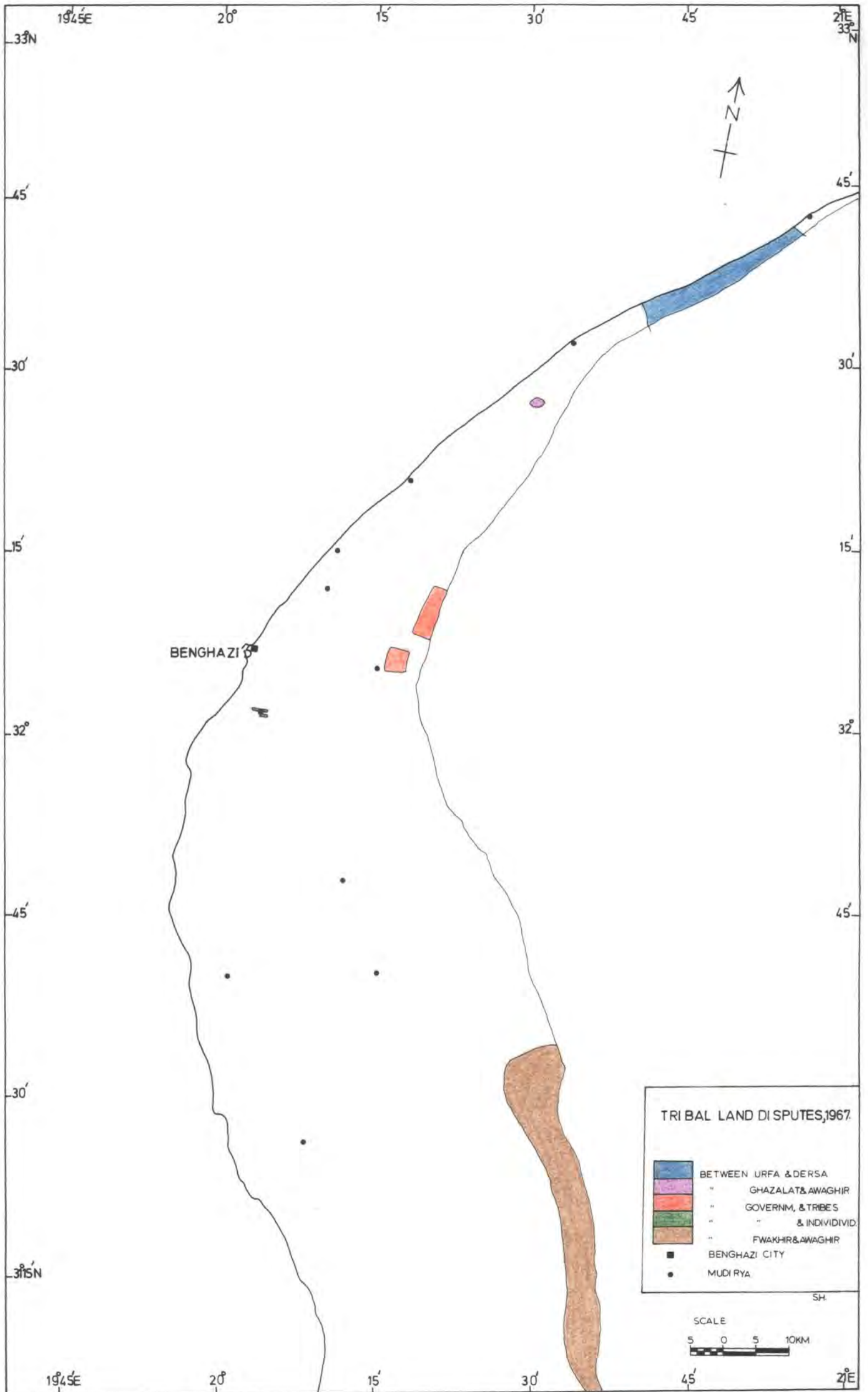


FIG.11.3.

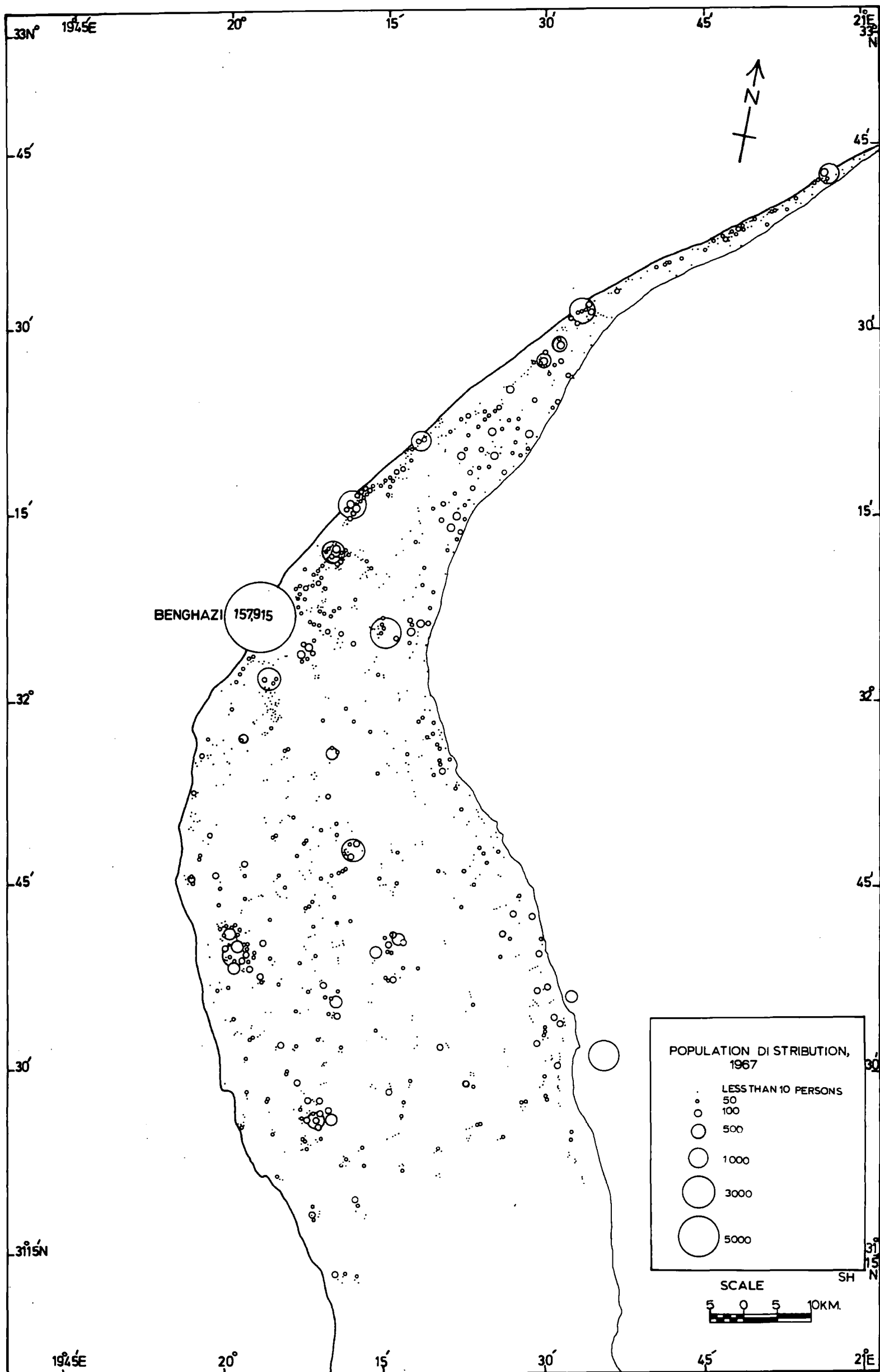


Fig.11.4.

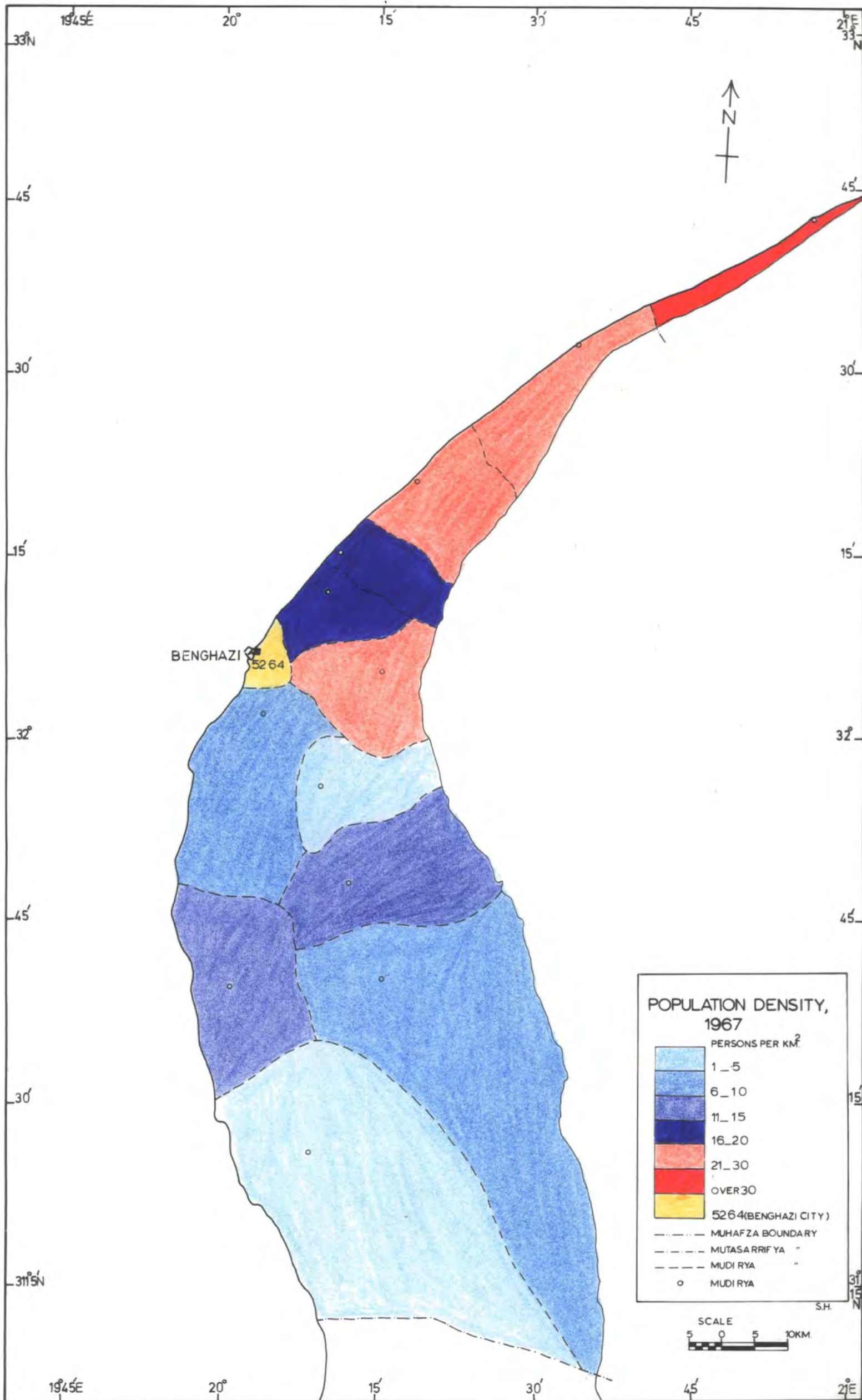


Fig.11.5.

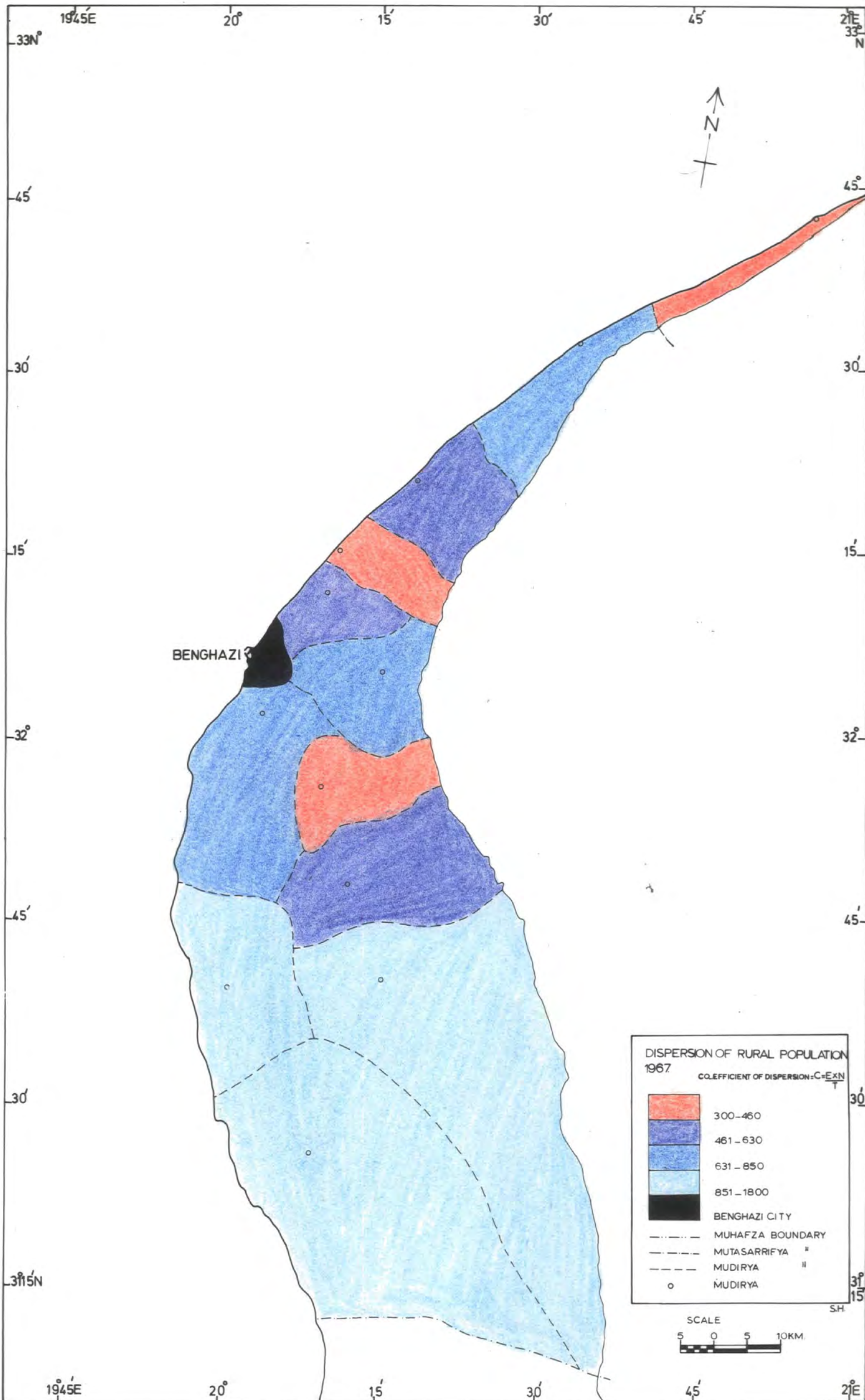


Fig.11.6.

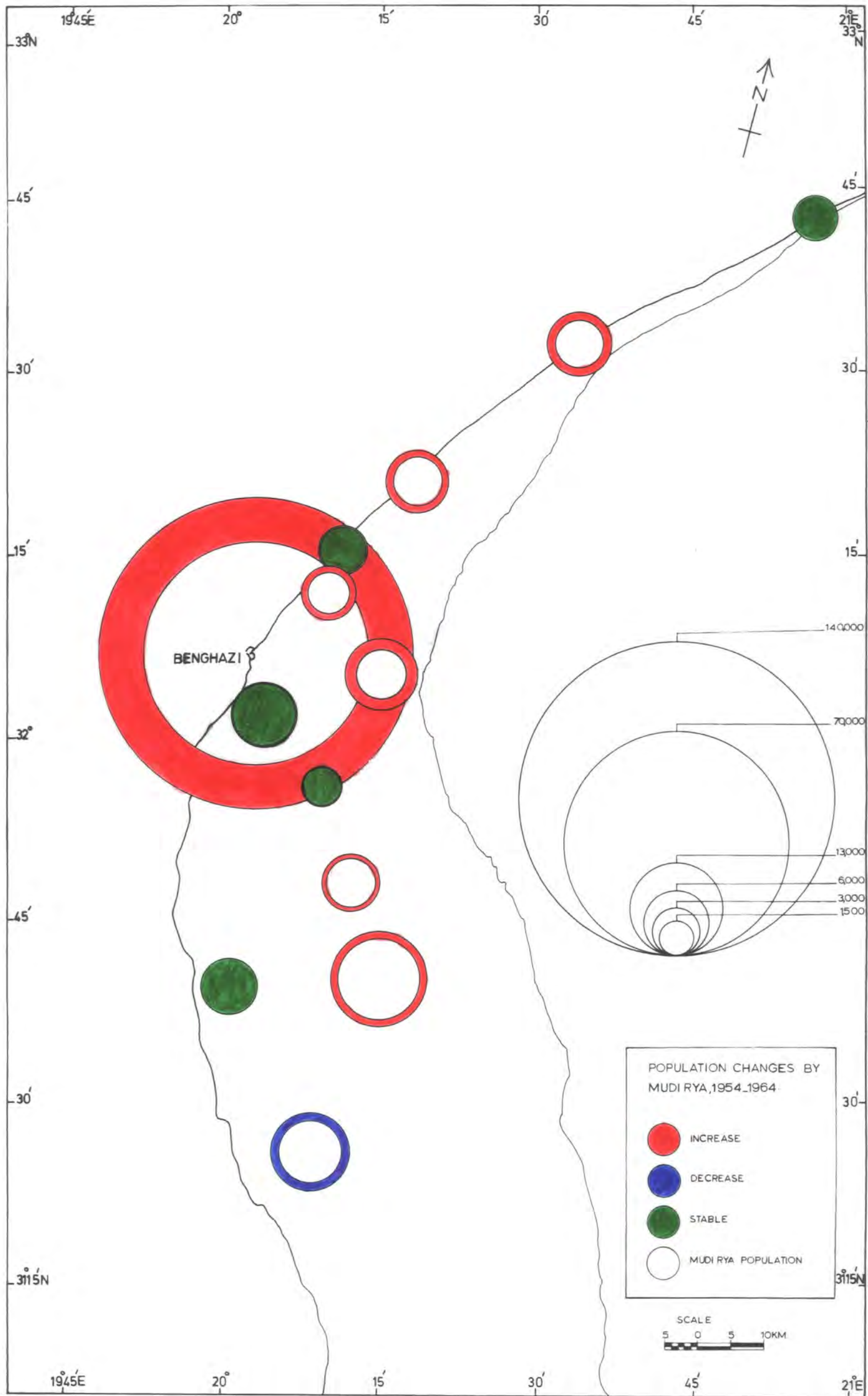


Fig.11.7.

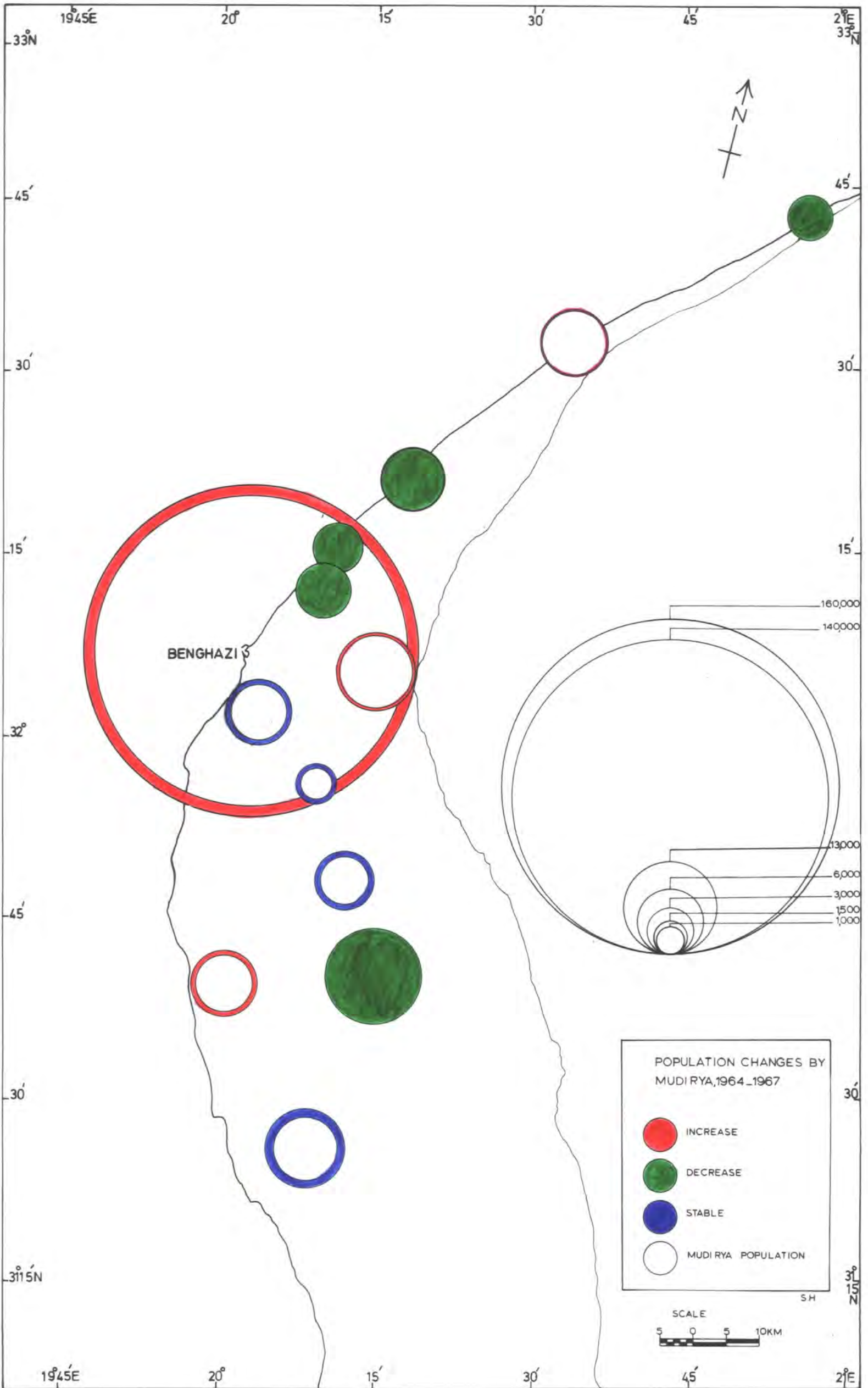


Fig.11.8.

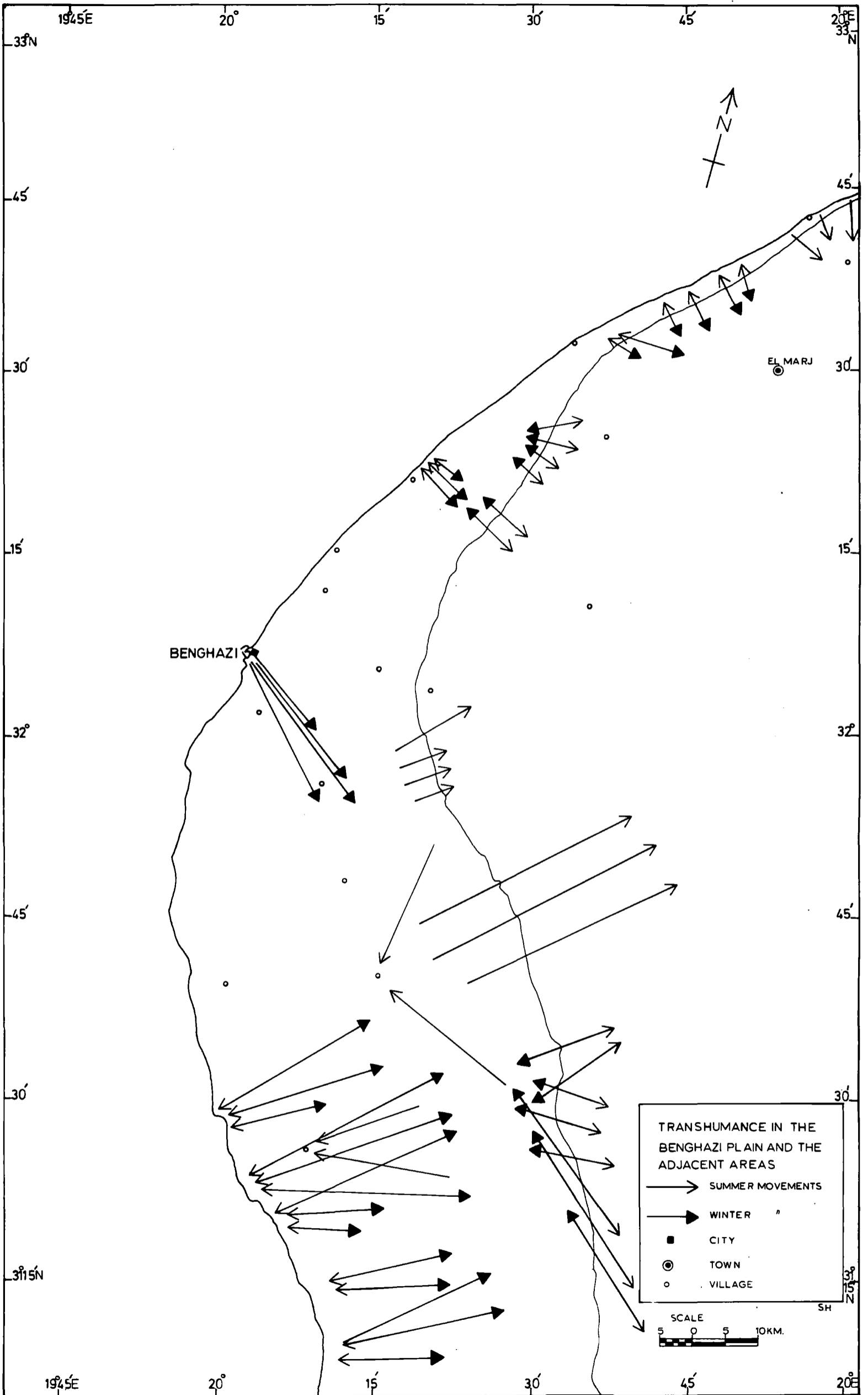


Fig.11.9.



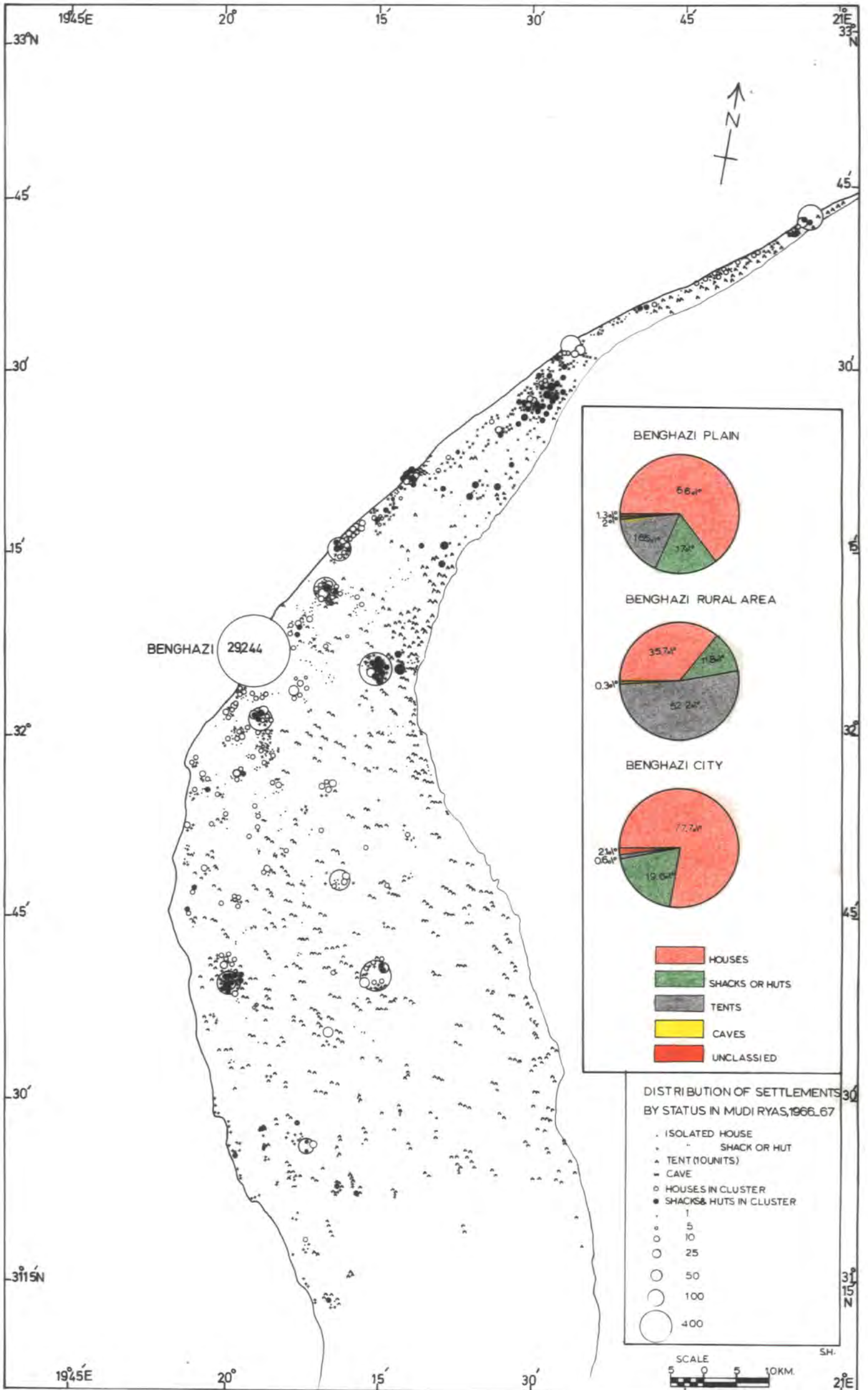


Fig.11.10.

### PLAN OF A RURAL ARAB HOUSE AT DERIANA

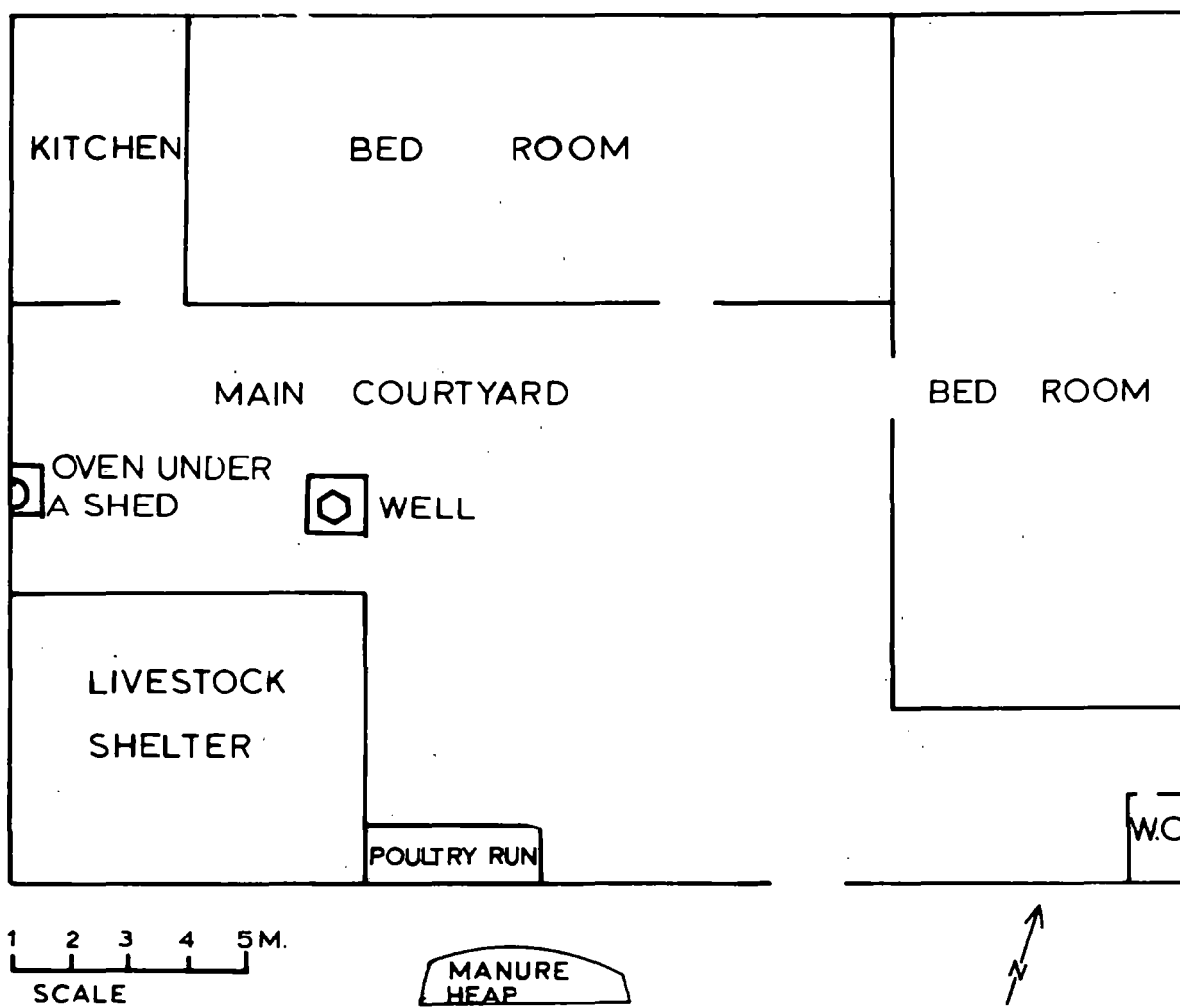
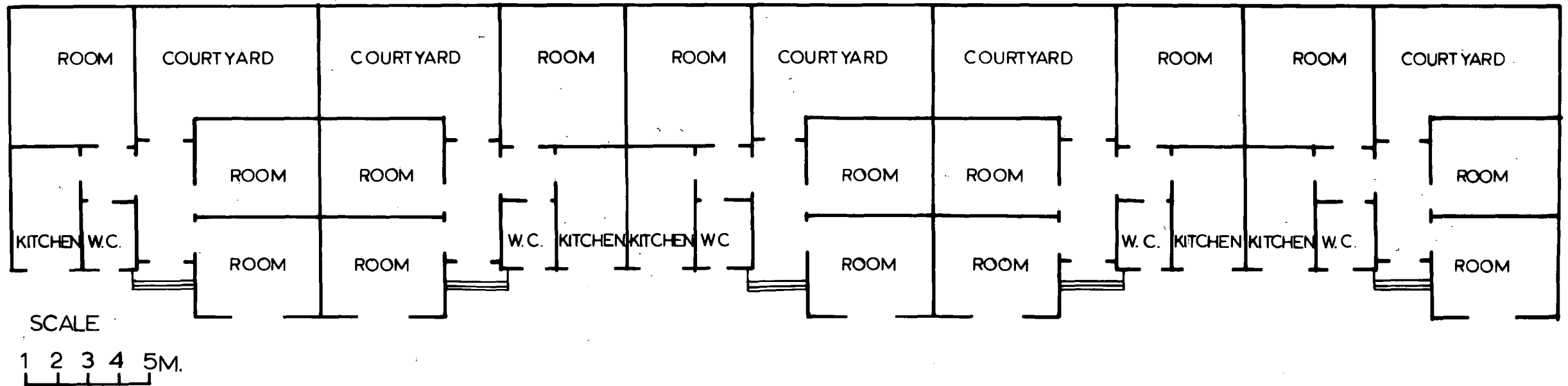


Fig.11.11.

# PLAN OF SEMI-DETACHED POPULAR HOUSES



### PLAN OF EXLENTE ARAB HOUSE AT BUTRABA

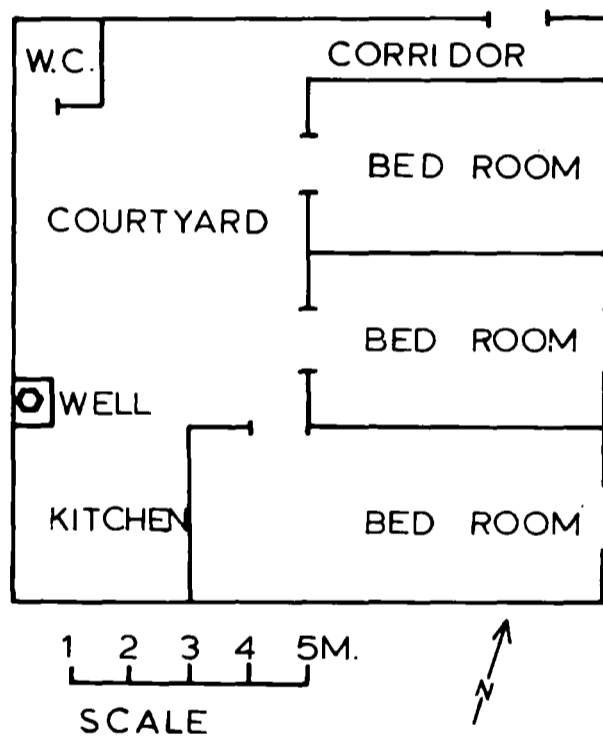


Fig.11.13.

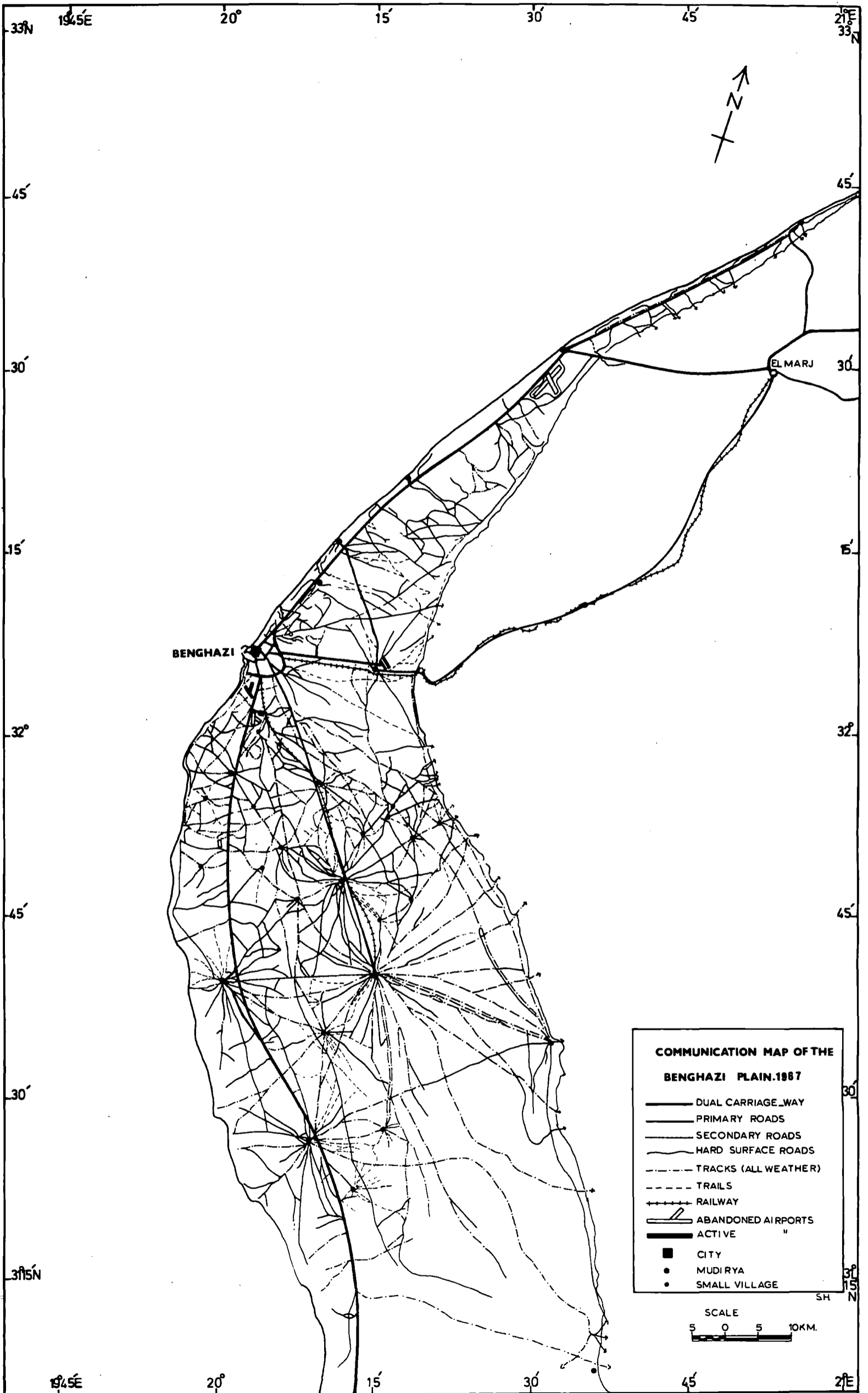


Fig.11.14.

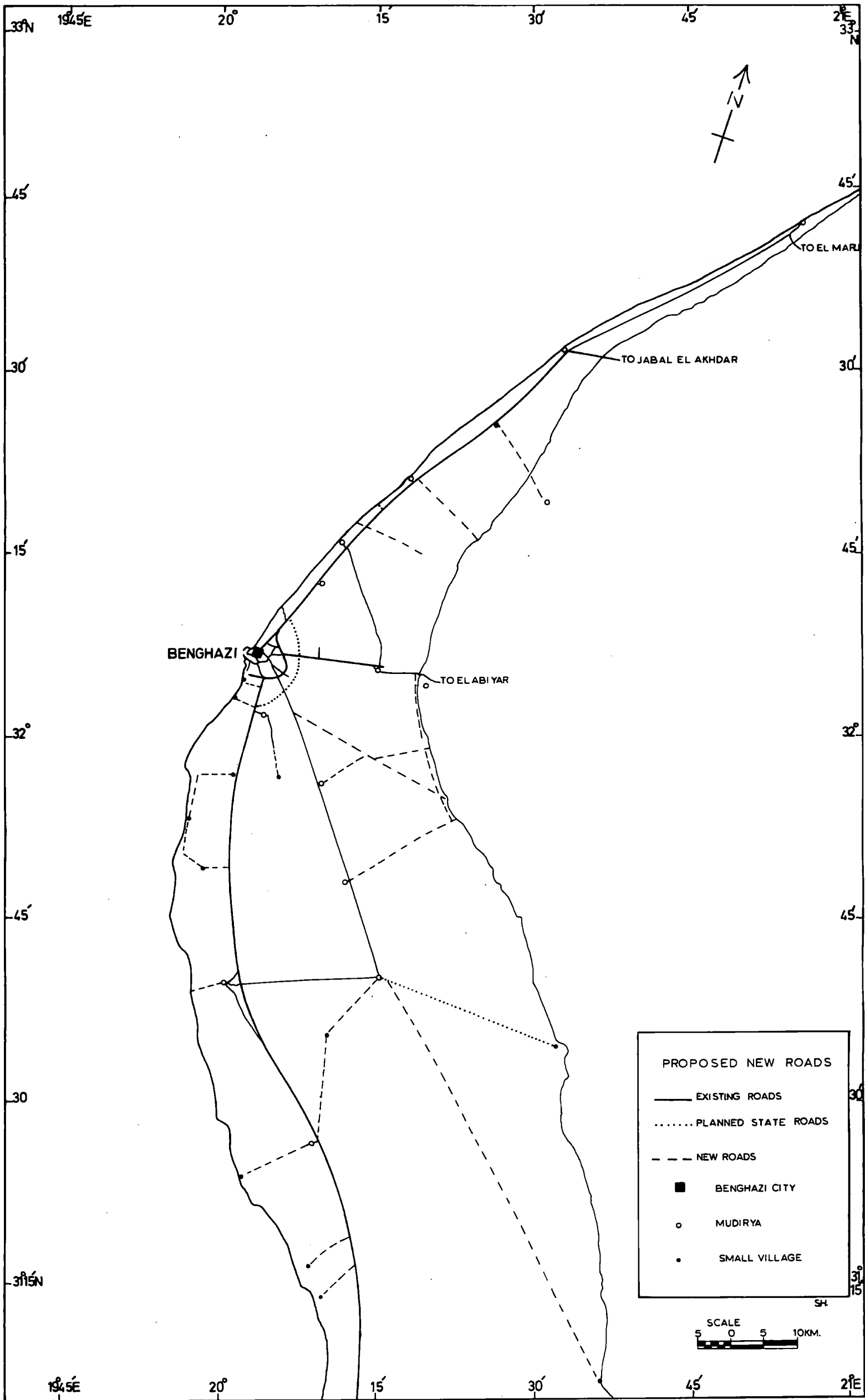


Fig.11.15.

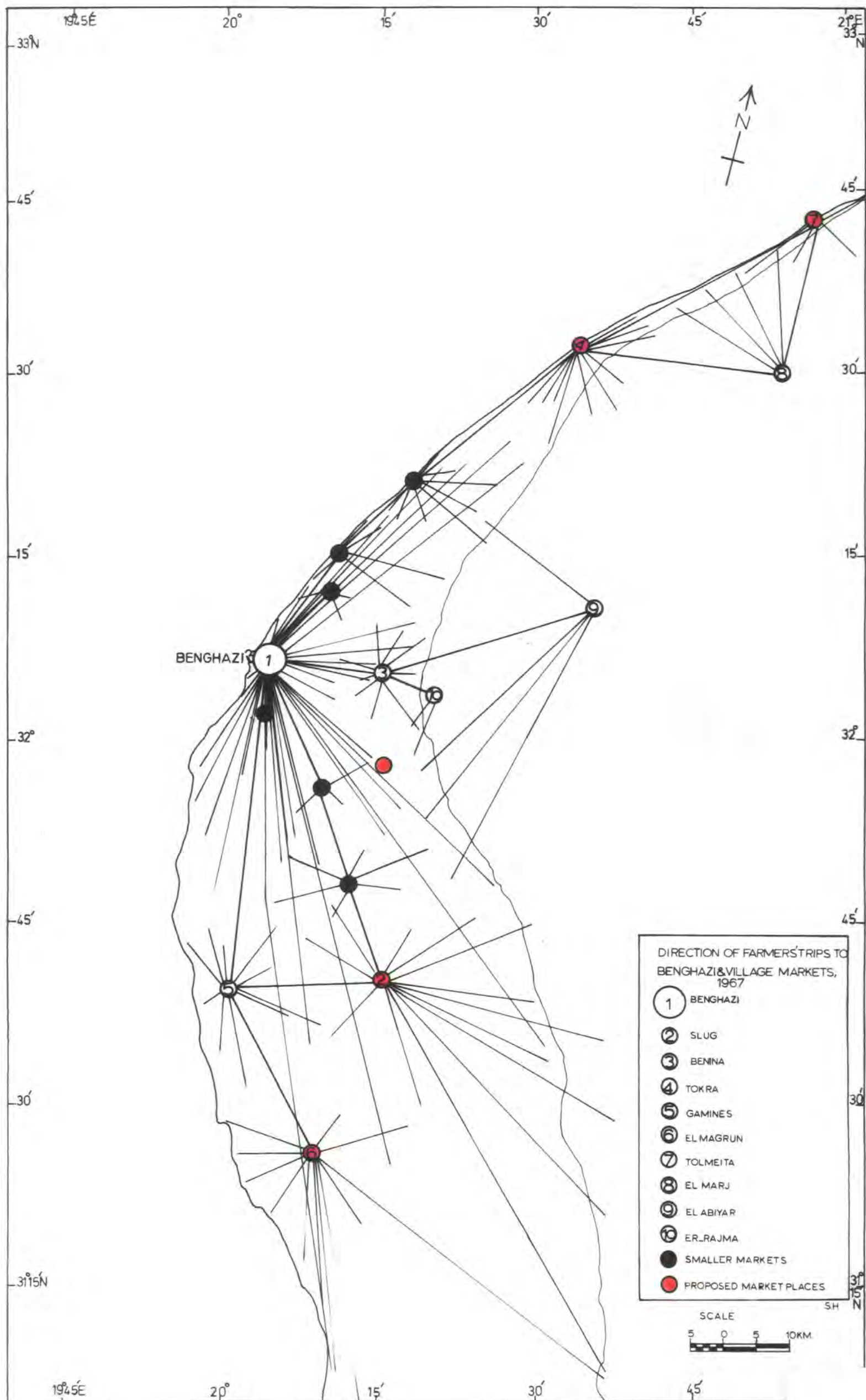


Fig.11.16.

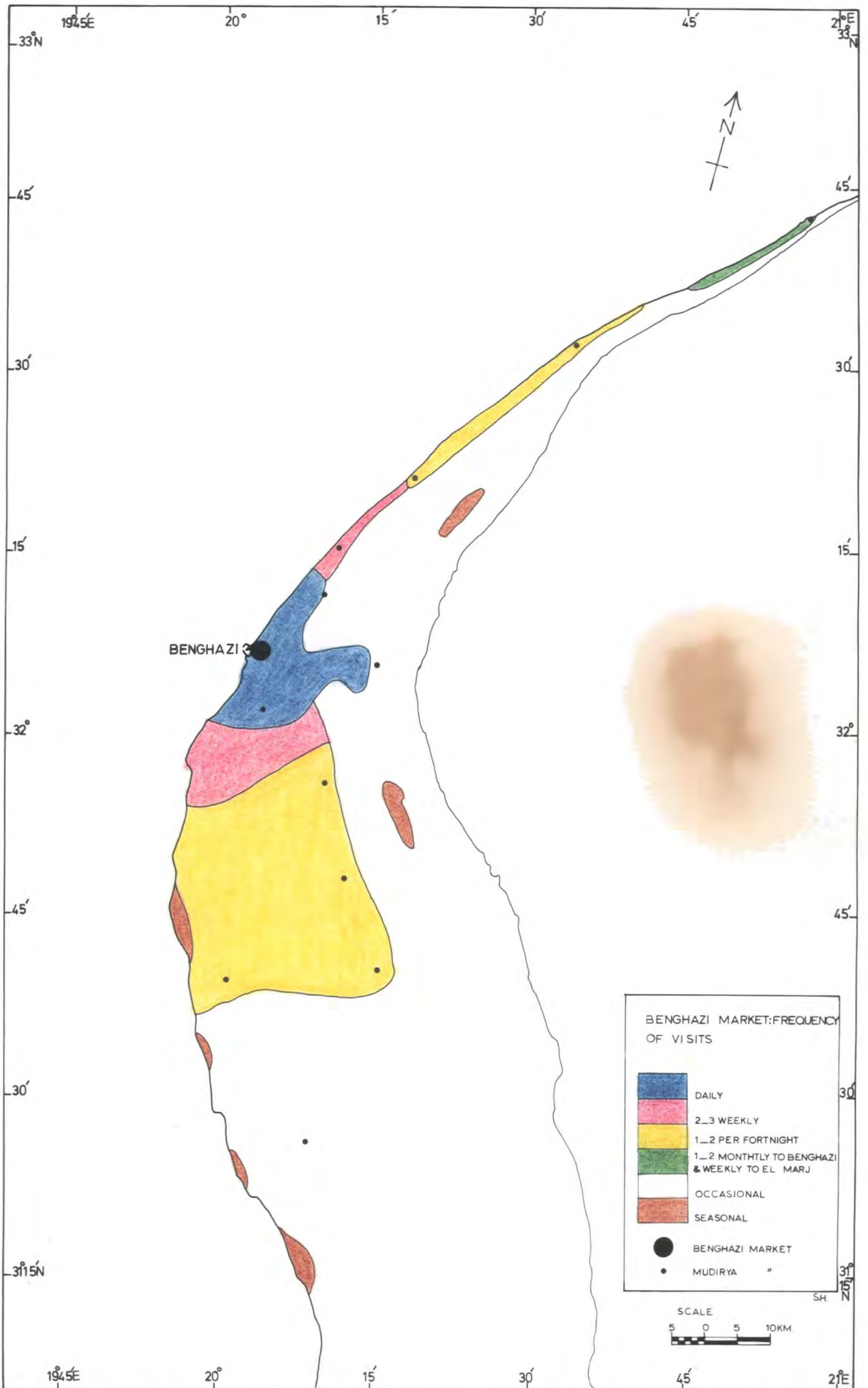


Fig.11.17.



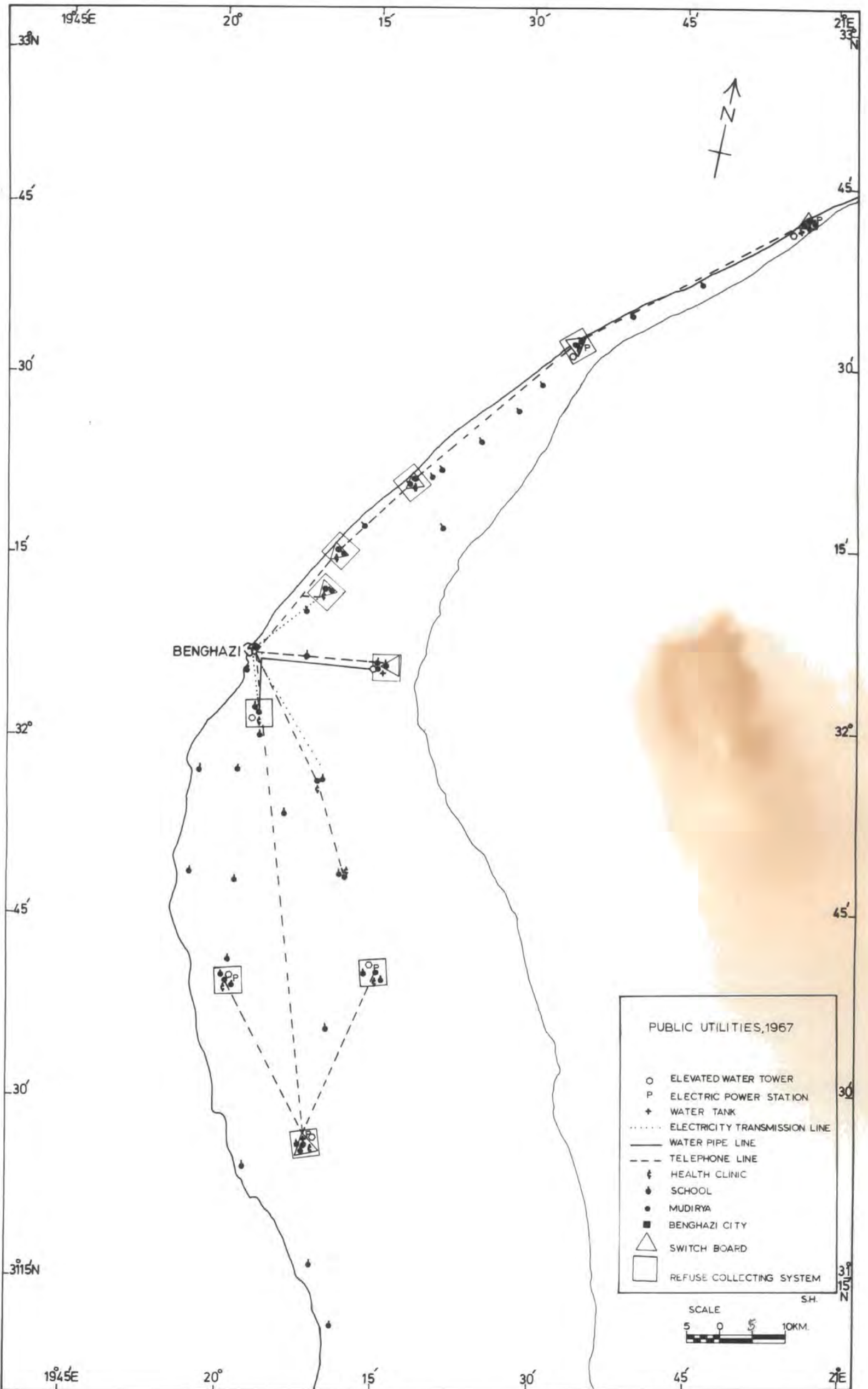


Fig.11.18.

FIG. 12.1.

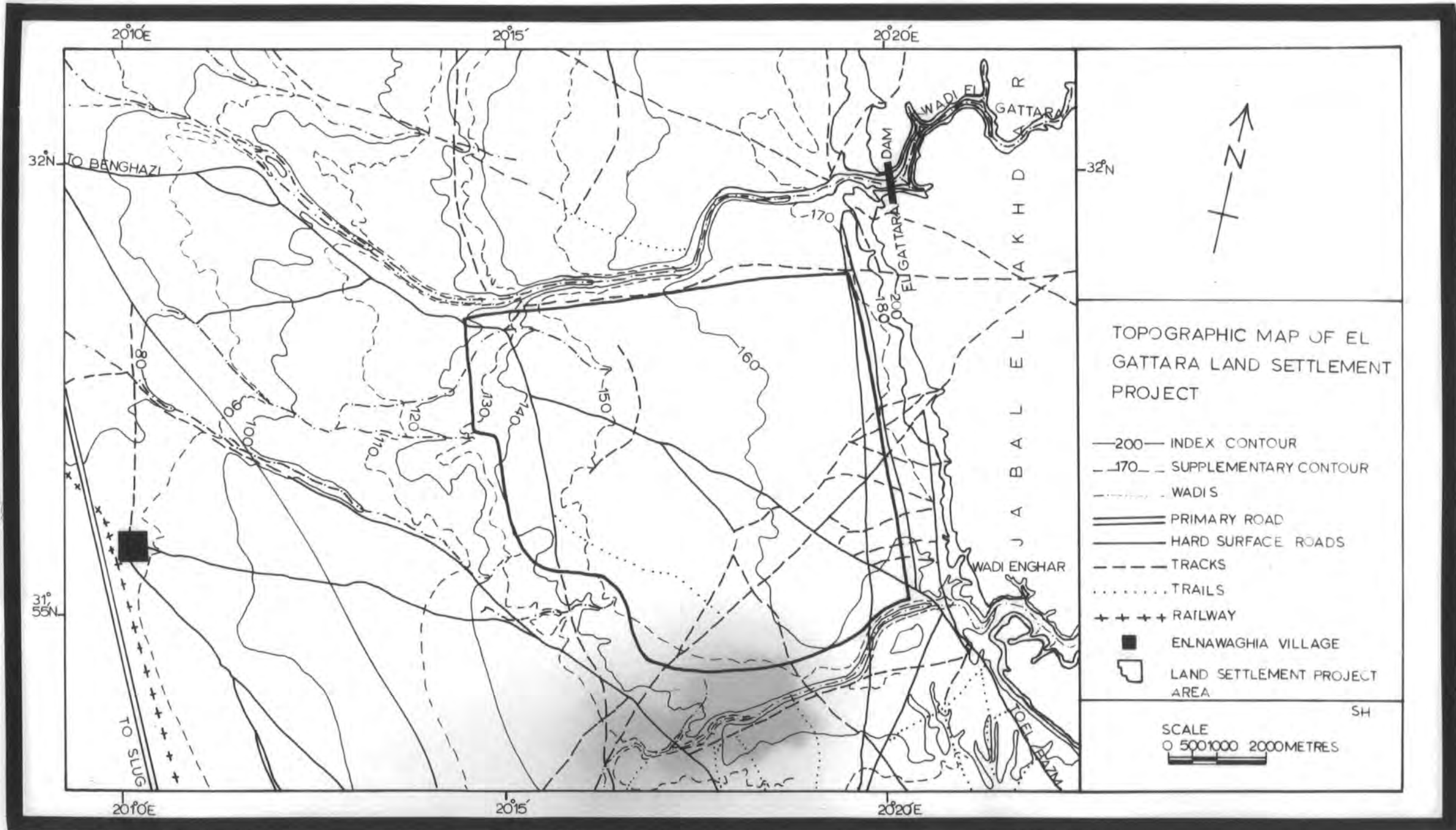
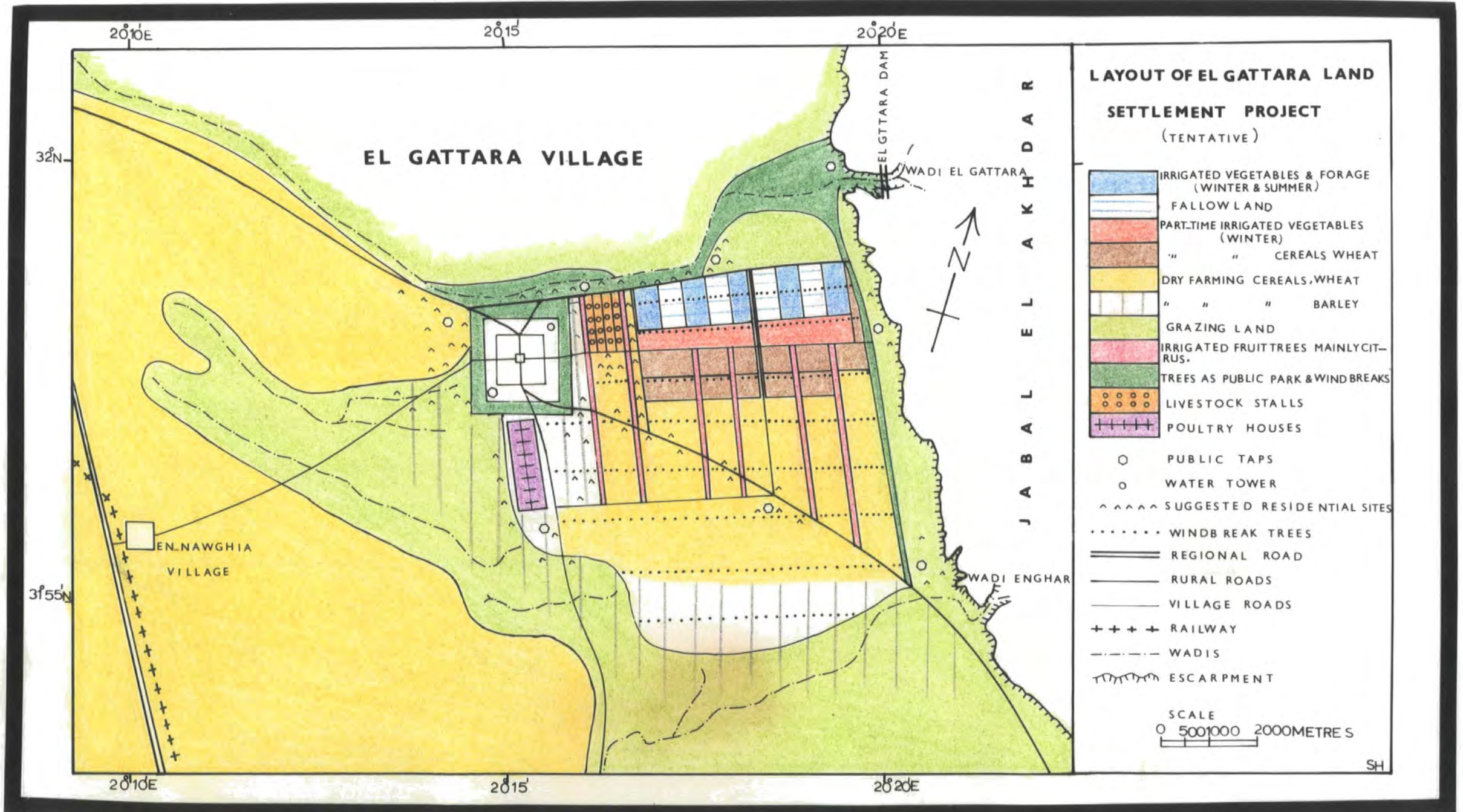


Fig. 12.2.



PLATES



Plate.1.1. Sand dune quarrying at El Thama.



Plate 1.2. Consolidated sand dunes, N.E. of Deriana.



Plate 1.3. Tokra Step.



Plate 1.4. Benina Step.



Plate 1.5. Sidi El Kilani Step  
(west of Slug).



Plate 3.1. Wadi El Gattara flood at El Keesh, south of Benghazi.



Plàte 4.1 ( Terra Rossa with Fragments of  
Gravel and Pebbles Resting on  
unweathered Rock.



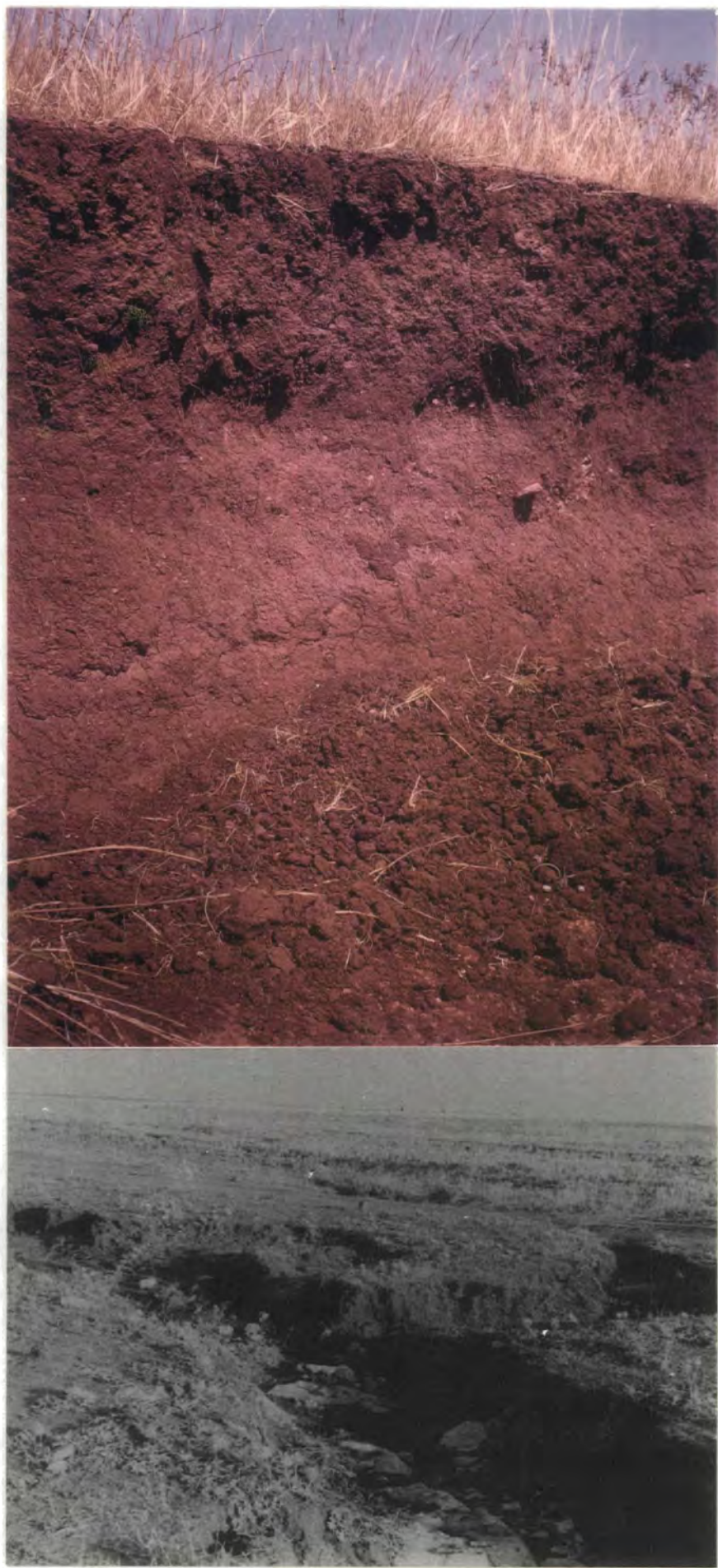


Plate 4.2. Gully erosion in residual terra rossa, north of Benina.



Plate 4.3. Reddish-yellow steppe soil with stones and gravel.

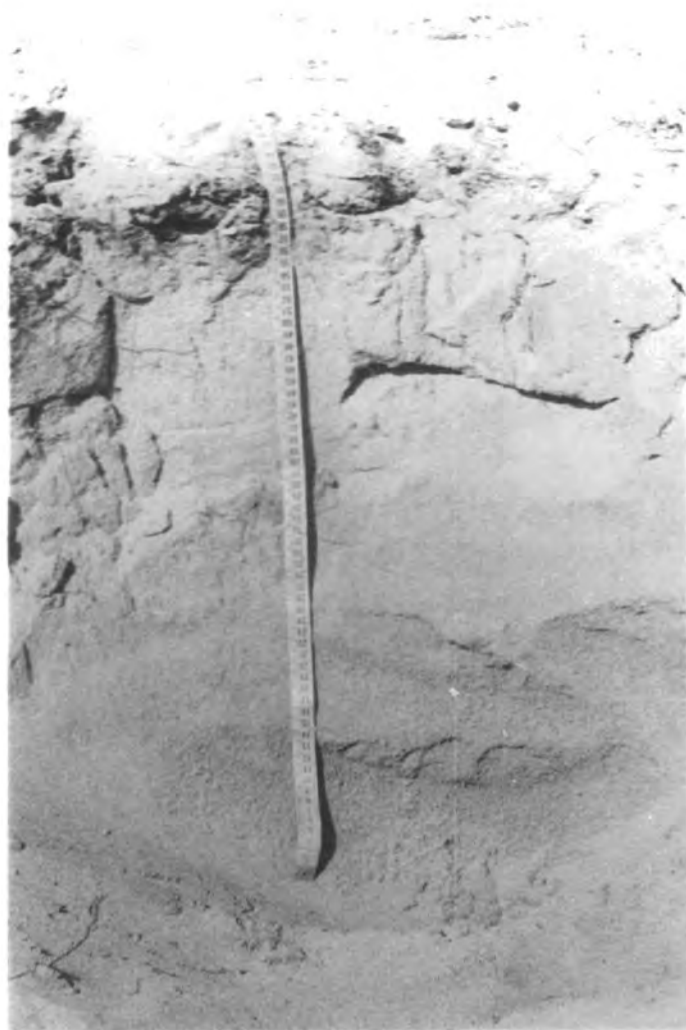


Plate 4.4. Regosols at Sidi Khalifa.



Plate 4.5. Regosols with animal manure.



Plate 4.6. Wood forest, east of Tolmeita.



Plate 4.7. Camel shrubs, south of Bersis.



Plate 4.8. Carob trees in Wadi Zaza.

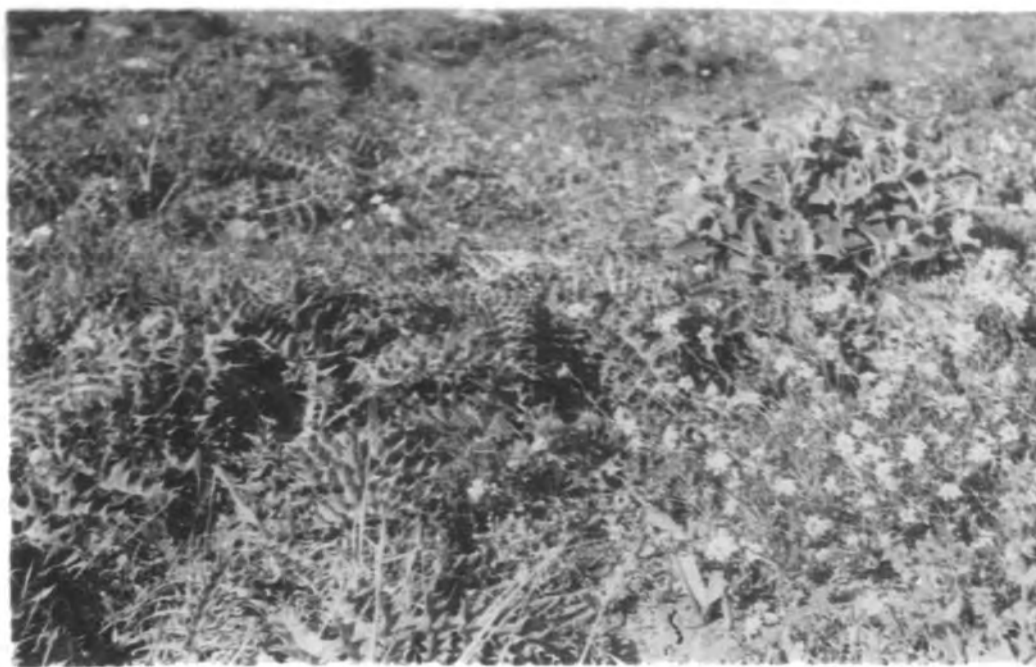


Plate 4.9. Artichoke grass, south of Tokra.



Plate 4.10. Carpet of lush flowers.



Plate 4.11. Halophyte vegetation south of Ganfuda.



Plate 4.12. Hydrophile plants in Budzira Lake.



Plate 4.13. Sand dune vegetation near El Kweifya.



Plate 4.13. Sand dune vegetation near Bussufon.



Plate 5.1. Remnant of ancient Greco-Roman canals near Deriana.



Plate 5.2. Animal-dalu irrigation method.



A

.



B



C

Plate 5.3. Human-dalu irrigation method.





Plate 5.4. Portable engine pump at Sidi Abdalla,  
west of Tolmeita.



Plate 5.5. Windmill near Benghazi.



Plate 5.6. El Gwarsha Sewage Purification Plant  
(under construction, 1967)



Plate 5.7. The location of the proposed secondary dam on Wadi El Gattara.



Plate 6.1. Tomato cultivation in the coastal sand dune at Er-Ragta.

Plate 6.2. Fig trees growing on:-



A. The Escarpment



B. The lithosols and rock outcrops (Plain)



C. The coastal sand dunes.



Plate 6.3. Palm trees covered with sand dunes.



Plate 6.4. Palm trees providing shade for vegetables at El Thama.



Plate 7.1. Afforestation south of Benghazi.



Plate 7.2. Predominant animals, east of Tolmeita.



Plate 9.1. Traditional method of harvesting cereals.



Plate 9.2. Harvesting and threshing by combine-harvester.



Plate 9.3. Traditional method of threshing near Slug.



Plate 9.4. The Saniya farming system at Sidi Khalifa.



Plate 9.5. El Thama farming system.



A

Plate 9.6. Trough farming system at Ganfuda.



B





A

Plate 9.7. Tahweedh farming system.



B



Plate 9.8. Dolina farming system 5 km. east of Benghazi.



Plate 11.1. View of Tolmeita looking from the escarpment.



Plate 11.2. Popular houses.



Plate 11.3. Tent and shack type of settlement, south of Bersis.



Plate 11.4. Semi-detached shacks near Tokra.



Plate 11.5. Caves at Tokra.



Plate 11.6. The new dual-carriageway.



Plate 11.7. The new Benina dual-carriageway  
(under construction, 1967)

## TABLES

**Table 2.1 - Mean, Maximum and Minimum Temperatures in the Benghazi Plain and the Adjacent Areas**

Region	Station		J	F	M	A	M	J	J	A	S	O	N	D	Mean annual
Coast	Benghazi	Mean	13	13.7	15.4	16.5	21.6	23.9	25	25.6	24.4	22.6	19.3	15	19.8
		Max.	17.3	18.2	20.6	23.9	27.3	29.1	29.5	30.1	29.6	27.9	24.3	19.3	24.8
		Min.	8.8	9.7	10.2	13	15.9	18.7	20.6	21	19.3	17.8	14.3	10.7	14.9
	Tokra	Mean	13.9	14.3	16.2	18.5	21.4	23.3	24.9	25.8	24.8	23.1	19.7	15.6	20.1
		Max.	17.7	18.3	20.6	23.7	26.4	27.8	28.5	29.3	28.9	27.5	23.8	19.3	24.3
		Min.	10.1	10.3	11.7	13.3	16.4	18.8	19.3	22.8	20.8	18.6	15.6	11.9	15.9
Tolmeita	Mean	14	14.3	16.2	18.3	20.2	23.3	25	25.7	24	22.6	19.8	15.7	19.9	
	Max.	17.9	17.9	20.3	22.8	24.5	27.6	28.7	29.2	28.2	27	24.3	19.8	24	
	Min.	10.2	10.7	12.1	13.7	15.8	18.9	21.4	22.2	19.8	18.1	15.4	11.6	15.8	
Plain	Ejdabya	Mean	12.7	14.7	16.9	20.2	24.3	26.1	26	26.5	25.3	22.8	19.9	14.8	20.8
		Max.	18.9	20.6	24.3	28.1	32.6	34.7	32.9	34.8	33.7	30.6	26.9	20.8	28.3
		Min.	6.6	7.8	9.5	12.3	16.1	17.4	18	18.2	16.9	15.1	12.9	8.7	13.3
	Slug	Mean	11.7	12.5	15.1	18.7	22.8	25.6	26.2	26.2	24.7	22.2	17.8	13.8	19.8
		Max.	17.6	18.1	21.9	26.4	31	33.8	34.1	34	32.4	29.7	24.3	19.7	26.9
		Min.	5.9	6.8	8.3	11.1	14.7	17.3	18.3	17.4	17	14.6	11.3	7.8	12.6
El Jabal	El Abiyar	Mean	10	11	13.4	17.4	22.1	22.3	25.5	25.2	24	21	17.1	12	18.4
		Max.	15.3	16.4	19.8	25	29.8	27.6	33.1	32.8	31.8	28.2	23.2	17.4	25
		Min.	4.7	5.6	7	9.9	14.4	16.9	17.8	17.7	16.1	13.9	10.9	6.6	11.9
	El Marj	Mean	10.5	11	12.9	15.9	20	22.7	23.7	23.8	23.8	19.2	16.9	12.3	17.7
		Max.	15.8	16.6	19.9	24.3	28.3	31.5	31.5	31.5	31.1	28.2	23.4	17.9	25
		Min.	5.1	5.5	5.8	7.6	11.7	14	15.8	16	14.5	12.2	9.8	6.6	10.4
Shahat	Mean	8.2	9.1	10.7	14	17.9	20.9	22	22.2	20.8	18.5	14.7	10.9	15.8	
	Max.	12.2	13.2	16.6	19.9	24.5	27.4	27.6	27.5	26.2	24.2	19.6	15	21.1	
	Min.	4.1	5	5.7	8.1	11.2	14.3	16.5	16.9	15.4	12.8	9.9	6.8	10.6	

Source: Torayah-Sharaf, A., 'Geography of Libya,' Alexandria, 1963, pp.705-707.

**Table 2.2 - Mean Monthly and Annual Temperature Ranges in the Benghazi Plain and the Adjacent Areas**

Region	Station	J	F	M	A	M	J	J	A	S	O	N	D	Annual
Coast	Benghazi	8.5	9.0	10.4	10.9	11.4	10.4	8.9	9.1	10.3	10.7	10.0	8.6	9.9
	Tokra	7.6	8.0	8.9	10.4	10.0	9.0	9.7	7.5	8.1	8.9	8.2	7.4	8.4
	Tolmeita	6.7	7.2	8.2	9.1	8.7	8.7	7.3	7.0	8.4	8.9	8.9	8.2	8.2
Plain	Ejdabya	12.3	12.8	14.8	15.8	16.5	17.3	14.9	16.6	16.8	15.5	14.0	12.1	15
	Slug	11.5	11.3	13.6	15.3	16.3	16.5	15.8	16.6	15.4	15.1	13.0	11.9	14.3
El Jabal	El Abiyar	10.6	10.8	12.8	15.1	15.4	10.7	15.3	15.1	15.7	14.3	12.3	10.8	13.1
	Shahat	8.0	8.2	10.9	11.8	13.3	13.1	11.1	10.6	10.8	11	9.7	8.2	10.6
	El Marj	10.7	11.1	14.1	16.7	16.6	17.5	15.7	15.5	16.6	16.0	13.6	11.3	14.6

Source: Calculated from Table.2.1.

**Table 2.3 - Percentage Monthly Distribution of Wind Direction in Benghazi**

Month	N.	N.E.	E.	S.E.	S	S.W.	W.	N.W.	Calm
January	8.5	7.5	3	21.5	10	13.5	9.5	20.5	6
February	7	4	4.5	19.5	11	10.5	13	26.5	4
March	11	9	5	16	10	12	10	22	5
April	16	16	2.5	13	6	8.5	8.5	23.5	3.5
May	18.5	19.5	1	9	5.5	6.5	7.5	29	6.5
June	27.5	25.5	1	6.5	2.5	3	8.5	21.5	4
July	51.5	13	0.5	1	-	2	2	24	6
August	45	18.5	-	0.5	1	1	5	24.5	4.5
September	37.5	16	3.5	2.5	2.5	5	6.5	22	4.5
October	15.5	9	3	13.5	12.5	8	11	20.5	7
November	10	11.5	5.5	24.5	9.5	8	9	15.5	6.5
December	5	7	3	22	14.5	12	14	18	4.5
Mean annual	21.5	13	2.5	12.5	7	7.5	8.5	22.5	5

Source: Torayah-Sharaf, A., 'Geography of the Kingdom of Libya,' Alexandria (U.A.R.), 1963, p.193.

Table 2.4 - Seasonal Distribution of Percentage of Wind Direction at Benghazi

Season	N	N.E.	E.	S.E.	S	S.W.	W.	N.W.	Calm
Winter	6.8	6.2	3.5	21	11.8	12	12.1	21.6	4.8
Spring	16.2	14.5	2.8	12.6	7.2	9	8.6	25.9	5
Summer	11.3	11	0.5	2.6	1.2	2	5.1	23.3	4.8
Autumn	21	12.2	4	13.5	8.1	7	8.8	19.3	6
Mean annual	21.5	13	2.5	12.5	7	7.5	8.5	22.5	5

Source: Calculated from Table 3.

Table 2.5 - Total monthly and annual amount of rainfall and total monthly and annual frequency in the Benghazi Plain and the adjacent areas

Region	Station	Longitude and Latitude	Alt. m.	No. of years	J	F	M	A	M	J	J	A	S	O	N	D	Mean annual
Coast	Tolmeita	32° 52' N. 29° 32' 30" E.	5	20	97.0	58.1	19.6	6.0	3.9	0.2	-	0.1	3.5	22.4	41.2	98.2	350.0
	Tokra	32° 32' 30" N. 20° 35' E.	13	12	12.1	9.8	5.1	2.5	1.3	0.2	-	0.2	1.2	3.6	6.1	11.1	53.4
	Benghazi	32° 05' 41" N. 20° 03' 38" E.	25	55	79.0	41.8	25.6	9.3	2.8	0.1	-	0.1	2.4	23.3	46.1	80.5	311
	Ez-Zweitina	30° 57' N. 20° 07' E.	8	5	13.3	11.7	6.6	3.6	1.9	0.1	-	0.1	2.0	4.3	7.6	13.6	64.8
Plain	Benina	32° 05' N. 20° 16' E.	122	15	67.2	40.4	19.4	4.6	2.0	0.4	0.1	-	1.0	15.0	22.0	66.1	226.4
	Slug	31° 40' N. 20° 15' E.	61	15	10.7	7.5	3.7	1.7	0.6	0.4	0.1	-	0.5	2.0	3.4	10.0	39.9
	Mjabya	30° 45' 30" N. 20° 13' E.	28	17	39.7	22.8	6.0	1.2	2.2	-	-	0.2	0.6	11.4	23.8	46.8	185.5
	El Bakur	32° 12' N. 20° 39' E.	282	7	8.7	6.3	1.5	1.0	0.8	0.1	-	0.2	0.3	2.3	3.8	6.1	31.1
First Escarpment	Er-Rajma	32° 04' N. 20° 21' E.	321	24	87.1	43.1	28.2	6.6	1.7	-	-	-	1.6	28.5	61.2	82.2	340.2
	Esh-Shaleidhina	31° 34' N. 20° 34' E.	240	11	11.5	8.8	4.5	1.8	1.1	0.1	-	-	0.8	4.5	6.6	12.3	52.0
	El Marj	32° 30' N. 20° 54' E.	285	23	77.5	60.2	17.6	6.1	3.1	0.3	0.6	0.1	0.7	13.9	43.9	86.0	309.7
	El Abiyar	32° 11' N. 20° 36' E.	290	18	12.8	10.2	4.3	2.0	1.6	0.6	0.2	0.2	0.6	2.6	7.3	12.4	50.5
El Jabal	Shahat	32° 49' 30" N. 20° 51' 50" E.	621	27	31.8	16.6	8.5	1.2	0.8	-	-	-	-	7.4	15.8	24.2	106.3
	El Marj	32° 30' N. 20° 54' E.	285	23	8.1	3.5	1.3	0.5	0.5	-	-	-	-	2.2	2.7	6.2	25.0
	El Abiyar	32° 11' N. 20° 36' E.	290	18	153.7	78.7	59.7	20.4	12.3	1.4	0.2	0.6	8.9	38.8	80.7	140.1	595.3
	El Abiyar	32° 11' N. 20° 36' E.	290	18	15.5	12.6	9.7	4.5	2.7	0.8	0.2	0.4	2.0	6.8	9.3	15.0	80.1
El Jabal	El Marj	32° 30' N. 20° 54' E.	285	23	117.3	86.8	42.2	17.0	6.1	1.2	0.3	0.5	1.9	36.2	56.7	118.5	484.7
	El Abiyar	32° 11' N. 20° 36' E.	290	18	15.5	13.0	7.9	4.1	2.1	0.8	0.3	0.5	1.4	5.2	8.1	15.5	74.1
	El Abiyar	32° 11' N. 20° 36' E.	290	18	61.2	55.1	22.4	31.6	4.3	0.2	0.1	0.1	1.1	15.6	30.9	84.5	307.1
	El Abiyar	32° 11' N. 20° 36' E.	290	18	13.8	12.2	5.3	2.2	1.5	0.4	0.1	0.3	0.8	4.1	7.3	13.8	61.8

(1) First line for rainfall in mm.  
Second line for frequency.

Source: Fantoli, A.. "Le Pioggie della Libia,"  
Roma, 1952, pp.432-33, 436-37, 446-51, 460-61, 464-65,  
468-69, 476-79, 488-89, 494-97.



**Table 2.6 - Fluctuations of Rainfall in Winter Months at Benghazi**

Year	J	F	M	A	M	J	J	A	S	O	N	D	Mean annual
1956	30.3	2.7	32.9	0.0	0.0	0.0	0.0	0.0	4.8	0.0	47.5	196.0	314.2
1961	62.0	99.5	0.0	0.0	2.5	0.0	0.0	0.0	1.0	10.3	2.5	70.8	248.8
Mean month	67.2	40.4	19.4	4.6	2.0	0.4	0.1	-	2.9	16.8	46.4	65.6	265.8

Source: Meteorological Office, Tripoli, 1967.

**Table 2.7 - Mean Monthly and Annual Amounts of Rainy and Dry Years at Selected Stations**

Station	Year	J	F	M	A	M	J	J	A	S	O	N	D	Mean annual
Benghazi	Rainy 1894	215.6	29.3	-	2.2	-	-	-	-	1.3	-	118.5	249.8	616.7
	Dry 1958	40.0	-	-	-	-	-	-	-	-	-	16.0	11.7	67.7
	Mean Month.	67.2	40.4	19.4	4.6	2.0	0.4	0.1	-	2.9	16.8	46.4	65.6	265.8
Tokra	Rainy 1938	107.5	89.5	73.3	24.3	0.6	-	-	-	2.6	55.2	58.0	83.6	494.6
	Dry 1933	30.9	15.4	7.5	0.3	6.9	-	-	-	0.2	0.9	18.6	84.4	165.1
	Mean Month.	79.0	41.8	25.6	9.3	2.8	0.1	-	0.1	2.4	23.3	46.1	80.5	311
Shahat	Rainy 1924	517.6	93.3	52.3	0.6	0.1	1.3	1.6	-	4.8	120.7	265.9	250.6	1348.8
	Dry 1915	20.9	39.5	14.7	9.6	-	3.0	-	3.5	3.6	1.0	12.3	12.1	120.2
	Mean Month.	153.7	78.7	59.7	20.4	12.3	1.4	0.2	0.6	8.9	38.8	80.7	140.1	595.5

Source: Fantoli, A., "Le Pioggie Della Libia," Roma, 1952, pp.448-450 and 476 and Meteorological Office, Tripoli, 1967.

**Table 2.8 - Fluctuations of the Mean Monthly and Annual Rainfall at Benghazi**

Year	J	F	M	A	M	J	J	A	S	O	N	D	Mean annual
1893	257.5	121.9	59.4	2.0	-	-	-	-	-	22.8	13.2	74.6	551.4
1894	215.6	29.3	-	2.2	-	-	-	-	1.3	-	118.5	249.8	616.7
1926	76.4	49.9	89.5	-	4.1	-	-	-	1.2	1.5	0.2	86.3	309.1
1927	64.7	29.1	11.3	24.6	-	-	-	-	4.6	86.2	16.8	8.5	245.8
1955	10.1	3.5	16.2	12.9	-	-	-	-	-	-	16.6	79.6	138.9
General Mean Monthly	67.2	40.4	19.4	4.6	2.0	0.4	0.1	-	2.9	16.8	46.4	65.6	265.8

Source: Fantoli, A., "Le Pioggie Della Libia", Roma, 1952, p.450.

**Table 2.9 - Mean Monthly and Annual Percentages of Relative Humidity at Selected Stations in the Benghazi Plain and the Adjacent areas**

Region	Station	J	F	M	A	M	J	J	A	S	O	N	D	M. ANN.	Region's M. Annual
Coast	Benghazi	64	58	53	55	57	59	67	66	55	56	56	60	59	62
	Tokra	68	64	62	60	65	69	69	69	66	60	57	66	65	
	Tolceita	64	61	61	62	62	66	67	64	53	59	60	66	63	
Plain	Sidiabya	67	63	45	42	38	33	34	44	51	52	51	61	49	51
	Slug	76	74	57	49	45	46	35	40	46	54	56	64	53	
El Sabal	El Abiyar	72	71	65	48	44	40	46	49	56	57	63	75	57	59
	El Marj	74	70	60	52	45	44	50	53	51	55	63	71	57	
	Shahat	75	74	68	61	51	48	57	64	64	64	70	74	64	

Source: *Bullettino Meteorologico Delle Colonie Italiane Tripoli, 1932-34.*

**Table 2.10 - Monthly Percentage of Overcast Days in Benghazi**

	J	F	M	A	M	J	J	A	S	O	N	D	Mean annual
Overcast days	4.5	3.5	3.2	2.8	2.5	1.1	0.7	1.1	1.5	1.8	2.4	3.9	2.5

**Table 2.11 - Seasonal Percentage of Overcast Days in Benghazi**

Season	Winter	Spring	Summer	Autumn
Overcast days	3.6	2.8	0.96	1.9

Source: Great Britain Admiralty, "Notes on Climate and Other Subjects in Eastern Mediterranean and Adjacent Countries," London, Oxford, 1916. p.271.

**Table 3.1 - Location, Depth and Chemical Analysis of Selected Wells in the Benghazi Plain, Spring, 1967**

No. of wells	Location	Depth from land surface/m.	Depth of water level/m	Specific conductance (microhos at 25°C)	Total dissolved solids (ppm)
1(1)	El Magrun (Village)	15.00	1.50	3900	2144.8
2	El Magrun (Markura)	2.00	0.50	4000	2333.0
3	Gasimoo	6.20	1.20	3800	2308.3
4(1)	Slug	7.00	3.00	5750	3316.0
5	Jardina	20.00	2.50	4400	2606.0
6	En-Nawaghia (Ed-Derai farm)	44.00	56.00	9200	5354.6
7(2)	En-Nawaghia (near wadi El Gattara)	4.500	2.00	225	130.5
8	El Gwaraha (El Paakat)	14.00	2.00	3700	2317.0
9	Monina (Budjaja farm)	100.00	40.00	2600	1500.8
10	El Kweifya	7.00	0.88	3900	2308.3
11	Sidi Khalifa	2.67	0.52	4300	2582.7
12	Deriana (near El Ajuz)	5.40	2.60	610	400.2
13	Tokra (Ardanu)	3.70	2.20	3600	1878.3
14	Tokra (Dujarrar)	11.00	1.00	4000	2368.1
15	Tolmoita (Sidi Abdalla)	4.70	1.00	2400	1516.8

(1) Gallery  
(2) Cistern

**Table 3.2 - Water Quality Classification**

Class (1)	Chloride (Cl) (ppm)	Sulphate (SO <sub>4</sub> ) (ppm)	Total dissolved solids (ppm)	Specific conductance (microhos at 25°C.)
Good	less than 250	less than 250	less than 1,000	less than 1,600
Fair	250 to 800	250 to 600	1,000 to 1,500	1,600 to 2,500
Poor	800 to 1,500	600 to 1,200	1,500 to 3,500	2,500 to 6,000
Brackish	1,500 to 3,500	1,200 to 2,500	3,500 to 6,000	6,000 to 10,000
Salty	more than 3,500	more than 2,500	more than 6,000	more than 10,000

(1) Water is classed according to whichever constituent is most conspicuous in the sample analysed. Classification of samples for which analyses are not complete is based on those constituents reported.

**Table 3.3 - Number of Wells, Cisterns and Springs in the Benghazi Plain, 1928-1967**

	1928 survey	1960 Census	1964 Estimation	1967 Survey
Wells	1,441	7,690	6,000	5,200
Cisterns	-	1,255	-	800
Springs	3	133	-	5

**Table 5.1 - Land Use Types in the Benghazi Plain  
according to the 1960 Census of Agriculture<sup>(1)</sup>**

In hectares					
Total land	Cultivable land	Land under permanent crop	Land under permanent meadow and pasture	Wood or forest land	Other lands
267,730	261,730	2,226	34	5	3,735
Percentage	97.8	0.8	0.01	-	1.39

**Source:** Calculations based on the 1960 Census of Agriculture, op.cit., pp.93 and 129.

(1) The arrangement of the above table is according to the 1960 Census of Agriculture definitions.

**Table 5.2 - Cultivable Land by Type of Utilisation<sup>(1)</sup>  
in the Benghazi Plain, 1960**

In hectares				
Total area	Temporary fallow	Under temporary crops (except vegetables and flowers)	Under temporary meadow	Under vegetables & flowers
261,730	175,941	69,470	13,946	2,366
Percentage	67.2	26.5	5.3	1.0

**Source:** Calculations based on the 1960 Census of Agriculture, op.cit., pp.93 and 129.

(1) The arrangement of the above table is according to the 1960 Census of Agriculture definitions.

**Table 5.3 - Land Use Type in the Benghazi Plain, 1965<sup>(1)</sup>**

No.	Land Use Category	Area in hectare	% of each type	% of B.P.
1	Settlement and associated non-agricultural land	9,449	100	1.6
2	Horticulture land (mainly gardens, usually with trees)	600	100	0.1
3	Tree and other perennial crop tree land Total	1,425	100	0.2
	(a) Irrigated tree land	847	59.4	0.1
	(b) Unirrigated tree land	578	40.6	0.1
4	Crop land Total	68,819	100	11.5
	(a) Irrigated crop land Total	1,114	1.6	0.2
	(i) Vegetables	1,064	1.5	0.19
	(ii) Legumes	50	0.1	0.01
	(b) Unirrigated crop land Total	67,705	98.4	11.3
	(i) Cereals	67,246	97.7	11.2
	(ii) Vegetables	410	0.6	0.07
	(iii) Legumes	49	0.1	0.03
5	Unimproved seasonal grazing land Total	499,957 <sup>(2)</sup>	100	(2)
	(a) Associated with wood land	1,750	0.4	-
	(b) Associated with brush land	96,962	19.4	-
	(c) Associated with rotation crop land (fallow)	178,071	35.6	29.7
	(d) Associated with lithosols and rock outcrops	223,174	44.6	-
6	Forest land Total	100,162	100	16.7
	(a) Wood land	1,750	1.7	0.3
	(b) Brush land	96,962	96.8	16.2
	(c) Afforested land	1,450	1.5	0.2
7	Unproductive land Total	241,474	100	40.3
	(a) Water bodies	14,100	5.8	2.4
	(b) Sand dunes	4,200	1.8	0.7
	(c) Lithosols and rock outcrops	223,174	92.4	37.2
	Total area of all land use types approx.	600,000	-	100

(1) This arrangement based on The World Land Use System.

(2) Included in other categories.

**Source:** 1965 Agricultural Statistics  
1967 Field Survey and questionnaires  
1 : 50,000, 1 : 100,000 and 1 : 250,000 scale maps.

Table 5.4 - Cultivable Land Use Types in the Benghazi Plain, 1965

Land Use Types	Total area ha.	% of each type	% of cultivable land	% of Benghazi Plain
<u>Irrigated Land</u>	2,561	100	1.0	0.40
Horticulture	600	23.4	0.2	0.10
Trees	847	33.1	0.3	0.10
Vegetables	1,064	41.5	0.4	0.19
Legumes	50	2.0	0.1	0.01
<u>Unirrigated Land</u>	68,283	100	27.4	11.40
Cereal total	67,246	98.5	27.0	11.20
Wheat	35,877	52.5	14.4	6.10
Barley	31,369	45.0	12.6	5.10
Trees	578	0.8	0.2	0.10
Vegetables	410	0.6	0.16	0.07
Legumes	49	0.1	0.14	0.03
<u>Fallow land</u>	178,071	100	71.5	29.60
<b>Total</b>	<b>248,915</b>		<b>100</b>	<b>41.40</b>

**Source:** Calculations based on:  
 1965 Agricultural Statistics  
 1967 Field Survey and questionnaire  
 1 : 50,000 scale map  
 1 : 100,000 scale map  
 1 : 250,000 scale map

Table 5.5 - Irrigated Land in the Benghazi Plain according to the 1960 Census of Agriculture

Mudirya	Irrigated area in ha.	By Dalu	By Pump	By others
El Magrun	1	1	(1)	-
Gamines	-	-	-	-
Slug	516	1	515	-
Jardina	-	-	-	-
En-Nawaghia	-	-	-	-
El Gwarsha	968	611	352	5
El Fweihat	1,219	1,019	200	-
Benina	-	-	-	-
El Kweifya	696	542	154	-
Sidi Khalifa	329	329	-	-
Deriana	682	682	-	-
Tokra	2,122	145	1,383	594
Tolmeita	-	-	-	-
<b>Total</b>	<b>6,533</b>	<b>3,330</b>	<b>2,604</b>	<b>599</b>

**Source:** 1960 Census of Agriculture, op.cit., p.515.

(1) No data were recorded.

Table 5.6 - Irrigated Land in the Benghazi Plain Mudiryas according to the types of utilisation in 1965

Mudirya	Vegetables	Trees	Horticulture	Legumes	In hectare Total
El Magrun	7	258.7	24.6	(1)	290.3
Gamines	23.5	50	16.5	5	95
Slug	2.5	20	9.6	-	32.1
Jardina	3	5	1.2	2	11.2
En-Nawaghia	-	1	5.2	-	6.2
El Gwarsha	145.3	260	159	9	573.3
El Fweihat	158.2	50	87	7	302.2
Benina	251	148	77	8	484
El Kweifya	120	26	57.6	5	208.6
Sidi Khalifa	127	10	36.6	5	178.6
Deriana	190	2.8	49.1	2	243.9
Tokra	22	13	52.3	6	93.3
Tolmeita	14.5	2.5	24.3	1	42.3
<b>Total</b>	<b>1,064</b>	<b>847</b>	<b>600</b>	<b>50</b>	<b>2,561</b>

**Source:** Calculations based on the 1965 Agricultural Statistics, op.cit.

(1) = No data available.

Table 5.7 - Irrigation Means in the Benghazi Plain according to the 1960 Census of Agriculture and 1967 Survey

Mudirya	Engine Pump		Windmills		Electrical Motors		Windmills destroyed 1967
	1960	1967	1960	1967	1960	1967	
El Magrun	(1)	4	-	1	-	-	-
Gamines	-	17	-	-	-	-	-
Slug	7	7	-	-	-	-	1
Jardina	-	-	-	1	-	-	1
En-Nawaghia	-	5	-	1	-	-	-
El Gwarsha	6	47	-	63	1	-	1
El Fweihat	3	60	-	8	1	10	1
Benina	-	7	-	-	-	8	-
El Kweifya	4	15	-	3	-	-	1
Sidi Khalifa	1	100	-	2	-	-	-
Deriana	-	22	-	-	-	-	-
Tokra	3	83	-	2	3	-	1
Tolmeita	-	25	1	2	2	-	-
<b>Total</b>	<b>24</b>	<b>392</b>	<b>1</b>	<b>83</b>	<b>7</b>	<b>18</b>	<b>6</b>

(1) Did not exist.

Table 5.8 - Windmill Types Operating in the Benghazi Plain in 1967

Size	Height above surface land	Water discharge per hour
Medium diameter	3.65 metres	2,200 litres
Large diameter	5.35 metres	4,400 litres

Table 5.9 - Irrigation in hectare/cm, for various soil texture and plant root depth

Active root zone depth	Sandy loam	Loam	Clay loam	Crops
30.5 to 36.6 cms.	7.6-15.9	15.9-22.2	19 -28.6	Wheat, barley, peas, cauliflowers, carrots, turnips, etc.
61 to 91.5 cms.	22.2-28.6	28.6-38	38 -47.6	Sweet and green chilli peppers, melons, pumpkins and cucumbers
91.5 to 122 cms.	28.6-38	38 -47.6	47.6-50.0	Fruit trees and alfalfa(1)

Source: MISHRA AND OTHERS, IRRIGATION GUIDE FOR FIELD CROPS. The Journal of International Agriculture in "World Crop," Grampian Press Ltd. London, December, 1967, pp.24-25.

(1) Negligible amount is cultivated.

**Table 5.10 - Irrigation Frequency and Irrigation Requirements of Various Crops Grown in the Coastal Region of Cyrenaica**

Crop	No. of irrigations required	Quantity of water reqd. each irrigation M/ha.	Irrigation interval days	Months in which irrigation needed	Total irrigation needed per hectare M
Wheat	2-3	500	30	P, N, A	1,500
Barley	1-2	500	30	P, N	1,000
Chick peas	1-2	500	30	N, A	1,000
Onions	11				
Tomatoes		300	20	A,	4,500
Water Melons		400	17-14	N,	to
Sweet Melons		500-550	14-10	J,	5,500
Sweet Corn		550	8-7	J,	per crop
Potatoes					
Cabbages	12	400-200	7	S, (1)	
Cauliflowers		300	7	O,	3,400
Peppers		300	10-14	N,	per crop
French Beans					
Peas					
Aubergines	12	300	20	A,	4,500
Okra	to	400	14	N,	to
Cucumbers	20	500	10	J,	5,500
Pumpkins		550	7-8	J,	
Garlic	10				
Spinach	to	300	7	S,	3,400
Carrots	12	to	to	O,	per crop
Coriander		400	14	N,	
Alfalfa	15	900	12-30	S, O, N, M. (2)	13,500
Oranges	11	800-1250	20-40	N, J, J, A same as (2) above	12,850

Source: (a) Leuenberger, R., Irrigation Requirements and Irrigation Intervals of various crops grown in the coastal region of Cyrenaica and Tripolitania (Mimeo.) P.A.O., Benghazi, Libya, 1965, pp.5-6.

(b) Singh, H., Farm Plan for 4-hectare farm in Gwarsha project area (Mimeo.) P.A.O., Benghazi, Libya, 1965, p.8.

- (1) No irrigation required if rainfall is normal or above normal and if it is distributed fairly evenly during December, January and February.
- (2) As above, but during December and January only.

**Table 5.11 - The Locations of the Check Dam on Jabal El Akhdar**

No.	Names of wadis on which the check dams are located	Height of the dams/metres
1	Wadi El Bakur	3.75
2	Wadi Hu Sanaba	
	North of El Abiyar	4.00
3	Wadi El Kwayginah	5.50
4	Wadi El Barrimah	3.00
5	Wadi El Oway	
	South of El Abiyar	6.00
6	Wadi Ghât Sultan	3.55
7	Wadi Halag	4.50
8	Wadi Birwa	
	15 kms. south of El Abiyar	4.00

Source: The Chief Engineer of the Yugoslav Firm Marianovic Hydroprojects, January, 1967.

**Table 5.12 - Irrigated and Unirrigated Legumes by Mudirya in the Benghazi Plain, 1965**

Mudirya	Irrigated area	Unirrigated area	Total in ha.
El Magrun	(1)	-	-
Gaminea	5	3	8
Slug	-	-	-
Jardina	2	-	2
En-Nawaghia	-	20	20
El Gwarsha	9	4	13
El Pweihat	7	-	7
Benina	8	2	10
El Kweifya	5	1	6
Sidi Khalifa	5	-	5
Deriana	2	-	2
Tokra	6	-	6
Tolmeita	-	20	20
Total	49	50	99

(1) N.A.

Source: 1965 Agricultural Statistics, op.cit.



**Table 5.13 - Uncultivable Land Use Types in the  
Benghazi Plain, 1965**

Land Use Types	Total area ha.	% of each type	% of uncultivated land	% of Benghazi Plain
<u>Settlement and associated non-agricultural land</u>	9,449	100	2.7	1.6
Built-up areas	8,000	84.7	2.2	1.30
Roads	550	5.8	0.2	0.09
Tracks	884	9.3	0.3	0.15
Railways	15	0.2	-	-
<u>Unproductive Land</u>	241,474	100	68.8	40.30
Water bodies	14,100	5.8	4	2.40
Sand dunes	4,200	4.8	1.2	0.70
Lithosols and rock outcrops	223,174	92.4	63.6	37.20
<u>Forest Land</u>	100,162	100	28.5	16.70
Woodland	1,750	1.7	0.5	0.30
Brush land	96,962	96.8	27.6	16.2
Afforested land	1,450	1.5	0.4	0.2
<b>Total</b>	<b>351,085</b>		<b>100</b>	<b>58.6</b>

**Source:** Calculations based on 1965 Agricultural Statistics, 1967 Field Survey and questionnaires  
 1 : 50,000 scale map  
 1 : 100,000 scale map  
 1 : 250,000 scale map

**Table 6.1 - The Return to One Quintal of Wheat and Barley or Seed in the Benghazi Plain**

Mudirya	Low production	Medium production	High production	Average
El Magrun	1-5	10-15	30-40	16.8
Gamines	1-5	10-15	30-40	16.8
Slug	15-20	30-40	60-80	40.8
Jardina	6-10	15-20	30-40	20
En-Nawaghia	7-10	15-20	30-40	20
El Gwarsha	6-10	15-20	30-40	20
El Pweihat	(1)	-	-	-
Benina	5-10	15-20	25-30	17.5
El Kweifya	5-10	15-20	25-30	17.5
Sidi Khalifa	7-15	20-30	40-50	27
Deriana	7-15	15-20	30-40	22
Tokra	7-10	15-20	30-40	20
Tolmeita	5-10	15-20	30-40	20
<b>Total Average</b>	<b>6-10</b>	<b>15-22</b>	<b>32-42</b>	<b>20.1</b>

(1) Irrigated farming, no cereal cultivation.

**Table 6.2 - Cereals and Legume Production, Area Sown and Percentages in the Benghazi Plain, 1960-1965**

Crops	1960				1965			
	Sown area/ha.	Production in qtls.	%	Average prod./qtls.	Sown area/ha.	Production in qtls.	%	Average prod./qtls.
<b>Cereal total</b>	58,706	54,530	92.8	0.8	67,246	95,460	98.9	1.4
Wheat	14,601	13,748	24.9	0.9	35,877	59,432	61.6	1.7
Barley	54,105	40,782	73.9	0.8	31,369	36,028	37.3	1.1
<b>Legume total</b>	64	678	1.2	12.2	99	1,037	1.1	10.5
Broad beans	42	473	0.86	11.3	82	876	0.9	9.9
Chick peas	2	17	0.03	2.1	6	89	0.1	14.8
Peas	14	188	0.34	13.4	5	72	0.1	14.4
<b>Total</b>	<b>58,770</b>	<b>55,208</b>	<b>100</b>	<b>0.8</b>	<b>67,345</b>	<b>96,497</b>	<b>100</b>	<b>1.4</b>

**Source:** Calculations based on:  
 1. 1960 Census of Agriculture, op.cit., pp.184-191 and 225.  
 2. 1965 Agricultural Statistics op.cit.



**Table 6.3 - Wheat Variety Trials at El Pweihat, Benghazi Plain, 1955-1961**

Wheat variety	Origin	Yield of grains in kilogrammes per hectare					
		1955-56	1956-57	1957-58	1958-59	1959-60	1960-61
Florengaurora	Algeria	363	675	278	455	331	-
P.44370	Greece	318	-	235	-	356	-
Idkeir	Local	220	368	38	370	194	-
Hoghrabiya (Baladi)	Local	185	-	-	225	116	273
Hedba Kahla	Tunisia	110	-	-	220	108	315
Capelli	Italy	158	-	-	-	60	348
Bart 46	U.S.A.	268	-	-	435	598	-
Fortunato	Italy	338	538	338	-	429	-
Mahmoudi D.98	Tunisia	170	538	333	230	143	327
B.T.2306	Morocco	-	528	-	475	-	-
B.D.3225	Morocco	-	-	-	213	192	256
Mentana	Italy	-	550	253	508	362	-
Egyptian 124/336	Egypt	-	-	238	533	331	-
Egyptian 1240/278	Egypt	-	-	185	520	-	-
Baladi	Local	-	-	-	213	255	-

Source: Calculated from:  
 (a) Abu Sharr, Crop Agronomy and Improvement in Cyrenaica, FAO Report No.1577, Rome, 1962, pp.38-43.  
 (b) Soghair, A. A., Crop Agronomy and Improvement in Cyrenaica, FAO Report No.1111, Rome, 1959, pp.46.

(1) From 1959 to 1961 crop trials were carried out in Zorda only, because the crop failed drastically in the Benghazi Plain in 1959.

**Table 6.4 - Barley Variety Trials at El Pweihat, Benghazi Plain, 1955-1961**

Variety	Origin	Yield of grains in kilogrammes per hectare					
		1955-56	1956-57	1957-58	(1) 1958-59	(2) 1959-60	1960-61
Herzaga	Morocco	563	1,108	175	-	1,283	1,046
Esperance	Morocco	175	-	175	-	1,169	946
Paphitico early	Cyprus	-	-	103	-	943	1,083
Baladi 16	Egypt	-	-	160	-	1,259	849
Athenais	Greece	610	1,013	130	-	719	1,073
B.M.C.	Palestine	373	-	-	-	-	816
Teza 73	Egypt	-	-	13	-	-	799
California Marlot	U.S.A.	405	598	-	-	823	-
Baladi 6 Row	Local	528	780	178	-	1,163	959
Bani Ulid	Tripolitanian	525	773	248	-	1,066	913
Atlas 46	U.S.A.	348	-	-	-	-	-
Bencher	U.S.A.	433	865	83	-	-	-
Kartin 403	Tunisia	333	-	-	-	-	-

Source: Calculated from:  
 (a) Abu Sharr, Crop Agronomy and Improvement in Cyrenaica, FAO Report No.1577, Rome, 1962, pp.54-58.  
 (b) Soghair, A. A., Crop Agronomy and Improvement in Cyrenaica (in Arabic), FAO Report No.1111 Rome, 1959, p.52.

(1) The crop failed thoroughly in the Benghazi Plain.

(2) Trials from 1959-1961 concerns Zorda only.

- = No trials.

**Table 6.5 - Broad Bean Variety Trials at Zorda (El Mari), 1958-1961**

Variety	Yield of grains in kg. per hectare		
	1958-59	1959-60	1960-61
Baladi (Local)	712	775	2,040
Baladi (Tripolitanian)	-	912	1,950
Docks Dwarf	362	(2)	-
Giant White	231	-	-
Giant Green	187	-	-
A.D.	(1)	718	174
Sharps S.M.N.	-	712	2,120
Baladi (Partlyc)	-	-	2,480
Coloured	-	-	2,300
Baladi (Green)	-	-	2,300
Baladi (Brown)	-	-	2,200
Cyprus	-	-	1,860

Source: Abu Sharr, Crop Agronomy and Improvement in Cyrenaica, FAO Report No.1577, Rome, 1962, p.66.

(1) No trials.

(2) In 1959-60 the English varieties failed completely, due to the attack of fungus.

**Table 6.6 - Pea Variety Trials at El Fweihat,  
Benghazi Plain, 1955-1961**

Variety	Yield of grains in kilogrammes per hectare					
	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61
Lincoln Small Blue	66	248	-	-	-	-
Zelma	26	640	-	-	766	-
Marvel	67	655	204	-	-	368
Conserve	(1)	-	203	-	-	-
Black Eyed Susan	92	510	234	-	1,083	1,081
Pilot	116	448	-	-	-	-
Vares	-	-	319	-	764	-
Pauli	-	-	311	650	1,222	1,343
Big Ben	-	-	294	-	822	1,093
Servo	-	-	273	-	1,065	-
Virtus	-	-	255	-	833	-
Meteor	-	-	-	1,318	-	-
Emigrant	-	-	265	-	977	300
English Wander	-	-	-	675	994	1,181
Peter Pan	-	-	-	756	-	-
Little Marvel	-	-	-	631	-	-
Feitham First	-	-	-	625	-	-

Source: Soghair, A. A. Crop Agronomy and Improvement in Cyrenaica.  
FAO Report No.1111, Rome, 1959, p.60.  
and  
Abu Sharr, Crop Agronomy and Improvement in Cyrenaica.  
FAO Report No.1577, Rome, 1962, pp.68-69.

(1) - a No trials.

**Table 6.7 - Vegetable Production and Area Cultivated in the  
Benghazi Plain in 1960 and 1965**

Vegetable crop	1960		1965	
	Area in ha.	Production in qtls.	Area in ha.	Production in qtls.
Tomatoes	697	10,222	372	13,035
Water Melons	449	6,597	349	18,171
Melons	314	4,601	104	2,072
Pumpkins	218	3,194	81	5,203
Cucumbers	77	1,121	45	2,154
Snake cucumbers	(1)	-	-	1,710
Coujets	-	-	55	1,766
Green onions	82(2)	1,204	45	1,769
Dry onions	105	1,387	64	2,070
Garlic	-	-	15	247
Lettuces	-	-	77	1,923
Green Chilli Peppers	181(3)	2,944	62	1,423
Red Chilli Peppers	28	410	22	209
Radishes	-	-	14	575
Aubergines	8	119	3	778
Cabbages	42	613	33	1,282
Cauliflowers	3	41	11	380
Green Beans	1	45	-	-
Green Peas	13	184	-	-
Carrots	3	22	17	530
Potatoes	12	119	6	90
Turnips	26	135	12	850
Others	135	1,979	-	-
Total	2,394	34,937	1,388	56,237

(1) Data not available.

(2) Including Garlic.

(3) Including Sweet Peppers.

Source: 1960 Agricultural Census, 1962, pp.231 and 242 and  
1965 Agricultural Statistics.

**Table 6.8 - Vegetable Production and Percentage of  
Total Value in the Benghazi Plain in 1965**

Crop	Production in quintals	Value in £L.	Percentage value
Tomatoes	13,035	195,525	36.0
Water Melons	18,171	145,368	26.8
Onions	3,839	30,310	5.6
Lettuces	1,923	28,845	5.3
Pumpkins	5,203	26,015	4.8
Chilli Peppers	1,632	25,525	4.7
Cucumbers	2,154	21,540	4.0
Coujets	1,766	17,060	3.1
Melons	2,072	10,360	2.0
Snake Cucumbers	1,710	10,260	1.9
Radishes	575	5,750	1.1
Cabbages	1,282	5,128	1.0
Garlic	247	4,940	0.9
Aubergines	778	4,668	0.9
Turnips	850	4,250	0.7
Cauliflowers	380	3,040	0.6
Carrots	530	2,650	0.5
Potatoes	90	540	0.1
Total	56,237	541,774	100.0

Source: Calculations based on the 1965 Agricultural  
Statistics, Ministry of Agriculture,  
Benghazi (unpublished)

**Table 6.9 - Area Planted with Tomatoes, Production and Average Yield per Hectare in the Benghazi Plain in 1960 and 1965**

Mudirya	1960 <sup>(1)</sup>			1965		
	Area planted ha.	Production in qtls.	Average production/ha.	Area planted ha.	Production in qtls.	Average production/ha.
El Magrun	10.7	157	14.7	3	60	20
Gamineo	2.9	41	14.1	4	100	25
Slug	0.7	10	14.3	0.5	7	14
Jardira	0.1	2	20	1	15	15
En-Rawaghia	-	-	-	-	-	-
El Gwaraha	123.5	1,813	14.7	60	1,800	30
El Pweihat	6	89	14.8	8.9	310	35
Benina	25.8	377	14.6	15	550	35
El Kweifya	73.8	1,080	14.6	35	1,225	35
Sidi Khalifa	74	1,086	14.7	40	1,400	35
Deriana	283	4,153	14.7	120	4,200	35
Tokra	91.5	1,343	14.7	70	2,660	38
Tolmeita	4.9	71	14.5	14.5	635	47
<b>Total</b>	<b>697</b>	<b>10,222</b>	<b>14.7</b>	<b>373</b>	<b>12,972</b>	<b>35.7</b>

Source: Calculations based on:  
(a) 1960 Census of Agriculture, United Kingdom of Libya, Ministry of Agriculture, Tripoli, 1962, p.243 and  
(b) The 1965 Agricultural Statistics.

(1) The 1960 Census of Agriculture did not give the area planted with tomatoes for each Mudirya. Therefore the average yield per hectare for each Mudirya is recorded according to the general average of the Benghazi Plain.

**Table 6.10 - Area Cultivated with Water Melons, Production and Average Yield per Hectare in the Benghazi Plain, 1960 and 1965**

Mudirya	1960			1965		
	Area cultivated	Production in qtls.	Average production/ha.	Area cultivated	Production in qtls.	Average production/ha.
El Magrun	28.3	413	14.6	2	80	40
Gamineo	2.04	57	27.9	2	80	40
Slug	3.9	30	7.7	-	-	-
Jardira	-	-	-	-	-	-
En-Rawaghia	-	-	-	-	-	-
El Gwaraha	116.82	715	6.1	52	2,090	40
El Pweihat	-	-	-	26	1,191	45
Benina	73.6	1,080	14.7	180	10,400	55
El Kweifya	25.4	373	14.7	4	180	45
Sidi Khalifa	22.6	330	14.6	32	1,600	50
Deriana	125.5	1,842	14.7	31	1,550	50
Tokra	43.2	634	14.7	20	1,000	50
Tolmeita	8.4	123	14.6	-	-	-
<b>Total</b>	<b>449.4</b>	<b>6,597</b>	<b>14.7</b>	<b>349</b>	<b>18,171</b>	<b>46</b>

Source: Calculations based on:  
(a) 1960 Census of Agriculture, op.cit. p.243.  
(b) 1965 Agricultural Statistics, op.cit.

**Table 6.11 - Area Planted with Onions and Garlic, Production and Yield Per Hectare in the Benghazi Plain, 1960 and 1965**

Crop	1960			1965		
	Area cultivated in ha.	Production in qtls.	Average prod./ha.	Area cultivated in ha.	Production in qtls.	Average prod./ha.
Dry onions	105	1,387	13.2	64	2,070	32.3
Dry garlic	5	37	7.4	15.5	247.5	16
Green onions and garlic	82	1,204	14.7	52.5	1,769	33.7
<b>Total</b>	<b>192</b>	<b>2,628</b>	<b>13.7</b>	<b>132</b>	<b>4,086.5</b>	<b>30.6</b>

Source: A. 1960 Census of Agriculture, op.cit. pp.231 and 243.  
B. 1965 Agricultural Statistics op.cit.

**Table 6.12 - Number and Production of Fruit Trees  
in the Benghazi Plain, 1960 and 1965**

Year	Total	No. of pro- ductive trees	No. of non- productive trees	Production in quintals
1960	274,400	175,100	99,300	18,464
1965	369,611	160,910	208,101	27,701

**Source:** 1960 Census of Agriculture.

United Kingdom of Libya, Ministry of Agriculture,  
Tripoli, Libya, 1962 p.265  
and  
The 1965 Agricultural Statistics, Ministry of  
Agriculture - Benghazi (unpublished)

**Table 6.13 - Percentage Value of Fruit Production  
in the Benghazi Plain in 1965**

Fruit Crop	Production in quintals	Total Value L.L.	Percentage of value
Table Grapes	9,029	135,435	78.7
Figs	3,903	15,612	9
Almonds	473	9,460	5.5
Dates	10,010	3,980	2.3
Olives	3,216	1,705	1
<u>Soft fruit total</u>	876	5,275	3
Pomegranates	574	3,365	2
Apples	42	504	0.3
Apricots	50	400	0.2
Peaches	47	376	0.2
Plums	35	350	0.2
Pears	28	280	0.1
<u>Citrus total</u>	72	482	0.3
Oranges	50	350	0.2
Lemons	22	132	0.1

**Source:** Calculations based on 1965 Agricultural Statistics.

**Table 6.14 - Number of Trees, Productive Trees, Percentages  
and the Average Yield of Fruit Trees in the Benghazi Plain,  
1960**

Fruit crop	No. of trees	No. of productive trees	Per- centages	Production in quintals	Average pro- duction per produc- tive tree kgs.
Table Grapes	107,600	69,700	64.5	4,827	7
Figs	41,100	30,500	74.2	5,222	17
Almonds	15,100	7,400	49	557	7.5
Dates	28,300	17,900	63.3	4,440	24.8
Olives	43,500	20,500	47	1,078	5.3
<u>Soft Fruits Total</u>	179,000	10,900	60.8	1,365	12.5
Pomegranates	9,300	6,000	64.5	810	13.5
Apples	2,400	1,300	54	129	9.9
Apricots	3,900	2,100	53.8	347	16.5
Peaches	1,200	700	58.3	71	10
Plums	700	700	100	3	0.4
Pears	400	100	25	5	5
<u>Citrus Total</u>	17,700	15,800	89.3	908	5.7
Oranges	1,400	500	35.7	23	4.6
Lemons	300	100	33.3	11	11
Tangerines	100	100	100	2	2
Grapefruits	15,900	15,100	95	872	5.8
Bananas	200	100	50	1	1
Other fruits	3,000	2,400	80	66	2.8
<b>Total</b>	<b>274,400</b>	<b>175,100</b>	<b>63.8</b>	<b>18,464</b>	<b>10.5</b>

**Source:** Calculations based on 1960 Census of Agriculture,  
United Kingdom of Libya, Ministry of Agriculture,  
Tripoli, 1962, p.265.

**Table 6.15 - Number of Trees, Productive Trees, Percentage and the Average Yield of Fruit Trees in the Benghazi Plain, 1965**

Fruit crop	No. of trees	No. of productive trees	Percentage	Production in quintals	Average production per productive tree kgs.
Table Grapes	121,450	60,290	49.6	9,029	15
Figs	20,509	15,830	77.2	3,903	24.6
Almonds	20,670	5,560	26.9	473	8.5
Dates	129,091	33,840	26.9	10,010	29.6
Olives	50,730	32,480	64	3,216	9.9
<b>Soft fruits total</b>	<b>31,609</b>	<b>11,760</b>	<b>37.2</b>	<b>1,001</b>	<b>8.5</b>
Pomegranates	9,913	5,120	51.6	764	15.5
Apples	4,450	1,160	23.8	42	3.6
Apricots	3,607	1,000	27.7	85	8.5
Peaches	4,277	1,650	38.5	47	2.8
Plums	4,608	1,290	38.6	35	2.8
Pears	4,754	1,540	32.3	28	1.8
<b>Citrus total (1)</b>	<b>13,552</b>	<b>1,150</b>	<b>8.5</b>	<b>72</b>	<b>6.3</b>
Oranges	10,431	900	8	50	5.4
Lemons	3,121	250	8.5	22	8.8
<b>Total</b>	<b>369,011</b>	<b>150,910</b>	<b>43.6</b>	<b>27,704</b>	<b>17.2</b>

Source: Calculations based on 1965 Agricultural Statistics, Ministry of Agriculture, Benghazi (unpublished)

(1) Data concerning tangerines, grapefruits and bananas are not recorded because their production was very negligible.

**Table 7.1 - Amount of Wood Extracted from the Holdings in the Benghazi Plain during 1959**

Mudirya	No. of holdings reported wood extract	Firewood qtls.	Round wood qtls.	Total qtls.	%
Gamines	1	10	-	10	2
El Gwaraha	35	140	-	140	29.3
El Fweihat	48	268	61	329	68.7
<b>Total</b>	<b>84</b>	<b>418</b>	<b>61</b>	<b>479</b>	<b>100</b>

Source: 1960 Census of Agriculture, op.cit., p.524.

**Table 7.2 - Estimated Area and No. of Trees in the Strict Reserve Forest in the Benghazi Plain, 1967**

Mudirya	Area/ha.	Number of trees	No. of trees/ha.
El Magrun	2	1,000	500
Gamines	1	500	500
Slug	55	27,940	508
El Gwaraha	1,108	731,280	660
Budzira	3	1,650	550
W. of El Kweifya	7	3,129	447
E. of El Kweifya	6	2,682	447
El Bakur	49	30,625	625
Scattered areas	157	78,500	500
<b>Total</b>	<b>1,450</b>	<b>877,306</b>	<b>623.3<sup>(1)</sup></b>

(1) Average.

**Table 8.1 - Number of Livestock, Percentages and Head Per Capita in the Benghazi Plain, 1960-1965**

Animals	1960			1965		
	No. of animals	Percentage	Head/capita	No. of animals	Percentage	Head/capita
Sheep	87,528	47.9	2.2	183,502	64.5	2.9
Goats	73,058	40	1.8	75,206	26.4	1.2
Cattle	6,245	3.4	0.15	5,302	1.9	0.08
Camels	6,270	3.4	0.15	8,971	3.2	0.14
Donkeys	6,562	3.6	0.16	7,630	2.7	0.12
Horses	3,123	1.7	0.08	3,839	1.3	0.06
Total	Rural area	182,786	100	284,450	100	4.4
	E.P.	-	-	-	-	1.4
Poultry	18,404	100	0.45	20,973	100	0.33
Beehives	688	100	-	1,049	-	-

Source: Calculations based on:

1. 1960 Census of Agriculture op.cit., pp.381-396.

2. 1965 Agricultural Statistics (unpublished)

3. Rural population in 1960 was 40,493 persons.

" " 1965 " 63,974

Benghazi Plain population in 1960 was 117,109 persons.

" " 1965 " 208,142

Table 8.2 - Number of Animals Killed in the  
Benghazi Plain, 1965

Animal	Rural areas	%	Benghazi	%	Total	%
Sheep	16,382	7.5	200,779	92.5	217,161	85.9
Goats	14,507	63.3	7,039	36.7	21,546	8.5
Cattle	7	0.1	4,689	99.9	4,696	1.9
Camels	1	0.01	9,385	99.89	9,386	3.7
<b>Total</b>	<b>30,897</b>		<b>221,892</b>		<b>252,789</b>	<b>100.0</b>

Source: Calculations based on the Statistics of Benghazi Municipality in 1966 and 1965 killed animals in the rural areas.

Table 9.1 - Area and Number of Holdings, by Legal  
Status of Holder, in the Benghazi Plain,  
1960

Mudirya	Private Domains		Communal Domains		State Domains		Total holdings	
	Holders	Area/ ha.	Holders	Area/ ha.	Holders	Area/ ha.	Holders	Area/ ha.
El Magrun	826	57,552	(1)	-	-	-	826	57,552
Gamines	833	35,679	-	-	-	-	833	35,679
Slug	843	26,864	-	-	-	-	843	26,864
Jardina	436	42,977	-	-	-	-	436	42,977
En-Nawaghia	(2)	-	-	-	-	-	-	-
El Gwarsha	652	30,943	-	-	-	-	652	30,943
El Fweihat	244	6,789	-	-	-	-	244	6,789
Benina	136	3,241	-	-	-	-	136	3,241
El Kweifya	241	3,339	-	-	-	-	241	3,339
Sidi Khalifa	335	8,948	-	-	-	-	335	8,948
Deriana	525	9,911	2	12	-	-	527	9,923
Tokra	707	50,286	25	126	-	-	732	50,412
Tolmeita	1,223	26,173	-	-	1	45	1,224	26,218
<b>Total</b>	<b>7,001</b>	<b>302,720</b>	<b>27</b>	<b>138</b>	<b>1</b>	<b>45</b>	<b>7,028</b>	<b>302,903</b>

Source: 1960 Census of Agriculture op.cit. p.18.

(1) No data available.

(2) Included in Jardina Mudirya.

Table 9.2 - Total Area of all Holdings, by  
Legal Status, in the Benghazi Plain  
according to the 1967 Survey

Holdings	Area in hectare	Percentage
Private	158,120	26.3
Communal	399,966	66.7
Zawiya	723	0.1
State	41,191	6.9
<b>Total</b>	<b>600,000</b>	<b>100</b>

Table 9,3 - Land Ownership in the Benghazi Plain according to the 1967 Survey

Mudirya	Zawiya		State	
	Area in ha.	Percentage	Area in ha.	Percentage
El Magrun	200	27.7	416	1.0
Gamines	(1)		700	1.7
Slug	20	2.7	3,311	8.0
Jardina	-		400	1.0
En-Nawaghia	-		200	0.5
El Gwarsha	-		4,500	11.0
El Fweihat	20	2.7	5,325	13.0
Benina	-		4,650	11.3
El Kweifya	-		1,850	4.4
Sidi Khalifa	45	6.4	200	0.4
Deriana	277	38.3	205	0.5
Tokra	10	1.5	7,200	17.5
Tolmeita	150	20.7	12,234	29.7
Total	723	100	41,191	100

(1) Data not available.

Table 9,4 - Area, Size and Number of Holdings in the Mutasarrifya<sup>(1)</sup> of Benghazi, 1960

Size of holding in ha.	No. of holdings	% of all holdings	Total area of holdings in ha.	% of total area
Under 0.5	5	0.05	1	-
0.5-1	11	0.15	6	-
1-2	28	0.4	30	-
2-3	55	0.8	116	0.1
3-4	219	3.2	658	0.3
4-5	80	1.1	324	0.1
5-10	1,294	18.7	8,705	3.9
10-20	1,895	27.4	24,998	11.1
20-50	2,124	30.7	60,841	27.1
50-100	764	11	148,405	21.6
100-200	304	4.4	36,251	15.1
Over 200	147	2.1	44,315	19.7
Total	6,926	100	224,050	100

(1) No data available for the Benghazi Plain by itself, which ostensibly does not differ too much from Benghazi Mutasarrifya.

Source: Calculations based on the 1960 Census of Agriculture, op.cit., p.40.

Table 9,5 - Average Size of Holdings in the 225 Farms Surveyed in the Benghazi Plain, 1967

Mudirya	Irrigated Swani		Shifting and dry farms		Sand dune farms		Dolinas	
	No. of holders	Area/ha.	No. of holders	Area/ha.	No. of holders	Area/ha.	No. of holders	Area/ha.
El Magrun	3	3	10	89	2	14	-	-
Gamines	4	3.7	4	10.6	-	-	-	-
Slug	4	2.5	5	23.3	-	-	-	-
Jardina	4	1.8	15	58	-	-	-	-
En-Nawaghia	7	50	10	50	-	-	-	-
El Gwarsha	25	10	4	20	1	9	-	-
El Fweihat	17	28	-	-	1	6	-	-
Benina	8	178	16	38.4	-	-	-	-
El Kweifya	20	6.7	7	15.7	2	17.2	-	-
Sidi Khalifa	2	1.2	4	10.5	-	-	5	105.1
Deriana	3	2.5	20	44.8	2	15.2	-	-
Tokra	8	9.4	5	12.6	-	-	-	-
Tolmeita	2	3.6	5	40	-	-	-	-
Total	107	300.4	118	526.3	8	62.4	5	105.1
Average area		2.8	4	4.5	4	7.8	4	21

Table 9.6 - Planting and Harvesting Dates of Farm Crops in the Coastal Areas of Libya

Crop	Planting season	Harvesting season
<b>Cereals</b>		
Wheat	October-November	April-May
Barley	-do-	-do-
<b>Legumes</b>		
Broad beans	-do-	-do-
- dry	-do-	-do-
- green	-do-	February-March
Chick peas		
- summer crop	-do-	April-May
- winter crop	March-April	June-July
Peas		
- dry	-do-	May-July
- green	-do-	-do-
French Beans	September or March-April	November-January
<b>Vegetables</b>		
Aubergines (egg plant)		
- summer crop	February-May	May-July
- winter crop	August-November	October-January
Onions		
- dry	March-May	July-October
- green	-do-	May-August
Potatoes		
- summer crop	February-March	May-June
- winter crop	September-October	February-March
Tomatoes		
- summer crop	December-January	February-March
- winter crop	April-May	June-August
Okra	February-March	April-May
Water Melons	March-April	June-July
Melons	-do-	-do-
Cucumbers	-do-	July-August
Pumpkins	March-April	June-July
Cabbages	September-November	December-February
Garlic	October-November	March-June
Spinach	October-December	December-February
Carrots	September or February	December-May
Coriander	October-November	December-March
Lettuce	Any time, except May-July	December-July
Cauliflowers	September-October	December-January
<b>Fruits</b>		
Dates	October-November	August-November
Figs	-do-	July-August
Grapes	-do-	July-October
Olives	-do-	October-January
Apples	-do-	June-August
Oranges	-do-	December-February
Tangerines	-do-	October-January
Lemons	-do-	December-February
Peaches	-do-	June-August
Pears	-do-	July-September
<b>Vegetables</b>		
Peppers		
- green	February-March	April-May
- red	-do-	June-August

- Source: 1. Nuttinson, M. Y., The Physical Environment and Agriculture of Libya..... op.cit.. p.166.  
 2. Singh, H., Farm Plant for 4 Hectare Farm in Gwarsha Project Area, Benghazi, op.cit..p.8.  
 3. Leuenberger, R. Irrigation Requirements and Irrigation Intervals of Various Crops Grown in the Coastal Region of Cyrenaica, op.cit.. p.7.

Table 10.1 - Composition of the Agricultural Gross Income in the 225 farms surveyed in the Benghazi Plain, 1967

Source of Income	Quantity sold in qtls.	Income in £L.	Percentage
Vegetables	553,960.5	96,267	34.3
Grains	68,641.07	68,551.6	24.4
Water Melons and Melons	561,226	63,144	22.4
Animals	2,567 <sup>(1)</sup>	27,750	9.9
Eggs	488,248 <sup>(2)</sup>	9,764.9	3.5
Fruits	952,832	8,674.5	3.1
Wool and Hair	347.07	4,996.6	1.8
Poultry	796 <sup>(1)</sup>	250	0.1
Total	-	279,884.6	100

(1) Heads

(2) Units



Grain	Total Value in £L.	Percentage
Wheat	30,827.2	45
Barley	19,869.7	29
Legume	17,855.7	26
Total	68,552.6	100

Table 10.3 - Distribution of Income from Animal Husbandry in the 225 Farms surveyed in the Benghazi Plain, 1967

Source of income	Total income in £L.	Percentage
Sheep and goats	26,091.5	94.0
Camels	1,354	4.9
Cattle	305	1.1
Total	27,750.5	100

Table 10.4 - Frequency Distribution of Gross Income Per Farm in the 225 Farms Surveyed in the Benghazi Plain, 1967

Income Scale £L.	No. of households	Percentage	Modified income scale £L.	Percentage
50-100	16	7.1	50-500	71.6
100-200	51	22.7		
200-300	46	20.4		
300-400	26	11.6		
400-500	22	9.8		
500-600	12	5.3	500-1,000	16
600-700	7	3.1		
700-800	8	3.6		
800-900	1	0.4		
900-1000	8	3.6	1,000-10,000	11.5
1000-5000	25	11.1		
5000-10,000	1	0.4	10,000-100,000	0.4
10,000-100,000	1	0.4		
100,000-200,000	1	0.5	100,000-200,000	0.5
Total	225	100		100

Table 10.5 - Gross Income from Non-Agricultural Activities in the 225<sup>(1)</sup> farms surveyed in the Benghazi Plain, 1967

Source of Income	No. of households	Gross income £L.	Income per household £L.	Percentage	Average income per month £L.
Government personnel	74	29,499	398.64	46	33.22
Social Welfare Assistance	36	4,560	126.67	7.1	10.56
Disablement Pension	2	207	103.50	0.3	8.63
Private	16	5,905	369.06	9.2	30.76
Others	60	23,953	399.22	37.4	33.27
Total and average	188	64,124	341	100	28.41

(1) 37 householders do not have income from non-agricultural activities.

Table 10.6 - Farm Expenditure in the 225 farms surveyed in the Benghazi Plain, 1967

Item of expenditure	Quantity per unit	Total Cost £L.	Percentage	Average cost per farm £L.
Seeds	690 qtls.	3,197.7	3.2	4.63
Fruit plants	241.25 trees	1,414	1.4	5.86
Wage of hired labour	257 labourers	64,068.9	64.5	2.49
Charges of hired machinery	1,435.7 hours	5,743	5.8	4.00
Fertilizers and manure	10,136 qtls.	6,355	6.4	0.63
Feed and water for animal	18,456 qtls.	6,273.2	6.3	0.34
Transport charges	201 farmers	12,025	12	59.83
Rents	10 farms	384.8	0.4	38.48
Total		99,441.6	100	117.26

**Table 10.7 - Net Income of Farming in the 225 Farms Surveyed in the Benghazi Plain, 1967**

Source of income	Gross income £L.	Expenditures £L.	Net income £L.	Net income per household £L.	Net income per capita £L.
Crop husbandry	227,962.60	66,530.90	161,431.70	678.30	83.74
Fruit cultivation	8,674.50	1,414.10	7,260.40	30.50	3.77
Animal husbandry	43,247.50	19,087	24,160.50	101.50	12.53
Non-agricultural activities	64,124	15,866 <sup>(1)</sup>	48,256	202	24.94
<b>Total</b>	<b>344,008.6</b>	<b>102,900</b>	<b>241,108.6</b>	<b>1,071.59</b>	<b>132.30</b>

(1) Transportation and rents expenditures.

**Table 10.8 - Average Expenditure of Normal Rural Family Consisting of 8 Persons in the Benghazi Plain, 1967**

Item of expenditure	Total cost per annum £L.	Cost per month £L.	Percentage
Food	170	14.17	43.3
Tea and cigarettes	70	5.83	18.7
Clothing	50	4.17	13.3
Hospitality and entertainment	40	3.33	10.7
Health	15	1.25	4.0
Light and heating	25	2.08	6.7
Family or tribal assistance	5	0.42	1.3
<b>Total</b>	<b>375</b>	<b>31.25</b>	<b>100</b>

**Table 10.9 - Farm Credit in the 225 Farms Surveyed in the Benghazi Plain, 1967**

Mudirya	Agricultural Bank		Shops		Private	
	No. of loans	Amount of £L.	No. of loans	Amount of £L.	No. of loans	Amount of £L.
El Magrun	1	470	7	365	-	-
Gamines	-	-	6	213	2	60
Slug	3	6,321	10	950	1	100
Jardina	1	150	5	280	2	500
En-Nawaghia	2	7,300	3	300	-	-
El Gwaraha	12	3,098	1	15	-	-
El Fweihat	3	640	1	50	-	-
Benina	1	6,000	-	-	1	240
El Kweifya	1	270	2	80	-	-
Sidi Khalifa	5	849	7	860	-	-
Deriana	5	6,900	11	1,160	-	-
Tokra	8	5,083	12	1,192	1	200
Tolmeita	-	-	2	190	-	-
<b>Total</b>	<b>42</b>	<b>37,081</b>	<b>65</b>	<b>5,655</b>	<b>7</b>	<b>1,100</b>

**Table 10.10 - Number and Size of Farm Population according to the 225 Farms Surveyed in the Benghazi Plain, 1967**

Mudirya	Total	Males	Pe- males	Age Groups			Average family size	No. of active farmers	Average of far- mers employed
				Young less than 15 yrs.	Adult 15-60 yrs.	Aged over 60 yrs.			
El Magrun	121	54	67	53	63	5	8.1	27	1.8
Gamines	87	39	48	40	41	6	5.4	26	1.6
Slug	210	99	111	104	90	16	8.4	40	1.6
Jardina	171	72	99	85	77	9	10.7	29	1.8
En-Nawaghia	107	50	57	49	55	3	9.7	26	2.3
El Gwaraha	250	125	125	94	138	18	11.4	47	2.1
El Fweihat	64	30	34	31	33	-	8	28	3.5
Benina	105	58	47	45	53	7	8.6	20	1.7
El Kweifya	117	55	62	49	58	10	7.8	31	2.1
Sidi Khalifa	99	45	54	46	49	4	6.2	27	1.7
Deriana	200	89	111	91	82	27	6.5	50	1.6
Tokra	228	113	115	89	117	12	8.1	86	3.7
Tolmeita	74	31	43	33	37	4	7.4	16	1.6
<b>Total</b>	<b>1,833</b>	<b>860</b>	<b>973</b>	<b>809</b>	<b>893</b>	<b>121</b>	<b>8.1</b>	<b>453</b>	<b>2</b>
<b>%</b>		<b>46.9</b>	<b>53.1</b>	<b>44.1</b>	<b>49.3</b>	<b>6.6</b>		<b>24.7</b>	

Table 10.11 - Distribution of Farm Labour in the 225 Farms Surveyed in the Benghazi Plain, 1967

Mudirya	Total No. of Households	Full-time farmers	Part-time farmers	Shifting Cultivators
El Magrun	16	9	1	6
Gamines	15	1	3	11
Slug	22	10	3	9
Jardina	15	1	-	14
En-Nawaghia	13	1	-	12
El Gwaraha	25	12	-	13
El Fweihat	10	8	-	2
Benina	8	5	-	3
El Kweifya	15	6	8	2
Sidi Khalifa	16	10	4	2
Deriana	28	12	7	9
Tokra	31	5	2	24
Tolmeita	10	2	1	7
<b>Total</b>	<b>225</b>	<b>82</b>	<b>29</b>	<b>114</b>
<b>Percentage</b>	<b>100</b>	<b>36.4</b>	<b>12.9</b>	<b>50.7</b>

Table 10.12 - Estimated Number of Farms in the Benghazi Plain according to the 1967 Survey

Mudirya	Coastal farms			Sand dune farms	
	Irrigated farms	Unirrigated farms	Deserted farms	Irrigated farms	Unirrigated farms
El Magrun	150	-	-	100	1,900 <sup>(1)</sup>
Gamines	200	-	-	-	200
Slug	6	-	-	-	-
Jardina	4	-	-	-	-
En-Nawaghia	7	-	-	-	-
El Gwaraha	364	-	80	87	350
El Fweihat	70	-	-	270	-
Benina	15	4 <sup>(2)</sup>	-	-	-
El Kweifya	24 <sup>(3)</sup>	-	-	-	100
Sidi Khalifa	25	-	100	175	-
Deriana	105	33	-	32	111
Tokra	250	-	100	-	-
Tolmeita	176	60	-	-	-
<b>Total</b>	<b>1,612</b>	<b>133</b>	<b>280</b>	<b>664</b>	<b>2,661</b>

(1) Unirrigated or partly irrigated.

(2) 8 of these farms are dolinas.

(3) Mostly are dolinas.

Table 10.13 - Labour Cost per Worker in the Shifting Cultivation Area in the Benghazi Plain, 1967

Item	Quantity Kg.	Cost per unit £L.	Total cost £L.
<b>Shahama (Food)</b>			
Sugar	10	0.05	0.50
Tea	1	0.60	0.60
Tomato Paste	10	0.18	1.80
Spices	0.25	0.80	0.20
Oil	10	0.27	2.70
Onions	5	0.12	0.60
Meat	2.5	0.60	1.50
<b>Money</b>	-	-	20.00
In Kind	400 <sup>(1)</sup>	0.25	20.00
<b>Total</b>	<b>438.75</b>	<b>-</b>	<b>47.90</b>

(1) Grains

Source: Interview with several households, 1967.

Table 10.14 - Farm Equipment, Number and Value Per Farm in the 225 Farms Surveyed in the Benghazi Plain, 1967

Type of equipment	No. of equipment	Average value per unit £L.	Total Value £L.	Average value per farm	Percentage
Machinery	157	577.6	89,892	339.52	85.8
Implements	626	22.13	13,850.4	61.56	13.2
Hand Tools	1,766	0.6	1,051.5	4.67	1
<b>Total</b>	<b>2,549</b>	<b>41.11</b>	<b>104,793.9</b>	<b>465.75</b>	<b>100</b>

**Table 10.15 - Total Value of Equipment Per Average Farm, by Mudiryas, in the 225 farms surveyed in the Benghazi Plain, 1967**

Mudiryas	No. of farms	Total Value £L.	Average Value per farm £L.
El Magrun	16	5,193.5	324.59
Gamines	15	9,481.7	632.11
Slug	22	5,897	268
Jardina	15	2,659.5	177.30
En-Nawaghia	13	4,379	336.85
El Gwarsha	25	9,727.5	389.10
El Pweihat	10	20,455.6	2,045.56
Benina	8	24,164.5	3,020.56
El Kweifya	16	3,727	232.94
Sidi Khalifa	16	3,547	221.69
Deriana	28	3,843.5	137.27
Tokra	31	9,228	313.81
Tolmeita	10	1,990	199
<b>Total</b>	<b>225</b>	<b>104,793.7</b>	<b>465.75</b>

**Table 10.16 - Distribution of Farm Machinery in the 225 farms surveyed, by Mudiryas, in the Benghazi Plain, 1967**

Mudiryas	Tractors		Windmills		Water Pumps		Motor Cars		Total Value £L.
	No.	Cost £L.	No.	Cost £L.	No.	Cost £L.	No.	Cost £L.	
El Magrun	2	3,200	(1)	-	2	180	1	900	4,280
Gamines	2	3,000	-	-	8	524	3	4,980	8,504
Slug	3	3,650	-	-	-	-	3	1,950	5,600
Jardina	2	2,525	-	-	-	-	-	-	2,525
En-Nawaghia	-	-	1	250	-	-	3	3,330	3,580
El Gwarsha	1	1,380	11	2,750	5	835	4	3,250	8,215
El Pweihat	8	12,100	2	500	10	3,334	4	3,450	19,384
Benina	6	11,500	-	-	6	4,850	2	2,035	18,385
El Kweifya	2	2,400	-	-	-	-	1	600	3,000
Sidi Khalifa	1	1,002	1	130	11	1,265	1	800	3,197
Deriana	1	1,600	-	-	5	587	1	250	2,437
Tokra	2	1,407	2	500	34	5,189	2	1,770	8,866
Tolmeita	-	-	-	-	3	359	1	1,560	1,919
<b>Total</b>	<b>30</b>	<b>43,764</b>	<b>17</b>	<b>4,130</b>	<b>84</b>	<b>17,123</b>	<b>26</b>	<b>24,815</b>	<b>89,892</b>

(1) Does not exist.

**Table 10.17 - Average Labour Cost of Machinery in the Benghazi Plain 1966-1967**

Type of machinery operating	Privately owned	Government owned
	Cost per hectare	Cost per hectare
	£L.	£L.
Caterpillar for land reclamation	5	4
Tractor for deep ploughing (10-15 cms.)	1-1.50	1
Tractor for disc harrows	1	1
Tractor for three disc plough	3	1.25
Combined machine for harvesting and threshing	4	2

**Source:** Interviews with tractor owners, co-operatives and Extension Guides.

**Table 10.18a - Labour cost and benefit of sowing and harvesting 7 qtls. of wheat by machinery in the Benghazi Plain, 1967**

Expenditure £L.			Gross Income £L.		
Items	Total cost	%	Items	Production % qtls.	Total cost
Seed	49	29	Wheat	100	400
Seeding & ploughing	70	41.4	Barley	20	40
Harvesting & threshing	50	29.6	Total income	-	440
			Total expenditure	-	169
<b>Total</b>	<b>169</b>	<b>100</b>	<b>Net income</b>	<b>-</b>	<b>271</b>

Table 10.18b - Labour Cost of Sowing and Harvesting 7 ails. of wheat by Human Power in the Benghazi Plain, 1967

Expenditure £L.			Gross Income £L.		
Items	Total cost	%	Items	Production %	Total cost
Seed	49	16.4	Wheat	130	520
Labour for sowing	40	13.4	Straw	28	56
Labour for harvest	168	40.1	Total income	-	576
Food expenses	90	30.1	Total expenditure	-	347
<b>Total</b>	<b>347</b>	<b>100</b>			<b>229</b>

Source: Interview with Mr. M. Hossain, a tractor owner, in D-611g, Slug on 24th May, 1967.

Table 10.19 - Distribution of Farm Equipment in the 225 Farms Surveyed in the Benghazi Plain, 1967

Equipment	Number	Total value £L.	% of Sub-total	% of Total	Cost per unit £L.	Average value/farm £L.
<b>Machinery</b>	157	89,832	100	85.8	572.20	399
Tractors	30	43,764	48.7		1,459	194.5
Windmills	17	4,130	4.6		243	18.4
Water pumps	84	17,123	19		203.8	76.1
Motor cars	26	24,815	27.7		916.73	110.3
<b>Implements</b>	1,467	13,850.40	100	13.2	9.40	61.6
Ploughs	333	6,767.30	48.9		20.32	30.1
Fences	1,103 <sup>(1)</sup>	4,412.10	31.8		19.60	19.6
Cart	31	2,671	19.3		86	11.9
<b>Hand Tools</b>	1,766	1,051.50	100	1.0	0.60	4.7
<b>Total</b>	<b>3,390</b>	<b>104,733.90</b>		<b>100</b>	<b>30.90</b>	<b>465.5</b>

(1) Quintals.

Table 10.20 - Distribution of Farm Implements in the 225 Farms Surveyed, by Mudiryas, in the Benghazi Plain, 1967

Mudirya	Ploughs		Fences		Carts		Total Value £L.	% Value
	No.	Cost £L.	Qtls.	Cost £L.	No.	Cost £L.		
El Magrun	45	247.50	113.7	455	1	110	842.5	6.1
Gaminee	30	54.25	167.5	670	2	240	964.2	7.6
Slug	26	50	15	60	3	187	297	2.1
Jardina	55	50.50	15.7	63	-	-	113.5	0.8
En-Kawaghia	21	32	125	500	3	255	787	5.7
El Gwaraha	35	400	13.6	54.5	12	964	1,418.5	10.3
El Pweihat	4	11	99.9	399.6	5	545	955.6	6.9
Benina	34	5040	50.9	203.5	3	190	5,433.5	39.2
El Kweifya	21	346.50	29.4	117.5	2	180	644	4.6
Sidi Khalifa	16	31.50	58.9	235.5	-	-	267	1.9
Doriana	21	380	236.6	946.5	-	-	1,326.5	9.6
Tokra	14	77	169.3	677	-	-	754	5.5
Tolmeita	11	17	7.5	30	-	-	47	0.3
<b>Total</b>	<b>333</b>	<b>6,767.30</b>	<b>1,103</b>	<b>4,412.10</b>	<b>31</b>	<b>2,671</b>	<b>13,850.40</b>	<b>100</b>

Table 10.21 - Distribution of Farm Hand Tools in the 225 Farms Surveyed by Mudiryas in the Benghazi Plain, 1967

Mudirya	No. of hand tools	Average hand tools per farm	%	Average cost per unit £L.	Total value £L.
El Magrun	71	4.4	6.7	1	71
Gaminee	22	1.5	1.3	0.61	13.50
Slug	-	-	-	-	-
Jardina	16	1.1	2	1.30	21
En-Kawaghia	8	0.6	1.1	1.50	12
El Gwaraha	127	5.1	8.9	0.74	94
El Pweihat	196	19.6	11	0.59	116
Benina	584	73	33	0.59	346
El Kweifya	155	9.7	7.9	0.54	83
Sidi Khalifa	149	9.3	7.9	0.56	83
Doriana	152	5.4	7.6	0.53	80
Tokra	251	4.9	10.3	0.43	108
Tolmeita	35	3.5	2.3	0.69	24
<b>Total</b>	<b>1,766</b>	<b>7.4</b>	<b>100</b>	<b>0.60</b>	<b>1,051.50</b>

Table 11.1 - Population Changes in the Benghazi Plain, 1954-1967

Mudirya	Censuses		Field Survey <sup>(1)</sup>			Rate of Increase or decrease %	
	1954	1964	1965	1966	1967	1954-64	1964-67
El Magrun	8,354	5,635	5,654	5,426	5,375	-4.8	-1.6
Gamineq	5,901	5,864	5,963	6,148	6,323	-0.06	2.7
Slug	9,240	12,387	12,451	12,646	12,718	3.4	0.9
Jardina	3,472	4,769	4,339	4,418	4,532	3.7	-1.7
En-Nawaghia	1,900	2,321	1,076	917	1,341	2.2	-26.4
El Gwaraha	4,914	5,230	5,384	5,490	4,486	0.6	-5.4
El Fweihat	(2)	-	-	-	-	-	-
Benina	3,238	7,147	7,308	7,795	8,672	12	7
El Kweifya	2,326	3,867	3,944	4,125	4,150	6.6	2.4
Sidi Khalifa	2,612	3,328	3,322	3,412	3,595	2.7	3.5
Deriana	3,292	5,550	5,633	5,750	5,864	6.8	1.8
Tokra	3,130	5,918	6,000	6,078	6,252	8.9	1.8
Tolmeita	2,677	2,825	289	3,000	3,090	0.6	3.7
Rural Total	51,043	64,841	63,974	65,196	66,398	2.7	0.8
Benghazi City	69,718	137,295	144,168	150,899	157,915	9.7	4.9
Benghazi Plain Total	120,761	202,136	208,142	216,095	224,313	7.2	3.6

(1) The statistics for 1965, 66 and 67 are based on the 1964 census figures, corrected for the increase and decrease supplied by Benghazi Municipality and the Benghazi Plain Mudiryas (see Appendix Table 11.1).

(2) Included with Benghazi City.

Source: 1954 and 1964 General Population Censuses, op.cit. and 1967 population survey.

Table 11.2 - Area, Percentages and Density of Population in the Benghazi Plain, 1967

Place	Population			Area		Density Persons per km. <sup>2</sup>
	No. of people	% of Benghazi Plain	% of rural area	Km. <sup>2</sup>	% of Benghazi Plain	
El Magrun	5,375	2.4	8.1	1,518	25.3	3.5
Gamineq	6,323	2.8	9.5	430	7.2	14.7
Slug	12,718	5.5	19.2	1,637	27.3	7.8
Jardina	4,532	2.0	6.8	420	7.0	10.8
En-Nawaghia	1,341	0.6	2.0	235	3.9	5.7
El Gwaraha	4,486	2.0	6.8	478	8.0	9.4
El Fweihat	(1)	-	-	-	-	-
Benina	8,672	3.9	13.0	323	5.4	26.8
El Kweifya	4,150	1.9	6.3	215	3.6	19.3
Sidi Khalifa	3,595	1.6	5.4	204	3.4	17.6
Deriana	5,864	2.6	8.8	222	3.7	26.4
Tokra	6,252	2.9	9.4	216	3.6	28.9
Tolmeita	309	1.4	4.7	62	1.1	49.8
Rural Total	66,398	29.6	100	5,970	92.5	11.1
Benghazi City	157,915	70.4	-	30	0.5	5264
Benghazi Plain Total	224,313	100	-	6,000	100.0	37.4

(1) Included with Benghazi.

Source: Calculations based on:  
1. 1967 Population survey  
2. 1 : 50,000 scale map.

Table 11.3 - Dispersion of Population in the Benghazi Plain, 1967

Village	Total rural population	Total population outside the villages	No. of settlements	Co-efficient of dispersion
El Magrun	5,375	4,611	1,085	930
Gamineq	6,323	4,911	1,231	956
Slug	12,718	9,618	2,337	1767
Jardina	4,532	2,922	949	609
En-Nawaghia	1,341	991	457	338
El Gwaraha	4,486	2,776	1,207	747
El Fweihat	(1)	-	-	-
Benina	8,672	3,747	1,479	639
El Kweifya	4,150	2,650	761	486
Sidi Khalifa	3,595	1,750	625	303
Deriana	5,864	4,964	717	628
Tokra	6,252	4,432	955	641
Tolmeita	3,090	1,837	812	459

(1) Included with Benghazi City.

Source: Calculations based on

(1) Demangeon's formula  $C = \frac{P}{A}$  given in Clarke, J. I. Population Geography, 1965 p.60.

(2) 1967 Population survey.

(3) 1967 Approximate estimation of settlement.

\* For explanation, see text.

Table 11.4 - Population Movement in the Benghazi Plain, 1954-1967

Place	Year	Growth by natural increase	Balance of migration	Total increase	Census Total No.	Statistics Total No.
Benghazi City	1954	(1)	-	67,577	69,718	-
	1964	4,820	1,873	6,693	137,295	95,207
	1965	4,238	2,635	6,873	144,168	102,080
	1966	5,393	1,338	6,731	150,899	108,349
	1967	4,830	2,186	7,016	157,915	115,365
Rural area	1954	-	-	13,798	51,043	-
	1964	-	-	-	64,841	54,203
	1965 <sup>(2)</sup>	840	281	569	63,974	53,745
	1966	1,216	742	1,211	65,196	54,394
	1967	1,249	142	1,107	66,398	55,453
Benghazi Plain	1954	-	-	81,375	120,761	-
	1964	4,820	1,820	2,302	202,136	149,410
	1965	5,078	2,354	7,442	208,142	155,825
	1966	6,555	596	7,942	216,095	162,743
	1967	6,079	2,044	8,075	224,313	170,818

(1) N.A.

(2) Data concerning the natural increase and balance of migration for the rural area and the Benghazi Plain 1964 up are not complete and therefore unreliable.

- Source: 1. The 1954 General Population Census (U.K.L.) Ministry of National Economy, Tripoli, 1959.  
 2. The 1964 General Population Census, Kingdom of Libya - Ministry of Economy and Trade, Tripoli, 1966.  
 3. The 1965, 66 and 67 Statistics of Populations Kutasarrifyas of Benghazi and El Marj, 1968.  
 4. The 1965, 66 and 67 Statistics of Benghazi City by the Statistics Department, Benghazi Municipality, 1968.

Table 11.5 - Distribution of Settlement Types, by Mudiyyas, in the Benghazi Plain, 1967

Mudiyya	House (housh)		Popular houses	Shacks and huts		Tents	Caves	Total
	In the village	In rural area		In the village	In rural area			
El Magrun	101	19	25	15	94	830	1	1,085
Gamines	300	136	25	65	15	689	-	1,231
Slug	451	19	50	16	-	1,800	-	2,336
Jardina	180	29	25	-	9	701	1	945
En-Nawaghia	41	14	25	2	8	367	-	457
El Gwaraha	304	395	50	20	80	362	4	1,215
1. Village	264	395	50	20	80	362	4	1,175
2. Tika	40	-	-	-	-	-	-	40
El Fweihat	-	95	-	-	-	-	1	96
Benina	388	94	50	167	74	701	5	1,479
El Kweifyn	320	93	25	45	17	260	1	761
Sidi Khalifa	227	100	25	40	3	230	-	625
Deriana	130	55	25	206	96	200	5	717
1. Village	125	55	25	131	96	200	5	637
2. Tansalukh	5	-	-	75	-	-	-	80
Tokra	251	56	125	255	157	160	2	1,006
1. Village	165	50	50	5	57	34	2	363
2. Bersis	20	2	25	130	45	35	-	257
3. Bujarrar	25	3	25	110	35	42	-	240
4. El Habni	11	1	25	10	20	49	-	115
Tolmeita	172	74	100	12	9	435	10	812
Total	2,865	1,179	550	844	562	6,735	30	12,765
%	22.4	9.7	4.3	6.6	4.4	52.7	0.2	100
Benghazi City	21,710	-	1,000	5,735	-	188	33	29,244 <sup>(2)</sup>

(1) N.A.

(2) There are about 578 unclassified units of settlements.

Source: Calculations based on: 1. 1967 field survey.  
 2. Topographic map of Libya scale 1/50,000.

Table 12.1 - A suggested rotation system for El Gattara Land Settlement Scheme

No. of plots	Area/ha.	1st year	2nd year	3rd year	4th year
I	150	Winter vegetables	Wheat 100 ha. Alfalfa 50 ha.	Summer vegetables and 50 ha. again under grain and oil seeds in winter.	Wheat
II	150	Wheat	Winter vegetables	Wheat and 50 ha. alfalfa and vetch.	Summer vegetables and 50 ha. again under grain and oil seeds in winter.
III	150	Summer vegetables and 50 ha. again under grain and oil seeds in winter.	Wheat	Winter vegetables	Wheat and 50 ha. alfalfa and vetch.
IV	150	Wheat and 50 ha. alfalfa and vetch.	Summer vegetables and 50 ha. again under grain and oil seeds in winter.	Wheat	Winter vegetables

Source: Based on Singh, H., Farm Plan..... op.cit. p.12.

Table 12.2 - Anticipated Production in the El Gattara, El Gwarsha and Butraba Settlements

A. CROPS

Enterprise	Total area cropped in hectares			Yield per hectare in quintals			Total production in quintals			Price per unit in £.	Gross value in £.
	El Gattara	El Gwarsha	Butraba	El Gattara	El Gwarsha	Butraba	El Gattara	El Gwarsha	Butraba		
Winter vegetables	890	105	90	Variable			1403.76	16557.5	672.5	3-5(1)	629,544
Summer vegetables	445	105	90	Variable			132388	31237.5	4035	2-4	492,087
<b>Total</b>	<b>1,335</b>	<b>210</b>	<b>80</b>				<b>272663</b>	<b>47775</b>	<b>1076</b>		
Wheat (irrigated)	445	525	25	25	-	-	14125	1312.5	-	4-5	55,968.75(3)
Wheat	2,000	-	120	12	-	-	24000	-	75	4-5	108,337.50
Barley (irrigated)	-	105	-	25	-	-	-	2525	-	3-3.50	8,531.25
Barley	420	-	480	12	-	-	8	5040	-	3-3.50	16,770
Grain & oil seed	200	525	120	15	15	5(4)	3000	787.5	60	5	19,237.50
Clover & vetch	400	525	-	400	-	-	160,000	24,000	-	0.50	90,500(5)
<b>Total grain</b>	<b>3,065</b>	<b>262.5</b>	<b>720</b>				<b>431,63</b>	<b>4725</b>	<b>255</b>		
<b>Total crops</b>	<b>4,800</b>	<b>472.5</b>	<b>800</b>				<b>475,726</b>	<b>70500</b>	<b>1592</b>		<b>1,420,976</b>
<b>Crops</b>		<b>6,072.5</b>									<b>1,420,976</b>

Grand Total Production Vegetables: 321,445 qtls. Grains: 48,145 Fodder: 181,000 qtls.

B. LIVESTOCK

Enterprise	Total Production									Total value in £.							
	Number			Milk litre			Meat kgm.				Eggs units	Wool A	Price per unit in				
	El Gattara	El Gwarsha	Butraba	El Gattara	El Gwarsha	Butraba	El Gattara	El Gwarsha	Butraba					El Gattara	El Gwarsha	Butraba	
Cows (6)	1,000	315	160	720,000	283,500	47,700	33,334	10,500	5332.8	-	-	-	-	0.05	0.60	-	82,060
Sheep (7)	2,000	-	800	36,000(8)	-	14,400	9,600	-	3840	-	-	-	8,400(9)	0.05	0.83	Wool	14,799.00
Goats (7)	500	-	-	9,000	-	-	2,400	-	-	-	-	-	250(9)	0.05	0.98	Hair	1,967
Poultry	5,000	2,600	800	-	-	-	-	-	-	-	-	-	750,000	390,000	120,000	-	18,900
<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>765,000</b>	<b>283,500</b>	<b>62,100</b>	<b>45,334</b>	<b>10,500</b>	<b>9172.8</b>	<b>750,000</b>	<b>390,000</b>	<b>120,000</b>	<b>8,650</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>117,722.00</b>
<b>Grand Total</b>				<b>1,110,600</b>				<b>65,006.8</b>		<b>1,260,000</b>			<b>8,650</b>				

- (1) Prices have been fixed according to 1967 market prices.
- (2) N.A.
- (3) Mostly will be consumed on the farm.
- (4) Grains only.
- (5) Will be fed for animals.
- (6) About 80 per cent of the cows will be milking at the time.
- (7) About 40 per cent of the sheep and goats will be milking at the time.
- (8) Mostly will be consumed by farmers.
- (9) The wool price is about £L.0.12 per kg. while the hair is about £L.0.50.

Source: Calculations based on: 1. Hakim Singh, Farm Plan for a 4-hectare farm in Gwarsha Project area. Libya Benghazi, 1965. pp.9-18.  
 2. Hakim Singh, Farm Plan for the Butraba settlement in the eastern region of Libya. Libya-Benghazi, 1965. p.23.  
 3. The topographic map of Libya, scale 1 : 50,000.  
 4. Leuenberger, R. Basic consideration.....op.cit.. 1965.



Table 12.3 - Agricultural production and consumption of the Benghazi Plain, 1967, and the estimated production of land settlement projects

Enterprise	Benghazi Plain production	Land settlement projects production	% of Benghazi Plain production	% of Land Settlement projects production	Benghazi Plain consumption in quintals
Grains	96,497	48,145	49.9	30.8	156.547
Vegetables	54,237	321,415	592.6	284	113,287
Meat	16,754	650	3.9	1.0	67,016
Milk <sup>(1)</sup>	60,683	1,110,600	183	?	60,683
Eggs <sup>(1)</sup>	1,628,900	1,260,000	77.4	?	1,628,900
Fodder	_(2)	181,000	-	-	-

(1) Milk and egg data for Benghazi Plain production are of 1959.

(2) N.A.

Source: Calculations based on estimated data from the land settlement projects and:

1. 1960 Census of Agriculture
2. 1965 Agricultural Statistics.
3. 1966-1967 Statistics of Benghazi Municipality.

## APPENDICES



## 13. Farm Production and Income

Item	Quantity or number actually sold	Value per unit	Total value
<b>A. CROPS</b>			
a) Wheat	.....	.....	.....
b) Barley	.....	.....	.....
c) Broad beans	.....	.....	.....
d) Chick peas	.....	.....	.....
e) Tomatoes	.....	.....	.....
f) Onions	.....	.....	.....
g) Melons	.....	.....	.....
h) Other vegetables	.....	.....	.....
<b>B. FRUITS</b>			
a) Grapes	.....	.....	.....
b) Olives	.....	.....	.....
c) Dates	.....	.....	.....
d) Figs	.....	.....	.....
e) Others	.....	.....	.....
<b>C. LIVESTOCK</b>			
a) Sheep	.....	.....	.....
b) Goats	.....	.....	.....
c) Cows	.....	.....	.....
d) Camels	.....	.....	.....
e) Poultry	.....	.....	.....
f) Others	.....	.....	.....
<b>D. LIVESTOCK PRODUCTS</b>			
a) Meat	.....	.....	.....
b) Wool	.....	.....	.....
c) Hair	.....	.....	.....
d) Ghee (SARM)	.....	.....	.....
e) Honey	.....	.....	.....
f) Eggs	.....	.....	.....
g) Hides	.....	.....	.....
h) Others	.....	.....	.....

## 14. Farming Expenses

Item	Quantity or Number	Value per unit	Total value
<b>A. SEEDS</b>			
a) Wheat	.....	.....	.....
b) Barley	.....	.....	.....
c) Others	.....	.....	.....
B. Fruit plants	.....	.....	.....
C. Wages of hired labour	.....	.....	.....
D. Hire charges for tractor and machinery	.....	.....	.....
E. Fertilizers and manures	.....	.....	.....
F. Feed and water for livestock	.....	.....	.....
G. Transport charges	.....	.....	.....
H. Rents	.....	.....	.....
I. Miscellaneous	.....	.....	.....

## 15. Family living expenses

Item	Value	₹
a) Food	.....	.....
b) Tea and cigarettes	.....	.....
c) Clothing	.....	.....
d) Hospitality and entertainment	.....	.....
e) Health	.....	.....
f) Lighting and heating	.....	.....
g) Family or Tribal assistance	.....	.....

## 16. Income from non-farm source

Name of source	No. of family members employed	Monthly amount earned
<b>A. Service</b>		
a) Government	.....	.....
b) Private	.....	.....
B. Trade and business	.....	.....
C. Transport and communication	.....	.....
D. Handicrafts	.....	.....
E. Others	.....	.....

(Cont'd.)

**17. Indebtedness**

- a) Amount of loan
- b) From whom?
- c) For what purpose?
- d) At what rate of interest?
- e) Condition of repayment

18. Are you a member in a co-operative?

19. What is your estimate of an annual income?

20. Do you follow a crop rotation system?

21. Do you get any assistance or advice from the Ministry of Agriculture?

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APPENDIX 4.1Soil Profile Descriptions

- Profile 1** Situated in an uncultivated area, south of El Magrun Village.
- 0 - 10cm. Reddish yellow sandy clay loam horizon. A dry and friable soil predominantly of small crumb and small blocky structure, but with occasional large clods. Contains very few hairy small and weak roots. As well as some stones and stoniness. Well defined boundary.
- 10 - 58 cm. Pink sandy clay loam formed by simultaneous weathering and oxidation. Damp and loose and almost devoid of roots, due to the excessive salinity. Contains some limestone fragments. Sharp boundary to lower horizon.
- Profile 2** Situated in a deserted agricultural area, east of Gamines Village.
- 0-2 cm. Dry friable very pale brown sandy horizon, with medium to small blocky structure. Almost devoid of organic matter, with few small and weak roots. Many boulders, stones and stoniness, with occasional rock out crops. Smooth boundary to lower horizon.
- 20 - 53 cm. Very pale calcareous sandy loam. Large and medium roots penetrate. Frequent limestone fragments present. Boundary is well defined.
- Profile 3** Situated in a fallow irrigated land north of Slug Village.
- 0 - 25 cm. Very pale brown sandy loam. Dry and slightly hard soil predominantly of small crumb and small blocky structure with occasional stones and stoniness. Contains small, weak and young roots with abundant of humus. Boundary is wavy and clear.
- 25 - 40 cm. More compact and reddish yellow sandy loam (Transitional). Only very occasional small limestone fragments present. Boundary is clear to lower horizon.
- 40 - 80 cm. Dry pink silt loam. More compact with occasional calcium carbonate concretions.
- Profile 4** Situated in Es-Silg area. The area is under shifting cultivation of mainly wheat.
- 0 - 10 cm. Dry and compact reddish yellow sandy clay loam. Many fine roots. Some limestone fragments present.
- Profile 5** Situated behind Ben Rajab house, N.E. of Jardina. Thick transported terra rossa soil.
- 0 - 35 cm. Very compact yellow clay loam with small crumb structure. Becomes more cloddy and compact with depth. Fairly well defined lower boundary.
- 35 - 50 cm. Still more compact reddish yellow sandy loam. Few fine penetrating roots. Well defined merging boundary to lower horizon.
- Profile 6** Situated in a fallow land 1 km. west of En-Narraghia Village.
- 0 - 18 cm. Pink silt loam, consisting mainly of relatively large clods that readily break down to large and medium blocky units. Contains few short roots. Boundary is merging type.
- 18 - 56 cm. Pink silt loam weakly indurated. Contains frequent fragments of limestone. Lower horizon is clearly defined.
- Profile 7** Situated in an irrigated area at El Fa'akat, South of El Gwarsha Village.
- 0 - 16cm. Dry light brown clay, with admixture of many plant roots. Small and medium blocky structure. Boundary is clearly defined.
- 16 - 90 cm. Reddish yellow clay. Contains some limestone fragments, with some fine and large roots. Sharp boundary to lower horizon.
- Profile 8** Situated in an area of irrigated transported terra rossa in El Fweihat, South of Benghazi.
- 0 - 22 cm. Yellow reddish sandy loam contains a high content of root material. Structure is platy, with some stones and stoniness. Boundary is merging and not very clear.
- 22 - 42 cm. Compact yellow reddish sandy loam; with occasional vertical cracks, breaking down to extremely hard blocky units. Few limestone fragments present. Boundary is clearly defined.
- 42 - 100 cm. Very hard reddish yellow clay, with small crumb structure.

(Cont'd.)

- Profile 9** Situated in an irrigated residual terra rossa, about  $\frac{1}{2}$  km. west of Benina Village.
- 0 - 12 cm. Dry stony surface horizon. Friable red sandy clay loam. Many included stone fragments of limestone. Many short and fine grass roots. Boundary is well defined.
  - 12 - 62 cm. Extremely compact and indurated layers of red clay soil, breaking down with difficulty to large blocky units. Only occasional large stones and stoniness. Contains large to medium roots. Boundary is clearly defined.
- Profile 10** Situated in Osman Dolina on sink-hole, about 4 km. east of Benghazi.
- 0 - 30 cm. Dry friable red clay with medium to small blocky structure. Contains very few stones and stoniness as well as few young stork roots. Smooth boundary to lower horizon.
  - 30 - 60 cm. Extremely compact red clay, with many vertical cracks giving a variable structure of prismatic and large blocky units. Fine and large roots penetrate. Boundary is merging toward the lower horizon.
- Profile 11** Situated in an irrigated area of a complex of residual terra rossa, lithosols and rock outcrops, west of El Kweifya Village.
- 0 - 15 cm. Dry slightly hard yellowish and sandy loam. Structure varies from small crumb to small blocky units. Some fine roots and small limestone fragments present. Boundary is clearly defined.
  - 15 - 50 cm. Red sandy loam; more compacted and breaking down into large and small blocky units. Fine and medium roots penetrate. Very few limestone fragments present. Solid limestone below 1m.
- Profile 12** Situated in an irrigated coastal sand dune area, north of Sidi Khalifa Village.
- 0 - 15 cm. Loose light particles of yellow sand. Boundary is not very clear. Contains many fine long roots.
  - 15 - 100 cm. Damp yellow sand, with many fine and large fruit tree roots. Very few stones and stoniness. Boundary is merging to the slightly altered parent material
- Profile 13** Situated in an irrigated residual terra rossa in Gasr El Ajuz, West of Deriana.
- 0 - 20 cm. Dry slightly hard yellowish red sandy clay, with many large clods. Contains few limestone fragments. Fine short roots present. Boundary is clear.
  - 20 - 50 cm. Yellow reddish clay. Extremely compact horizon, but still break into units that are predominantly blocky, but includes small crumbs and some single grains. Well defined boundary.
- Profile 14** Situated in a Sebka area, 2 km. east of Deriana Village.
- 0 - 10 cm. Loose reddish sandy clay loam horizon. Contains mineral and incorporated organic matter. Abundant, long thin and small roots. Boundary is clearly defined to lower horizon.
  - 10 - 50 cm. Reddish brown clay; with abundance of soluble salt accumulation. Abundant small and medium roots. Rests on solid limestone bedrock.
- Profile 15** Situated in a fallow transported terra rossa in Bujarrar, 5 km. west of Tokra.
- 0 - 17 cm. Dry red clay horizon. Crumbly structure; with few limestone fragments. Fine short roots. Boundary is clearly defined.
  - 17 - 350 cm. Reddish yellow sandy clay loam. Massive structure breaking down to small blocky units. Fine roots penetrate. Sharp boundary to the lower horizon.
- Profile 16** Situated in an irrigated area at Tokra Village.
- 0 - 19 cm. Dry extremely friable brown sand, with blocky structure, but the whole readily breaking down into single grain and small crumb units. Limestone and pottery fragments are common. Abundant small, strong and thin roots. Boundary is merging into the lower horizon.
  - 19 - 50 cm. Slightly damp and slightly more compact horizon of a light brown sandy loam. Readily breaking down to single grain, small crumb and small blocky units. Large and small roots penetrate. Many small limestone and pottery fragments present.
- Profile 17** Situated in an irrigated fan - area near the coast, just west of Sidi Abdalla, 3 km. West of Tolmeita.
- 0 - 60 cm. Light brown sandy loam. Dry and extremely friable; with a platy structure at the top of the horizon, but the whole readily breaking down into single grain and small crumb units. Many fine roots penetrate. Many limestone fragments present. Boundary is smooth toward the lower horizon.
  - 60 - 200 cm. Slightly damp and slightly more compact horizon of a yellowish red sandy clay loam. Readily breaking down to single grain, small crumb and small blocky units. Small roots penetrate. Many limestone fragments present.

Appendix Table 4.3 CHEMICAL ANALYSIS OF THE SOIL SAMPLES IN THE AREA SURVEYED OF THE BENGHAZI PLAIN, 1967

Appendix Table 4.2 MECHANIC. ANALYSIS OF THE SOIL SAMPLES IN THE SURVEYED AREAS OF THE BENGHAZI PLAIN, 1967.

Profile No.	Sample No.	Horizon	Depth cm.	PH	PASTE	MOISTURE %	GENERAL COLOR	Sand %	Silt %	Clay %	Texture	Saturation	Electrical conductivity $\mu\text{mhos/cm} \times 10^3$ at 25°C.	% organic matter & loss on ignition	Carbon org. %	Nitrogen org. %	CaCO <sub>3</sub> %	ANALYSIS OF SATURATION EXTRACT (mg/litre)								
																		Ca <sup>++</sup>	Mg <sup>++</sup>	Na <sup>+</sup>	K <sup>+</sup>	Cl <sup>-</sup>	Total	S.A.P.	C.A.P.	
1	1	1	0-10	7.50		7.5	YR 7/5	55.4	22.0	22.6	Sand. clay. loam	37	10.00	2.08	1.64	0.18	52.50	3.9	9.3	99.00	60.00	50.00	10.00	207.00	4.88	19.31
	2	2	10-20	7.50		7.5	YR 7/5	54.4	23.0	23.0	Sand. clay. loam	38	0.19	0.72	0.42	0.08	50.00	0.1	7.4	19.00	8.50	10.00	1.00	36.00	4.70	19.31
2	3	1	0-20	7.50		10	YR 7/5	69.4	17.0	16.0	Sand	38	0.2	1.93	1.33	0.18	62.50	4.6	5.6	4.50	1.80	2.70	1.00	11.00	1.40	35.46
	4	2	20-33	7.50		10	YR 7/5	75.4	3.6	7.6	Sandy loam	32	0.2	0.81	0.56	0.09	60.00	3.1	8.3	70.00	64.00	36.00	21.00	190.00	4.67	18.99
3	5	1	0-25	7.50		10	YR 7/5	60.4	17.0	2.6	Sandy loam	46	0.50	0.42	0.05	32.50	0.4	2.3	4.00	3.20	1.90	1.00	1.00	1.00	1.00	1.00
	6	2	25-40	7.50		7.5	YR 7/5	71.4	24.0	4.6	Sandy loam	44	0.32	0.81	0.54	0.06	45.00	0.4	4.9	2.00	2.00	2.50	1.00	1.00	1.00	1.00
4	7	1	0-10	7.50		7.5	YR 7/5	37.4	35.0	7.6	Silt loam	46	0.28	0.98	0.23	0.02	32.00	0.3	1.6	18.00	9.00	1.00	1.00	1.00	1.00	1.00
	8	2	10-20	7.50		7.5	YR 7/5	51.4	36.0	12.6	Silt loam	43	0.28	0.98	0.23	0.02	32.00	0.3	1.6	18.00	9.00	1.00	1.00	1.00	1.00	1.00
5	9	1	0-10	7.50		7.5	YR 7/5	47.4	29.0	27.6	Sand. clay. loam	40	0.28	0.98	0.23	0.02	20.00	1.0	5.3	3.70	1.90	1.50	0.50	10.50	0.70	18.99
	10	2	10-20	7.50		7.5	YR 7/5	48.4	24.0	27.6	Clay loam	48	0.47	0.75	0.50	0.02	35.50	0.2	8.2	2.70	1.50	0.50	0.50	10.50	0.68	18.99
6	11	1	0-10	7.50		7.5	YR 7/5	44.4	18.0	37.6	Sand loam	47	0.36	0.62	0.56	0.08	3.00	1.3	9.1	6.70	3.10	0.50	0.50	10.50	0.70	18.99
	12	2	10-20	7.50		7.5	YR 7/5	37.4	32.0	10.6	Silt loam	30	0.36	0.85	0.58	0.10	40.00	0.9	6.5	7.00	3.10	0.50	0.50	10.50	0.70	18.99
7	13	1	0-10	7.50		7.5	YR 7/5	45.4	34.0	3.6	Silt loam	49	0.29	0.72	0.51	0.60	30.00	4.2	8.3	3.70	1.10	0.68	0.50	10.50	0.70	18.99
	14	2	10-20	7.50		7.5	YR 7/5	45.4	21.0	23.6	Clay	50	0.81	7.31	1.34	0.16	42.50	0.8	3.6	10.00	3.00	2.50	0.25	0.25	0.25	0.25
8	15	1	0-10	7.50		7.5	YR 7/5	44.4	27.0	38.6	Clay	48	0.35	0.81	0.81	0.06	15.00	1.2	3.7	3.00	1.50	1.10	0.25	0.25	0.25	0.25
	16	2	10-20	7.50		7.5	YR 7/5	52.4	35.0	12.6	Sandy loam	38	0.28	2.08	1.68	0.11	5.00	2.3	5.6	3.00	1.50	1.10	0.25	0.25	0.25	0.25
9	17	1	0-10	7.50		7.5	YR 7/5	45.4	17.0	37.6	Sand loam	54	0.55	1.01	0.78	0.09	17.00	3.2	9.7	4.00	2.10	0.68	0.68	0.68	0.68	
	18	2	10-20	7.50		7.5	YR 7/5	37.4	21.0	41.6	Clay	43	0.55	0.62	0.45	0.09	17.50	3.2	9.7	4.00	2.10	0.68	0.68	0.68	0.68	
10	19	1	0-10	7.50		7.5	YR 7/5	50.4	25.0	23.6	Sandy clay loam	47	0.36	0.58	0.58	0.10	10.50	1.7	9.1	3.50	1.50	1.50	0.50	11.50	0.70	18.99
	20	2	10-20	7.50		7.5	YR 7/5	32.4	13.0	47.0	Clay	51	0.49	1.56	1.32	0.12	5.00	0.4	5.3	1.50	0.50	0.50	0.50	11.50	0.70	18.99
11	21	1	0-10	7.50		7.5	YR 7/5	45.4	18.0	36.6	Sand loam	43	0.29	0.94	0.69	0.08	5.00	1.9	7.1	3.60	1.50	0.60	0.60	0.60	0.60	
	22	2	10-20	7.50		7.5	YR 7/5	67.4	19.0	13.6	Sandy loam	46	3.6	1.41	0.53	0.10	5.00	1.9	6.6	20.00	3.00	0.60	0.60	0.60	0.60	
12	23	1	0-10	7.50		7.5	YR 7/5	45.4	20.0	34.6	Clay	48	0.31	0.78	0.44	0.05	5.00	1.0	1.6	40.00	3.00	0.60	0.60	0.60	0.60	
	24	2	10-20	7.50		7.5	YR 7/5	95.4	2.0	2.6	Sand	26	0.003	0.23	0.14	0.02	75.00	2.4	0.6	2.00	0.80	0.75	0.50	110.00	0.68	18.99
13	25	1	0-10	7.50		7.5	YR 7/5	45.4	3.0	4.6	Sand	26	0.17	0.62	0.41	0.02	75.00	2.4	0.6	2.00	0.80	0.75	0.50	110.00	0.68	18.99
	26	2	10-20	7.50		7.5	YR 7/5	50.4	18.0	31.6	Sandy clay	41	0.35	1.79	1.12	0.11	20.50	3.2	2.3	2.50	1.80	0.55	0.55	0.55	0.55	
14	27	1	0-10	7.50		7.5	YR 7/5	39.4	23.0	37.6	Clay	40	0.31	1.02	1.02	0.09	5.00	3.2	2.6	1.50	0.80	0.75	0.50	110.00	0.68	18.99
	28	2	10-20	7.50		7.5	YR 7/5	47.4	23.0	29.6	Sandy clay loam	45	0.35	1.79	1.12	0.11	20.50	3.2	2.3	2.50	1.80	0.55	0.55	0.55	0.55	
15	29	1	0-10	7.50		7.5	YR 7/5	45.4	23.0	30.6	Clay	39	0.31	1.02	1.02	0.09	5.00	3.2	2.6	1.50	0.80	0.75	0.50	110.00	0.68	18.99
	30	2	10-20	7.50		7.5	YR 7/5	45.4	28.0	26.6	Clay	39	0.32	2.13	1.32	0.11	22.50	0.9	6.3	70.00	4.00	4.00	0.60	15.00	0.70	18.99
16	31	1	0-10	7.50		7.5	YR 7/5	45.4	16.0	26.6	Sand	32	0.89	0.84	0.62	0.08	5.00	4.9	3.1	5.00	1.80	0.60	0.60	0.60	0.60	
	32	2	10-20	7.50		7.5	YR 7/5	55.4	10.0	4.6	Sand	30	0.37	1.82	1.04	0.10	70.00	2.6	9.2	9.00	5.50	3.50	0.70	21.00	1.96	29.46
17	33	1	0-10	7.50		7.5	YR 7/5	79.4	23.0	1.6	Sandy loam	33	0.55	0.83	0.52	0.06	32.00	4.3	6.4	14.00	10.40	0.60	0.60	0.60	0.60	
	34	2	10-20	7.50		7.5	YR 7/5	64.4	16.0	19.6	Sandy loam	38	1.42	1.32	0.94	0.09	62.50	4.2	7.4	4.20	3.10	0.60	0.60	0.60	0.60	
	35	1	0-10	7.50		7.5	YR 7/5	49.4	21.0	29.6	Sandy clay loam	35	0.38	0.71	0.51	0.05	40.00	6.8	6.8	14.00	5.00	0.60	0.60	0.60	0.60	



Appendix Table 6.1

Wheat and Barley Sown Area and Production Statistics,  
by Mudiryas, in the Benghazi Plain, 1965

Appendix Table 6.2

Legumes Sown Area and Production Statistics, by  
Mudiryas, in the Benghazi Plain, 1965

Mudirya	Wheat					Barley					Mudirya	Broad Beans					Chick Peas					Pean				
	Quantity sown in qtls.	Area sown (Hec-tares)	Harvested area (Hec-tares)	Total production in qtls.	Average production in qtls.	Quantity sown in qtls.	Area sown (Hec-tares)	Harvested area (Hec-tares)	Total production in qtls.	Average production in qtls.		Quantity sown in qtls.	Area sown (Hec-tares)	Harvested area (Hec-tares)	Total production in qtls.	Average production in qtls.	Quantity sown in qtls.	Area sown (Hec-tares)	Harvested area (Hec-tares)	Total production in qtls.	Average production in qtls.	Quantity sown in qtls.	Area sown (Hec-tares)	Harvested area (Hec-tares)	Total production in qtls.	Average production in qtls.
El Magrun	500	1,500	1,500	3,000	2	1,300	3,900	3,900	7,800	2	El Magrun	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gamines	500	1,500	1,500	1,500	1	1,100	3,300	3,300	3,300	1	Gamines	8	8	8	105	13	-	-	-	-	-	-	-	-	-	-
Slug	3,000	9,000	3,300	10,000	3	3,300	9,900	200	600	3	Slug	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Jardina	700	2,100	100	100	1	1,200	3,600	300	300	1	Jardina	1	1	1	12	12	-	-	-	-	-	-	-	-	-	-
En-Nawaghia	500	1,500	150	150	1	300	900	150	150	1	En-Nawaghia	5	20	20	7.5	1.5	-	-	-	-	-	-	-	-	-	-
El Gwaraha	1,100	3,300	3,000	6,000	2	1,200	3,600	3,600	7,200	2	El Gwaraha	12	12	12	220	18	-	-	-	-	-	2	2	2	22	11
El Fweihat	170	977	977	2,932	3	123	369	369	1,478	4	El Fweihat	5.5	5.5	5.5	110	20	-	-	-	-	-	1	1	1	15	15
Benina	800	2,000	2,000	6,000	3	400	1,000	1,000	4,000	4	Benina	8	8	8	144	16	2	2	2	24	12	-	-	-	-	-
El Kweifya	500	1,250	1,250	5,000	4	200	500	500	2,000	4	El Kweifya	3	3	3	70	12	2	2	2	30	15	1	1	1	15	15
Sidi Khalifa	500	1,250	1,250	3,750	3	200	500	500	2,000	4	Sidi Khalifa	5	5	5	180	20	-	-	-	-	-	1	1	1	20	20
Deriana	600	1,500	1,500	4,500	3	400	1,000	1,000	4,000	4	Deriana	1	1	1	20	20	1	1	1	20	20	-	-	-	-	-
Tokra	500	1,250	1,250	2,500	2	400	1,000	1,000	2,000	2	Tokra	5	5	5	100	20	1	1	1	15	15	-	-	-	-	-
Tolmeita	3,500	8,750	8,750	14,000	4	600	1,800	1,800	3,000	5	Tolmeita	5	20	20	7.5	1.5	-	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>17,870</b>	<b>35,877</b>	<b>22,427</b>	<b>59,432</b>	<b>2.5</b>	<b>10,327</b>	<b>31,369</b>	<b>17,619</b>	<b>36,028</b>	<b>2.8</b>	<b>Total</b>	<b>57.5</b>	<b>87.5</b>	<b>87.5</b>	<b>976</b>	<b>22.3</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>89</b>	<b>15</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>72</b>	<b>18</b>

Source: 1965 Agricultural  
Statistics, Benghazi  
Plain Mudiryas, 1967.

Appendix Table 6.3A FRUIT TREES, PLANTED AREA AND PRODUCTION STATISTICS, BY MUDIRYAS IN THE BENGHAZI PLAIN, IN, 1965.

Mudirya	Table Grapes					Figs					Almonds					Dates					Olives					Pomegranates				
	Number of trees	Productive trees	Area planted/ha.	Production in quintals	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.	Number of trees	Productive trees	Area planted/ha.	Production in quintals	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.
El Nagrun	40,000	30,000	200	6,000	20	10,000	8,000	17	8,600	30	157	100	1	5	5	4,862	1,000	41	300	30	2,558	1,000	22	50	5	-	-	-	-	-
Qasines	1,012	1,500	9	150	10	2,209	2,000	3.9	400	20	321	100	-	10	10	1,048	500	8.8	150	30	5,862	2,000	-	200	10	155	100	-	10	10
Blag	70	40	-	4	10	55	-	-	-	-	65	40	-	4	10	40	-	0.3	-	-	600	200	20	8	4	-	-	-	-	-
Jardina	70	50	0.3	3	10	60	30	0.1	-	-	50	20	-	4	20	100	-	0.8	-	-	150	50	-	10	20	30	20	-	4	20
Ro-Shaughia	4,276	-	21	-	-	820	500	1.5	-	-	482	300	-	-	-	47	20	0.4	-	-	-	-	-	-	-	-	-	-	-	-
El Qasaba	8,339	4,000	25	400	10	6,782	400	1.2	48	12	4,951	3,000	15	300	10	78,850	4,000	100	1,200	30	33,696	25,500	100	2,550	10	3,910	2,000	5	300	15
El Fawhat	4,276	2,000	21	-	-	820	400	1.5	-	-	482	200	-	-	-	47	20	0.4	-	-	1,053	500	-	-	-	485	200	-	-	-
Banina	8,277	500	15	50	10	2,247	600	5.0	120	20	10,968	500	40	50	10	-	-	-	-	-	3,278	500	12	150	30	2,345	600	5	120	20
El Kweifya	1,500	700	7.5	70	10	2,500	1,900	4.4	380	20	500	300	2	30	10	35,000	25,000	50	7,500	30	1,800	800	12	80	10	2,500	1,800	-	270	15
Sidi Khalifa	34,704	14,000	104	1,400	10	1,097	800	1.9	240	30	185	100	-	10	10	3,450	2,000	29	600	30	820	400	-	40	10	331	200	-	50	15
Deriana	14,026	5,000	42	500	10	560	300	0.9	60	20	41	-	-	-	-	813	100	-	20	20	174	30	-	3	10	18	-	-	-	-
Tokra	3,600	2,000	10.7	200	10	211	1,501	0.4	301	20	1,968	400	8	40	10	2,034	500	17	80	20	1,759	500	8	25	20	496	200	1	50	15
Talmeita	500	500	2.5	250	15	750	750	1.3	225	30	560	500	-	20	4	2,800	800	23	160	20	1,000	1,000	-	100	10	-	-	-	-	-
Total	181,450	60,850	142.5	9,029	10	20,509	15,850	23.8	3,903	20	20,670	5,560	66	473	8.1	129,091	33,860	270.7	10,010	21	50,730	32,480	174	3,216	11.2	9,913	5,120	11	764	15.5

Source: 1965 Agricultural Statistics.

Annex 6.3

## FRUIT TREES, PLANTED AREA AND PRODUCTION STATISTICS BY MUDIRYAS IN THE BENGHAZI PLAIN, IN 1965.

Mudirya	Apples					Apricots					Peaches					Plums					Oranges					Lemons											
	No. of trees	Productive trees	Area planted/ha.	Production in quintals	Average production per tree kg	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.	No. of trees	Productive trees	Area planted/ha.	Production in qts.	Average production per tree kg.							
El Magrun	229	150	1	4.2	3	-	-	-	-	-	100	50	-	2	4	-	-	-	-	-	50	40	-	2	5	-	-	-	-	-	-	-	-	-	-	-	
Gamias	29	10	-	1	10	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Slug	30	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Jardina	50	-	-	-	-	20	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
El-Suwayhia	1,137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
El Gharaba	412	150	1	12	8	1,059	500	4	40	8	1,056	400	3	28	7	1,198	400	4	28	7	413	150	1	12	8	1,661	800	5	40	5	296	150	1	12	8	-	
El Feihat	137	500	-	-	-	1,000	-	-	-	-	1,837	1,000	1	-	-	1,225	800	-	-	-	1,925	100	-	-	-	-	7,000	-	-	-	-	-	-	-	-	-	
Benina	782	-	2	-	-	648	-	1	-	-	861	-	2	-	-	1,515	-	5	-	-	1,929	-	7	-	-	1,102	-	3	-	-	-	2,715	-	6	-	-	-
El Sweifa	150	100	-	10	10	800	400	-	40	10	200	100	-	10	10	100	50	-	5	10	100	50	-	5	10	150	100	-	10	10	150	100	10	10	10	-	-
Sidi Khalifa	72	50	-	5	10	-	-	-	-	-	89	50	-	5	10	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dariana	10	-	-	-	-	16	-	-	-	-	15	-	-	-	-	16	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tokra	423	200	1	10	5	289	100	-	5	5	104	50	-	2.5	5	54	40	-	2	5	7	-	-	-	-	318	-	1	-	-	-	-	-	-	-	-	
Tolanta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	300	4	9	5	-	-	-	-	-	-	-	-	-	-	-	-
Total	4,450	1,160	5	42.2	7.6	3,607	1,000	5	85	7.6	4,277	1,650	6	47.5	7	4,608	1,290	9	35	7.5	4,754	1,540	12	28	6.5	10,431	900	9	50	7.5	3,121	250	17	22	9	-	-

LIVESTOCK AND ANIMALS SLAUGHTERED IN 1965 IN SEDENTARY AND NOMADIC AREAS BY MUDIRYA

IN THE BENGHAZI PLAIN

Draught animals, poultry and bee-hives in 1965 in Sedentary and Nomadic Areas by Mudirya

Mudirya	Sheep			Goats			Camels			Cattle			Mudirya	Horses			Donkeys			Poultry			Bee-hives														
	Alive			Slaughtered			Alive			Slaughtered				Alive			Slaughtered			Sedentary	Nomads	Total	Sedentary	Nomads	Total	Sedentary	Nomads	Total									
	Sedentary	Nomads	Total	Sedentary	Nomads	Total	Sedentary	Nomads	Total	Sedentary	Nomads	Total		Sedentary	Nomads	Total	Sedentary	Nomads	Total																		
El Magrun	3,650	10,950	14,600	600	2,000	2,600	2,950	8,800	11,750	150	300	450	100	545	645	-	-	-	40	9	150	-	-	-	El Magrun	50	100	150	150	350	500	1,100	900	2,000	-	-	-
Gamines	2,070	8,400	10,470	300	900	1,200	511	2,000	2,511	200	800	1,000	85	350	435	-	-	-	72	150	222	-	-	-	Gamines	150	250	400	150	350	500	500	300	800	-	-	-
Slug	-	45,756	45,756	-	3,400	3,400	-	9,914	9,914	-	2,100	2,100	-	5,901	5,901	-	-	-	-	375	275	-	-	-	Slug	-	451	451	-	1,900	1,900	-	300	500	-	2	2
Jardina	1,258	15,600	16,858	700	1,400	2,100	152	2,470	2,622	10	400	410	-	113	113	-	-	-	2	450	452	-	-	-	Jardina	14	196	210	31	500	531	100	700	800	3	-	3
En-Nawaghia	-	5,064	5,064	-	500	500	-	728	728	-	120	120	-	595	595	-	-	-	-	150	150	-	-	-	En-Nawaghia	-	180	180	-	200	200	-	500	500	-	-	-
El Owarsha	11,504	29,496	37,000	800	500	1,300	1,456	5,614	7,050	300	500	800	130	58	188	-	-	-	6,011	470	1,081	-	-	-	El Owarsha	280	170	450	364	437	801	2,000	1,000	3,000	-	-	-
El Fweihat	3,408	-	3,408	-	-	-	1,363	-	1,363	-	400	400	4	-	4	-	-	-	414	-	414	-	-	-	El Fweihat	170	-	170	42	-	42	1,014	-	1,014	3	-	3
Benina	4,023	18,130	18,153	-	800	800	329	2,500	2,829	-	-	-	36	264	300	-	-	-	166	428	594	-	-	-	Benina	50	153	183	54	281	335	500	1,700	2,200	1	-	4
El Kweifya	8,000	1,500	9,500	700	400	1,100	6,000	1,100	7,400	100	150	250	75	25	100	-	-	-	200	74	274	-	-	-	El Kweifya	80	20	100	250	50	300	1,100	400	1,500	-	-	-
Sidi Khalifa	4,847	1,560	6,407	600	400	1,000	1,394	956	2,350	500	300	800	66	184	250	-	-	-	120	140	260	-	-	-	Sidi Khalifa	60	66	126	223	148	371	1,600	400	2,000	2	3	5
Deriana	3,960	3,366	7,326	700	600	1,300	4,200	5,600	9,800	800	1,000	1,800	55	120	175	-	-	-	500	400	900	-	-	-	Deriana	70	90	160	200	300	500	1,100	700	1,800	8	15	23
Tokra	2,500	1,380	3,950	400	300	700	2,100	9,380	11,480	700	1,800	2,500	55	145	200	1	-	1	155	175	300	5	2	7	Tokra	120	150	250	200	250	450	1,500	500	2,000	3	6	9
Tolmaita	500	1,500	2,000	185	197	382	1,709	4,000	5,709	585	3,292	3,877	-	64	64	-	-	-	26	194	220	-	-	-	Tolmaita	85	923	1,009	-	-	-	250	2,809	3,050	123	875	1,000
Total	45,800	137,702	183,502	4,985	11,397	16,382	22,144	53,062	75,206	3,345	11,162	14,507	606	7,770	8,971	1	-	1	7,706	2,996	5,302	5	2	7	Total	1,110	2,729	3,839	1,664	4,766	6,430	10,764	10,209	20,973	145	904	1,049

Appendix Table 8.2

Distribution of Animal Products, by Mudiryas, in the Benghazi Plain,  
1959

Mudirya	Milk production in litres					Eggs in "00"	Wool in qtls.	Goat hair in qtls.	Camel hair in qtls.	Honey in qtls.
	Sheep	Goats	Cows	Camels	Total					
El Magrun	1,516	1,397	175	1,970	5,058	236	264	12	8	-
Gamines	1,548	1,211	1,564	1,279	5,602	532	243	91	6	-
Slug	3,232	2,291	399	5,156	11,078	2,497	533	63	151	-
Jardina	1,929	1,382	732	1,062	5,105	1,188	216	10	5	-
En-Nawaghia <sup>(1)</sup>	-	-	-	-	-	-	-	-	-	-
El Gwarsha	1,846	902	1,907	547	5,202	3,503	216	26	13	2
El Fweihat	303	152	339	59	853	1,005	62	1	-	-
Benina	304	229	266	87	886	974	84	21	1	1
El Kweifya	560	203	1,104	180	2,047	1,570	83	2	1	2
Sidi Khalifa	533	718	391	468	2,110	727	127	5	24	-
Deriana	418	2,141	623	98	3,280	603	77	14	1	-
Tokra	372	2,822	2,387	198	5,779	1,397	107	21	3	2
Tolmeita	1,325	7,713	4,238	407	13,683	2,057	139	69	6	32
<b>Total</b>	<b>13,886</b>	<b>21,161</b>	<b>14,125</b>	<b>11,511</b>	<b>60,683</b>	<b>16,289</b>	<b>2,151</b>	<b>335</b>	<b>219</b>	<b>39</b>

Source: Calculated from 1960 Agricultural Census op.cit. p.46.

(1) Included with Jardina.

Appendix Table 10.1

Farm Production and Gross Income in the 225 farms surveyed, by Hudiyas, in the Benghazi Plain, 1967

Hudiyas	Grains						Vegetables except pumpkins		Melons		Pumpkins		Fruits		Animal Products						Poultry/heads		Eggs/units		Miscellaneous		Total Value	Annual gross income per household £.	Annual gross income per capita £.		
	Wheat		Barley		Legumes		Quantity qtls.	Total value £.	Quantity qtls.	Total value £.	Quantity qtls.	Total value £.	Quantity qtls.	Total value £.	Sheep and goats		Cows (heads)		Camels (heads)		Wool and hair/kg.		Quantity	Total value £.	Quantity	Total value £.				Quantity	Total value £.
	Quantity qtls.	Total value £.	Quantity qtls.	Total value £.	Quantity qtls.	Total value £.									Quantity qtls.	Total value £.	Quantity qtls.	Total value £.	Quantity qtls.	Total value £.	Quantity	Total value £.									
El Magrun	103.5	319	2,094	624.8	500	310	3,096	1,145	3,113	825	20,400	4,020	6,970	3,998	253	2,475	-	-	4	160	660	256.30	784	243.10	39,792	262.70	-	-	15,119.10	944.94	116.66
Gaminee	273.5	1,371	240.7	672.96	215	21.50	3,016	530	1,378	115	-	-	222.2	271.7	147	1,470	-	-	-	-	1,403	612.30	-	-	500	22.80	-	-	5,187.06	345.8	42.69
Slug	676.2	3,429	949.1	2,877.3	2,200	240	6,723	1,287.6	440	25	1,100	80	842	99	292	2,968	-	-	-	-	21,476	666.81	-	-	-	-	-	-	12,672.71	576	71.12
Jardina	1,999.8	9,994	904	271.3	200	16	960	.117	123	10	160	21.1	300	10	617	4,936	-	-	-	-	3,041	1,191.60	-	-	48,776	243.88	15 kg.	30	19,282.78	1,289.32	156.71
En-Sawagha	231.6	1,108.6	475	855	-	-	1,250	145	-	-	-	-	-	-	214	2,352	-	-	-	-	1,022	302.15	-	-	21,840	436.80	-	-	4,698.32	361.41	44.62
El Owareha	702.7	4,513.6	563	2,289	7,569	417	93,111	9,773	23,805	2,898	2,898	593	23,570	593	302	3,355	-	-	-	-	1,804	562.80	-	-	45,500	910	-	-	25,641.30	1,027.38	128.84
El Fwihat	30	150	166.4	499.2	14,200	1,485	33,914	39,000	25,200	2,835	9,000	2,220	-	-	-	-	-	-	-	-	1,211	394	-	-	219,856	397.12	-	-	48,980.32	4,898.03	604.70
Benina	237.3	1,186.5	237.3	935.7	21,766	6,508.8	8,500	900	488,740	51,977.0	3,649.7	2,165	3,260	380	283	3,380	6	300	1	100	861	47.20	7	4.40	21,476	429.52	litres 4,534	291.2	68,555.35	8,569.42	1,097.95
El Kweifya	300	1,500	422.4	367.2	1,117.8	5,409	41,800	560	8,240	925.2	1,481	1,545	76	773	-	-	-	-	-	-	642	309.56	-	-	35,848	716.96	12	4.20	12,031.92	792	92.84
Sidi Khalifa	177.2	886	53.2	159.6	930	186.4	89,273	8,866.3	-	-	2,295	2,125	7,875	835	28	453	13	219	-	-	220	100.48	-	-	16,380	327.60	7,811	702.2	14,858.58	926.66	114.65
Deriana	314	1,570	148	444	-	-	173,648	7,616	16,555	1,982	32,265	2,196	1,850	530	163	2,679	-	-	-	-	815	257.60	-	-	6,792	135.84	-	-	19,410.44	693.23	85.58
Tokra	339.9	1,199.5	404.3	1,332.9	26,900	3,064	85,950	7,167	15,120	1,701	58,080	3,400	1,140	1,085	85	708	7	510	1	45	394	133.10	5	2.50	38,584	771.68	80 kg.	80	20,697.2	667.67	82.43
Tolmeita	680	3,400	203.3	6,099	-	-	9,570	765	100	430	30	1,250	140	146	146	146	5	325	-	-	550	162.50	-	-	6,926	138.32	296 kg.	212	12,705.92	1,270.59	156.86
<b>Total</b>	<b>6,065.7</b>	<b>30,827.2</b>	<b>6,570.7</b>	<b>19,869.9</b>	<b>56,000.4</b>	<b>17,855.7</b>	<b>396,529.96</b>	<b>77,871.9</b>	<b>561,226</b>	<b>63,144</b>	<b>157,430.70</b>	<b>18,395.10</b>	<b>95,283.2</b>	<b>8,674.3</b>	<b>2,530</b>	<b>26,091</b>	<b>31</b>	<b>1,354</b>	<b>6</b>	<b>305</b>	<b>23,693</b>	<b>4,996.60</b>	<b>796</b>	<b>250</b>	<b>488,248</b>	<b>9,764.96</b>	<b>-</b>	<b>1,345.4</b>	<b>279,884.80</b>	<b>-</b>	<b>-</b>

APPENDIX TABLE 10.2 INCOME FROM NON-AGRICULTURAL SOURCE IN

APPENDIX TABLE 10.3 FARM EXPENSES IN THE 225 FARMS SURVEYED IN THE BENGHAZI PLAIN, 1967

THE 225 FARMS SURVEYED IN THE BENGHAZI PLAIN, 1967.

Mudirya	Social Welfare		Ministry of the Interior		Government employment		Private firms		Others		Mudirya	Grains						Fruit Plants		Wages of Hired Labour		Charges of hired machinery		Fertilisers and manure		Cost of feed & water for animals		Transport charges		Rents	
	No. of farmers	Total Value £/L.	No. of farmers	Total Value £/L.	No. of farmers	Total Value £/L.	No. of farmers	Total Value £/L.	No. of farmers	Total Value £/L.		Wheat	Barley		Others		Quantity in qtls.	Total cost/£L.	No. of Labourers	Total Cost/£L.	No. of Hours	Total Cost/£L.	Quantity in qtls.	Total Cost/£L.	Quantity in qtls.	Total Cost/£L.	No. of farmers	Total Cost/£L.	No. of farmers	Total Cost/£L.	
												Quantity in qtls.	Total cost/£L.	Quantity in qtls.	Total cost/£L.	Quantity in qtls.	Total cost/£L.	Quantity in qtls.	Total cost/£L.					Quantity in qtls.	Total Cost/£L.	Quantity in qtls.	Total Cost/£L.	No. of farmers	Total Cost/£L.	No. of farmers	Total Cost/£L.
El Magrun	2	168	1	87	3	3,633	1	120	3	1,930	El Magrun	33.5	19	34.5	170.50	2.5	24	53.15	101.0	9	1,739	43	172	1,785	1,147	401	1,723.90	14	935	1	6
Geminoe	3	360	-	-	5	1,104.20	2	268	4	1,540	Geminoe	1	4	1	3	1	2	-	-	1	30	57.3	231.25	375	233	573.20	1,313.80	15	476	1	7
Slug	2	300	-	-	5	2,188	2	480	10	5,166	Slug	33	150	26	101.60	2	5.60	50.0	75	3	230	31.5	120	72	109	1,162.50	2,629	18	1,089	1	0.70
Jardina	2	180	1	120	8	7,844	1	90	5	1,412	Jardina	122	500.60	80	318.0	-	-	2.30	8.90	3	316	44.3	44.3	-	-	53,476	1,844.35	17	1,250	-	-
Kn-Nawaghia	2	360	-	-	2	1,332	1	505	5	1,560	Kn-Nawaghia	22	113	33	119.90	-	-	-	-	1	600	80	214	-	-	593.32	2,609.90	11	683	-	-
El Gwareha	5	684	-	-	4	20,883	3	726	8	1,970	El Gwareha	22.2	107.50	31	105.30	4	16.40	90	2.70	9	1,629.8	124	484	706	426.7	958.52	2,904.20	21	1,326	-	-
El Pweihat	-	-	-	-	1	444	1	2,400	1	6,000	El Pweihat	-	-	-	-	10.2	137	-	3	20	9,200	-	-	253	106.1	138	455	1	48	10	60
Benina	-	-	-	-	8	3,342	2	860	1	600	Benina	13.5	63.20	109	327.40	7	42	-	-	153	44,280	580.2	2,335	2,650	1,634.8	555.75	1,681.50	10	1,555	-	-
El Kweifya	2	192	-	-	5	984	2	420	4	1,774	El Kweifya	-	-	-	-	9.4	101.10	220.0	216	10	1,152.8	46.1	139	489	295	508.30	1,260	15	665	1	6
Sidi Khalifa	3	456	-	-	10	2,983.40	-	-	3	920	Sidi Khalifa	-	-	-	-	5	80.75	-	-	7	615	55.2	110	1,140	723.5	177.60	697.30	14	717	-	-
Deriana	14	1,740	-	-	7	2,112	-	-	7	1,084	Deriana	-	-	4	16	5	93.75	-	-	17	1,403.3	71	214	1,368	817.4	367	667.80	27	1,539	-	-
Tokra	1	120	-	-	10	4,034.92	-	-	4	3,230	Tokra	41	186	14	47	6.1	112.40	23.80	68.50	22	2,218	272	1,089	1,298	813.5	170	636.50	28	1,500	5	225
Tolmeita	-	-	-	-	6	2,210.40	1	36	5	1,933	Tolmeita	13	49.40	3.12	10.40	-	-	-	-	2	455	31	182	-	-	53	53.28	10	320	2	80.61
<b>Total</b>	<b>36</b>	<b>4,560</b>	<b>2</b>	<b>207</b>	<b>74</b>	<b>29,498.92</b>	<b>16</b>	<b>5,905</b>	<b>60</b>	<b>23,953</b>	<b>Total</b>	<b>301.2</b>	<b>1,363.70</b>	<b>338.6</b>	<b>1,219.10</b>	<b>51.2</b>	<b>615</b>	<b>439.25</b>	<b>1,414.10</b>	<b>257</b>	<b>64,068.9</b>	<b>1,435.7</b>	<b>5,743</b>	<b>10,136</b>	<b>6,333</b>	<b>6,273.20</b>	<b>184.56</b> (1)	<b>201</b>	<b>12,025</b>	<b>21</b>	<b>384.31</b>

Source: 1967 Questionnaires.

Source: 1967 Field Survey and Questionnaires.

(1) About £L 5,730 is accounted for the cost of water.

Appendix Table 10.4

Family Living Expenses in the 225 Farms Surveyed in the  
Benghazi Plain, 1967

Mudirya	£L.							Total	Agricultural Bank		Shops		Private	
	Food	Tea & cigarettes	Clothing	Hospitality and entertainment	Health	Heating and Lighting	Family or tribal assistance		No. of farmers	Total Value £L.	No. of farmers	Total Value £L.	No. of farmers	Total Value £L.
El Wagrún	187.00	67.00	58.00	52.00	14.80	20.00	22.50	418.30	1	470	7	365	-	-
Gamines	174.75	42.63	61.87	26.00	14.25	31.13	7.06	357.69	-	-	6	213	2	60
Slug	244.96	58.23	83.20	52.00	24.28	22.96	10.00	492.63	3	6,321	10	950	1	100
Jardina	270.35	67.07	89.12	57.06	23.94	42.48	8.70	558.72	1	150	5	280	2	500
En-awaghia	223.72	53.00	92.73	59.36	22.82	43.82	19.67	515.12	2	7,300	3	300	-	-
El Gwaraha	232.36	79.04	91.36	63.18	18.09	56.73	21.40	562.16	12	3,098	1	15	-	-
El Fweihat	289.50	73.55	137.50	82.50	37.50	59.20	31.60	711.35	3	640	1	50	-	-
Benina	251.54	82.46	149.62	77.31	21.00	48.46	14.57	647.96	1	6,000	-	-	1	240
El Kweifya	239.20	68.19	74.00	48.33	31.13	45.55	11.60	518.00	1	270	2	80	-	-
Sidi Khalifa	206.25	61.76	64.38	59.06	18.44	54.46	8.40	472.75	5	849	2	860	-	-
Deriana	206.69	60.98	53.10	42.74	13.87	28.14	12.86	418.38	5	6,900	11	1,160	-	-
Tokra	371.64	99.45	97.50	72.32	29.70	56.29	15.57	742.47	8	5,083	12	1,192	1	200
Tolmeita	127.20	75.84	39.80	22.50	3.50	6.00	13.30	288.14	-	-	2	190	-	-
<b>Total</b>	<b>3,025.16</b>	<b>889.20</b>	<b>1,099.18</b>	<b>714.36</b>	<b>270.38</b>	<b>515.22</b>	<b>197.23</b>	<b>6,703.67</b>						
% of Total	45.0	13.3	16.3	10.7	4.0	7.7	3.0	100	42	37,081	65	5,655	7	1,100



Appendix Table 11.1

Population Statistics, by Mudiyyas, in the Benghazi Plain  
For 1965, 1966 and 1967

Mudiyya	Births		Deaths		Provincial Migration				International Migration				Balance				Total		Grand Total
	M	F	M	F	Arrivals		Departures		Arrivals		Departures		De-crease		In-crease		M	F	
					M	F	M	F	M	F	M	F	M	F	M	F			
El Magrun	32	43	4	(1)	-	-	19	41	9	6	5	-	-	-	9	2	3,224	3,080	6,304
Gamines	49	52	12	2	28	22	41	33	-	2	-	-	-	35	50	2,183	3,200	5,383	
Slug	25	19	-	1	6	11	20	26	-	-	-	-	-	40	32	4,530	3,879	8,409	
Jardina	30	28	1	2	1	1	2	5	-	-	-	-	-	28	22	2,284	2,050	4,335	
En-Nawaghia	8	7	-	-	-	-	-	-	-	-	-	-	-	8	7	556	520	1,076	
El Gwaraha	60	27	-	-	38	8	55	49	-	-	-	-	14	33	-	2,837	2,547	5,384	
El Fweihat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benina	53	45	2	3	29	17	16	21	-	-	-	-	-	64	38	2,720	2,304	5,024	
El Kweifya	43	43	1	1	-	-	13	12	-	-	-	-	-	29	30	1,415	1,290	2,705	
Sidi Khalifa	43	50	5	3	3	6	36	36	-	-	-	-	-	15	17	1,615	1,476	3,091	
Deriana	13	7	1	1	-	2	4	3	-	2	-	-	-	8	7	2,050	1,891	3,941	
Tokra	79	58	-	-	-	1	25	27	2	2	5	6	-	-	51	28	2,394	2,243	4,637
Tolmeita	50	45	-	5	-	-	10	15	-	-	-	-	-	40	25	1,779	1,111	2,890	
	460	424	26	18	125	77	232	248	2	6	5	6	-	14	327	235	27,919	25,826	53,745
										1	9	6	5						
El Magrun	66	56	1	2	3	5	14	138	-	-	41	57	114	170	-	-	3,107	2,959	6,066
Gamines	91	93	7	9	33	140	139	136	-	-	-	-	-	78	88	3,299	2,269	5,568	
Slug	95	77	-	-	58	41	38	34	-	-	-	-	-	115	84	4,647	3,957	8,604	
Jardina	64	65	-	-	57	68	90	98	-	-	-	-	-	31	35	2,327	2,091	4,418	
En-Nawaghia	13	12	-	-	12	14	18	20	-	-	-	-	-	7	6	476	441	917	
El Gwaraha	93	81	-	1	68	48	83	22	-	3	-	-	-	75	6	2,925	2,565	5,490	
El Fweihat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benina	10	2	-	-	28	25	41	11	-	-	-	-	-	6	34	2,981	2,510	5,491	
El Kweifya	-	-	-	-	-	-	-	-	-	-	-	-	77	-	72	1,338	1,548	2,886	
Sidi Khalifa	45	45	4	6	13	24	25	37	-	-	-	-	-	29	26	1,660	1,521	3,181	
Deriana	31	23	3	1	24	42	27	23	-	-	-	-	-	25	41	2,080	1,978	4,058	
Tokra	27	115	-	-	17	20	93	108	-	-	-	-	-	51	27	2,445	2,270	4,715	
Tolmeita	80	68	2	1	20	37	53	59	-	-	-	-	-	65	45	1,844	1,156	3,000	
	615	537	16	20	453	547	732	785	-	44	57	191	170	256	526	29,129	25,263	54,392	
										1	9	6	7						
El Magrun	51	43	-	-	9	4	72	83	-	-	-	20	31	-	-	3,087	2,928	6,015	
Gamines	91	56	4	-	36	31	33	62	-	-	-	-	-	90	25	3,431	2,312	5,743	
Slug	76	59	-	-	30	31	51	75	1	3	-	-	-	54	18	4,701	2,975	8,676	
Jardina	93	92	-	-	18	15	48	41	-	-	-	-	-	63	51	2,390	2,142	4,532	
En-Nawaghia	15	12	-	-	132	85	17	15	-	-	-	-	-	130	82	606	523	1,129	
El Gwaraha	72	100	6	3	198	178	173	189	-	-	-	-	-	91	86	2,404	2,052	4,456	
El Fweihat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benina	-	-	-	-	-	-	-	-	-	-	-	-	-	475	408	3,456	2,912	6,368	
El Kweifya	31	21	4	2	11	14	2	1	-	-	-	-	-	36	32	1,528	1,383	2,911	
Sidi Khalifa	74	41	8	-	60	50	28	28	-	-	-	-	-	98	65	1,763	1,601	3,364	
Deriana	79	83	6	2	12	21	33	35	-	-	-	-	-	52	67	2,131	2,041	4,172	
Tokra	94	108	-	-	39	48	73	90	-	-	-	-	-	60	66	2,542	2,347	4,889	
Tolmeita	61	52	1	1	18	16	28	27	-	-	-	-	-	50	40	1,894	1,196	3,090	
	737	608	88	8	563	493	558	644	1	3	-	-	20	311	199	29,933	25,412	55,345	

(1) N.A.

Source: Benghazi and El Marj Mutasarrifiyas, 1967.

