表2.7　5ヶ年計画投資額

Table 2.7　Investment in the Five-year Plan

(Unit: YR×10^6)

	YR Million	Percent
Total Fixed Capital Formation	15,971	100
Sector Allocation		
(a) Agriculture	2,276	14
(b) Industry	3,996	25
Manufacturing	(1,998)	(12)
Electric Power & Water	(1,373)	(9)
Construction	(451)	(3)
Mining	(174)	(1)
(c) Transport & Communications	4,925	31
(d) Other Services	4,774	30
Housing	(2,090)	(13)
Public Administration	(1,963)	(12)
Trade & Banking	(721)	(5)
Program Responsibility		
(a) Government	5,400	34
(b) Mixed Enterprise	4,949	31
(c) Cooperatives	1,101	7
(d) Private Sector	4,521	28
Investment Financing		
(a) Domestic Financing	9,365	59
Government	(2,649)	(17)
Enterprises	(1,109)	(7)
Private Households	(5,607)	(35)
(b) Foreign Financing	6,606	41

Source: A World Bank Country Report, YAR, 1979

表4.1 ハッジャ州人口

Table 4.1 Population of Hajjah Province

Quada	Nahiya	Population		
		Total	Female	Male
Hajjah		133,910	69,463	10,736
	Hajjah	22,053	11,317	10,736
	Mabyan	20,357	10,446	9,911
	Al Maghrabah	6,232	3,062	3,170
	Al Jamimah	5,441	2,788	2,653
	At Tur	16,065	8,119	7,946
	Beni Al Awam	16,606	8,795	7,811
	Kahlan Afar	11,452	6,017	5,435
	Maswar	16,612	8,890	7,722
	Najrah	6,682	3,510	3,172
	Al Shaghadrah	12,410	6,519	5,891
Midi		74,896	35,763	39,133
	Midi	7,294	3,535	3,759
	Harad	17,394	8,336	9,013
	Abs	25,421	12,603	12,818
	Kaidenah	24,832	11,289	13,543
Al Mahabisha		74,817	38,727	36,090
	Al Mahabisha	8,567	4,465	4,102
	Al Mufleh	7,298	3,803	3,493
	Aflah & Kheiran	26,790	13,911	12,879
	Al Qof	13,682	6,893	6,789
	Kahlan Al Sharaf	7,408	3,934	3,474
	Al Sharhil	11,072	5,721	5,351
Washha		64,033	33,420	30,613
	Aslam	16,918	8,481	8,437
	Washha	19,035	9,955	9,080
	Kasher	16,380	9,056	7,324
	Mustabah	11,700	5,928	5,772
Shahara		48,922	25,210	23,712
	Shahara	15,951	8,349	7,602
	Al Madan	9,394	4,874	4,520
	Al Qufla	8,182	3,989	4,193
	Swair	4,917	2,480	2,437
	Falimat Habour	10,478	5,518	4,960
	Total	396,578	202,583	193,995

表 4.2　雨量計設置位置及び観測期間

Table 4.2　Location and Observation Period of Rain Gauge

Station	Location		Elevation (m)	Period of Observation
	Latitude	Longitude		1972 1973 1974 1975 1976 1977 1978
Sakain	16°50'N	43°27'E	2,230	
Bani Uwair	16°46'N	43°41'E	2,100	
Washhah	16°26'N	43°21'E	500	
Huth	16°14'N	43°58'E	1,850	
Shaharah	16°11'N	43°42'E	1,300	
Al Mahabishah	16°00'N	43°30'E	1,600	
Khamir	16°00'N	43°58'E	2,350	
Shibam	15°31'N	43°54'E	2,650	
Mahweet	15°29'N	43°36'E	2,100	
Hajjah	15°41'N	43°36'E	1,650	
At Tur	15°35'N	43°24'E	200	
Al Mikras	15°39'N	43°16'E	260	
Al Zuhra	15°44'N	43°01'E	70	
Gebel Al Milh	15°41'N	42°49'E	20	
Surdud	15°15'N	43'15'E	250	
Bahana	16°15'N	43°50'E	1,200	
Sana'a	15°21'N	44°12'E	2,300	

表4.3 月別平均雨量
Table 4.3 Monthly Mean Rainfall

Unit: mm

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total
Sakain	0	5.2	53.9	124.7	30.2	16.8	37.4	113.8	8.3	0	0	0	390.3
Bani Uwair	0	0	9.5	73.6	29.0	4.0	22.0	72.0	10.0	0	0	0	220.1
Washhah	48.3	ND	11.6	117.3	64.7	8.5	13.3	2.4	38.4	ND	ND	ND	ND
Huth	3.5	15.2	38.1	71.4	9.2	1.5	0	48.5	32.7	0	0	0	220.1
Shahara	0	0	44.6	62.3	19.5	43.4	107.0	91.7	99.3	0	0	0	467.8
Al Mahabisha	35.1	23.4	37.5	238.7	100.7	38.0	51.1	137.5	51.6	37.2	23.4	19.5	793.7
Khamir	2.4	1.0	36.9	126.2	39.5	14.0	58.6	105.4	2.6	0	0	7.7	394.3
Shibam	16.7	1.3	42.5	81.0	69.3	34.7	104.7	168.3	15.0	23.8	16.8	2.8	576.9
Mahweet	0	16.3	8.7	98.1	65.3	42.2	72.6	234.4	98.2	65.0	16.4	0	717.2
Hajjah	0.1	6.7	36.6	153.8	79.3	19.5	87.4	149.8	62.2	3.1	0.4	7.7	606.6
At Tur	9.1	1.0	18.7	125.2	115.9	106.5	85.5	235.5	127.0	88.9	34.4	0	947.7
Al Mikras	0	0	ND	ND	ND	ND	ND	59.0	44.4	8.2	0	0	ND
Al Zuhra	5.2	4.7	0.5	1.6	9.8	4.7	38.4	34.1	13.2	42.9	8.9	0.1	164.1
Gebel Al Milh	5.3	0	0.1	0	0	0	1.3	36.8	0	12.0	ND	ND	ND
Surdud	0	17.9	8.0	1.1	57.4	21.7	30.4	124.7	97.5	70.5	37.2	3.9	470.3
Baitna	12.8	4.8	47.9	36.1	77.6	28.1	137.5	115.3	38.8	23.4	7.6	0	529.9
Sana'a	1.7	1.0	18.1	47.3	38.9	2.3	27.3	63.3	3.4	24.5	6.7	1.1	235.6

表 4.4 水 質 分 析 結 果

Table 4.4 Result of Water Quality Analysis

Water samples		Hajjah Well	Wadi Masana	Bab el Hal Spring	Wadi Laah	WHO Criteria
PH		7.7	7.9	8.2	8.1	7.0 ∿ 8.5
E.C. Millimhos/cm		0.56	0.48	0.43	0.44	
Ca	meq	2.0	4.8	4.0	5.2	
	ppm	40	96	80	104	75
Mg	meq	4.4	2.8	2.2	0.6	
	ppm	53	34	27	7	50
K	meq	0.01	0.01	0.01	0.01	
	ppm	0.4	0.4	0.4	0.4	
Na	meq	2.8	2.3	2.3	3.5	
	ppm	64	53	53	81	
HCO_3	meq	5.76	5.28	4.48	6.24	
	ppm	351	322	273	381	
CO_3	meq	NIL	NIL	NIL	NIL	
	ppm					
Cl	meq	2.40	1.68	1.92	1.68	
	ppm	85	60	68	60	200
SO_4	meq	0.60	0.55	1.00	1.70	
	ppm	29	26	48	82	200
NO_3	meq	0.22	0.22	0.25	0.21	
	ppm	14	14	16	13	
Sum of Cations	meq	9.21	8.91	8.41	9.31	
	ppm	157.4	183.4	160.4	192.4	
Sum of Ca + Mg	meq	6.4	6.6	6.2	5.8	
	ppm	93	130	107	111	
Sum of Anions	meq	8.98	7.73	7.97	9.83	
	ppm	479	422	405	536	
SAR		1.6	1.3	1.3	2.1	

Table 4.5 Physiography and Soils

	Physiography/Terrain Units	Dominant 50%	Soil Units Associated 20 - 50%	Inclusions 20%	Land Class	Area (km^2)
L	LOWLAND					
L1	Salty flats	Zg - 2/3a	-	Zt - 2/3a	6	320
L2	Low dunes and sand sheets	Re - 1a	Je - 2a	Yh - 2a	4	1,160
L3	Recent wadi alluvium	Je - 1/2a	Jc - 1/2a	-	2	250
L4	Alluvial plain (old wadi alluvium)	Yh - 1a	Jc - 1/2a(g)	Re - 1a(g)	3	370
L5	Alluvial fan (Piedmont), gravelly surface	Yh - 2a(g)	Yk - 2a(g)	Je - 2a(g)	4	320
L6	Northern alluvial fan, medium textured	Je - 2a	Re - 2a	Yh - 2a	1	700
L7	Southern alluvial fan, coarse textured	Jc - 1a	Rc - 1a(g)	-	3	1,000
L8	Fluvial terrace (old wadi terrace)	Yh - 2a	Je - 2a	-	1	370
L9	Isolated hills	I	-	Yh - 2bc(1)	6	200
						(4,690)
M	MIDLAND					
M1	Piedmont, gravelly surface	Yh - 2a(g)	Yk - 2a(g)	-	4	250
M2	Colluvial slopes and talus	Je - 16(s)	Jc - 16(s)	Re - 1/2b	4	70
M3	Lower midland scarpment	I	Yh - 2b(1)	Yk - 2ab(1)	6	Nil
M4	Dissected upland, coarse textured	Je - 1a(g)	I	Xh - 1b(s)	4	890
M5	Dissected upland, medium textured	Xh - 2ab	Je - 1ab(g)	Xh - 2b(g)	3	710
M6	Higher midland scarpment	I	Yk - 2bc(1)	Yk - 2ab(1)	6	30
M7	Dissected plateau on Yemen Volcanics, gravelly surface	Re - 1a(g)	-	I	4	100
M8	Dissected plateau on inclined limestone and green shale, stony surface	Re - 1bc(1)	I	-	6	1,170
M9	Rock floor on Old Yemen Volcanics	I	-	Je - 1b(1)	6	870
						(4,090)
H	HIGHLAND					
H1	Highland scarpment	I	Je - 1c(g)	-	6	30
H2	Dissected mountain on Yemen Volcanics	Yk - 1ab(1)	Yh - 1ab(1)	I	6	200
H3	Highland plateau on limestone and shale	Xh - 2ab	Je - 2a	-	2	360
H4	Dissected mountain on granite and gneiss	Yk - 1ab(g)	I	-	4	170
H5	Small inter-mountain plain	Yh - 2a	Yk - 2ab	Re - 2ab	1	50
						(810)
						9,590

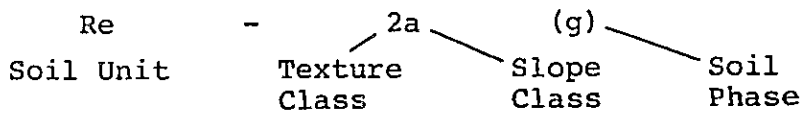
表4.6 土壌記号の説明

Table 4.6 Key to Soil Symbols

Soil Units*

R	Regosols	X	Xerosols
Re	Eutric Regosols	Xh	Haplic Xerosols
Rc	Calcaric Regosols	Z	Solonchak
J	Fluvisols	Zt	Takyric Solonchak
Je	Eutric Fluvisols	Zg	Gleyic Solonchak
Jc	Calcaric Fluvisols	I	Lithosols
Y	Yermosols		
Yh	Haplic Yermosols		
Yk	Calcic Yermosols		

Example of Symbol



Texture Class

1. Coarse textured: Sands, loamy sands and sandy loams with less than 18% clay, and more than 65% sand.
2. Medium textured: Sandy loams, loams, sandy clay loams, silty loams, silt, silty clay loams and clay loams with less than 35% clay and less than 65% sand.
3. Fine textured: Clays, silty clays, sandy clays, clay loams and silty clay loams with more than 35% clay.

Slope Class

a.	Level to gently undulating	(0 - 8%)
b.	Rolling to hilly	(8 - 30%)
c.	Steeply dissected to mountainous	(30% -)

Soil Phase

(g)	Gravelly
(s)	Stony
(l)	Lithic

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* Definitions of the soil units are given in Volume I, Soil Map of the World.

表4.7 土 地 分 類
Table 4.7 Land Classification

Land Class		Terrain Unit	Area (km^2)
Class 1 (Arable)	L6	Nothern alluvial fan, medium textured	700
	L8	Fluvial terrace	370
	H5	Intermountain plain	50
			1,120
Class 2 (Arable)	L3	Recent wadi alluvium	250
	H3	Highland plateau on limestone and shale	360
			610
Class 3 (Arable)	L4	Alluvial plain (old wadi alluvium)	370
	L7	Southern alluvial fan, coarse textured	1,000
	M5	Dissected uplands, medium textured	710
			2,080
Class 4 (Limited Arable)	L2	Low dunes and sand sheets	1,160
	L5	Alluvial fan (piedmont)	320
	M2	Colluvial slopes and talus	70
	M4	Dissected uplands, coarse textured	890
	M7	Dissected plateau on Yemen Volcanics	100
	M1	Piedmont, gravelly surface	250
	H4	Dissected mountain on granite and gneiss	170
			2,960
Class 6 (Non-arable)	L1	Salty flats	320
	L9	Isolated hills	200
	M3	Lower midland scarpment	Nil
	M6	Higher midland scarpment	30
	M8	Dissected plateau on inclined limestone and green shale, stony surface	1,170
	M9	Rock floor on Yemen Volcanics	870
	H1	Highland scarpment	30
	H2	Dissected mountain on Yemen Volcanics	200
			2,820
		Total	9,590

表4.8 労働力及び畜力

Table 4.8 Labour Force and Draught Power

Quada	Population	No. of household	No. of farm household	Active force labour	No. of farm labour	No. of farm labour/ farm	No. of cattle	No. of cattle/ farm
Hajjah	133,900	25,900	18,600	33,900	24,700	1.3	19,400	1.05
Midi	74,900	14,200	10,200	18,900	13,800	1.4	39,700	3.90
Al Mahabisha	91,800	18,200	13,100	23,200	16.900	1.3	14,000	1.06
Washha	47,100	9,200	6,700	11,900	8,700	1.3	7,400	1.10
Shahara	48,900	9,400	6,800	12,400	9,100	1.3	7,500	1.10
Total	396,600	76,900	55,400	100,300	73,200	Ave. 1.3	88,000	1.64

表 4.9　作物別栽培面積・単位収量・単価・生産高・生産額
Table 4.9　Crop Production Value

Crops	Cultivated area (ha)	Unit yield (ton/ha)	Unit price (YRs/ton)	Products (tons)	Value ($\times 10^3$YRs)
Cotton	100	0.6	2,000	60	120
Coffee	1,000	0.4	28,000	400	11,200
Qut	6,800	2,200 bundles	70	$14,960 \times 10^3$	1,047,200
Wheat	500	0.8	2,000	400	800
Barley	400	1.0	1,800	400	720
Grapes	1,000	4.8	12,000	4,800	57,600
Vegetables	400	8.0	5,000	3,200	16,000
Legumes	1,000	0.8	6,000	800	4,800
Tobacco	100	1.2	21,000	120	2,520
Sesame	100	0.5	25,000	50	1,250
Potatoes	200	8.0	4,000	1,600	6,400
Maize	500	1.5	1,500	750	1,125
Sorghum/Millet	70,000	0.8	2,000	56,000	112,000
Fruits, etc.	1,800	8.0	6,000	14,400	86,400
Total	83,900				1,348,135

表 4.10　作物別粗生産額・純生産額等（ハッジャ州）

Table 4.10　Gross Crop Production Value, Production Cost and Net Crop Production Value (Hajjah Province)

Crops	(A) Cultivated area (ha)	(B) Gross production value (×10³YRs)	(C) Unit production cost (YRs/ha)	(D) Total production cost, (A)×(C) (×10³YRs)	(E) Production tax, (B)×10% (YRs)	(F) Gross production cost, (D)+(E) (×10³YRs)	(G) Net production value, (B)-(F) (×10³YRs)
Cotton	100	120	220	22	12	34	86
Coffee	1,000	11,200	4,000	4,000	1,120	5,120	6,080
Qut	6,800	1,047,200	4,000	27,200	104,720	131,920	915,280
Wheat	500	800	200	100	80	180	620
Barley	400	720	200	80	72	152	568
Grapes	1,000	57,600	15,000	15,000	5,760	20,760	36,840
Vegetables	400	16,000	2,500	1,000	1,600	2,600	13,400
Legumes	1,000	4,800	1,500	1,500	480	1,980	2,820
Tabacco	100	2,520	2,500	250	252	502	2,018
Sesame	100	1,250	2,000	200	125	325	925
Potatoes	200	6,400	2,500	500	640	1,140	5,260
Maize	500	1,125	270	135	115	250	875
Sorghum/Millet	70,000	112,000	240	16,800	11,200	28,000	84,000
Fruits, etc.	1,800	86,400	14,000	25,200	8,640	33,840	52,560
Total	83,900	1,348,135		91,987	134,816	226,803	1,121,332

- to be continued -

and Net Livestock Production Value (Hajjah Province)

表 4.11 畜産部門粗生産額・純生産額等（ハッジャ州）

(1) Meat Production

	Livestock population (heads)	No. of slaughtered animals (heads)	Meat production per head (kg)	Meat production ($\times 10^3$ tons)	Unit price (YRs/kg)	Production value ($\times 10^3$ YRs)
Cattle	88,000	—				
adult	—	6,330	200	1,260	15	18,990
calves	—	1,600	50	80	10	800
Sheep	168,000	58,800	10	588	30	17,640
Goats	195,000	68,250	10	683	20	13,650
Chickens	402,000	402,000	0.8	322	37.5	12,060
						63,140

(2) Milk and Eggs Production

	Livestock population (heads)	Off-take (%)	No. of adult (heads)	Production per head (litre, kg)	Production ($\times 10^3$ litre, kg)	Unit price (YRs)	Production value ($\times 10^3$ YRs)
Cattle	88,000	9.0	7,920	200	1,584	2	3,168
Sheep	168,000	35.0	58,800	17	999	2	1,998
Goats	195,000	35.0	68,250	17	1,160	2	2,320
Chickens	402,000	2.5	10,050	10	100	20	2,000
							9,486

(3) Production Cost

	No. of slaughtered animals (heads)	Feed per head (YRs)	Amount ($\times 10^3$ YRs)
Cattle			
adult	6,330	1,050	6,646
calves	1,600	100	160
Sheep	58,800	100	5,880
Goats	68,250	100	6,825
Chickens	402,000	5	2,010
			21,521

(4) Net Production Value

	Production value: Meat (1)	Production value: Milk & eggs (2)	Cost (3)	Net production value (1)+(2)-(3) ($\times 10^3$ YRs)
Cattle				
adult	18,990	3,168	6,646	15,512
calves	800	—	160	640
Sheep	17,640	1,998	5,880	13,758
Goats	13,650	2,320	6,825	9,145
Chickens	12,060	2,000	2,010	12,050
	63,140	9,486	21,521	51,105

Source: Appraisal of Livestock Credit and Processing Project, Yemen Arab Republic (World Bank authorization)

表６１　簡易水道施設設置箇所別給水人口・給水量・水源
Table 6.1 List of Water Supply Schemes

Name of town or village	Planned service Population (persons)	Planned supply amount (m^3 per day)	Water resources
1. Hajjah	15,000	(existing)	
2. Suq Al Aman	1,800	144	Wadi Waru
3. Ash Shafadirah	9,500	760	Wadi Husayb
4. North Mabyan	5,400	432	Wadi Mawr
5. Jabal Al Dafir	4,800	384	Wadi Sharas
6. Mabyan	5,100	408	Wadi Mawr
7. Bani Kais	5,200	416	Wadi Laah
8. Bayt Idhaqah	5,200	416	Wadi Hijlah
9. Kuhlan	5,900	472	Wadi Umyan
10. Affar	3,700	296	Wadi Umyan
11. Sharhil	4,000	320	Wadi Yamaniyah
12. Qufl Shamal	2,300	184	Wadi Yamaniyah
13. Al Shaafeen	3,100	248	Wadi Yamaniyah
14. Al Mahabisha	15,000	(under construction)	
15. Miftah	2,000	160	
16. Kusher	3,400	272	Wadi Mawr
17. Al Muhanaq	4,000	320	Wadi Bawhal
18. Aslam	1,600	128	Wadi Bawhal
19. Habur	2,100	168	Wadi Hashid
20. Shahara	2,000	160	Wadi Hashid
21. Al Madan	6,700	536	Wadi Mawr
22. Washha	12,500	1,000	Wadi Harad
23. Abs	5,300	424	Wadi Bawhal
24. Harad	2,300	184	Wadi Harad
25. Midi	3,800	304	Wadi Harad
	(131,700)		

表６２　耕地形態別雨量別面積

Table 6.2　Land Use and Rainfall

Land use category	Annual Rainfall (mm) 1 - 200 (km^2)	200 - 400 (km^2)	400 - 600 (km^2)	600 - 800 (km^2)	800 - (km^2)	Total area (km^2)
A. Irrigated cropland	15 (1.1%)	70 (5.0%)	75 (5.3%)	- (-)	- (-)	160 (11.4%)
B. Rainfed cropland/ annual cultivation	50 (3.5%)	245 (17.4%)	330 (23.5%)	95 (6.7%)	30 (2.1%)	750 (53.2%)
C. Rainfed cropland/ opportunistic sultivation	35 (2.5%)	75 (5.3%)	10 (0.7%)	- (-)	- (-)	120 (8.5%)
D. Rainfed cropland/ terraced	- (-)	- (-)	150 (10.6%)	110 (7.8%)	20 (1.4%)	280 (19.8%)
E. Cropland/ rangeland	100 (7.1%)	- (-)	- (-)	- (-)	- (-)	100 (7.1%)
Total	200 (14.2%)	390 (27.7%)	565 (40.1%)	205 (14.5%)	50 (3.5%)	1,410 (100.0%)

表６３　土地等級別雨量別面積

Table 6.3　Land Class and Rainfall

Land class	Annual Rainfall (mm) 0 - 200 (km²)	200 - 400 (km²)	400 - 600 (km²)	600 - 800 (km²)	800 - (km²)	Total area (km²)
A. Class 1 (arable)	250(6.6%)	410(10.8%)	390(10.2%)	60(1.6%)	10(0.2%)	1,120(29.4%)
B. Class 2 (arable)	10(0.2%)	180(4.7%)	250(6.6%)	160(4.2%)	10(0.2%)	610(16.0%)
C. Class 3 (arable)	510(13.4%)	900(23.6%)	450(11.8%)	180(4.7%)	40(0.8%)	2,080(54.6%)
Total	770(20.2%)	1,490(39.1%)	1,090(28.6%)	360(10.5%)	60(1.2%)	3,810(100.0%)
D. Unused arable land	570(24.1%)	1,100(46.6%)	525(22.2%)	155(6.6%)	10(0.5%)	2,360(100.0%)
E. Total cropland / Total arable land	26.0%	262%	51.8%	56.9%	83.3%	Ave. 37.0%
F. Unused arable land / Total arable land	74.0%	73.8%	48.2%	43.1%	16.7%	Ave. 63.0%

表６４　選定作物の適応性評価

Table 6.4　Evaluation of Selected Crops

Crops	Water saving	Market-ability	Profit-ability	Technical adaptability
Lowland				
Sorghum	B	C	B	A
Millet	A	C	B	A
Maize	B	B	B	A
Cotton	B	C	B	A
Sesame	C	B	B	B
Potatoes	C	A	A	B
Tomatoes	C	A	A	A
Okra	C	B	A	A
Onion	C	A	A	C
Cucumber	C	A	A	B
Pepper	C	B	A	A
Papaya	C	A	B	A
Banana	C	A	A	A
Groundnuts*	B	B	B	B
Sunflower*	A	B	B	A
Midland				
Sorghum	B	C	B	B
Maize	B	B	B	A
Sesame	C	B	B	A
Potatoes	C	A	A	A
Tomatoes	C	A	A	B
Okra	C	B	A	B
Onion	C	A	A	A
Cucumber	C	A	A	A
Pepper	C	B	A	B
Papaya	C	A	B	B
Banana	C	A	A	B
Soybean	A	B	B	A
Groundnuts*	B	B	B	A
Highland				
Sorghum	B	C	B	B
Wheat	B	B	B	A
Barley	B	B	B	A
Potatoes	B	A	A	B
Grapes	B	A	C	A
Coffee	B	B	C	A
Qut	B	A	A	A
Rape seeds*	B	B	B	A
Soybean*	A	B	B	B
Pear*	C	A	B	B
Peaches*	C	A	B	B
Plum*	C	B	A	B

A:　Good　　B:　Fair　　C:　Poor

*:　New crops

表６５　将来の作物生産（ハッジャ州）

Table 6.5　Future Crop Production (Hajjah Province)

Crops	Cultivation area (ha)	Unit yield (tons/ha)	Gross production value ($\times 10^3$YRs)	Unit production cost (YRs/ha)	Total production cost ($\times 10^3$YRs)	Net production value ($\times 10^3$YRs)
Millet	65,500	0.8	104,700	700	56,300	48,400
Sorghum	37,100	1.0	74,200	700	33,400	40,800
Maize	34,600	2.0	103,800	1,000	45,000	58,800
Wheet & Barley	20,200	1.2	48,500	300	10,900	37,600
Legumes	11,200	1.4	94,100	2,200	34,000	60,100
Vegetables	7,100	10.0	568,000	5,000	92,300	475,700
Qut	6,800	2,200 bundles	1,047,200	4,000	132,000	915,200
Potatoes	5,700	16.0	364,800	5,000	64,900	299,900
Sesames	4,100	1.0	102,500	3,000	22,600	79,900
Coffee	1,500	0.6	25,200	6,000	11,500	13,700
Fruits	1,200	12.0	86,400	21,000	33,800	52,600
Grapes	1,000	6.3	75,600	19,500	27,100	48,500
Total	196,000		2,695,000		563,800	2,131,200

表６６　ハッジャ州要望学校数

Table 6.6 Number of Schools Requested by Province

Quada	Nahiya	No. of Primary Schools	No. of Preparatory Schools	No. of Secondary Schools	No. of Religious Institutes
Hajjah	Hajjah	4		1	1
	Mabyan	3	1		
	Al Maghraban	1			
	Al Jamimah	1			
	At Tur	3	1		
	Bani Al Awam	2			
	Kuhlan Affar	2	1		
	Maswar	3			
	Najrah	1			
	Al Shaghadirah	2	1		
Midi	Midi	1	1		
	Harad	2		1	
	Abs	5	1	1	
	Kaydinah	3			
Al Mahabisha	Al Mahabisha	1	1		1
	Miftah	1			
	Aflah Khayran	3		1	
	Aslam	2			
	Al Quf	1			
	Sharhil	2	2		
	Kuhlan Ash-Sharaf	1			
Washah	Washah	3			
	Kusher	3			
	Mustaba	2			
Shahara	Shaharah	1	1		
	Al Madan	1	1		1
	Al Qaflah	1			
	Suwayr	1			
	Zulaymat Habur	1			
Total		57	11	4	3

表６７　小学校改善計画（学校数・生徒数等）

Table 6.7 Improvement Plan of Primary Schools

	No. of Childrens to be attendant	No. of Schools	No. of Pupils	No. of School attendance (%)
Present Condition	75,500	210	13,500	18
Proposed Plan				
a. improvement		210	21,000	
b. new construction				
- Hajjah		22	1,320	
- Midi		11	660	
- Al Mahabisha		11	660	
- Washah		8	480	
- Shahara		5	300	
Sub-total		57	3,500	
Total	75,500	267	24,500	32

表 6.8 病院施設改善計画

Table 6.8 Improvement Plan of Hospital Facilities

Description	Name of Towns	No. of Existing Beds in 1979	No. of Proposed Beds
Main Hospital	Hajjah	100	200
Branch Hospital	Kuhlam	10	30
	Midi	10	30
	Al Mahabisha	10	30
	Harad	10	30
	Sharhil	10	30
	Abs	20	30
	Al Tur	-	30
	Washah	-	30
	Shaharah	-	30
Total		170	470
		(Population/bed:	850)

表６９　簡易健康相談所等改善計画

Table 6.9 Improvement of Health Center Facilities

Quada	Nahiya	Health Center	Rural Health Units
Hajjah	Hajjah	1	
	Mabyan		1
	Al Maghrabah		1
	Al Jamimah		1
	At Tur	1	
	Bani Al Awam		1
	Kuhlan Affar		1
	Maswar		1
	Najrah		1
	Al Shaghadirah		1
Midi	Midi	1	
	Harad	1	
	Abs	1	
	Kaydinah		1
Al Mahabisha	Al Mahabisha	1	
	Maftah		1
	Aflah Khayran		1
	Aslam		1
	Al Quf		1
	Sharhil		1
	Kuhlan Ash-Sharaf		1
Washah	Washah	1	
	Kusher		1
	Mustaba		1
Shahara	Shaharah	1	
	Al Madan		1
	Al Qaflah		1
	Suwayr		1
	Sulaymat Habur		1
Total		8	21

表 6.10　電力施設計画（対象町村名・戸数・発電機容量）

Table 6.10　Electric Power Supply Scheme

Name of Town or Village	Planned Service Households	Capacity of Generator (kVA)
1. Hajjah	(existing)	
2. Suq Al Aman	170	75
3. Ash Shafadirah	2,200	1,000
4. North Mabyan	1,100	500
5. Jabal Al Dafir	1,700	750
6. Mabyan	1,700	750
7. Bani Kais	460	200
8. Bayt Idhaqah	1,100	500
9. Kuhlan	1,700	750
10. Affar	1,100	500
11. Sharhil	690	300
12. Qufl Shamal	170	75
13. Al Shaafeen	230	100
14. Al Mahabisha	(under construction)	
15. Miftah	690	300
16. Kusher	230	100
17. Al Muhanaq	1,100	500
18. Aslam	170	75
19. Habur	690	300
20. Shaharah	690	300
21. Al Madan	2,200	1,000
22. Washah	2,200	1,000
23. Abs	460	200
24. Harad	170	75
25. Midi	460	200

表9.1 事業費積算内訳表

Table 9.1 Project Cost Estimates

Description	Amount ($\times 10^3$ YRs)	Amount ($\times 10^3$ US$)
1. Project office	11,900	2,640
2. Branch offices	2,400	530
3. Meteoro-Hydrological observation network	400	90
4. Rural water supplies	12,900	2,870
5. Rural road network	149,300	33,180
6. Agricultural research station	6,800	1,510
7. Research and training center for irrigation and mechanization	16,000	3,560
8. Pilot irrigation projects	16,000	3,560
9. Forest nursery	200	40
10. Pilot afforestation scheme	1,000	220
11. Rural infrastructures	34,000	7,560
Total	252,000	56,000

Item	Quantity	Unit	Rate (YR'000)	Amount (YR'000)
1. Project office				
Buildings	5,000	sq.m	2	10,000
Office, Guest house, Residence, etc.				
Civil works	3	ha	100	300
Fixtures	L.S.			500
Contingencies (10%)				1,100
Total				11,900

Item	Quantity	Unit	Rate (YR'000)	Amount (YR'000)
2. Branch office				
2.1 Al Mahabisha branch office				
Buildings	500	sq.m	2	1,000
Civil works	0.25	ha	100	25
Fixtures	L.S.			50
Contingencies (10%)				125
Sub-total				1,200
2.2 Abs branch office				
Buildings	500	sq.m	2	1,000
Civil works	0.25	sq.m	100	25
Fixtures	L.S.			50
Contingencies (10%)				125
Sub-total				1,200
Total				2,400
3. Meteoro-Hydrological observation network				
Meteorological station	5	place	40	200
Hydrological station	2	place	100	200
Total				400

Item	Quantity	Unit	Rate (YR'000)	Amount (YR'000)
4. Rural water supplies				
4.1 Sharhil				
Materials and installation	L.S.			2,700
Pumps, electrical equipments and pipes				
Civil works and buildings	L.S.			1,000
Contingencies (10%)				400
Sub-total				4,100
4.2 Qufl Shamal				
Materials and installation	L.S.			1,500
Pumps, electrical equipments and pipes				
Civil works and buildings	L.S.			1,000
Contingencies (10%)				300
Sub-total				2,800
4.3 Al Shaafen				
Materials and installation	L.S.			2,100
Pumps, electrical equipments and pipes				
Civil works and buildings	L.S.			1,000
Contingencies (10%)				300
Sub-total				3,400

Item	Quantity	Unit	Rate (YR'000)	Amount (YR'000)
4.4 Abs				
Materials and installation	L.S.			1,400
Pumps, electrical equipments and pipes				
Civil works and building	L.S.			1,000
Contingencies				200
Sub-total				2,600
Total				12,900
5. Rural road network				
5.1 Secondary road				
Hajjah — Al Mahabisha	47	km	800	37,600
Al Mahabisha — Abs	33	km	400	13,200
Contingencies (10%)				5,000
Sub-total				55,800
5.2 Bridge on Wadi Mawr	L.S.			6,000
5.3 Feeder roads				
Abs — Qufl — Al Mahabisha	47	km	300	14,100
Qufl — Sharhil	25	km	300	7,500
Other feeder roads				
a. Mountain region	144	km	300	43,200
b. Tihama region	75	km	200	15,000
Contingencies (10%)				7,700
Sub-total				87,500
Total				149,300

Item	Quantity	Unit	Rate (YR'000)	Amount (YR'000)
6. Agricultural research station				
Buildings Office, storage, etc.	2,300	sq.m	2	4,600
Land reclamation	10	ha	50	500
Farm operation equipment Hand tractors and attachments	L.S.			600
Laboratory equipments	L.S.			400
Workshop equipment	L.S.			100
Contingencies (10%)				600
Total				6,800
7. Research and training center for irrigation and mechanization				
Buildings Offices, residences, etc.	4,700	sq.m	1.5	7,000
Land reclamation	20	ha	50	1,000
Construction equipments Bulldozers, power shovels, etc.	L.S.			5,000
Farm operation equipment	L.S.			2,000
Workshop equipment	L.S.			400
Laboratory equipment	L.S.			100
Contingencies (10%)				1,600
Total				17,100

Item	Quantity	Unit	Rate (YR'000)	Amount (YR'000)
8. Pilot irrigation projects				
8.1 Wadi-delta plain — Abs area				
Diversion weirs	2	units	3,000	6,000
Main canals	15	km	150	2,250
Tubewells ϕ300mm × 100m	100×4	m	3	1,200
Farm roads, supply canals and land reclamation	L.S.			1,000
Contingencies				1,050
Sub-total				11,500
8.2 Swampy lands — Jaya, Tahannen and Sharhil area				
Tubewells ϕ300mm × 30m	30×9	m	3	810
Main pipe-lines	6	km	160	960
Farm roads, supply pipes and land reclamation	L.S.			500
Contingencies				230
Sub-total				2,500
8.3 Wadi lands	L.S.			2,000
Total				16,000

Item	Quantity	Unit	Rate (YR'000)	Amount (YR'000)
9. Forest nursery	L.S.			200
10. Pilot afforestation scheme	L.S.			1,000
11. Rural infrastructures				
11.1 Health facilities				
Main hospital	1	place	8,000	8,000
Branch hospitals	3	place	6,000	18,000
Rural health units	2	place	2,000	4,000
Sub-total				30,000
11.2 Electric power supplies	L.S.			4,000
(Costs of generaters were included in estimate of water supplies.)				
Total				34,000

表 9.2　事業費年度別一覧表
Table 9.2　Annual Fund Requirement

(Unit: $\times 10^3$ YRs)

Description	Year in order										Total	
	1	2	3	4	5	6	7	8	9	10	($\times 10^3$ YRs)	($\times 10^3$ US$)
(1) Project office	11,900										11,900	2,640
(2) Branch offices				2,400							2,400	530
(3) Meteoro-Hydrological observation network		400									400	90
(4) Rural water supplies		5,000	7,000	900							12,900	2,870
(5) Rural road network		33,500	45,000	28,800	21,000	21,000					149,300	33,180
(6) Agricultural research station			4,000	2,800							6,800	1,510
(7) Research and training center for irrigation and mechanization			5,000	12,100							17,100	3,800
(8) Pilot irrigation project						4,000	5,500	6,500			16,000	3,560
(9) Forest nursery						150	50				200	40
(10) Pilot afforestation scheme						300	300	200	100	100	1,000	220
(11) Rural infrastructures			2,000	2,000	8,000	9,000	9,000	4,000			34,000	7,560
Total ($\times 10^3$ YRs)	11,900	38,900	63,000	49,000	29,000	34,450	14,850	10,700	100	100	252,000	
($\times 10^3$ US$)	2,640	8,640	14,000	10,890	6,450	7,660	3,300	2,380	20	20		56,000

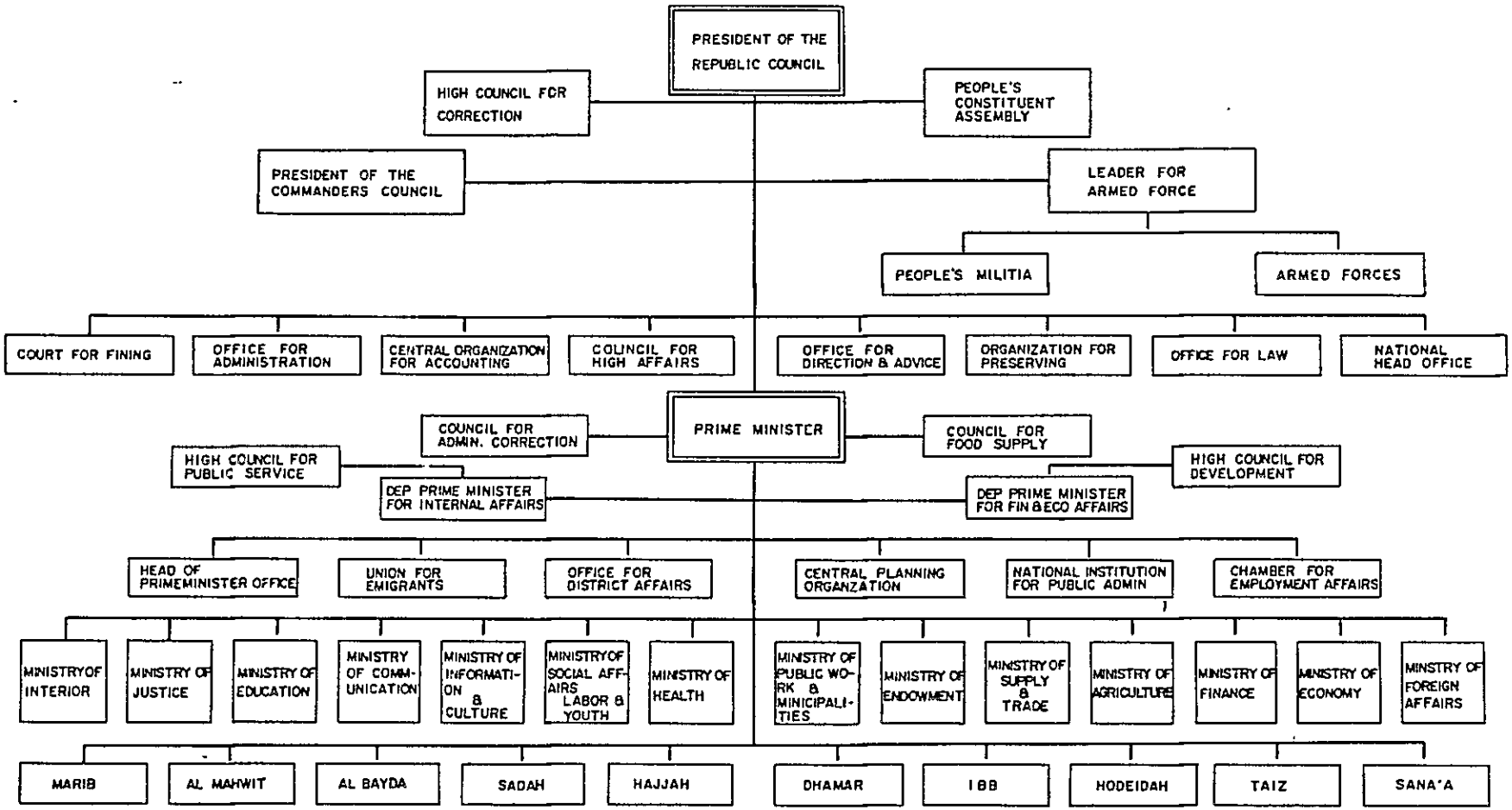


図 2.1　イエーメン国政府組織図

Fig 2 1　Organization of Government of the Yemen Arab Republic

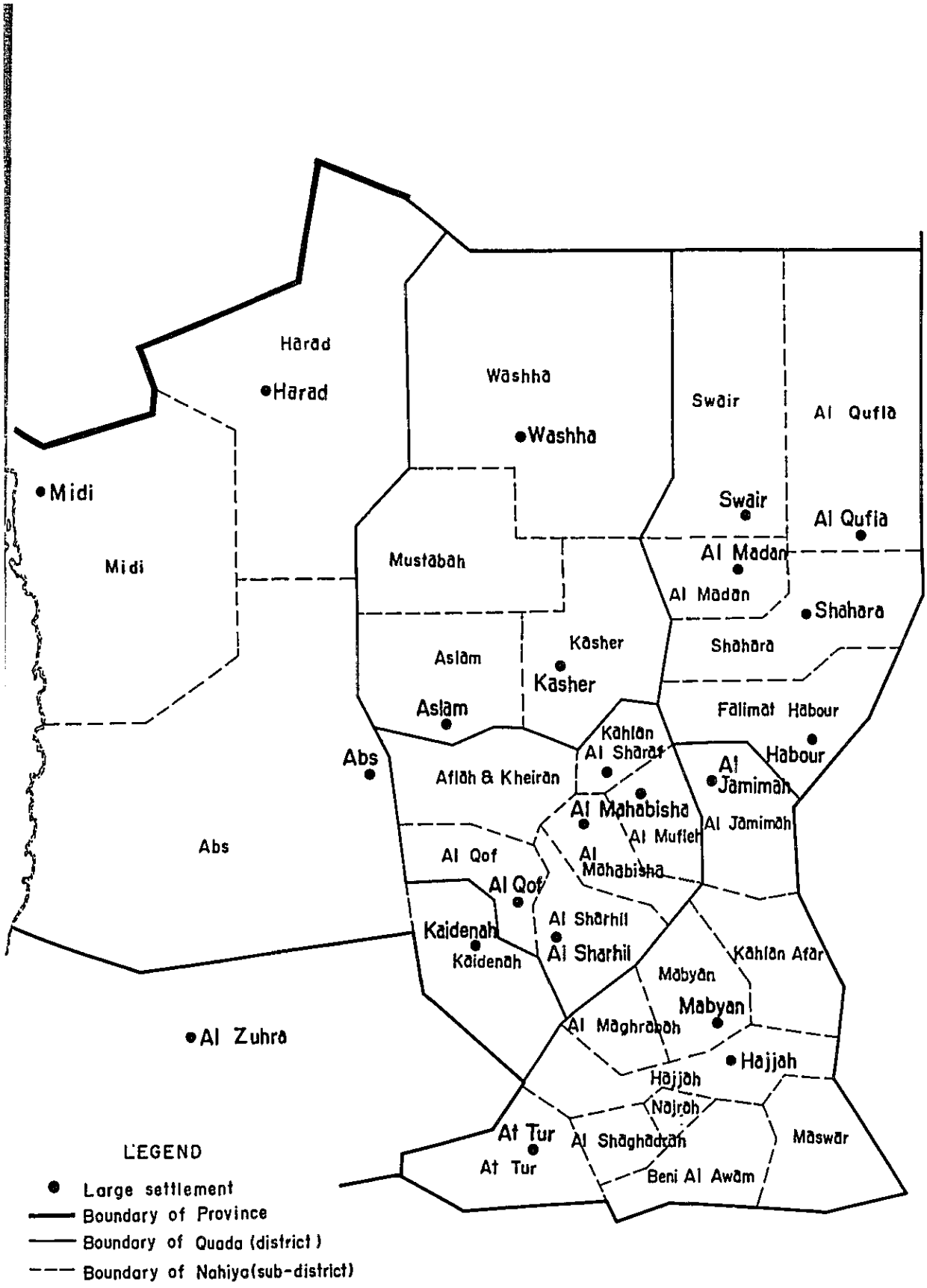


図 4.1　ハッジャ州行政区域図

Fig.4.1 Administrative Division of Hajjah Province

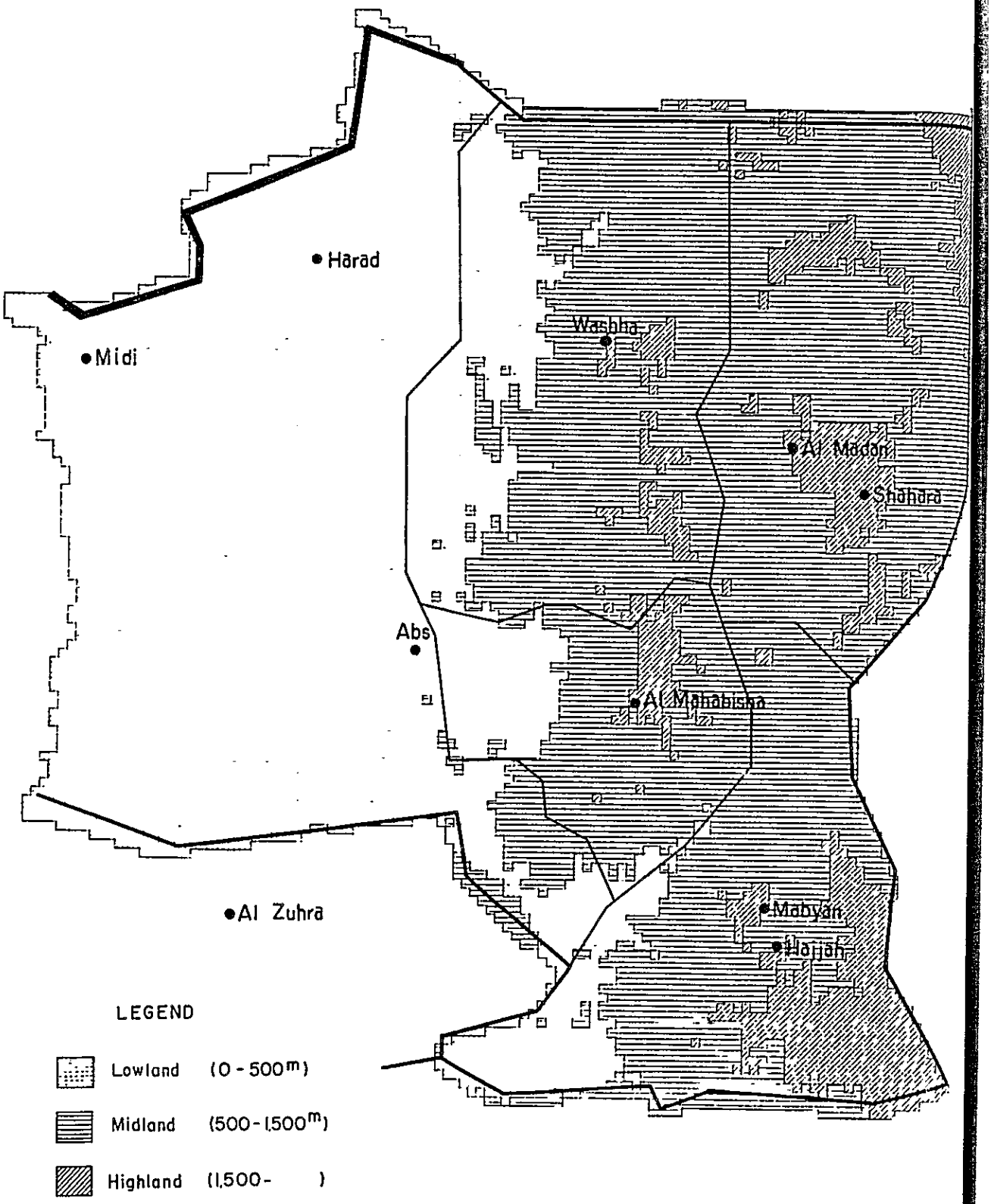
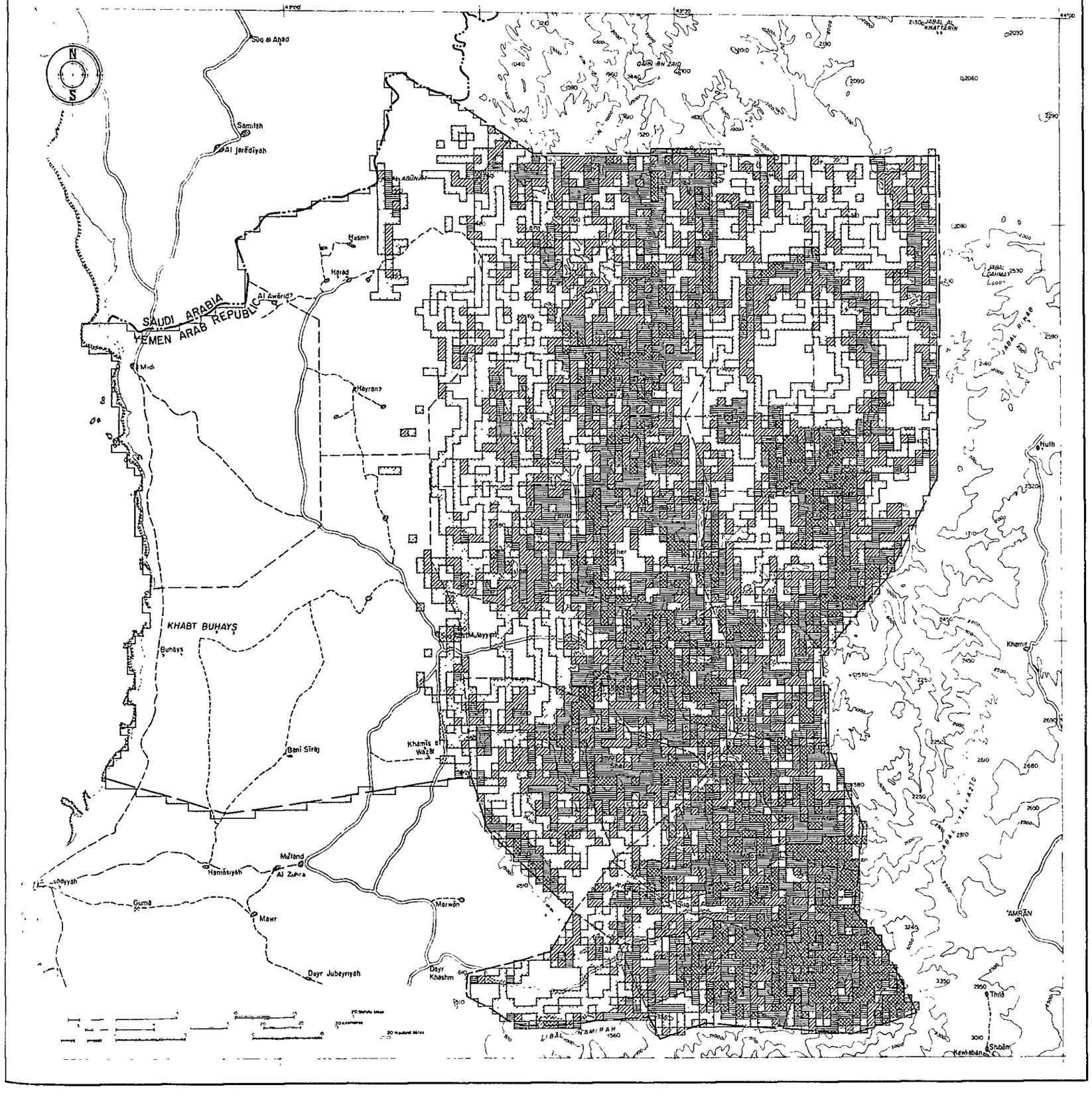


図 4.2　ハッジャ州標高別地域分布図

Fig. 4.2　Physiographical Regions



LEGEND

- 0 - 2 PERCENT SLOPE GRADIENT
- 2 - 6 PERCENT SLOPE GRADIENT
- 6 - 13 PERCENT SLOPE GRADIENT
- 13 - 25 PERCENT SLOPE GRADIENT
- 25 - 55 PERCENT SLOPE GRADIENT
- OVER 55 PERCENT SLOPE GRADIENT

Fig.4.3 Slope Analysis

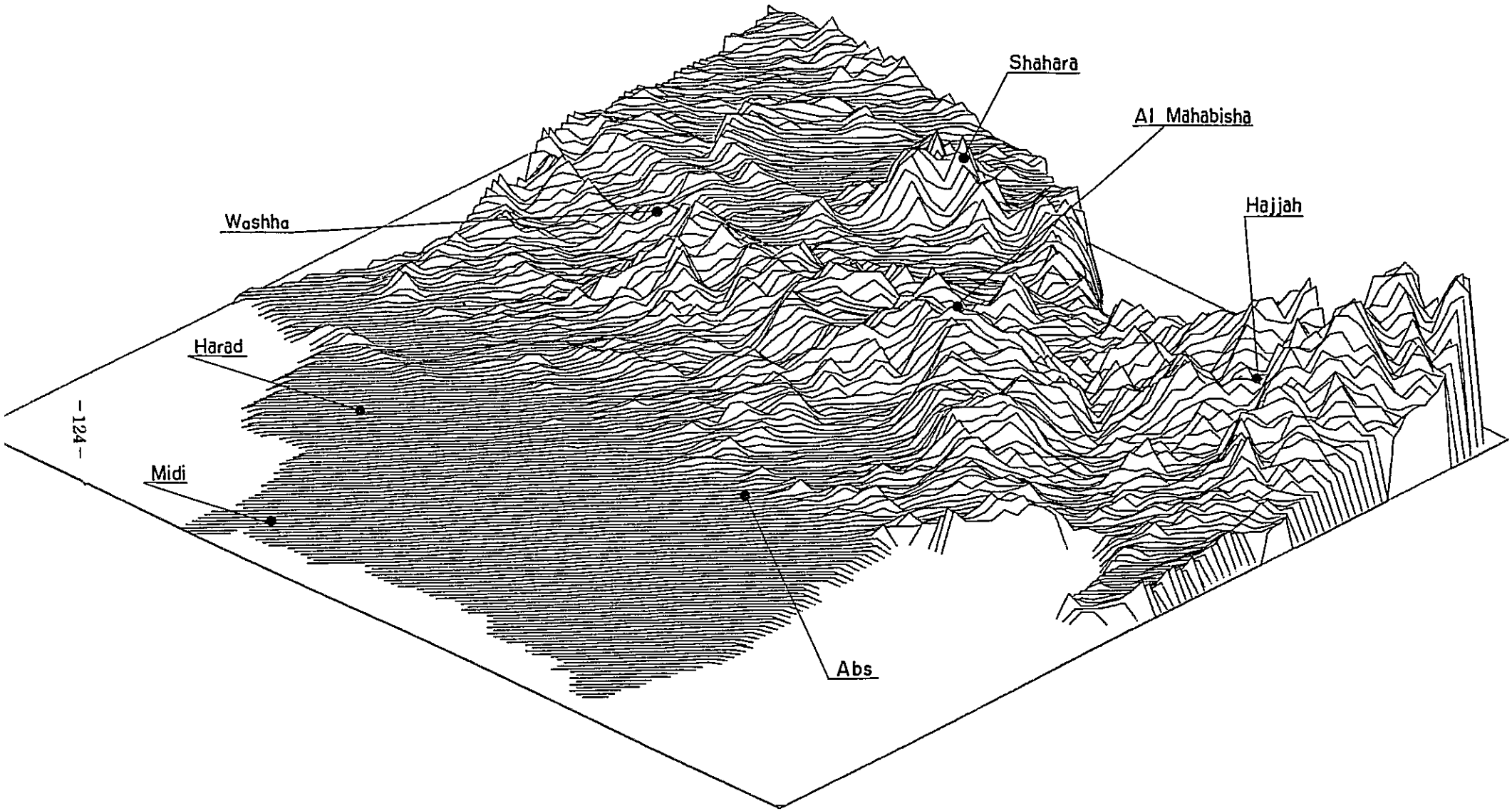
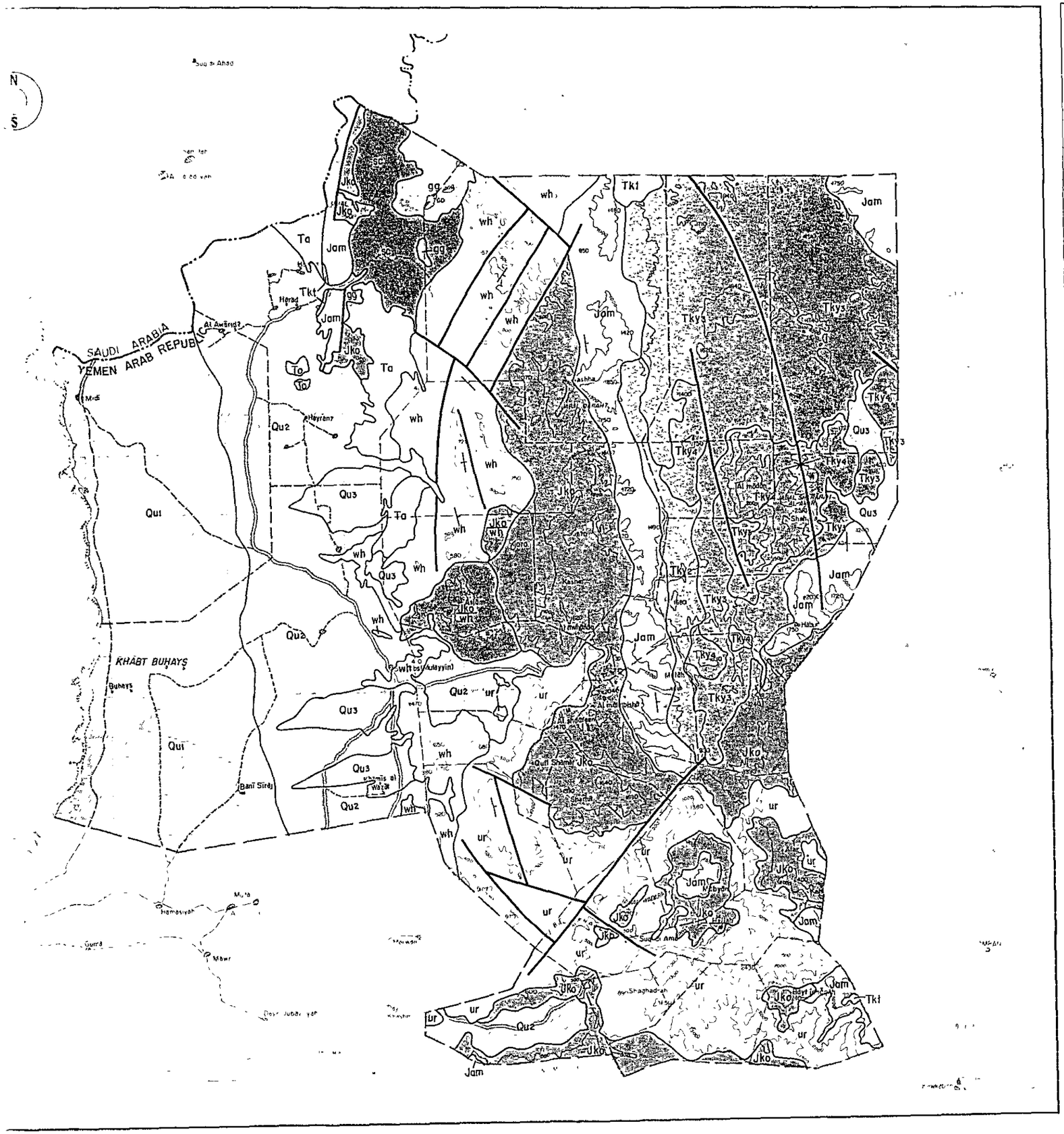


図 4.4　ハッジャ州鳥かん図

Fig. 4.4　Bird's-eye View of Hajjah Province



LEGEND

QUATERNARY

Qu

- Qu1 Coastal sand
- Qu2 Alluvial fans
- Qu3 River-terrace deposits

TERTIARY ~ CRETACEOUS

Miocene

- Ta Hypabyssal andesite and diabase intrusives

Lower Miocene — YEMEN VOLCANICS

Tky

- Tky4 Leucocratic felsic tuff with some dark basaltic flows
- Tky3 Predominantly felsic and tuffaceous older than Tky4
- Tky2 Predominantly felsic and tuffaceous older than Tky3

Eocene

- Tkt TAWILAH GROUP AND MEDJ-ZIR SERIES
  Continental type coarse crossbedded sandstone with lenses of conglomerate and gravel

JURASSIC

Upper

- Jam AMRAN SERIES
  Limestone, marl and shale

Lower

- Jko KOHLAN SERIES
  Green shale with sandstone and conglomeratic bands in lower part; sandstone and some conglomerates in upper part

PRE-CAMBRIAN

- ur Predominantly granite, gneiss
- wh Chlorite-sericite schist, amphibole schist, graphite schist, marble quartzite, slate, conglomerate and greenstone
- gg Gneissic granite, gneissic granodiorite and injection gneiss
- sc Low-grade metamorphosed sedimentary rocks
- Jko/wh Area includes two undifferentiated units

Fault — Dip and strike of bed

Syncline

Fig.4.5 Geology

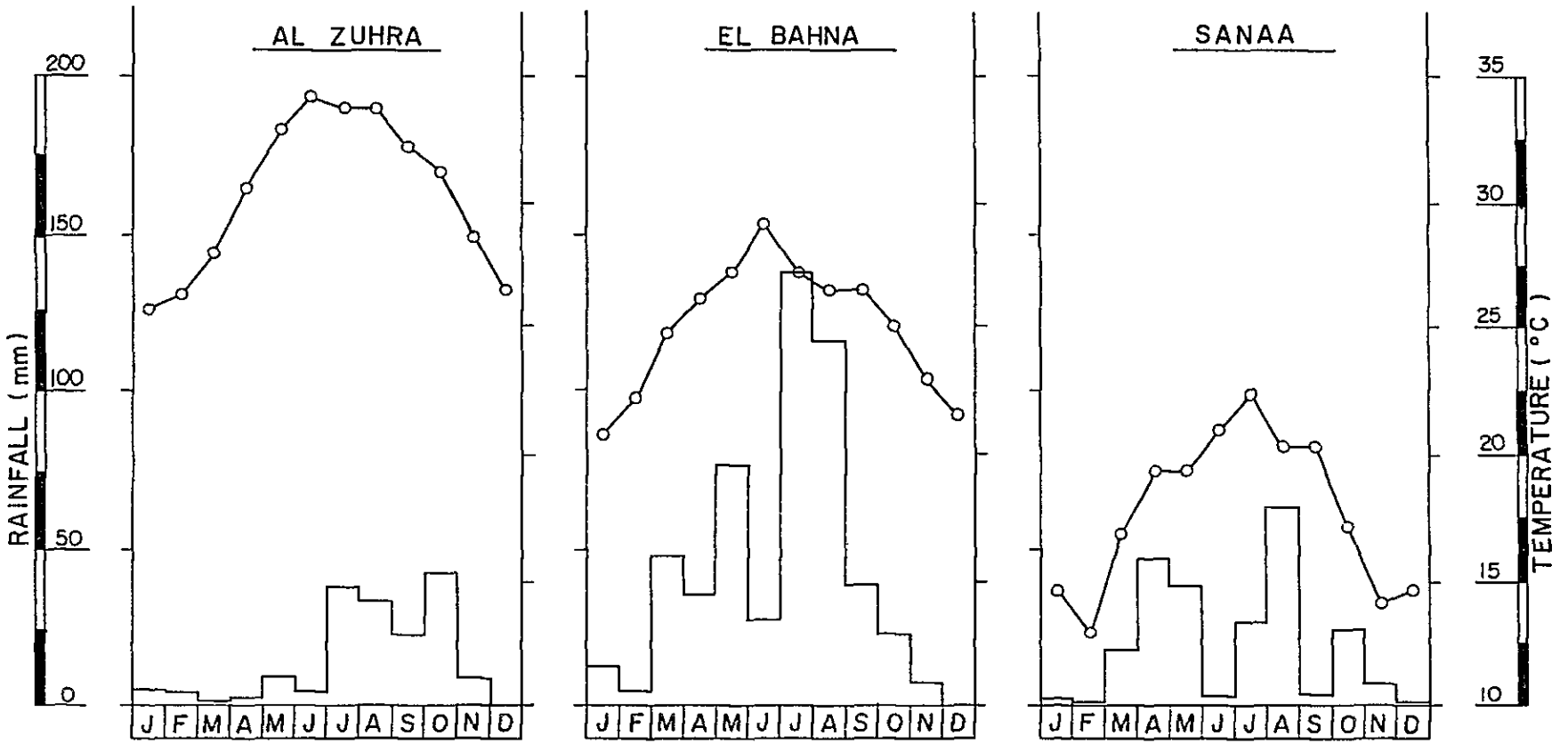


図 4.6　月別平均降雨量・気温のパターン図

Fig. 4.6　Monthly Rainfall and Temperature

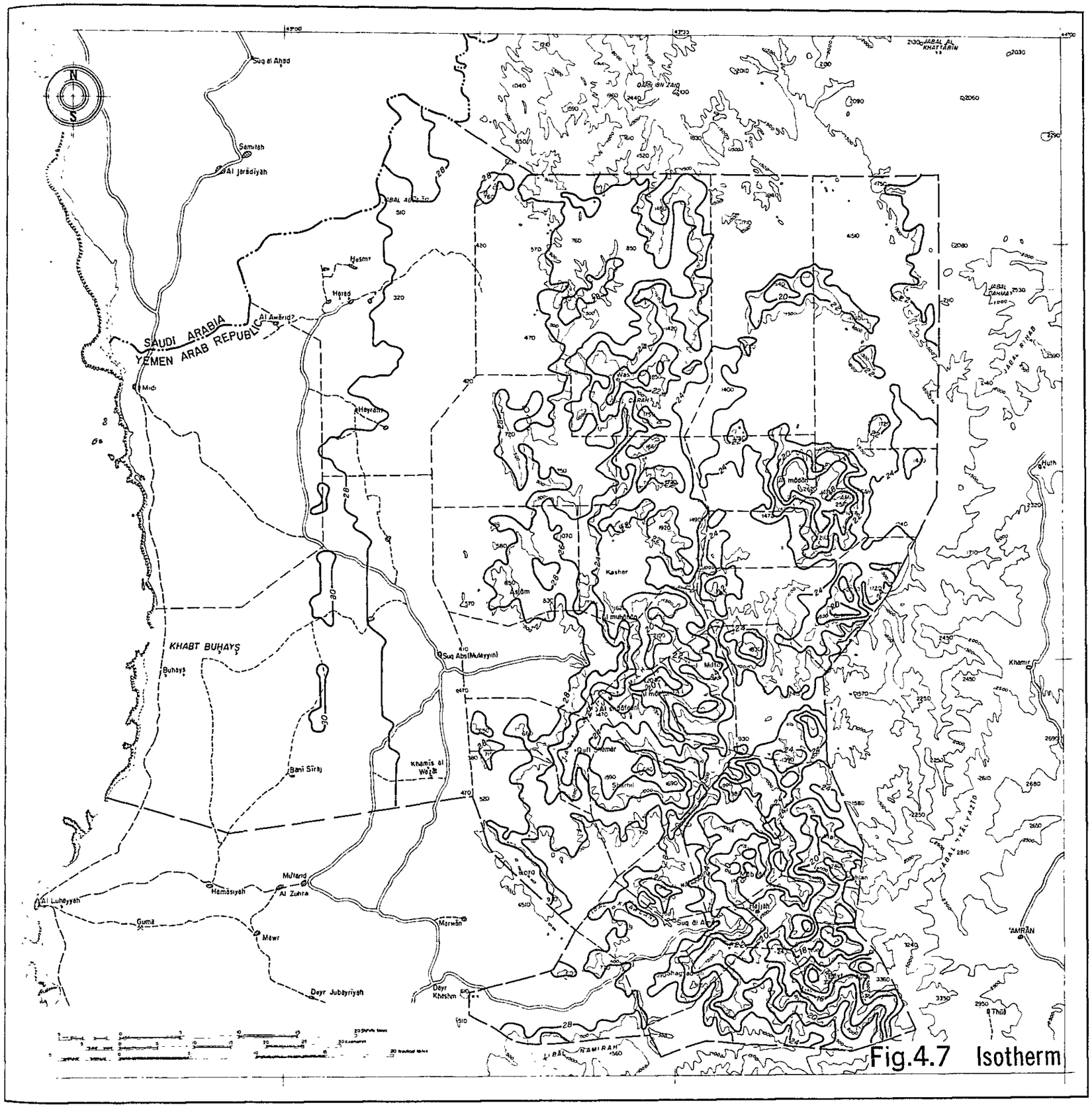
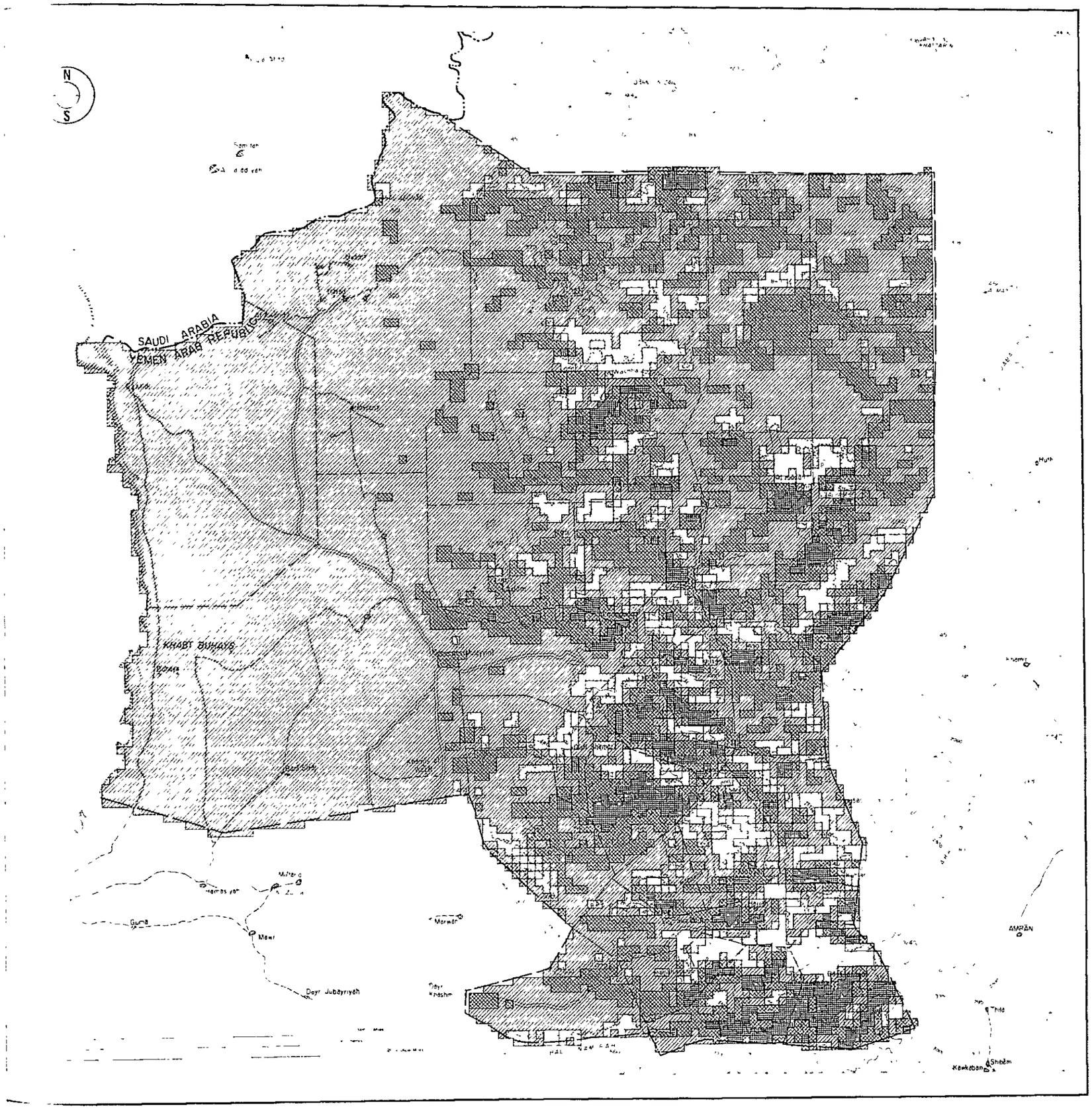


Fig.4.7 Isotherm



LEGEND

☐	LESS THAN	50		PERCENT
⊡	50	-	55	PERCENT
▨	55	-	60	PERCENT
▩	60	-	65	PERCENT
▦	OVER	65		PERCENT

Fig.4.8 Sunshine Intensity

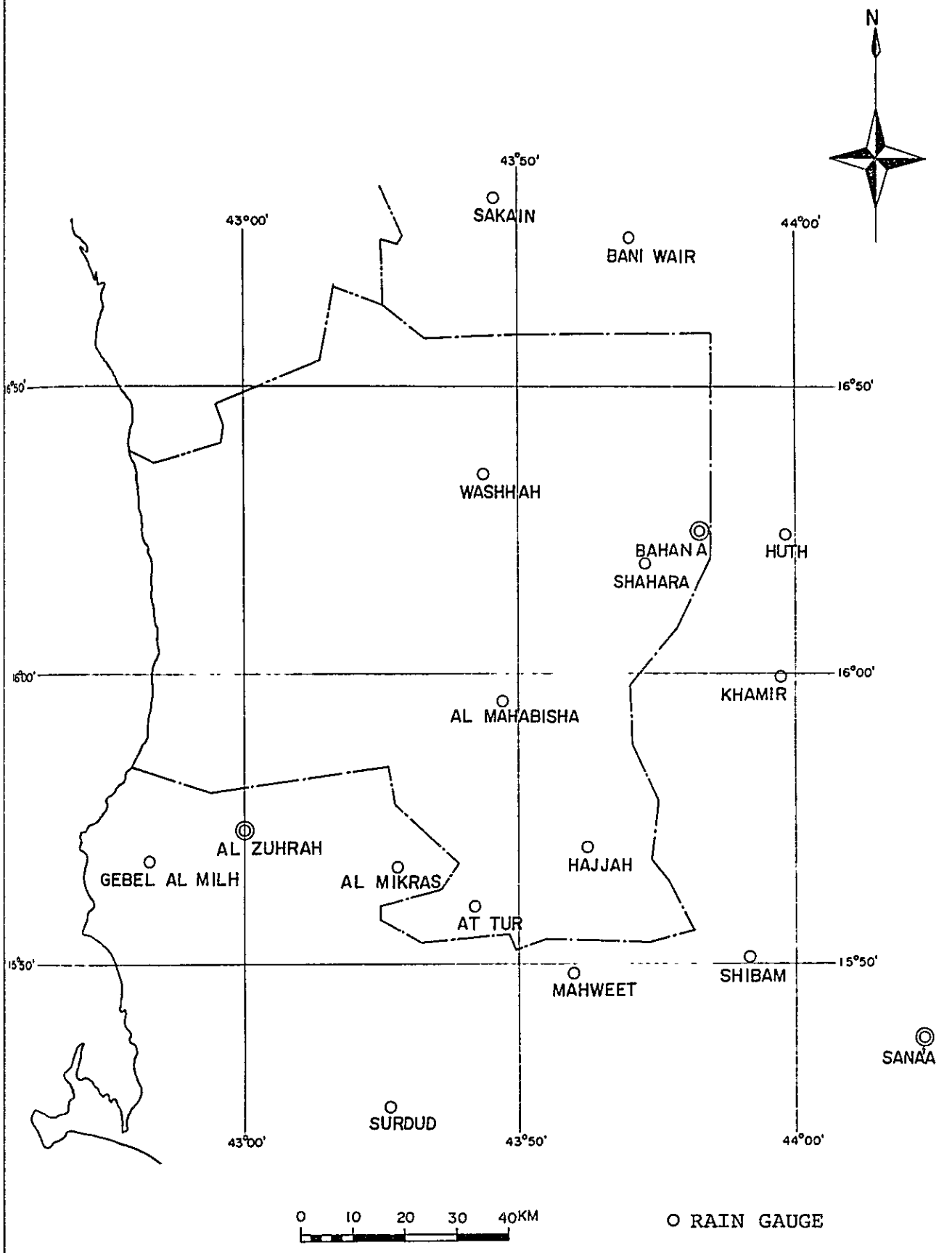


図 4.9　雨量計等観測地点位置図

Fig. 4.9　Location of Gauge Station

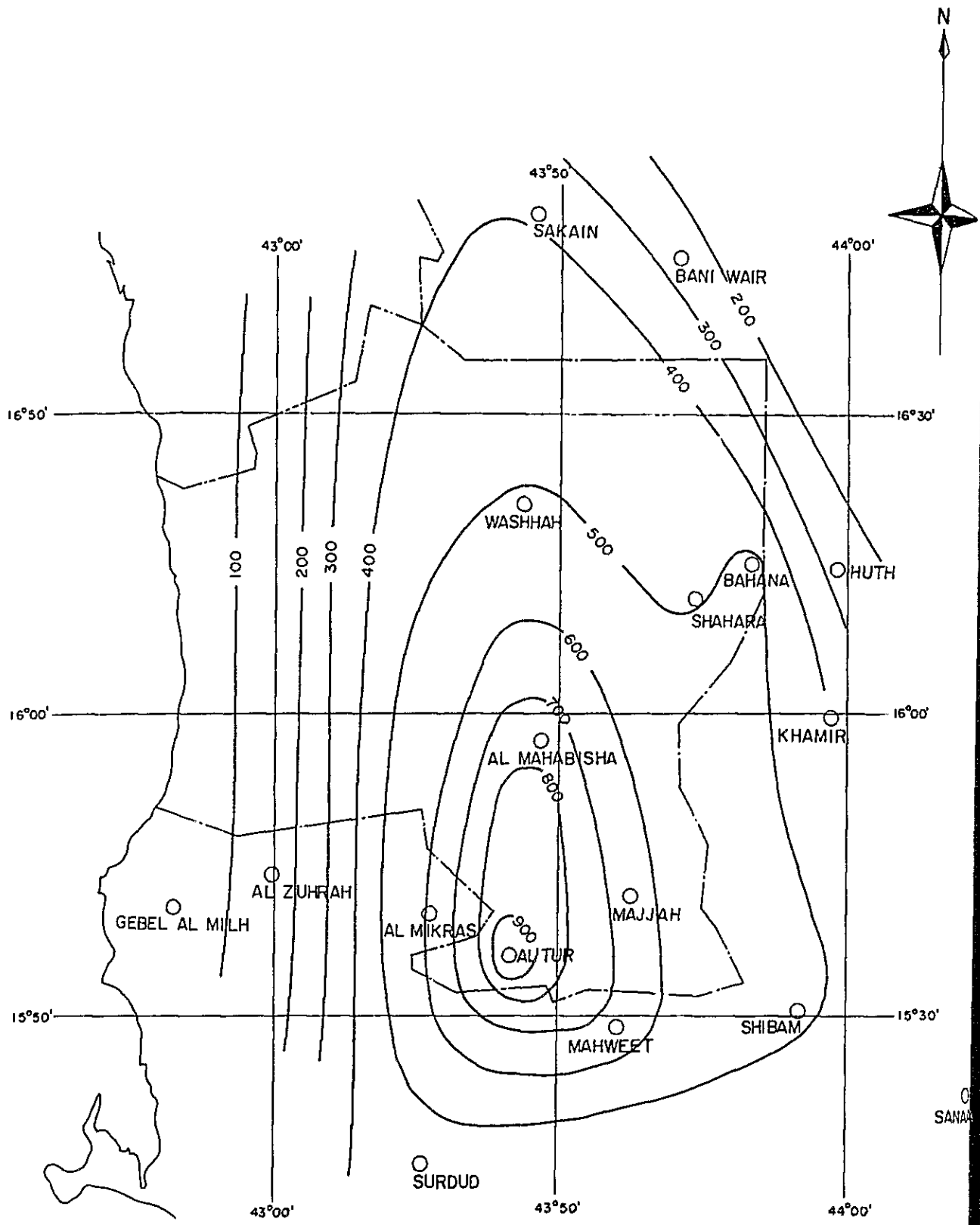


図 4.10 等 雨 量 線 図

Fig. 4.10 Isohyetal Map

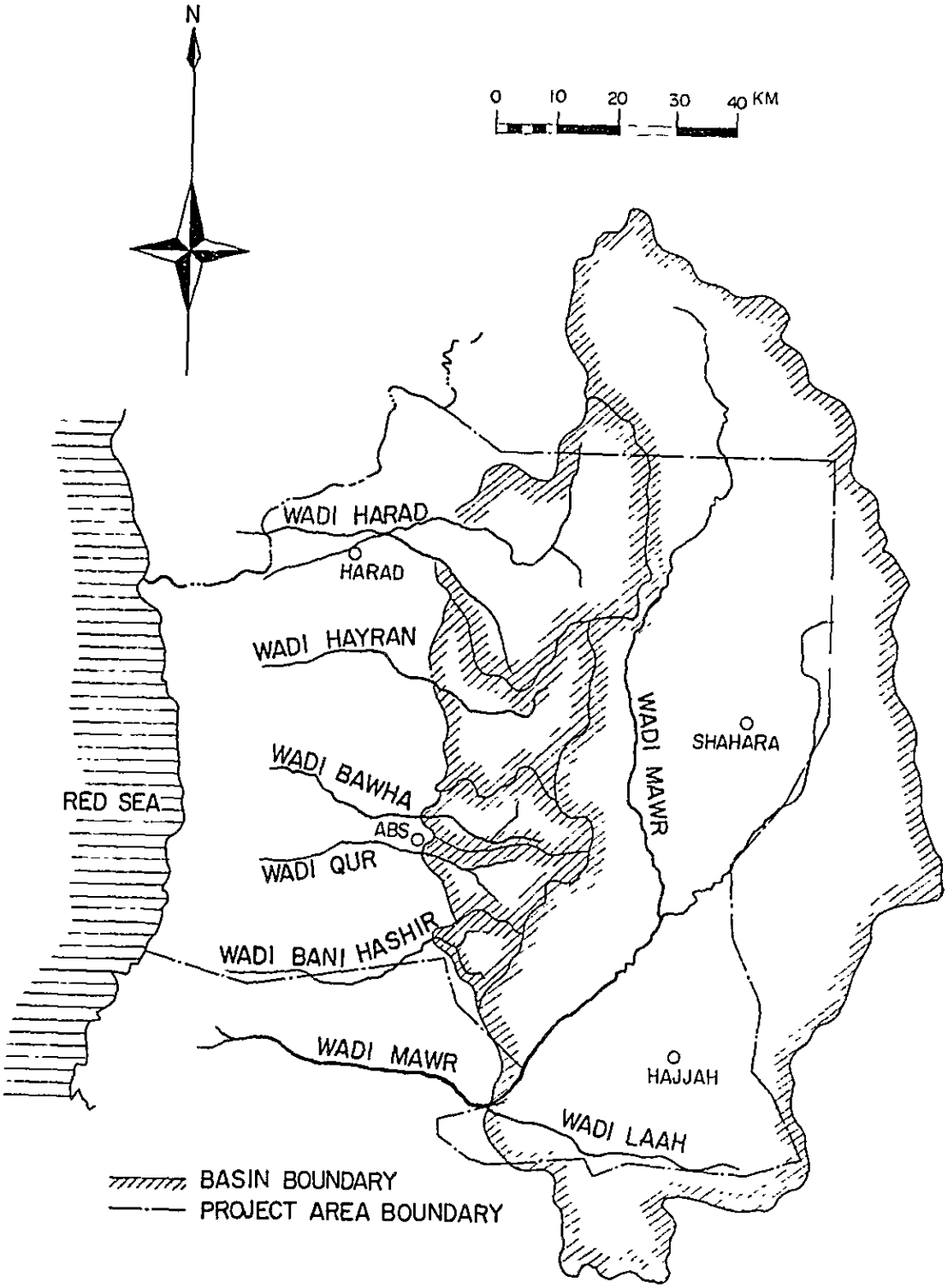


図 4.11　ワディ流路及び流域区分図

Fig. 4.11　River System and River Basin

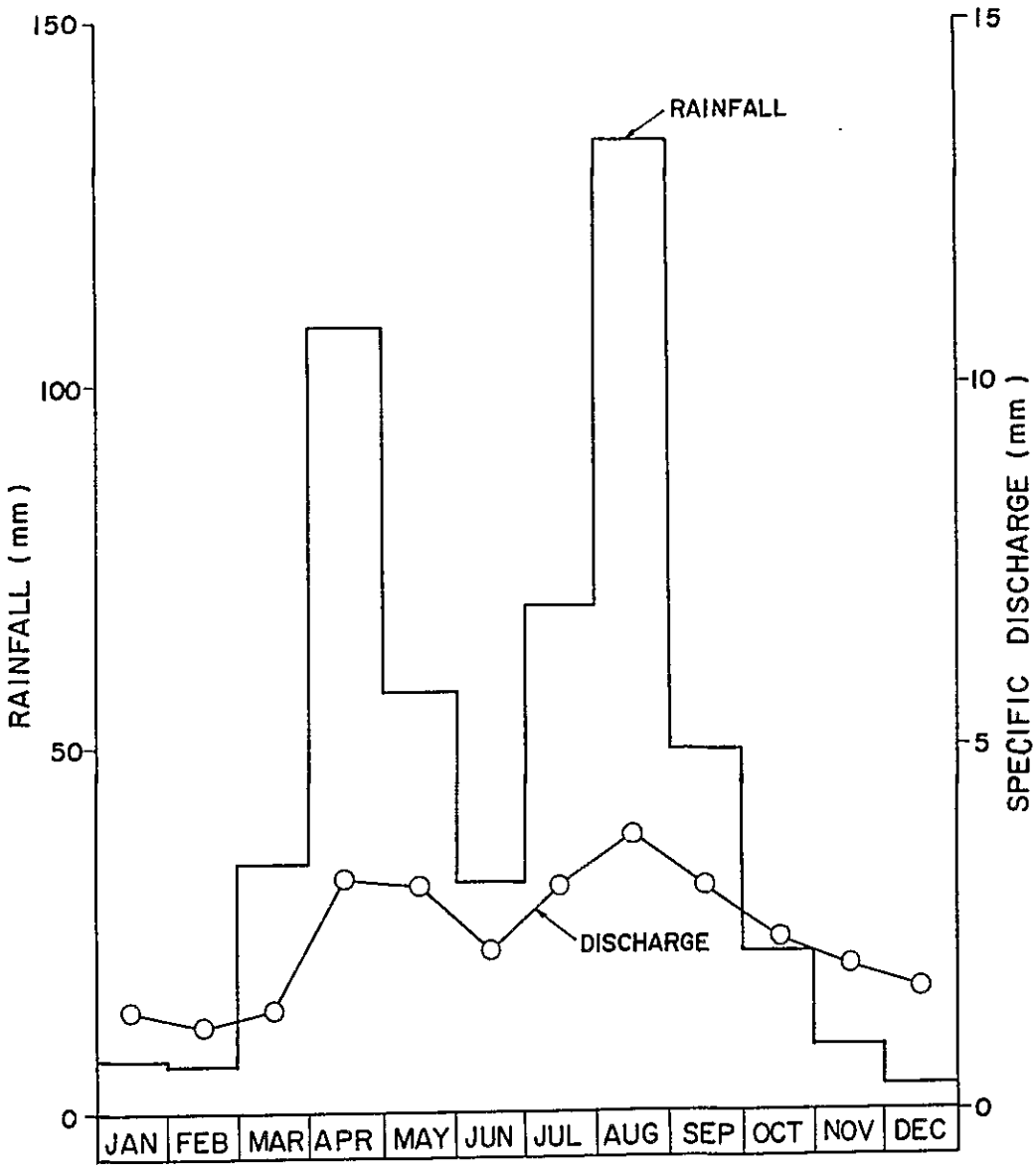


図 4.12　月別平均降雨量及び比流量図

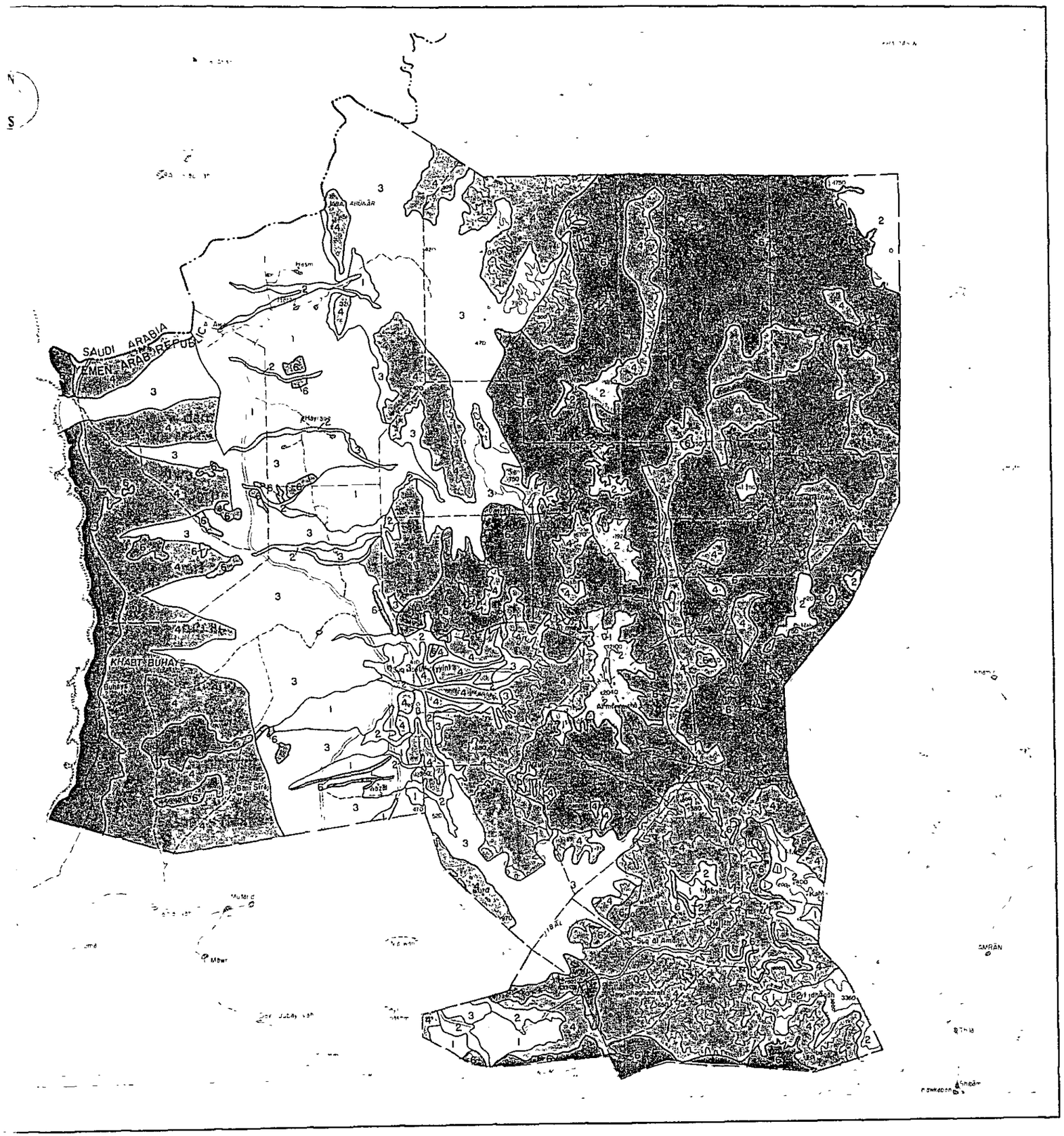
Fig. 4.12　Average Rainfall and Specific Discharge

LEGEND

Soil Units

Physiography/Terrain Units	Dominant >50%	Associated Inclusions 20~50%	Inclusions <20%	Class	Area ('000 ha)
L LOWLAND					469
L1 Salty flats	Zg-2/3a	–	Z1-2/3a	6	32
L2 Low dunes and sand sheets	Re-1a	Je-2a	Yh-2a	4	116
L3 Recent wadi alluvium	Je-1/2a	Jc-1/2a	–	2	25
L4 Alluvial plain(old wadi alluvium)	Yh-1a	Jc-1/2a(g)	Re-1a(g)	3	37
L5 Alluvial fan(piedmont),gravelly surface	Yh-2a(g)	Yk-2a(g)	Je-2a(g)	4	32
L6 Northern alluvial fan, medium textured	Je-2a	Re-2a	Yh-2a	1	70
L7 Southern alluvial fan, coarse textured	Jc-1a	Rc-1a(g)	–	3	100
L8 Fluvial terrace (old wadi terrace)	Yh-2a	Je-2a	–	1	37
L9 Isolated hills	I	–	Yh-2bc(l)	6	20
M MIDLAND					409
M1 Piedmont, gravelly surface	Yh-2a(g)	Yk-2a(g)	–	4	25
M2 Colluvial slopes and talus	Je-1b(s)	Jc-1b(s)	Re-1/2b	4	7
M3 Lower midland escarpment	I	Yh-2bc(l)	Yk-2ab(l)	6	0
M4 Dissected upland, coarse textured	Je-1a(g)	I	Xh-1b(s)	4	89
M5 Dissected upland, medium textured	Xh-2ab	Je-1ab(g)	Xh-2b(g)	3	71
M6 Higher midland escarpment	I	Yk-2bc(l)	Yk-2ab(l)	6	3
M7 Dissected plateau on Old Yemen Volcanics, gravelly surface	Re-1a(g)	–	I	4	10
M8 Dissected plateau on inclined limestone and green shale, stony surface	Re-1bc(l)	I	–	6	117
M9 Rock floor on Old Yemen Volcanics	I	–	Je-1b(l)	6	87
H HIGHLAND					81
H1 Highland escarpment	I	Je-1c(g)	–	6	3
H2 Dissected mountain on Yemen Volcanics	Yk-1bc(l)	Yh-1bc(l)	I	6	20
H3 Highland plateau on limestone and green shale	Xh-2ab	Je-2a	–	2	36
H4 Dissected mountain on granite and gneiss	Yk-1ab(g)	I	–	4	17
H5 Small inter-mountain plain	Yh-2a	Yk-2ab	Re-2ab	1	5
					959

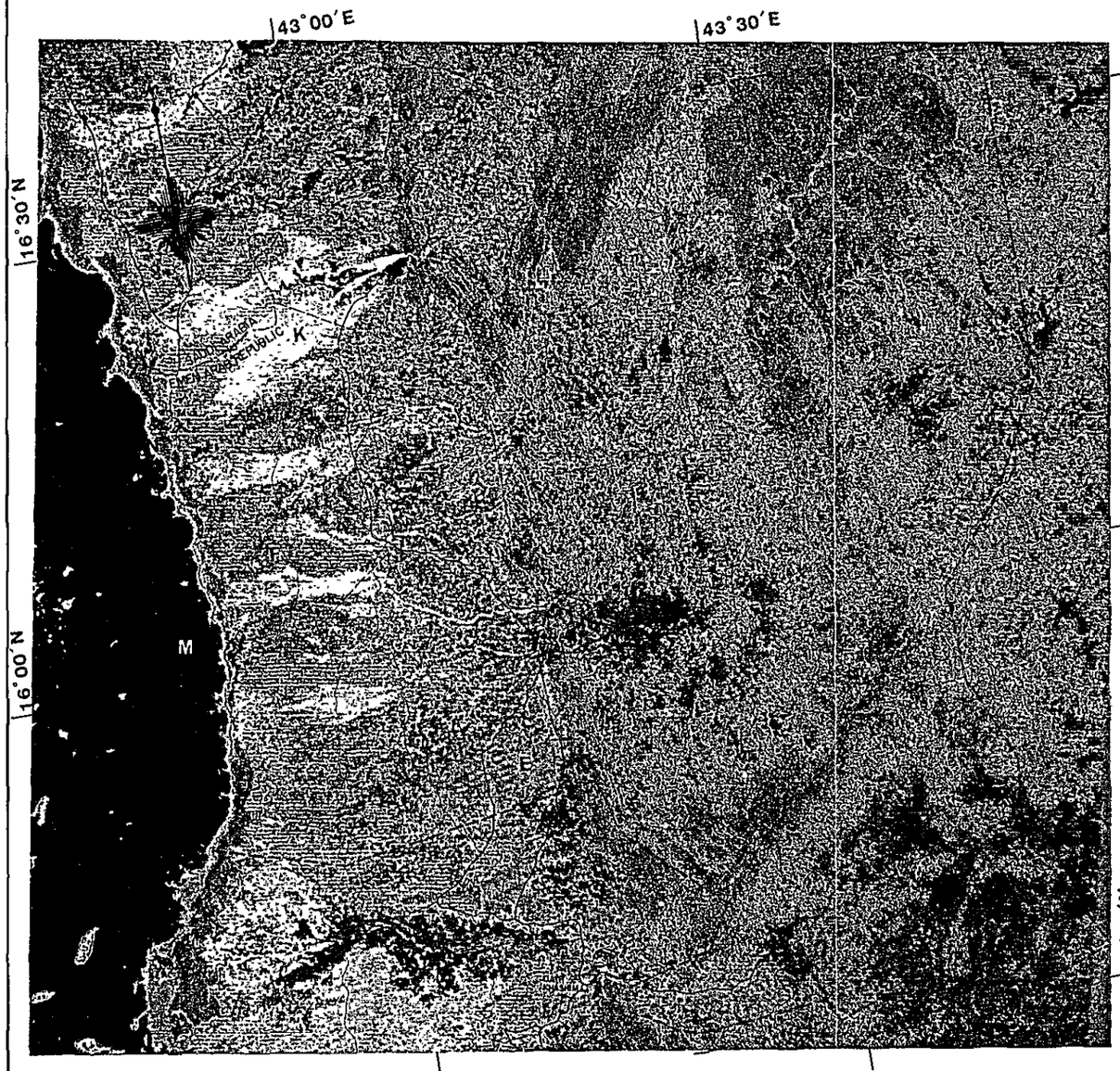
Fig.4.13 Physiography and Soils



LEGEND

		Area (10^3 ha)
1	CLASS 1 (ARABLE)	112
2	CLASS 2 (ARABLE)	61
3	CLASS 3 (ARABLE)	208
4	CLASS 4 (LIMITED ARABLE)	296
6	CLASS 6 (NON ARABLE)	282
		959

Fig.4.14 Land Classification



Land Cover- October 1972

LEGEND	
Red	Cropland, Intensive cultivation, Dense vegetation cover
Orange	Cropland, Medium to low density vegetation cover
Magenta	Cropland, Dense vegetation cover
Purple red	Cropland, Medium density vegetation cover
Yellow	Cropland, Low density vegetation cover, Rangeland in Midland and Highland
Green yellow	Rangeland, Dwarf shrub grassland, Partially cropland for opportunistic planting
Green	Rangeland, Dense shrub and trees
Green blue	Rangeland, Dwarf shrub and grassland on Yemen Volcanics
Purple blue	Rangeland, Shrub and grassland on Limestone and Greenshale
Cyan	Rangeland, Shrub and grassland on Granite and Gneiss
K White	Wadi bed or flood plain, Partially cropland for opportunistic planting
Blue green	Salt affected land or wet sand, Rangeland on Granite and Gneiss (Midland)
M Blue	Water
N Grey	Beach sand or coral reef

Fig.4.15 Land Cover Map (October 13, 1972)

LEGEND

Category of Land Use	Land Use Subdivision	
Irrigated Crop Land	A_1	Intensively cultivated under irrigation / Pumping and diverted stream flow / Sorghum, vegetables and tropical fruits
	A_2	Intensively cultivated under irrigation / Diverted stream flow / Mainly sorghum
Rainfed Cropland/ Annual Cultivation	B_1	Densely cultivated / Irregular spate irrigation / Mainly sorghum
	B_2	Densely cultivated / Sorghum and millet
	B_3	Wadi lands / Vegetables and sub-tropical fruits
	B_4	Gently sloping lands receiving hill slope runoff / Sorghum and maize
Rainfed Cropland/ Opportunistic Cultivation	C	Mainly millet and sorghum
Rainfed Cropland/ Terraced	D_1	Densely cultivated/ Sorghum, wheat, barley, and qut
	D_2	Sparsely cultivated / Sorghum, millet, wheat and barley
Rainfed Cropland/ Rangeland	E	Opportunistic planting otherwise dwarf shrub grassland / Mainly millet
Rangeland	F_1	Dwarf grassland
	F_2	Trees and shrub
	F_3	Open shrub and grassland on rocky slopes
	F_4	Grassland and scattered shrub
Unused	G_1	Sand dunes and isolated hills
	G_2	Salt affected land
	G_3	Wadi bed

Fig.4.16 Present Land Use

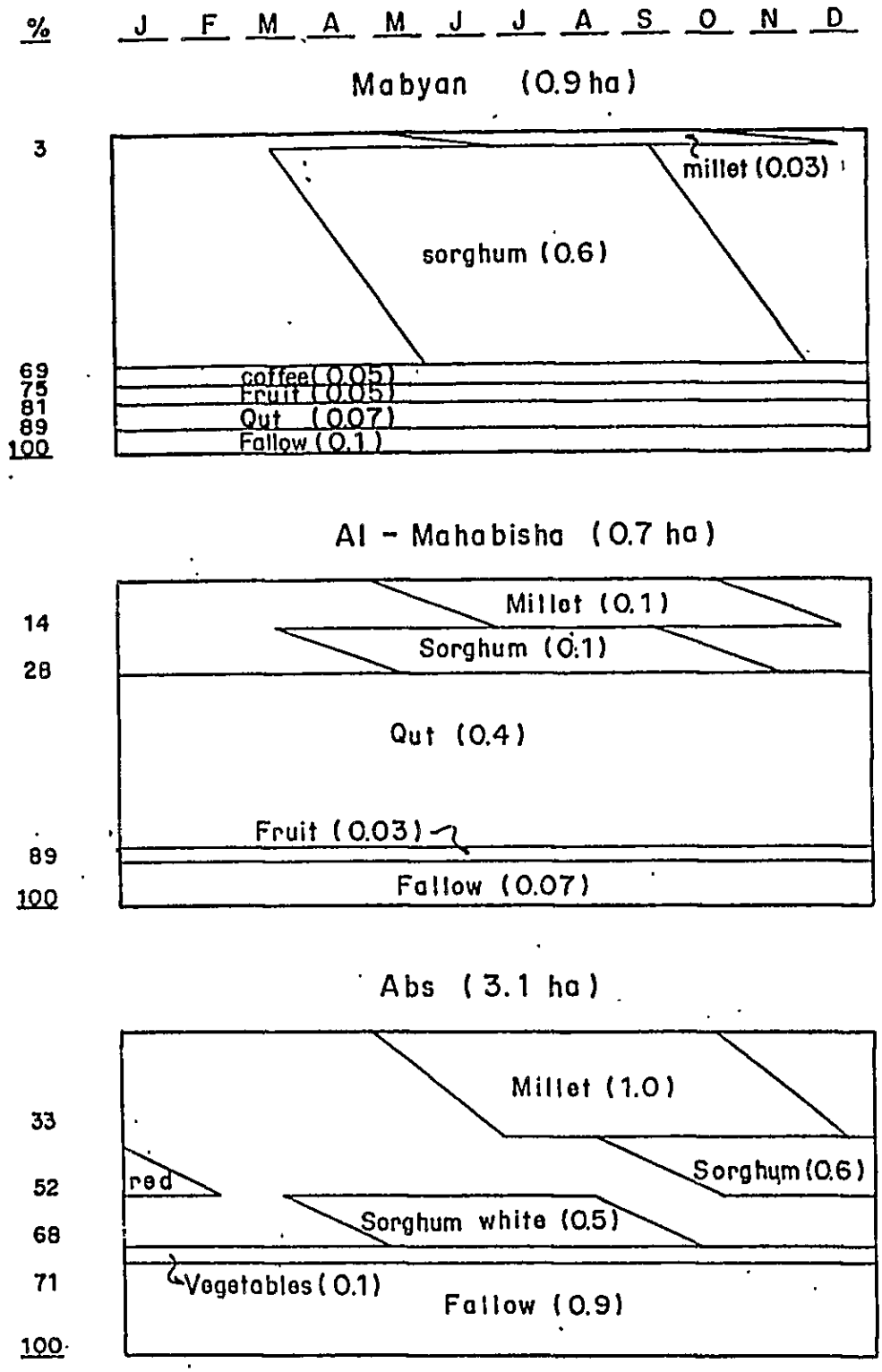
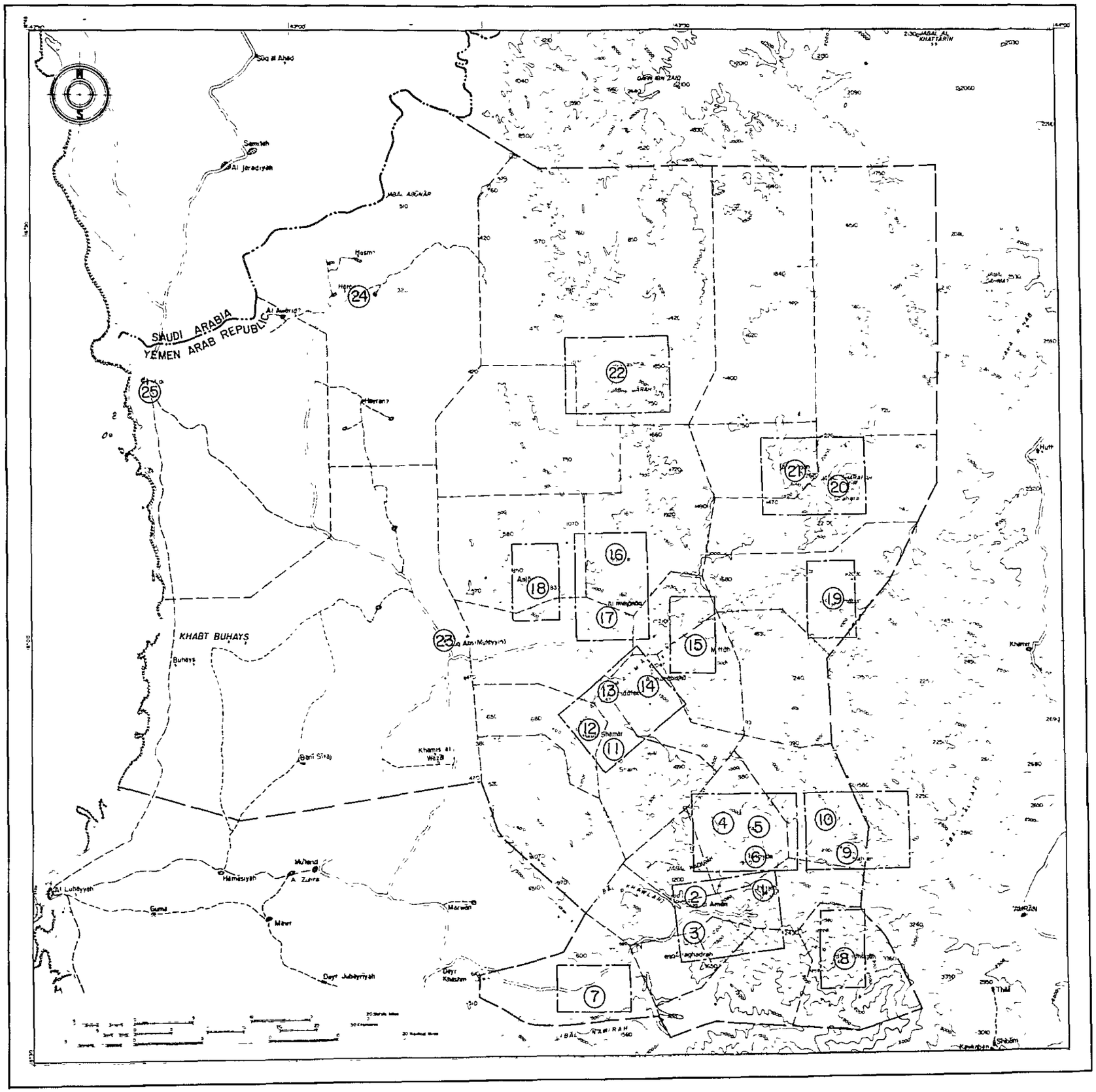


図 4.17　現在の作付体系図

Fig. 4.17　Present Cropping Pattern



List of Water Supply Schemes

Name of Town or Village	Planned Service Population (Persons)
1 Hajjah	15,000
2 Suq Al Aman	1,800
3 Ash Shafadirah	9,500
4 North Mabyan	5,400
5 Jabal Al Dafir	4,800
6 Mabyan	5,100
7 Bani Kais	5,200
8 Bayt Idhaqah	5,200
9 Kuhlan	5,900
10 Affar	3,700
11 Sharhil	4,000
12 Qufl Shamal	2,300
13 Al Shaafeen	3,100
14 Al Mahabisha	15,000
15 Miftah	2,000
16 Kusher	3,400
17 Al Muhanaq	4,000
18 Aslam	1,600
19 Habour	2,100
20 Shahara	2,000
21 Al Madan	6,700
22 Washha	12,500
23 Abs	5,300
24 Harad	2,300
25 Midi	3,800

Boundary of Maps Scaled 1/50,000

Fig. 6.1 Location of Water Supply Scheme

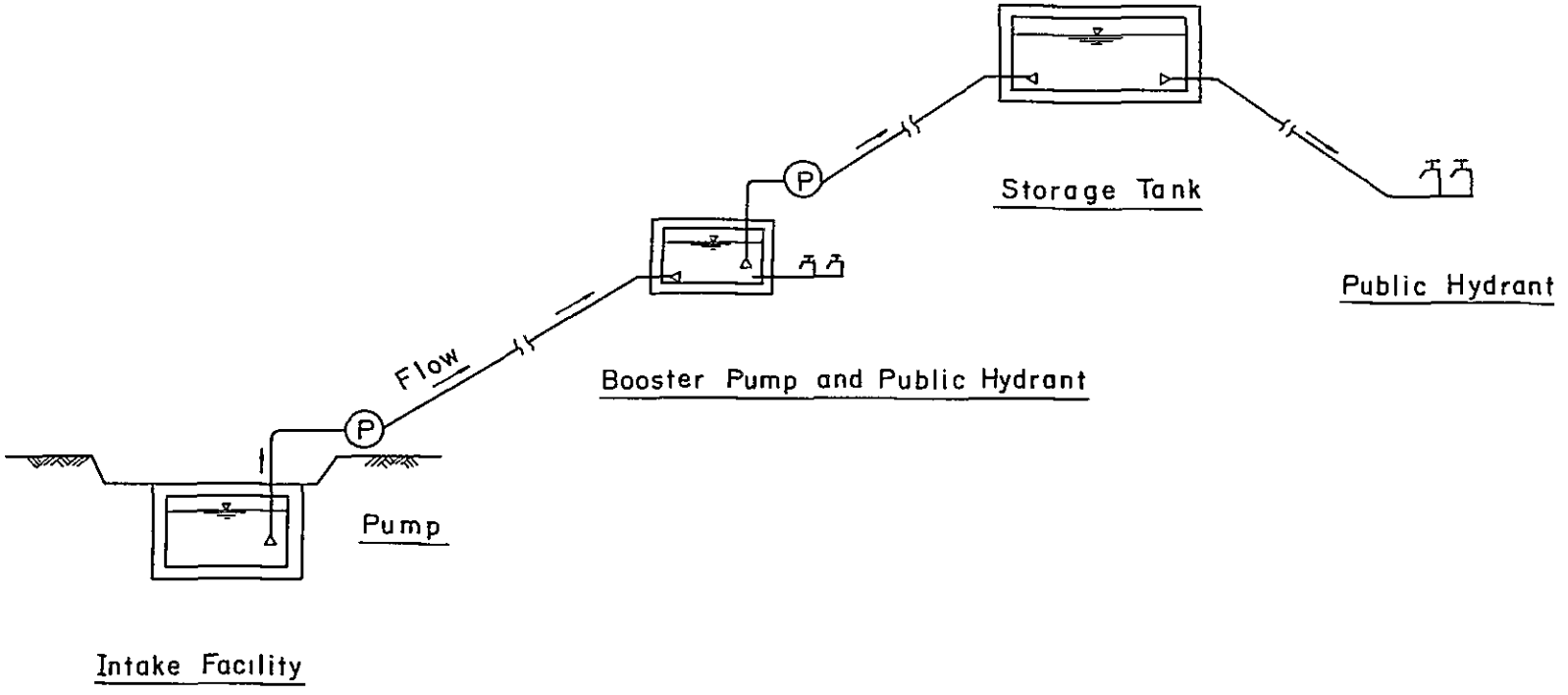


図 6.2　簡易水道施設送水方式標準図

Fig. 6.2　Typical Profile of Water Supply System

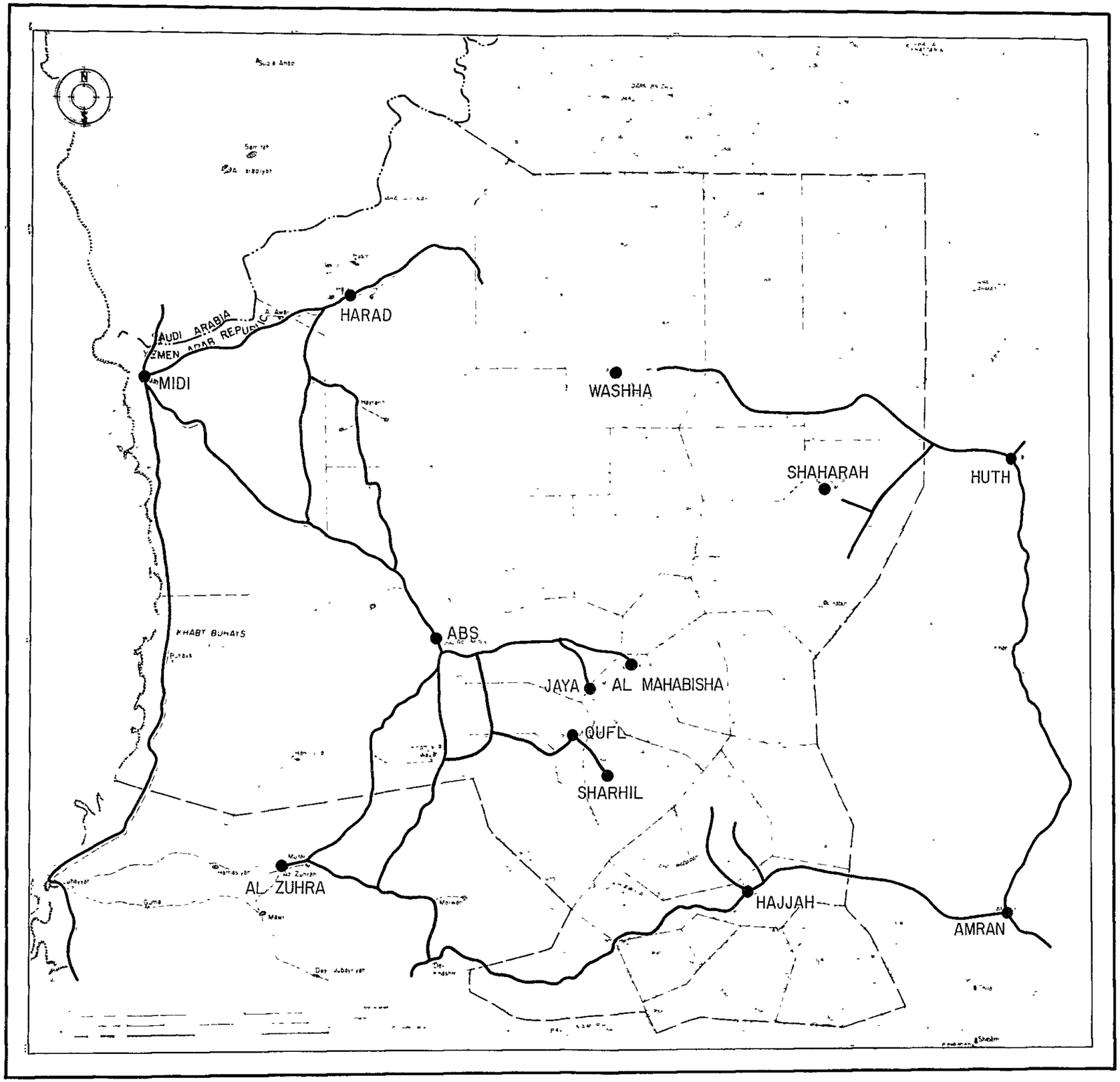


Fig. 6.3 Existing Road Network in Hajjah Province

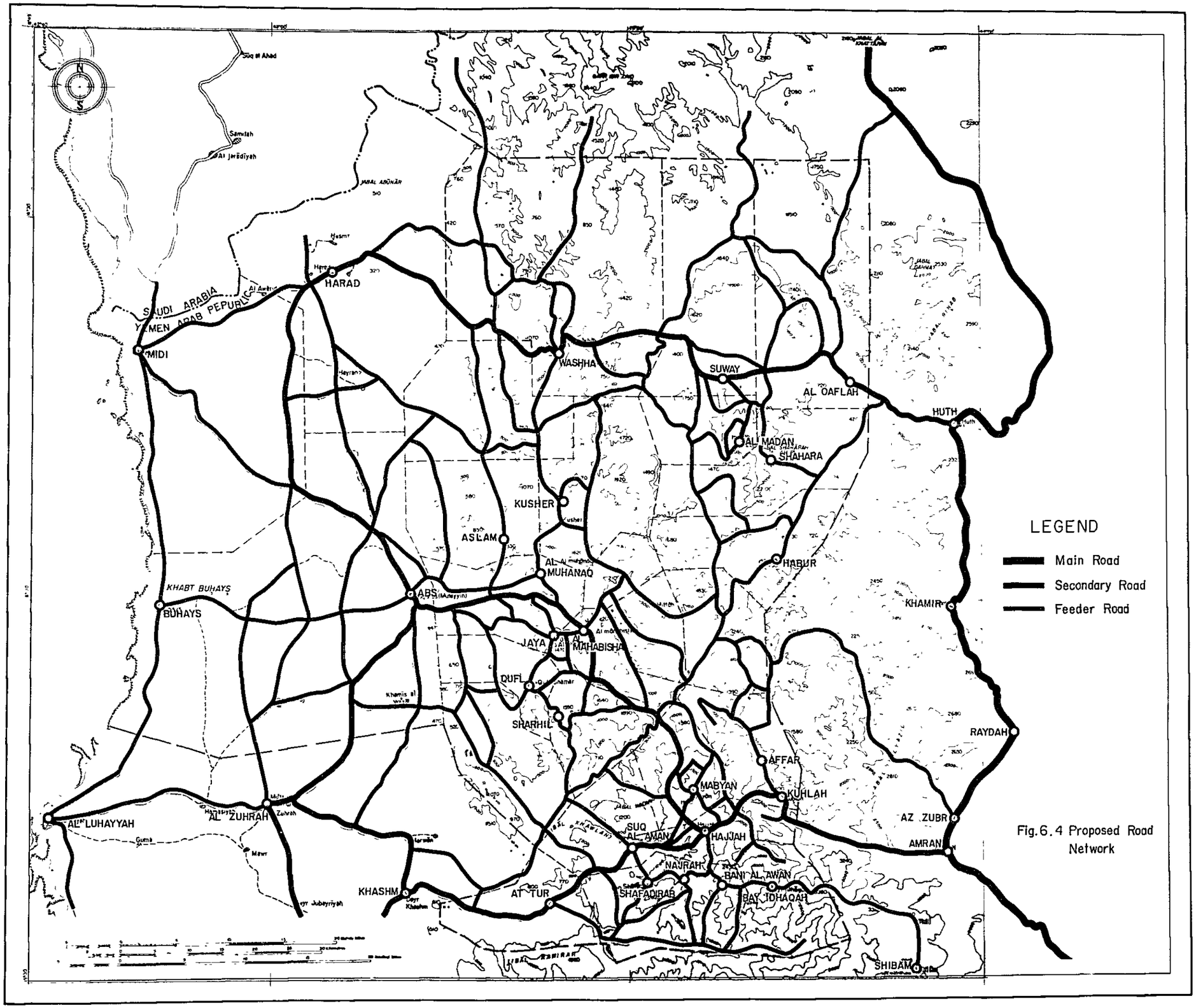


Fig.6.4 Proposed Road Network

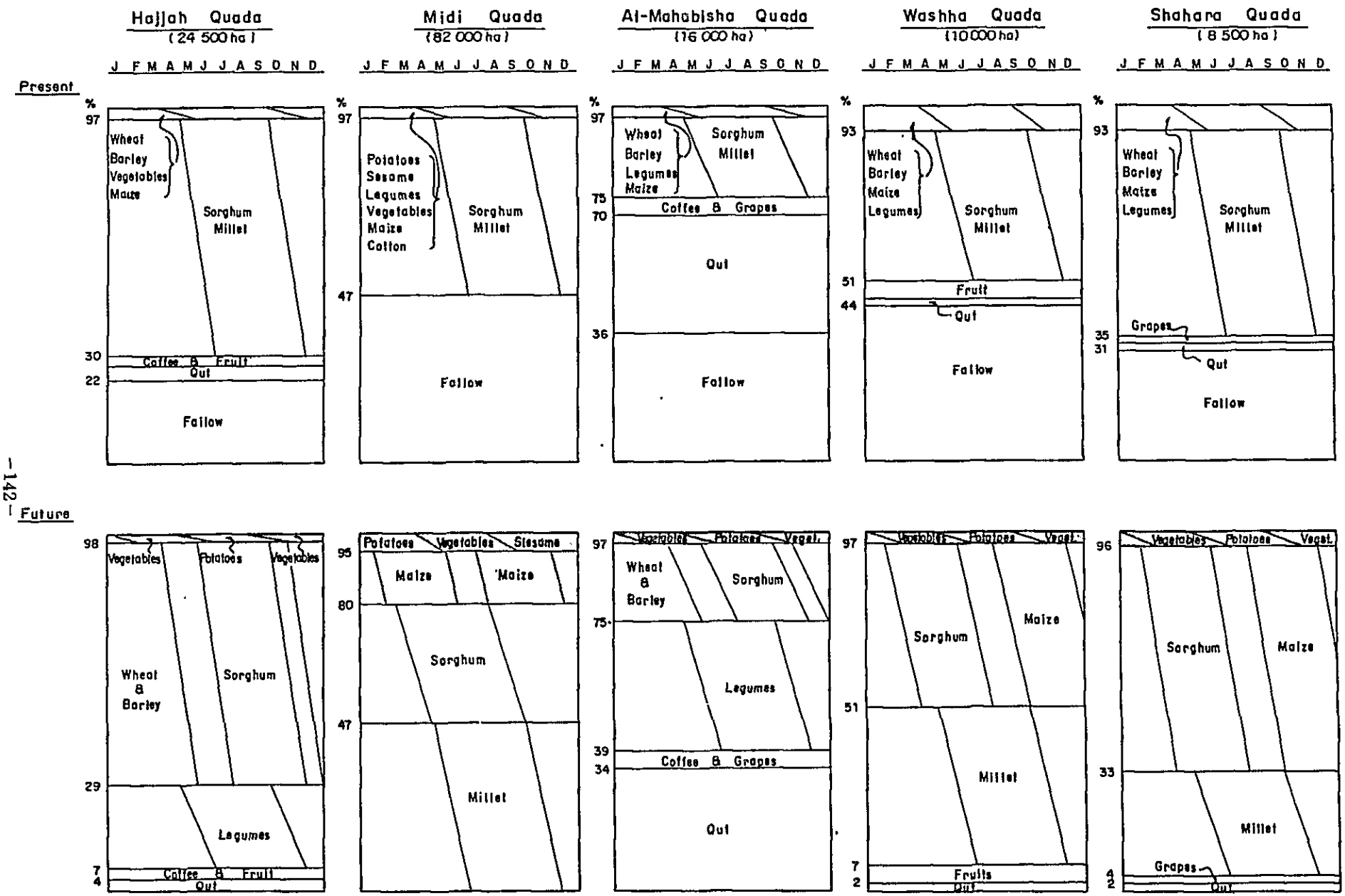
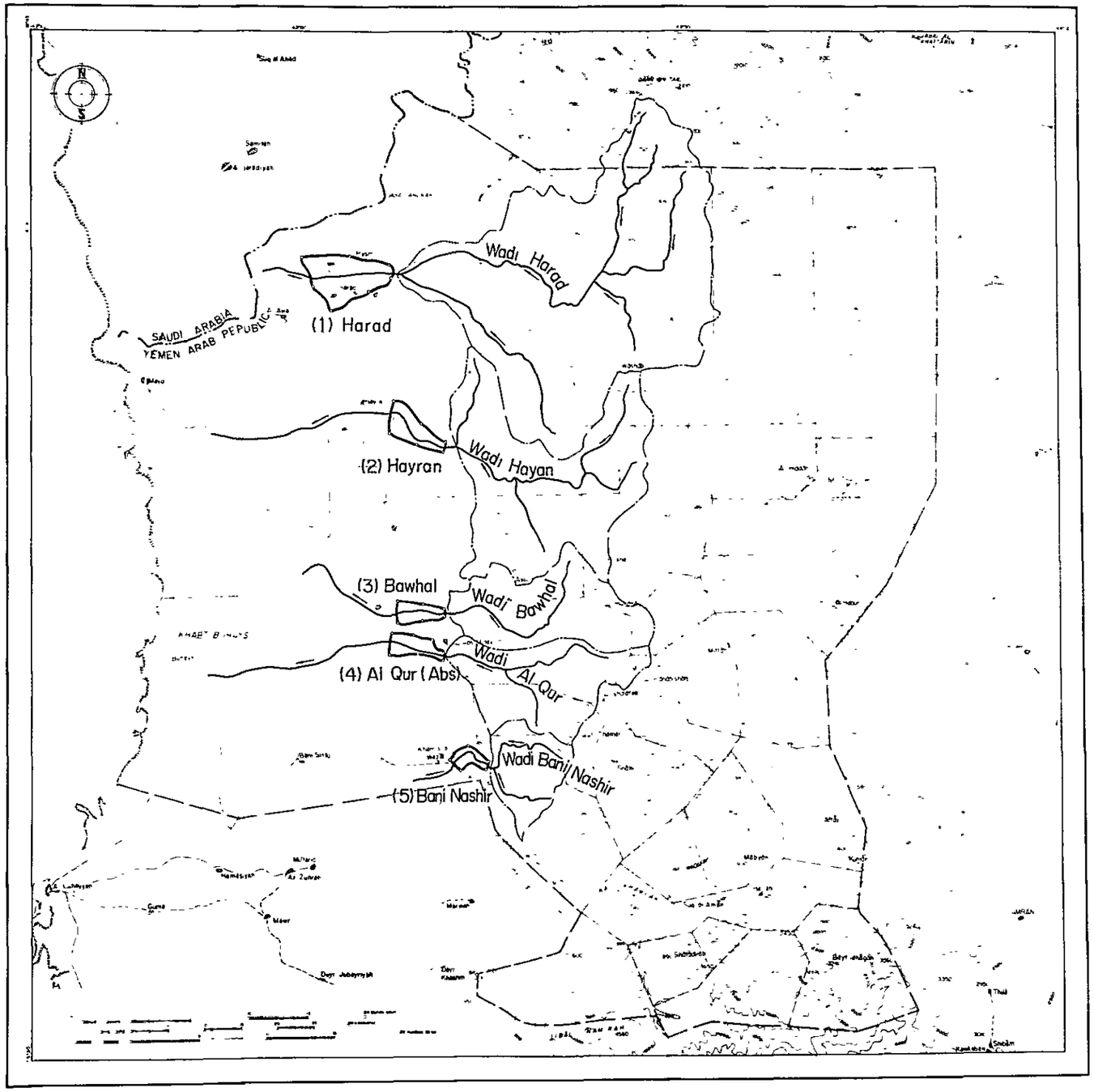


図 6.5　現在及び将来の作付体系図

Fig. 6.5　Present and Future Cropping Pattern



Irrigable Area in Lowland

Name of Wadi	Catchment Area (sq km)	Irrigable Area (ha)
(1) Harad	994 7	3,500
(2) Hayran	414.6	1,800
(3) Bawhal	249 8	1,200
(4) Al Qur	243.0	1,300
(5) Bani Nashir	126.7	700

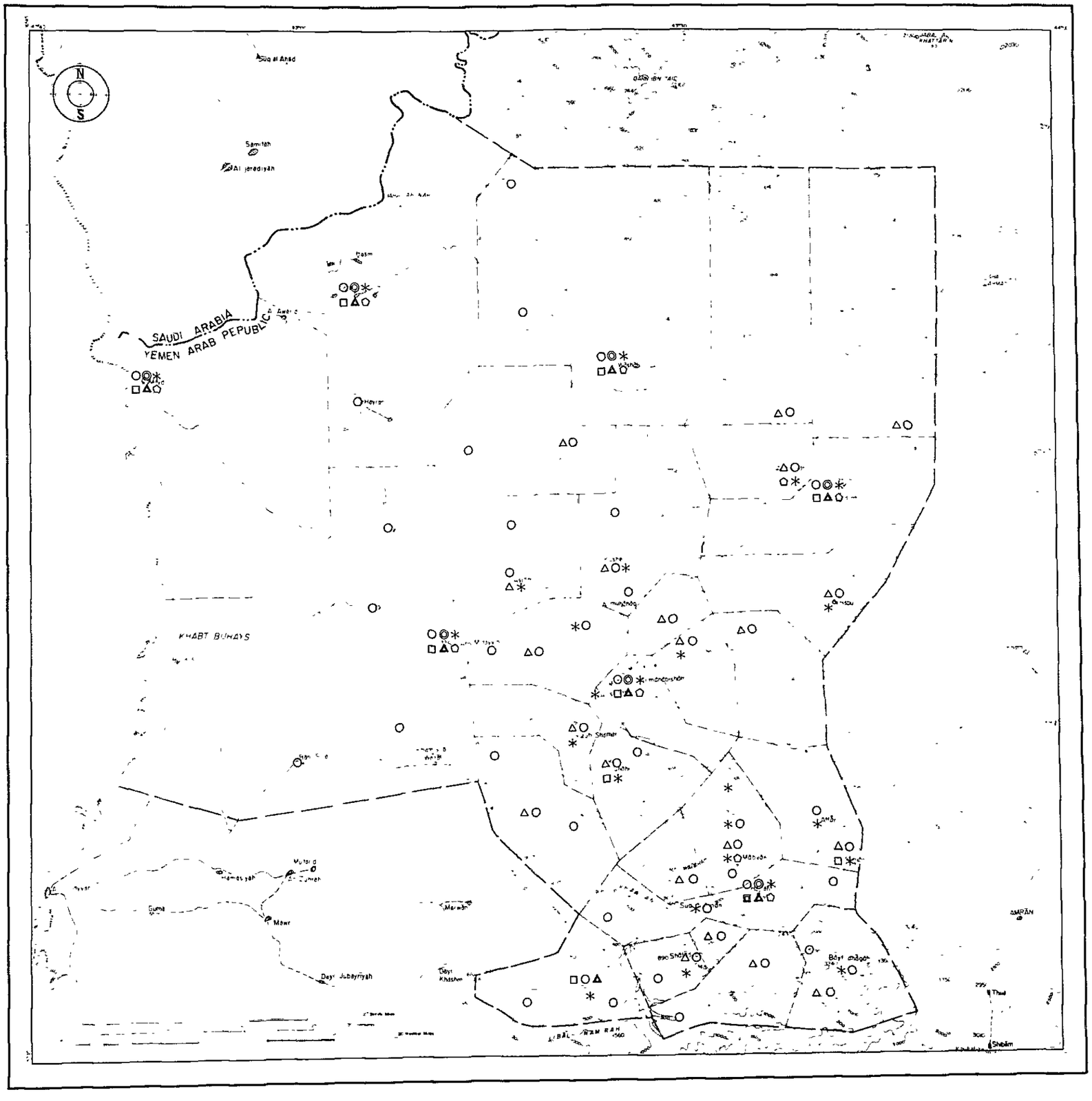
Legend

Wadi

Catchment Area

Irrigable Area

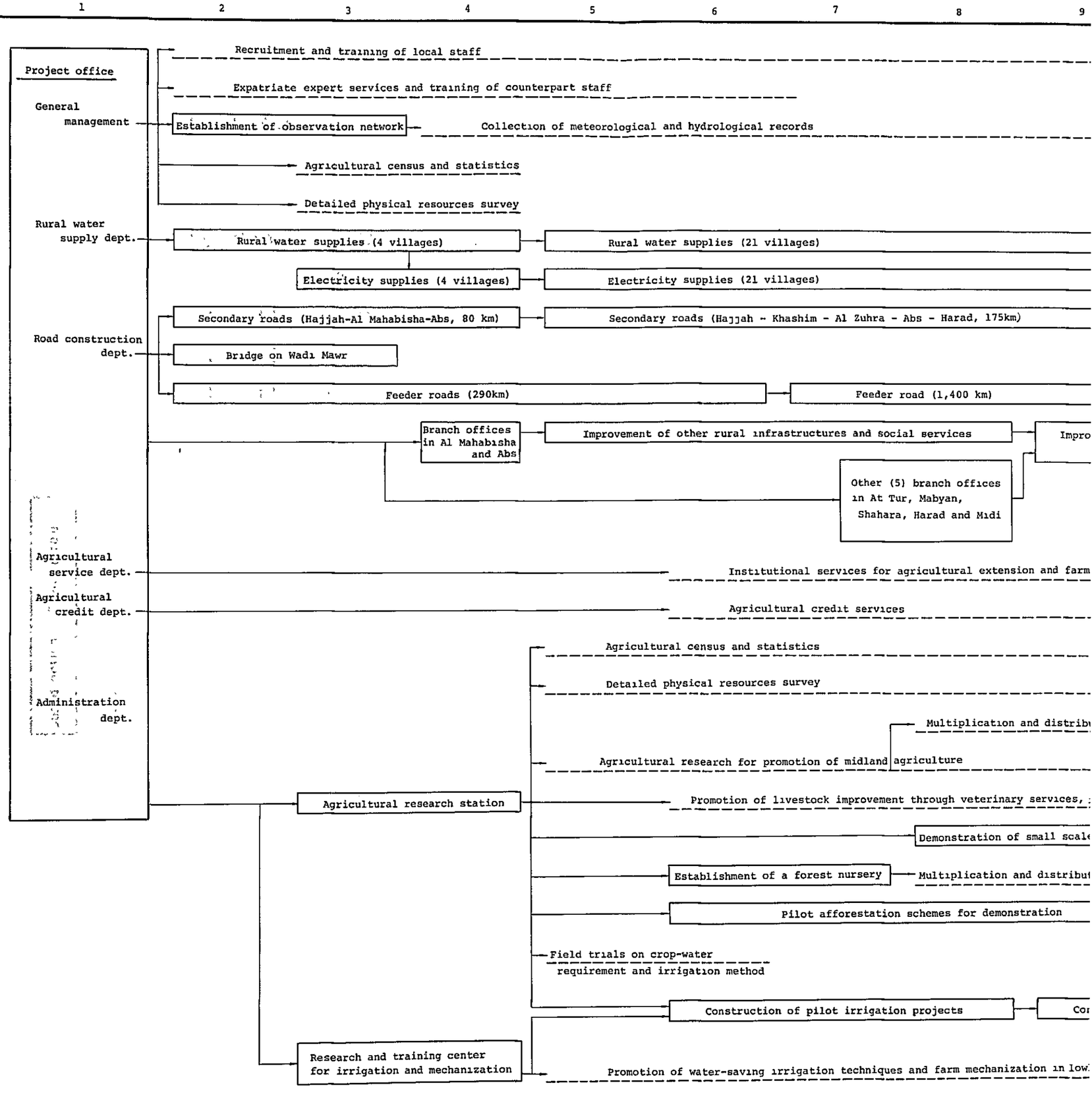
Fig. 6.6 Irrigable Area in Lowland



LEGEND

- ○ Primary School
- ◎ Public Hall
- ▣ Main Hospital
- □ Branch Hospital
- ▲ Health Center
- △ Rural Health Unit
- ✳ Electric Power Supply
- ⬠ Telephone Exchange

Fig. 6.7 Geneval Plan of Rural Infrastructures


1
2
3
4
5
6
7
8
9
Project office
General management
Recruitment and training of local staff
Expatriate expert services and training of counterpart staff
Establishment of observation network
Collection of meteorological and hydrological records
Agricultural census and statistics
Detailed physical resources survey
Rural water supply dept.
Rural water supplies (4 villages)
Rural water supplies (21 villages)
Electricity supplies (4 villages)
Electricity supplies (21 villages)
Road construction dept.
Secondary roads (Hajjah-Al Mahabisha-Abs, 80 km)
Secondary roads (Hajjah - Khashim - Al Zuhra - Abs - Harad, 175km)
Bridge on Wadi Mawr
Feeder roads (290km)
Feeder road (1,400 km)
Branch offices in Al Mahabisha and Abs
Improvement of other rural infrastructures and social services
Impro
Other (5) branch offices in At Tur, Mabyan, Shahara, Harad and Midi
Agricultural service dept.
Institutional services for agricultural extension and farm
Agricultural credit dept.
Agricultural credit services
Administration dept.
Agricultural census and statistics
Detailed physical resources survey
Multiplication and distribu
Agricultural research for promotion of midland agriculture
Agricultural research station
Promotion of livestock improvement through veterinary services,
Demonstration of small scale
Establishment of a forest nursery
Multiplication and distribut
Pilot afforestation schemes for demonstration
Field trials on crop-water requirement and irrigation method
Construction of pilot irrigation projects
Co
Research and training center for irrigation and mechanization
Promotion of water-saving irrigation techniques and farm mechanization in low

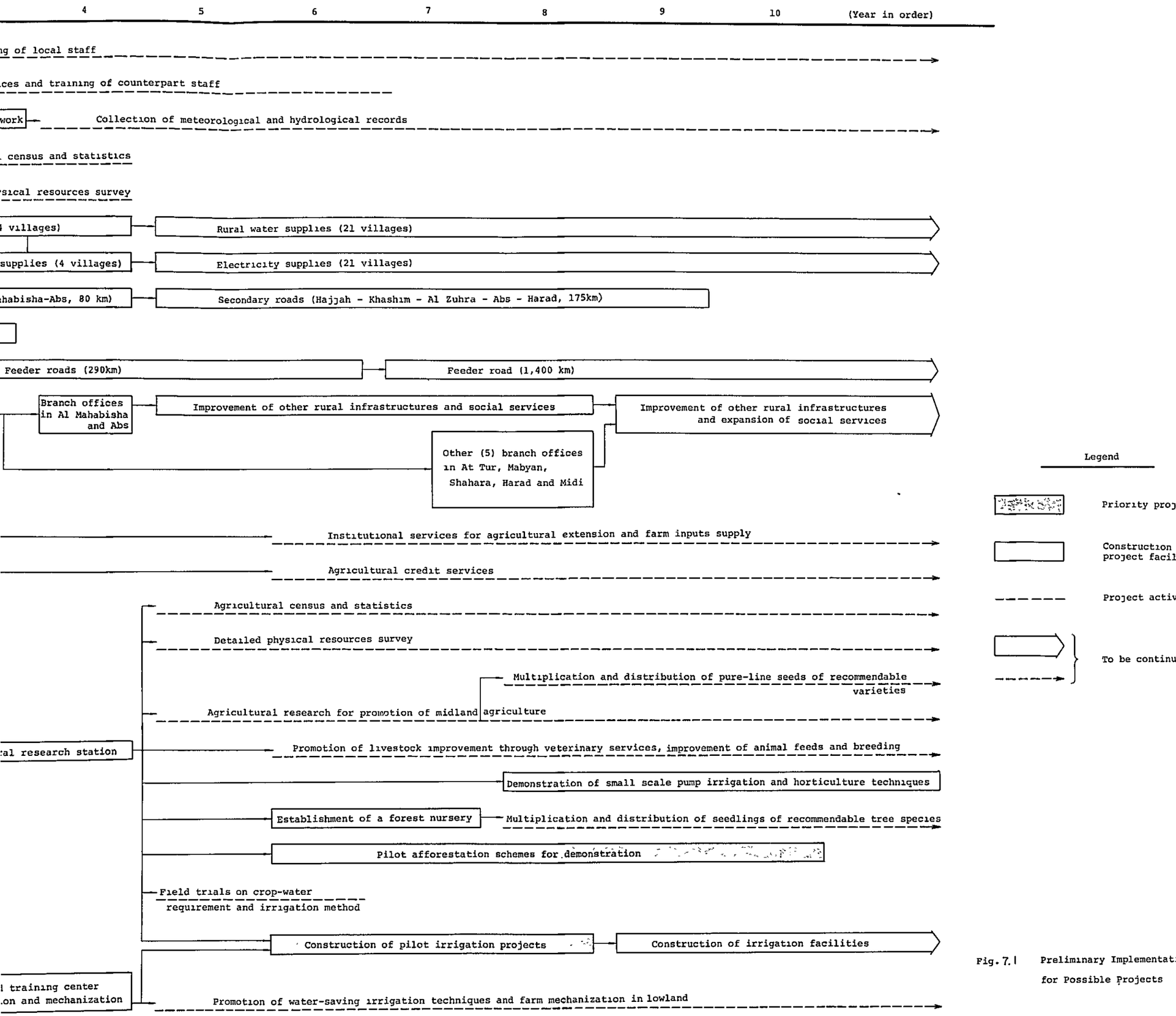


Fig. 7.1 Preliminary Implementation Schedule for Possible Projects

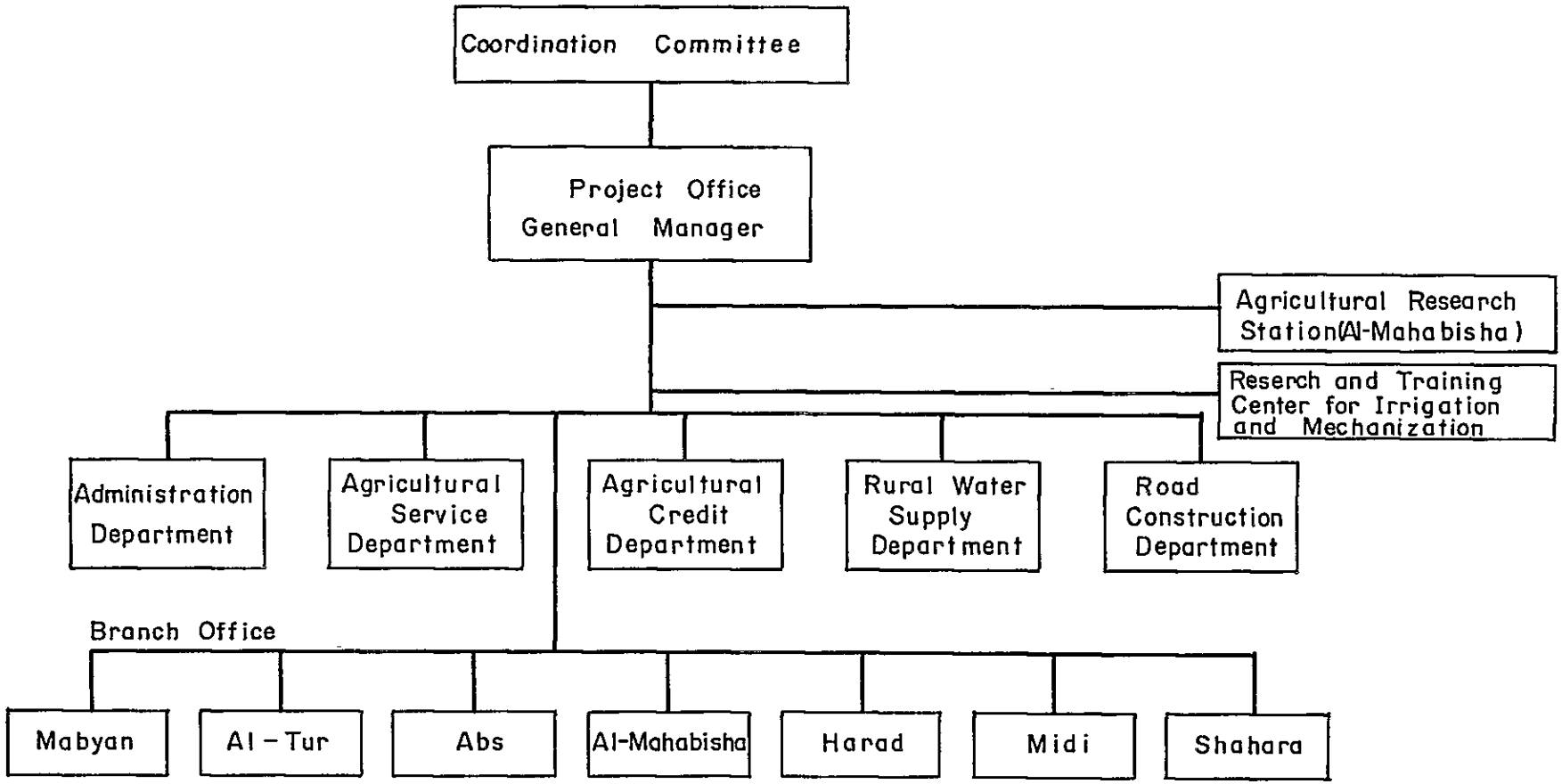
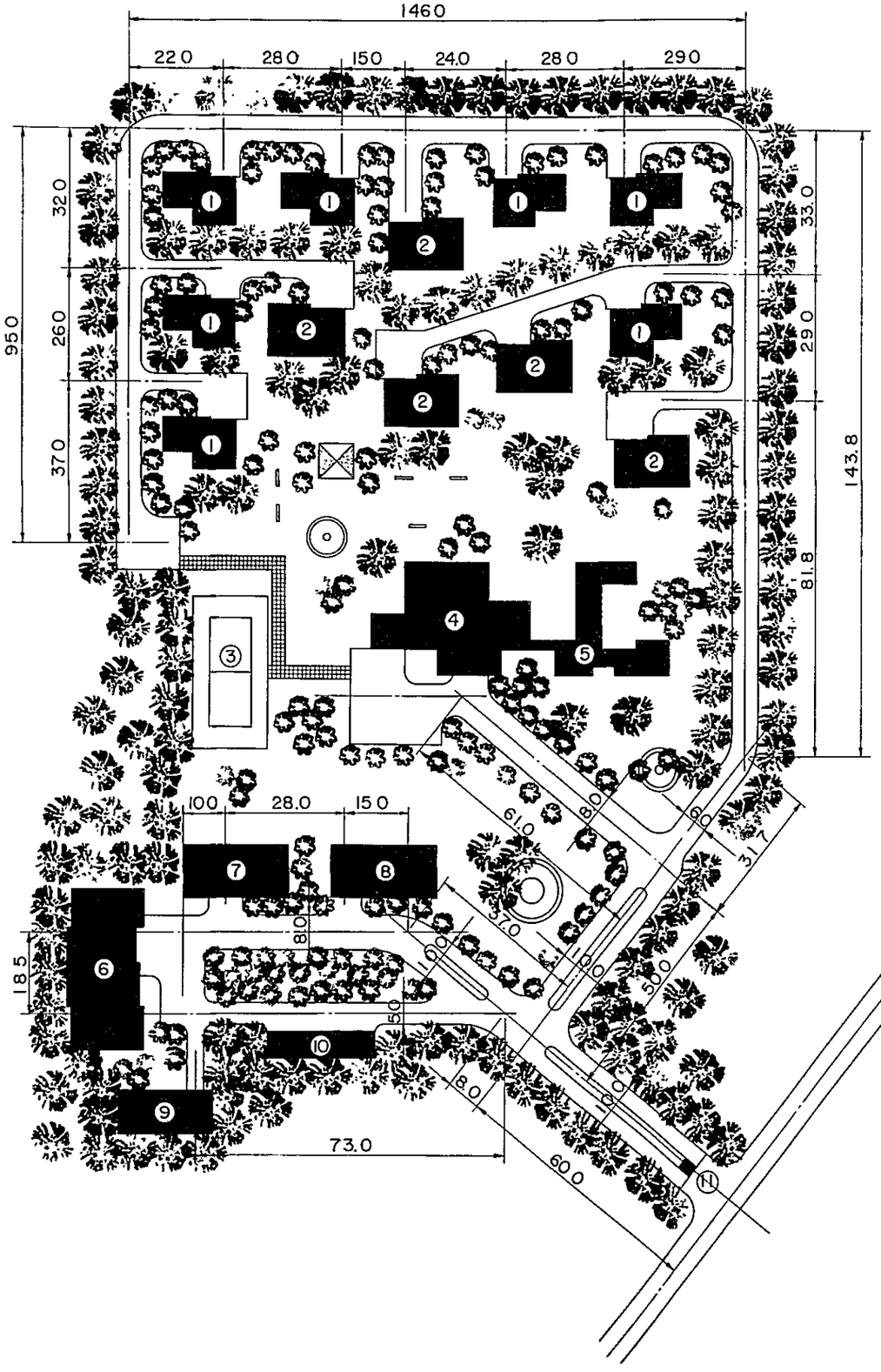
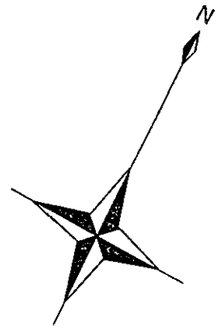


図 8.1 ハッジャ州農村総合開発プロジェクトオフィス組織図

Fig. 8.1 Organizational Set-up of Hajjah Province Integrated Rural Development Project Office





LEGEND

1 TWO BEDROOM RESIDENCE
2 THREE BEDROOM RESIDENCE
3 TENNIS COURT
4 CLUB
5 GUEST HOUSE
6. MAIN OFFICE
7 ROAD CONSTRUCTION DEPARTMENT
8 RURAL WATER SUPPLY DEPARTMENT
9 DRIVERS' DORMITORY
10 COVERED PARKING
11. MAIN GATE AND GUARD HOUSE

Fig. 8.2 Proposed Layout of Project Office

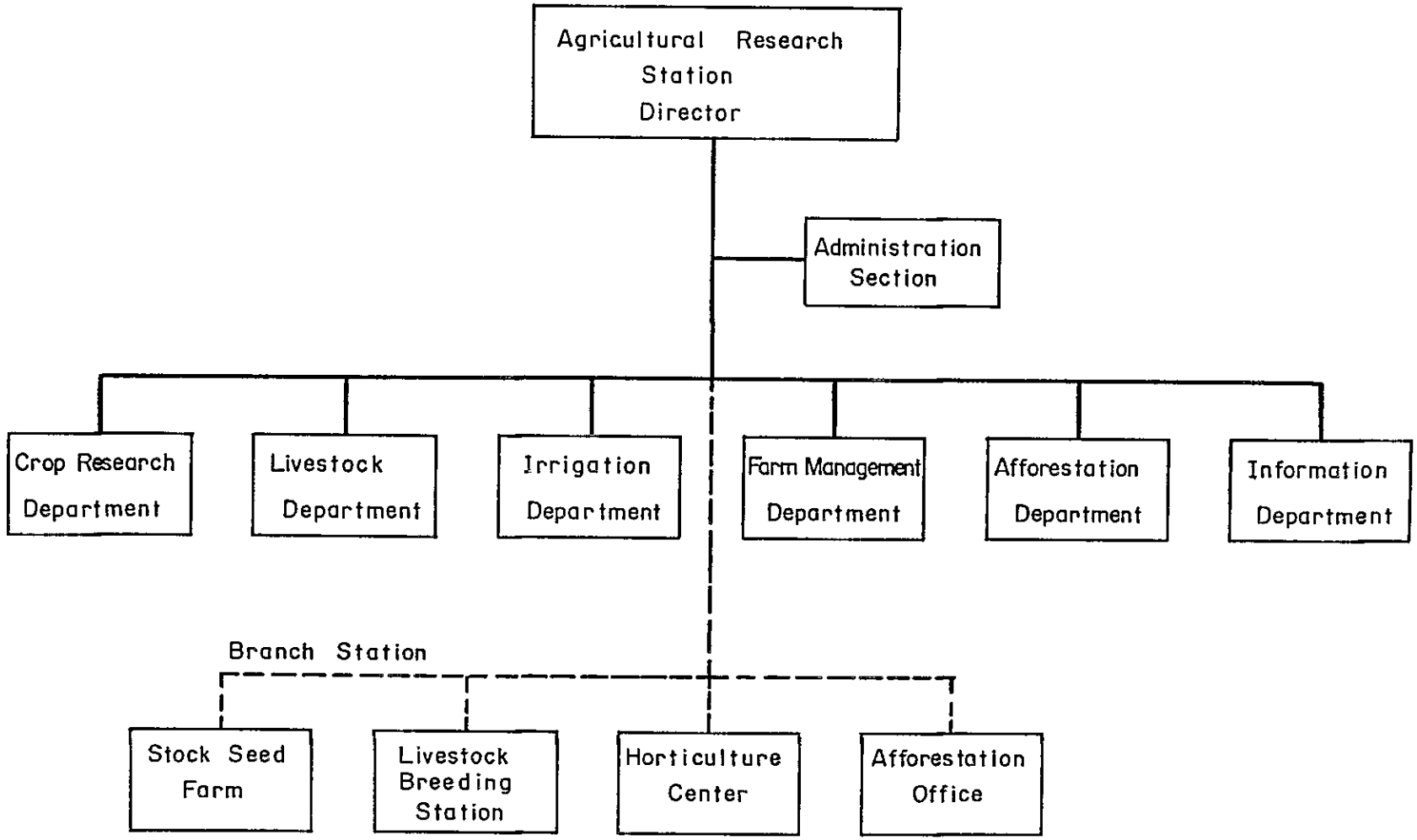


図 8.3　丘陵地農業総合試験場組織図

Fig. 8.3　Organization of Agricultural Research Station

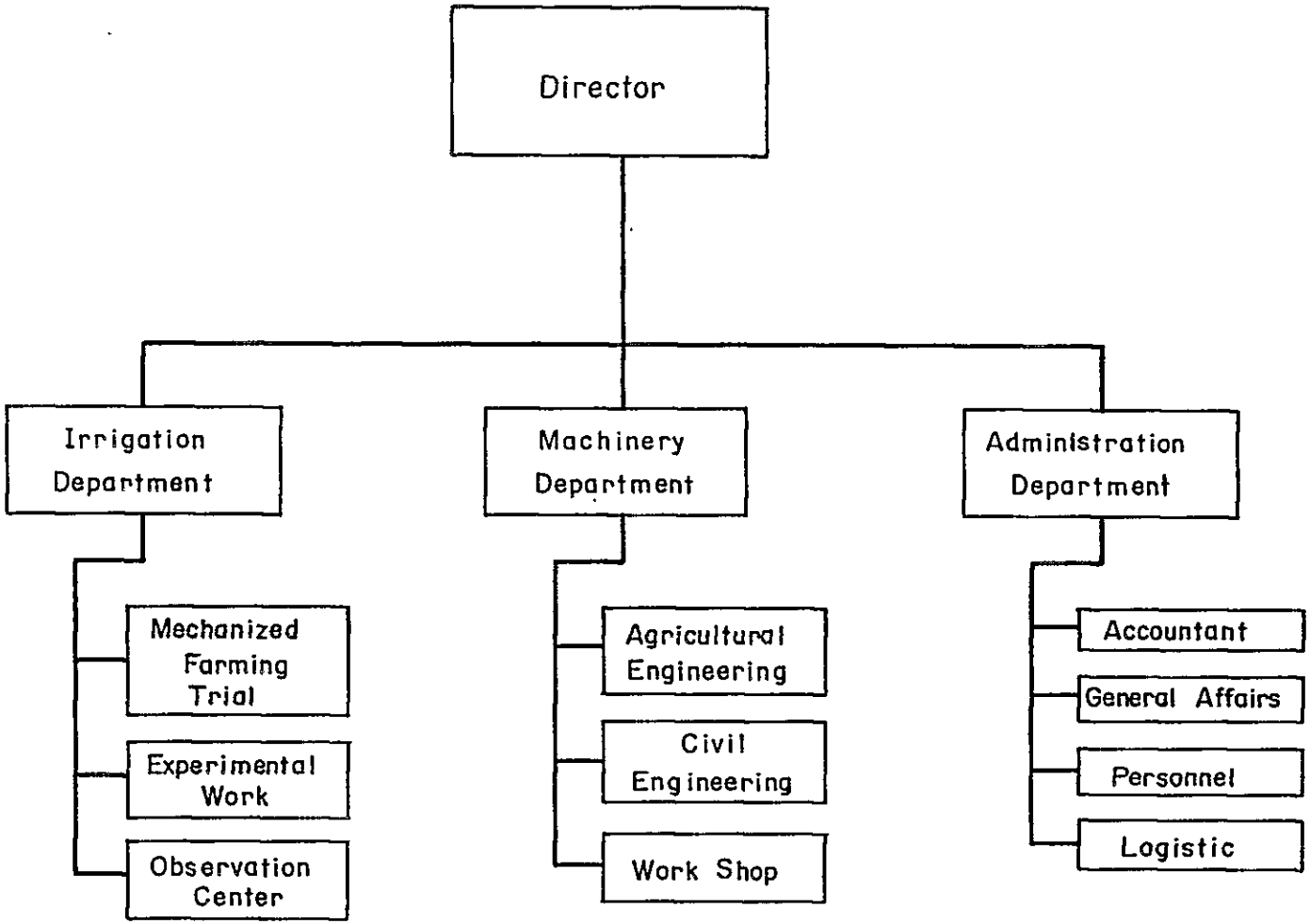


図 8.4　機械化かんがい試験研修センター組織図

Fig. 8.4　Organization of Research and Training Center for Irrigation and Mechanization

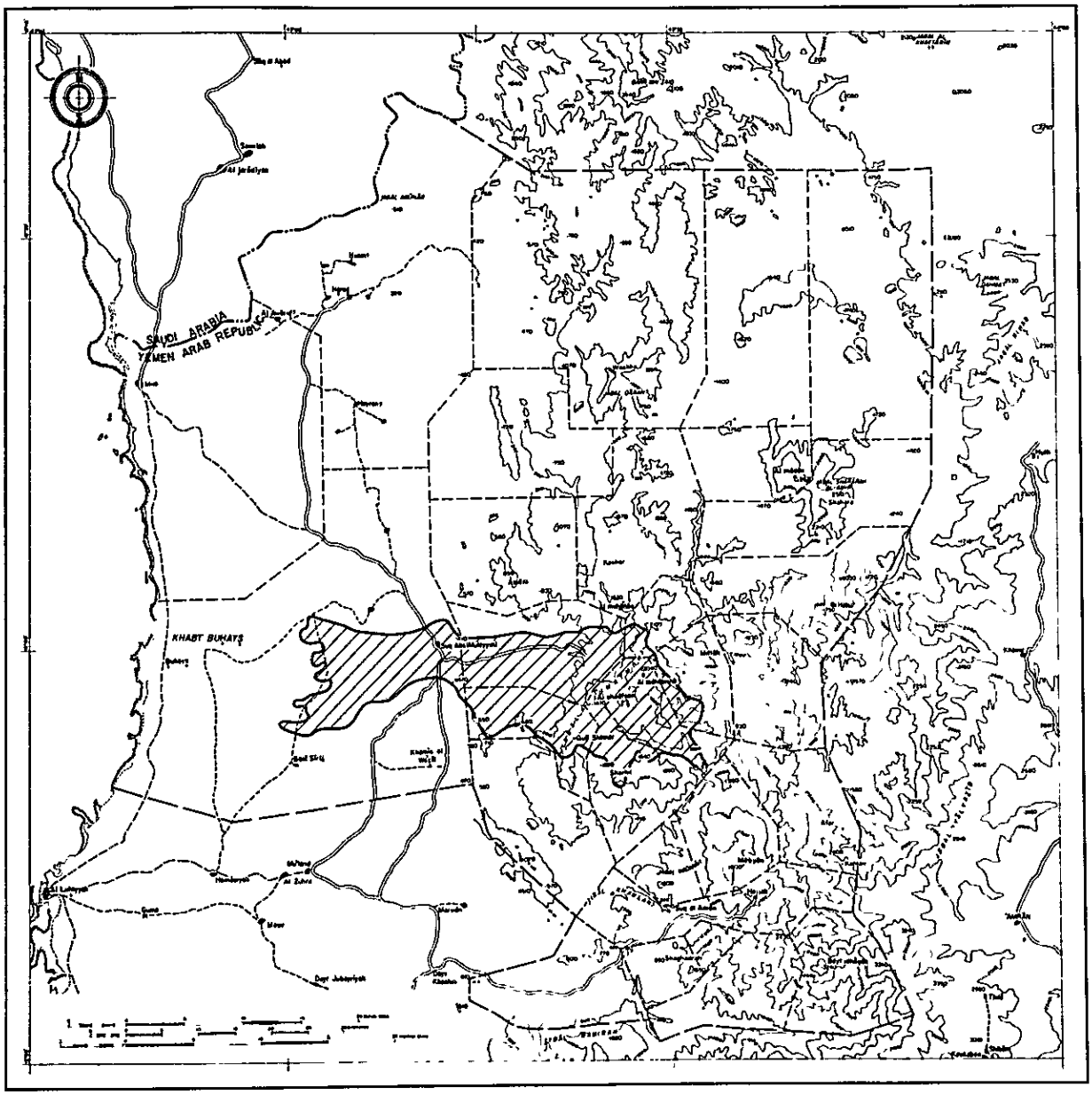
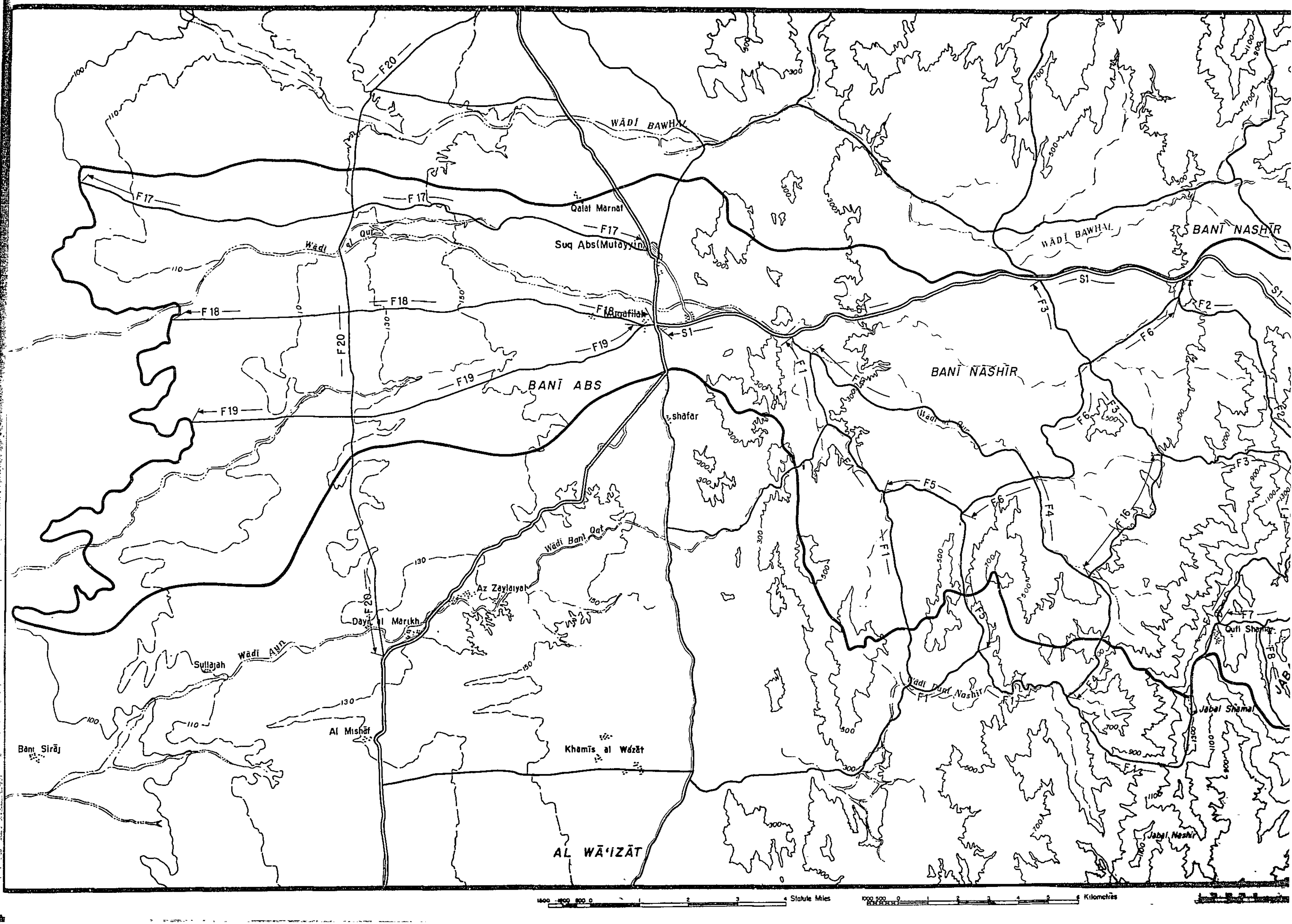


図 9.1　優先地域位置図

Fig.9.1　Location Map



BANĪ ABS
BANĪ NASHĪR
AL WĀ'IZĀT
Wādī Bawhal
Qalat Marnaf
Suq Abs(Mutayyin)
Shafar
Az Zaylaiyah
Dayr al Marikh
Sullajah
Wādī Ayn
Al Mishaf
Bani Siraj
Khamis al Wazat
Wādī Bani Qat
Wādī Bani Nashir
Jabal Shamal
Jabal Nashir
Qufl Shamar
Wādī al Qur
F17
F18
F19
F20
S1
Statute Miles
Kilometres

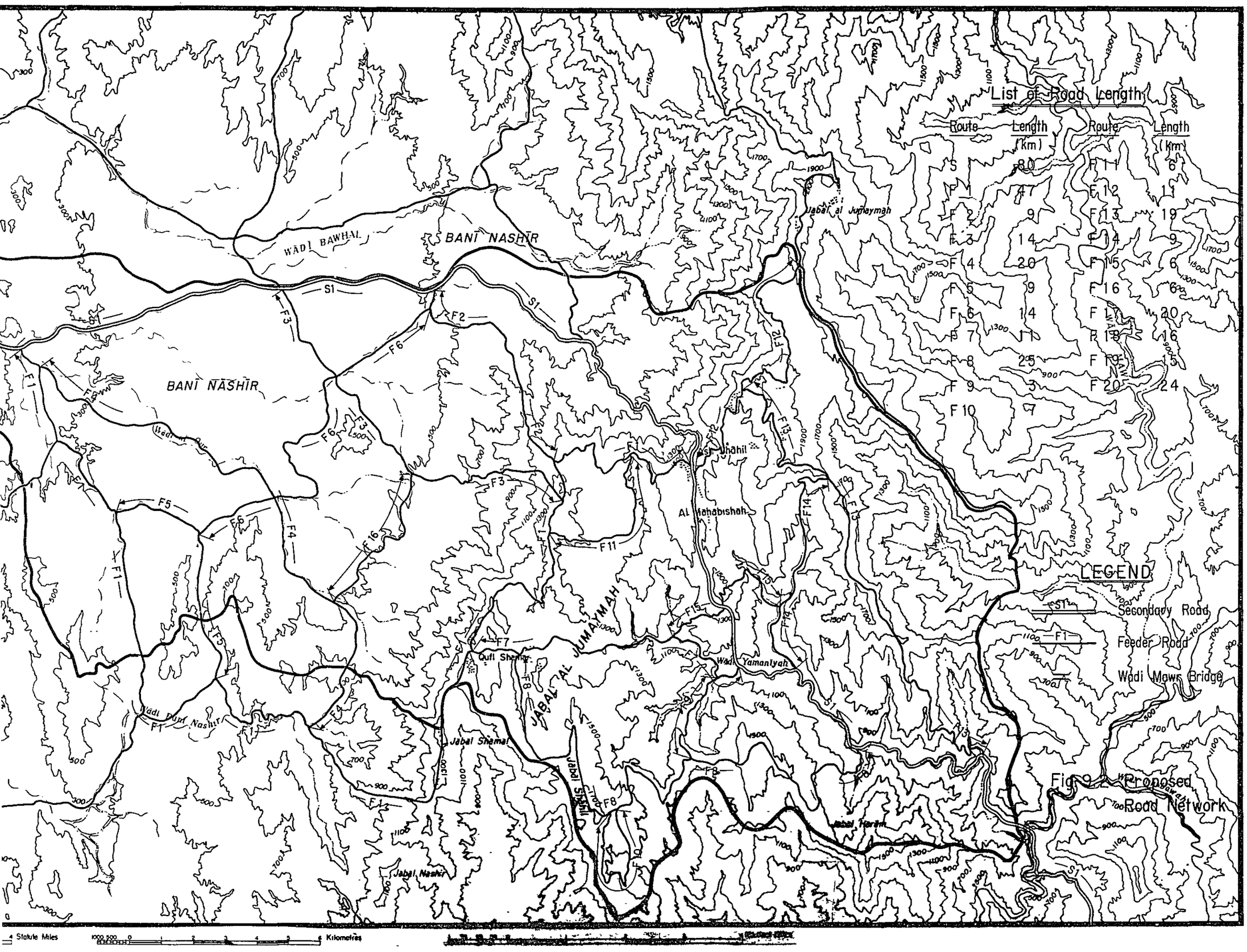
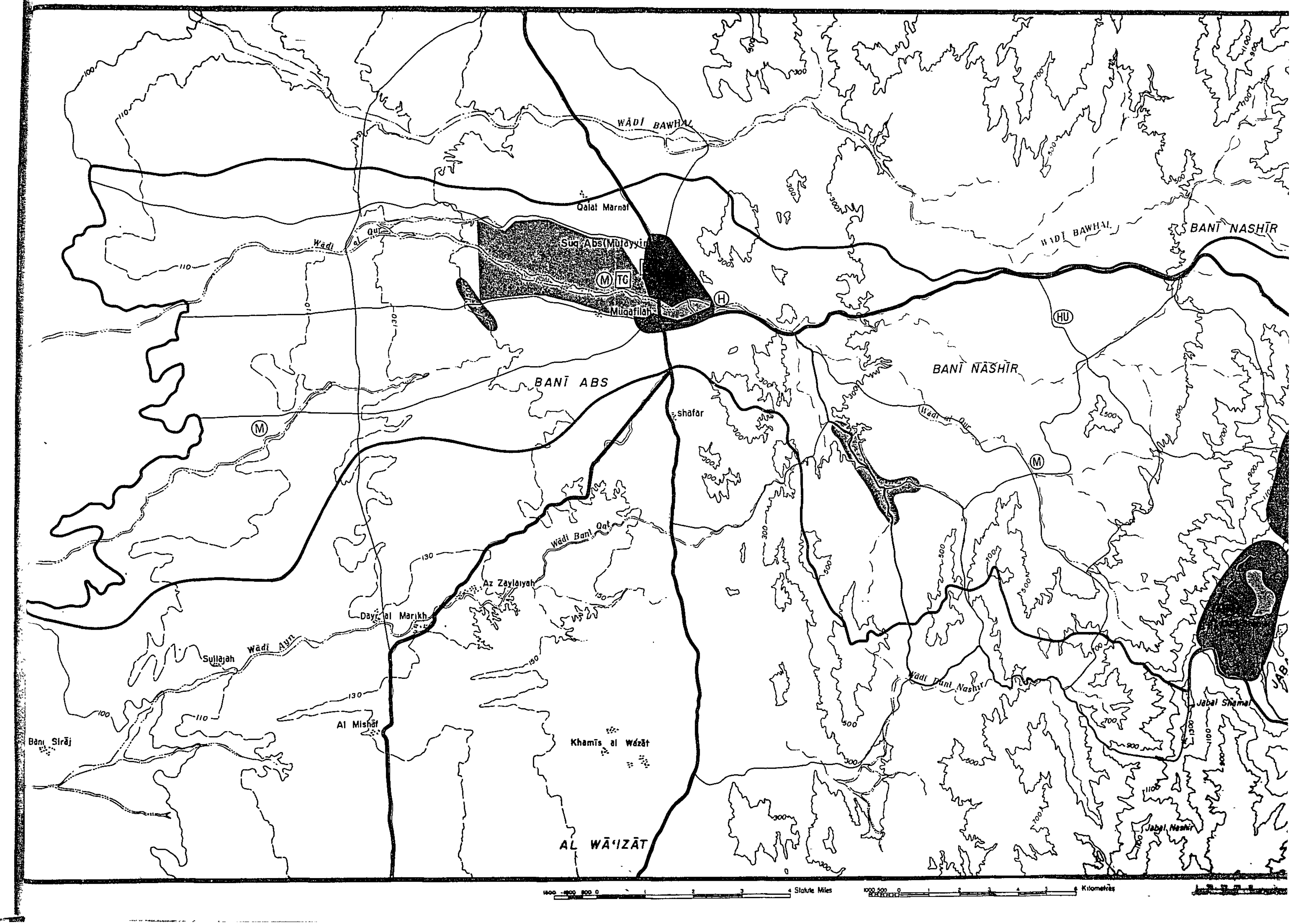


Fig 9.2 Proposed Road Network



WĀDĪ BAWHAL
Qalat Marnaf
Wādī al Qur
Suq Abs (Mutayyin)
Muqafilah
BANĪ ABS
BANĪ NĀSHIR
WĀDĪ BAWHAL
BANĪ NĀSHIR
Wādī al Qur
shāfar
Wādī Banī Qat
Az Zaylaiyah
Dayr al Marikh
Sullajah
Wādī Ayn
Al Mishāf
Banī Sirāj
Khamīs al Wa'zāt
AL WĀ'IZĀT
Wādī Banī Nashir
Jabal Shamal
Jabal Nashir
Statute Miles
Kilometres

LEGEND

- BO — Branch Office
- M — Meteorological Station
- H — Hydological Station
- Rural Water and Electric Power Supplies
- Secondary Road
- Feeder Road
- Wadi Mawr Bridge
- RS — Agricultural Research Station
- FC — Research and Training Center for Irrigation and Mechanization
- Pilot Irrigation Project
- Pilot Afforestation Scheme
- BH — Branch Hospital
- HU — Rural Health Unit

BANI NASHIR

WADI BAWHAL

BANI NASHIR

Jabal al Jumaymah

JABAL AL JUMAYMAH

Wadi Yamantyah

Wadi Bani Nashir

Jabal Shama

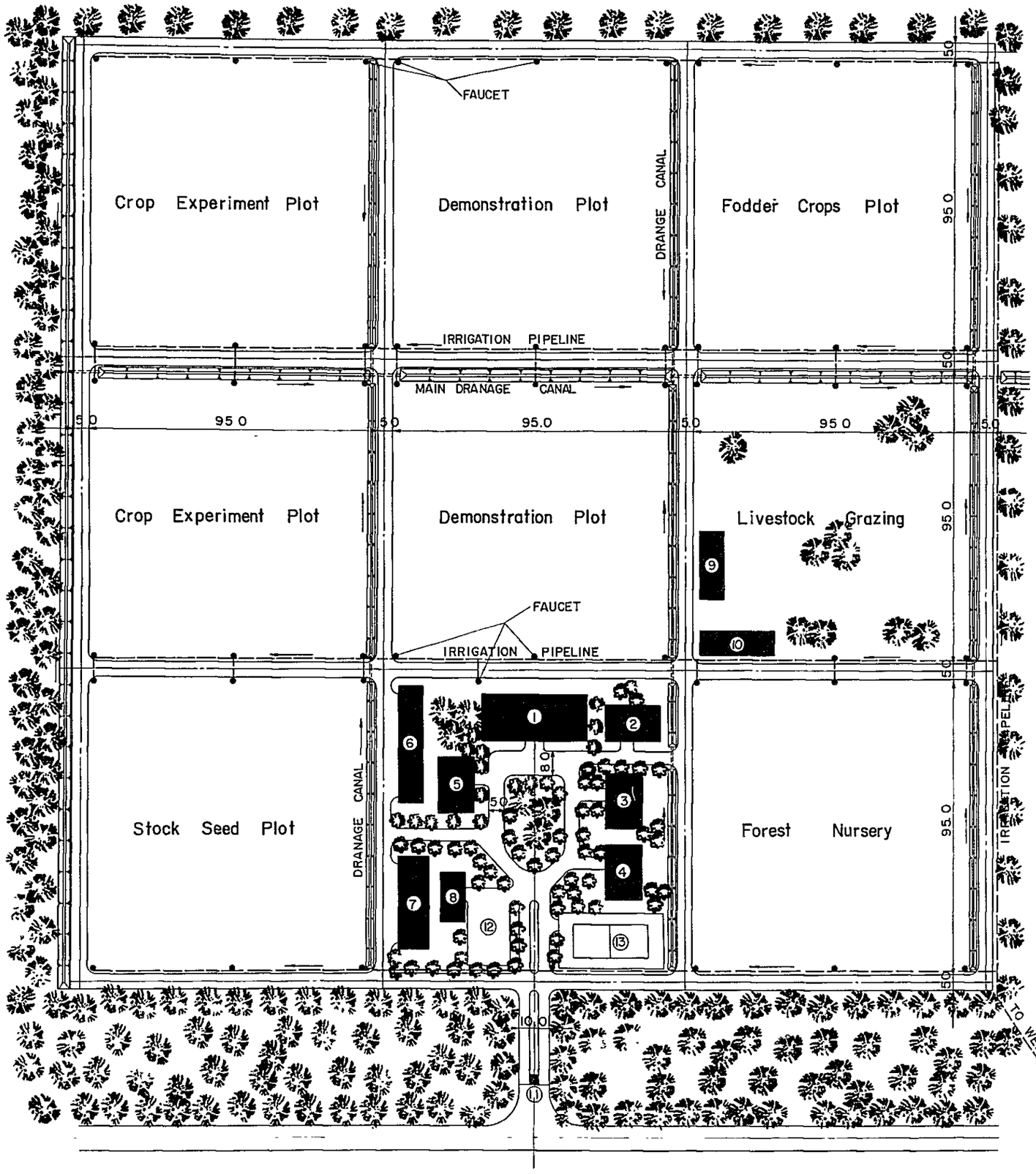
Jabal Nashir

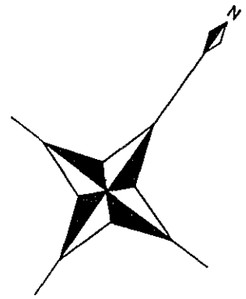
Jabal Yarim

Statute Miles

Kilometres

Fig. 9.3 General Plan of Priority Projects





LEGEND

1 MAIN OFFICE
2 LIVESTOCK DEPARTMENT
3 AFFORESTATION DEPARTMENT
4 IRRIGATION DEPARTMENT
5 CROP RESEARCH DEPARTMENT
6 FARM TOOLS STORAGE
7 FERTILIZER STORAGE
8 WATCHMAN'S DORMITORY
9 FODDER STORAGE
10 STABLE
11 MAIN GATE AND GUARD HOUSE
12 PARKING AREA
13 TENNIS COURT

Fig. 9.4 General Layout of Agricultural Research Station

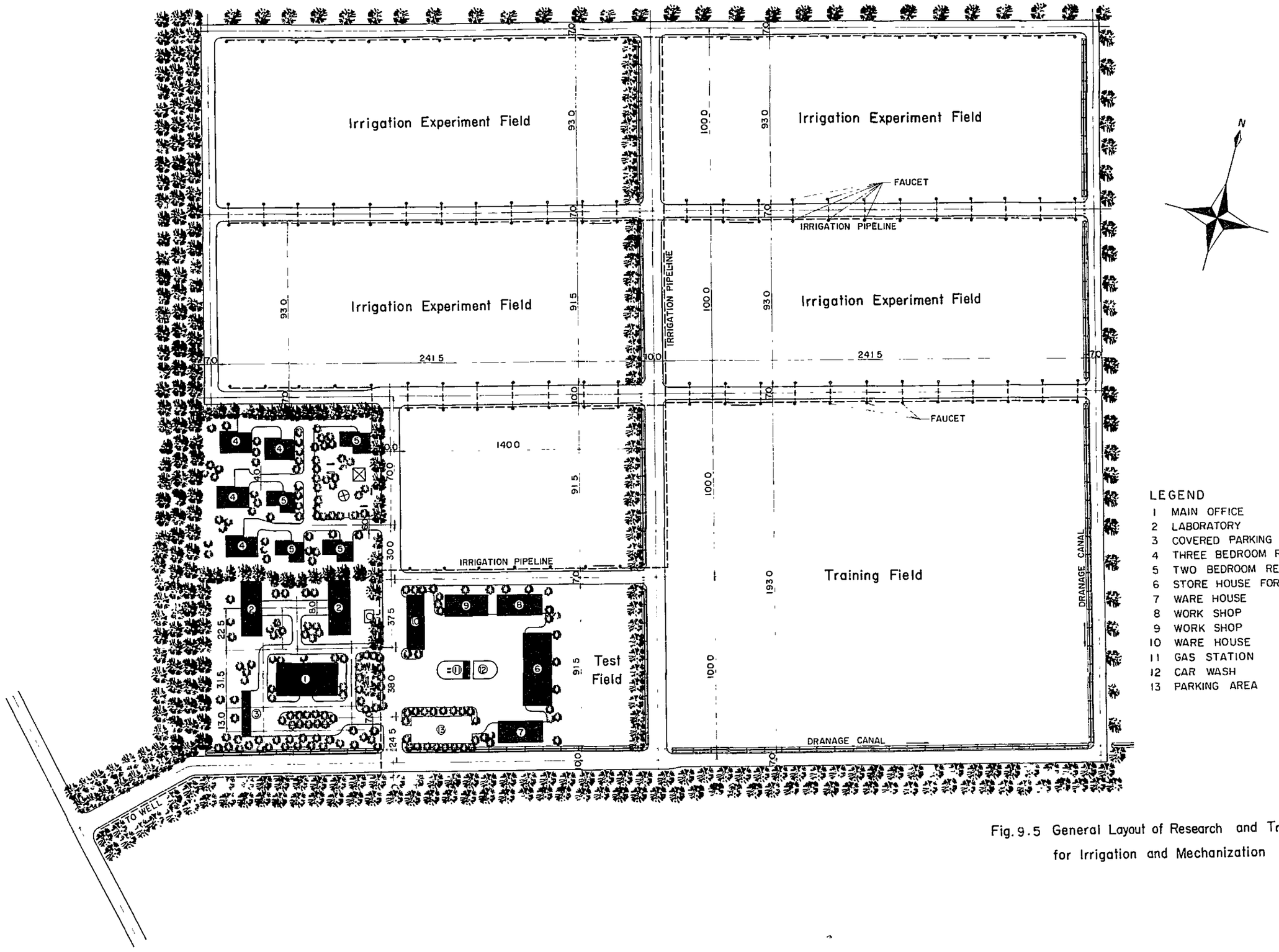


Fig. 9.5 General Layout of Research and Training Center for Irrigation and Mechanization

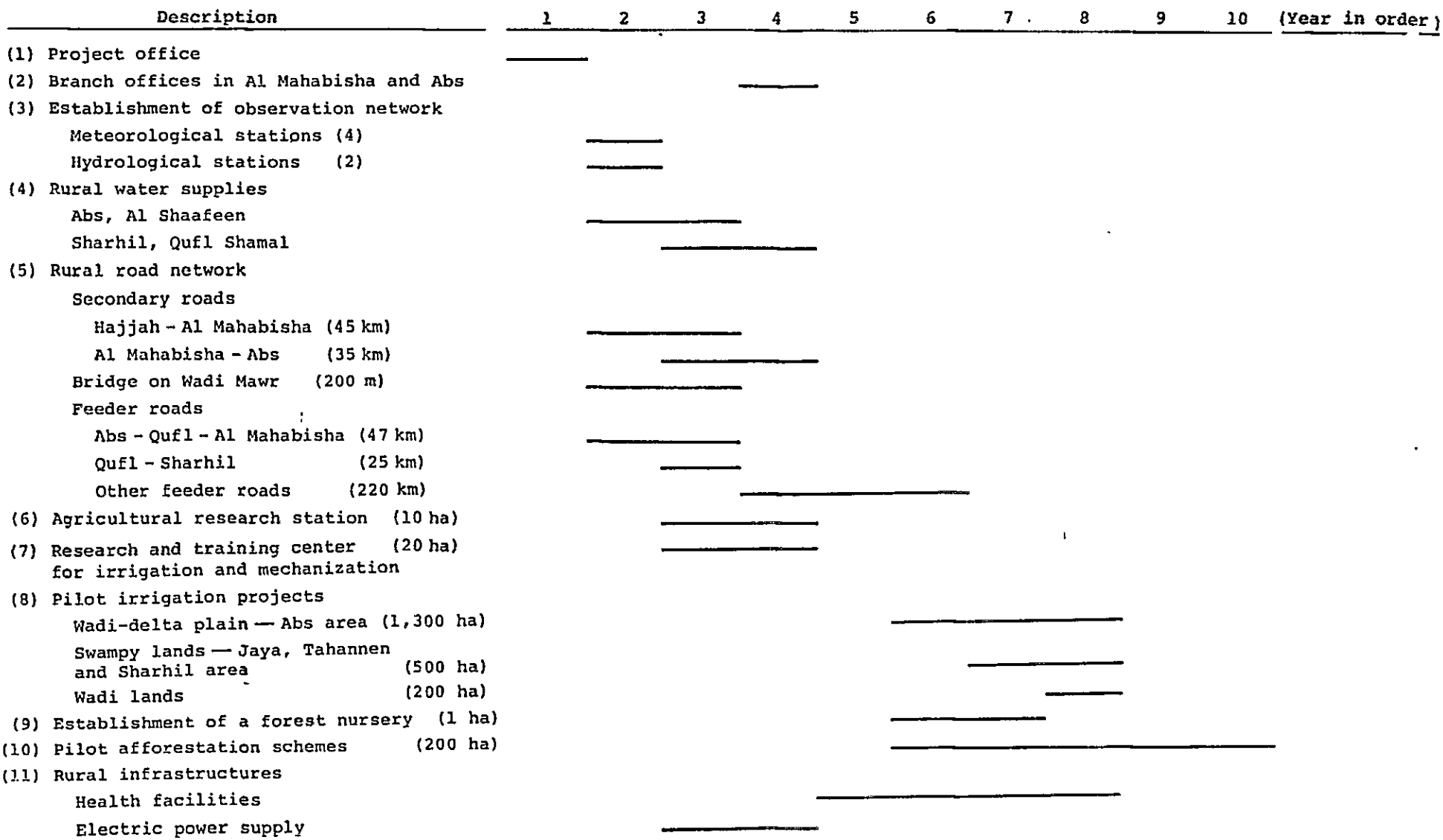


図 9.6　優先プロジェクトの実施スケジュール概定図

Fig. 9.6　Preliminary Implementation Schedule for Priority Projects

SCOPE OF WORKS ON MASTER PLAN STUDY FOR HAJJAH PROVINCE INTEGRATED RURAL DEVELOPMENT IN THE YEMEN ARAB REPUBLIC

(1) Introduction

In response to the request of the Government of the Yemen Arab Republic, the Government of Japan has decided to conduct a study of Master Plan for Hajjah Province Integrated Rural Development in accordance with laws and regulations in force in Japan, and the Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will carry out the study.

The present documents set forth the scope of works in regard to the above-mentioned study which to be carried out in close cooperation with the Government of the Yemen Arab Republic and authorities concerned.

(2) Objectives of the Study

The objectives of the study will be:

a) to formulate, on the basis of the result of the preliminary survey conducted by JICA, the Master Plan for the Integrated Rural Development (hereinafter referred to as "IRD") in Hajjah Province area and

b) to transfer technical knowledge to the Government staff of the Yemen Arab Republic concerned.

(3) Outline of the Study

The Master Plan study consists of the field works in Yemen and home works in Japan.

Field Works

a) Data collection and investigation

1) Natural environment

Topography, geology, soil, meteorology, hydrology and vegetation

2) Social and economic survey:

Culture and history
Land use and land classification
Industry and marketing system
Infrastructures (road, irrigation and etc.)

3) Agricultural survey:

Agricultural infrastructures
Crops, cultivation
Livestock
Farm management and economy
Farmer's association, marketing of agricultural products

b) Plan formulation of the basic IRD

1) Objectives of the IRD
2) Selection and delineation of priority regions in the Province for the staged development
3) Study of development strategy and identification of possible projects
4) Preparation of investment program

Home Works

The Master Plan shall be established in accordance with the findings in the field works, and based on the results of items 3-b and the followings:

a) Data adjustments and analysis

b) Assessment of capable resources and study of the obstructing factors for development

c) Preparation of the Master Plan incoporating the outcome of item 3-b.

(4) Reports

The JICA will prepare and submit the following reports to the Government of the Yemen Arab Republic, according to the attached work schedule.

a) Interim Report: Twenty (20) copies in English at the end of field study on Hajjah Province area.

b) Draft Final Report: Twenty (20) copies in English after the completion of the field works. The Government of the Yemen Arab Republic is requested to provide JICA with its comments after the receipt of the draft final report.

c) Final Report: Fifty (50) copies in English after the receipt of the draft final report.

(5) Undertakings of the Government of the Yemen Arab Republic

To secure the smooth performance of the study, the Government of Yemen Arab Republic is requested:

a) to provide the study team with data and information necessary for the study.

b) all equipments and materials are exempted from taxes and custom duties including personal effects.

c) to assure security of the team during their services in Yemen.

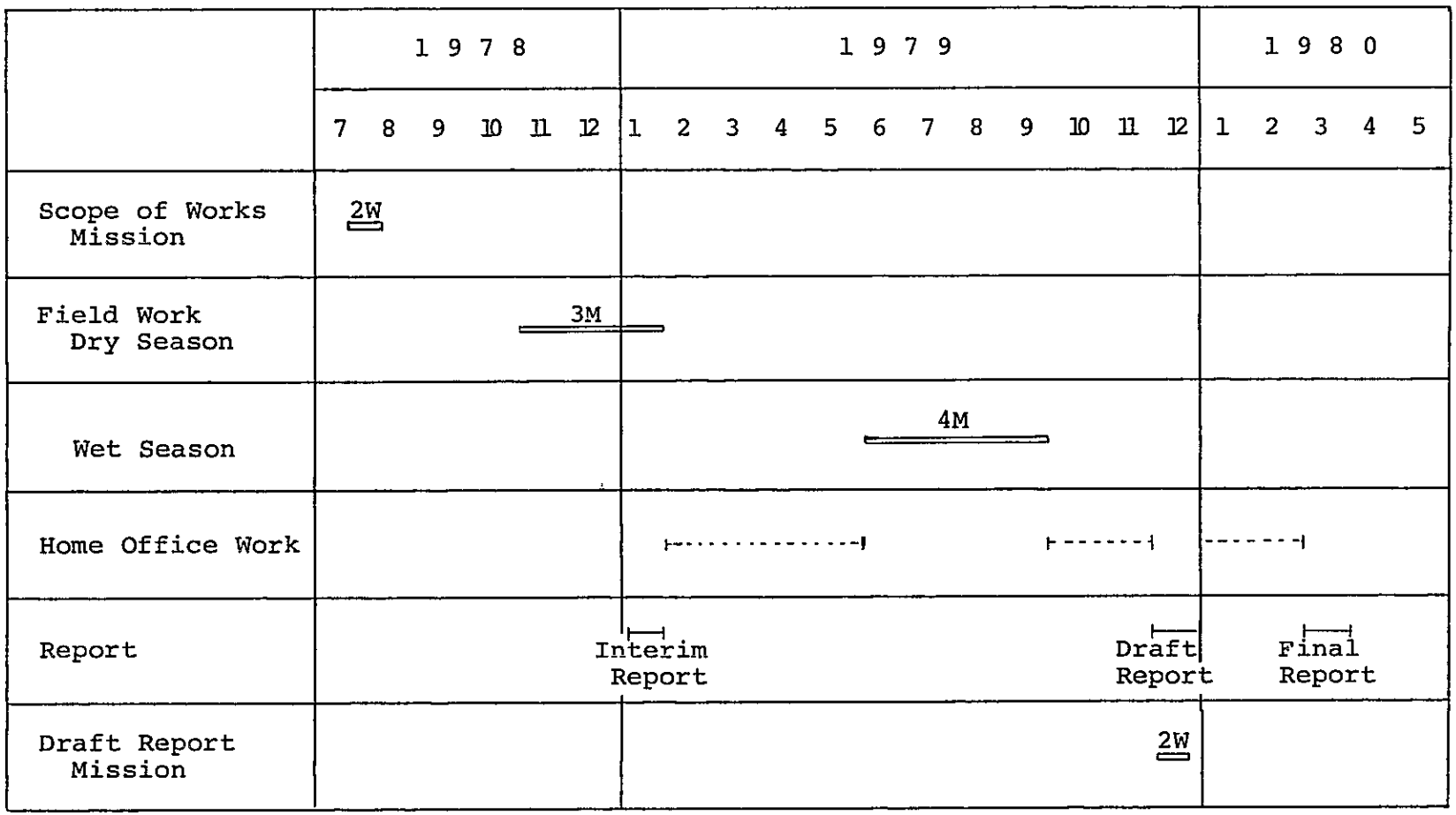
d) to assign the necessary number of counterpart personnel to cooperate and assist the team, as well as to be trained during the implementation of the project.

e) to provide and arrange the study team with suitable office and accommodation in Hajjah Town for about 10 Japanese team members.

f) to assist the team in hiring 4-wheel-drive vehicles.

g) to make necessary arrangements for the work schedule.

WORK SCHEDULE



JAPANESE MASTER PLAN STUDY TEAM

(1) First Study Team

Assignment	Name	Present Position
Leader	Mr. Shizen Inoue	Vice President Agricultural Development Consultants Association, Japan (ADCA)
Photogrammetry	Mr. Toru Kawasaki	Advisor (ADCA)
Remote Sensing	Dr. Mitsuru Nasu	Advisor (ADCA)
Agricultural Economy	Mr. Naoki Ariga	Advisor (ADCA)
Agricultural Engineering	Mr. Takao Kume	Advisor (ADCA)

(2) Second Study Team

Assignment	Name	Present Position
Leader	Mr. Shizen Inoue	Vice President Agricultural Development Consultants Association, Japan (ADCA)
Regional Economy	Mr. Masatoshi Akagawa	Advisor (ADCA)
Agronomy	Mr. Naoki Ariga	Advisor (ADCA)
Geography	Mr. Shoji Ando	Advisor (ADCA)
Geology	Mr. Toru Kawasaki	Advisor (ADCA)
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Ministry of Communication

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