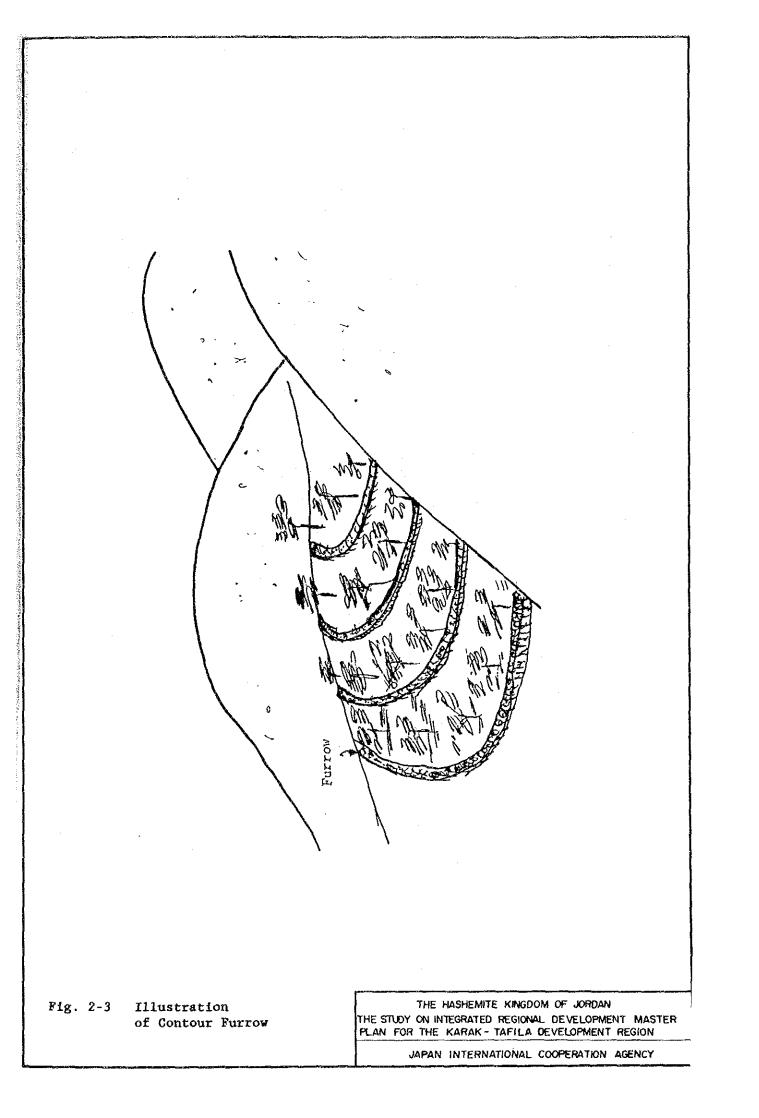
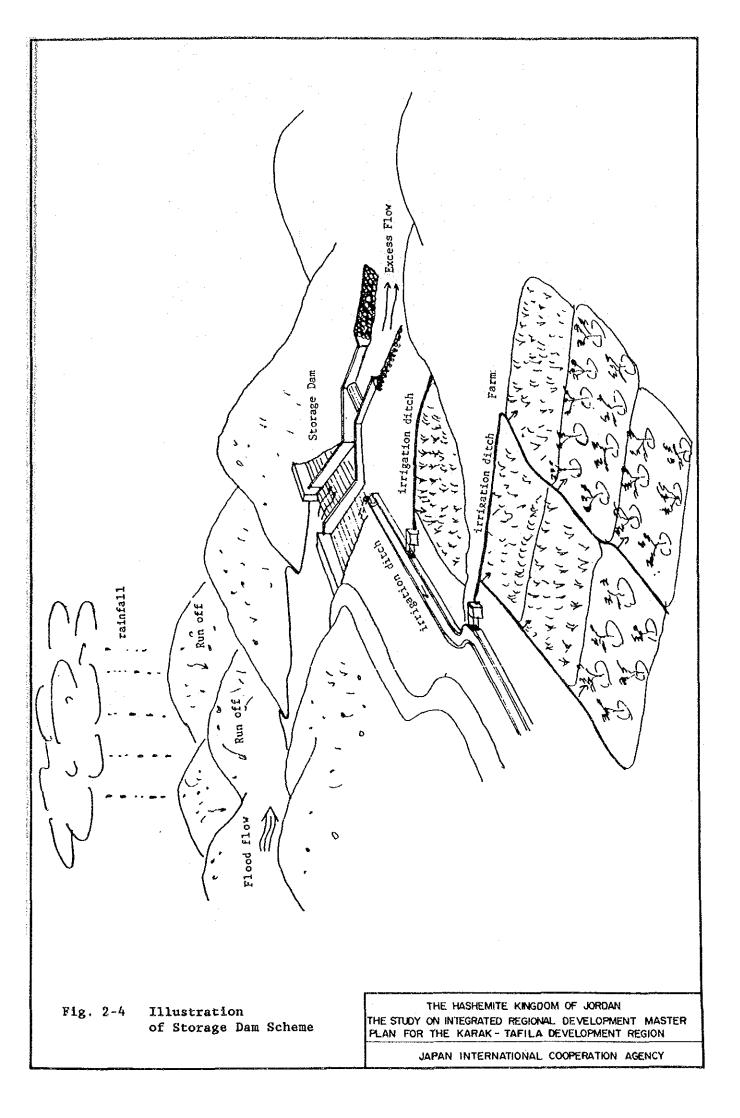
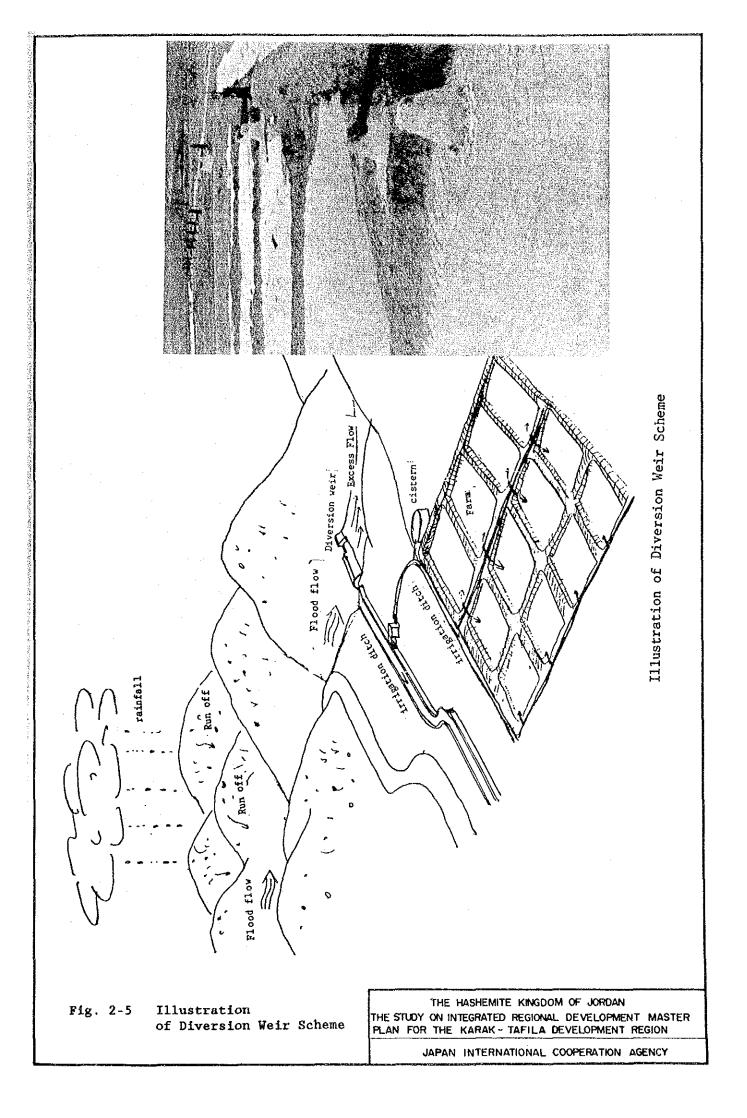
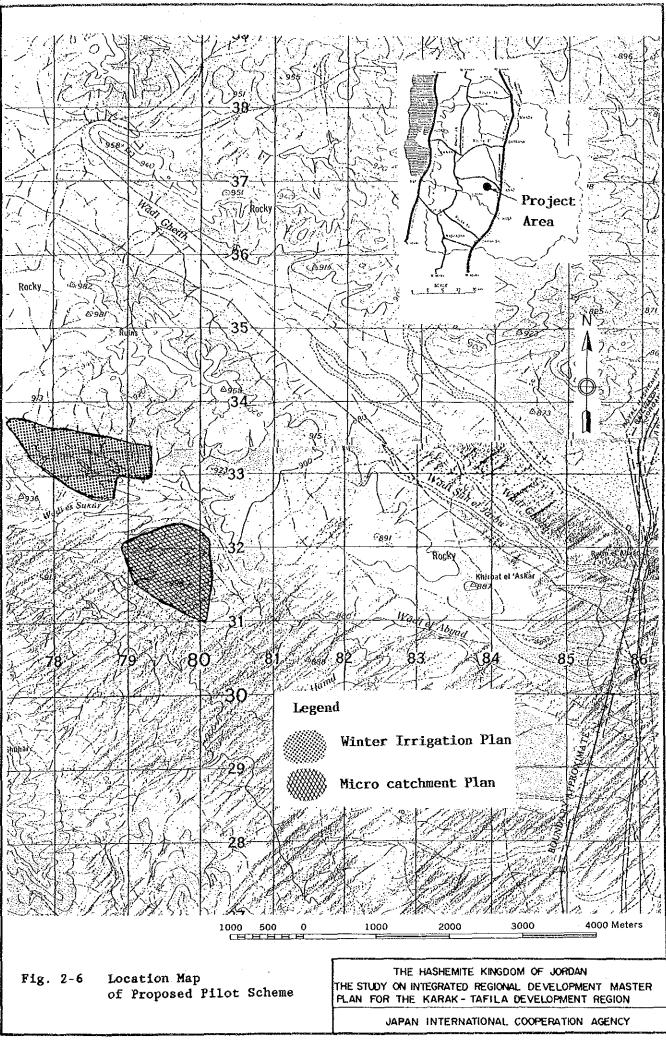


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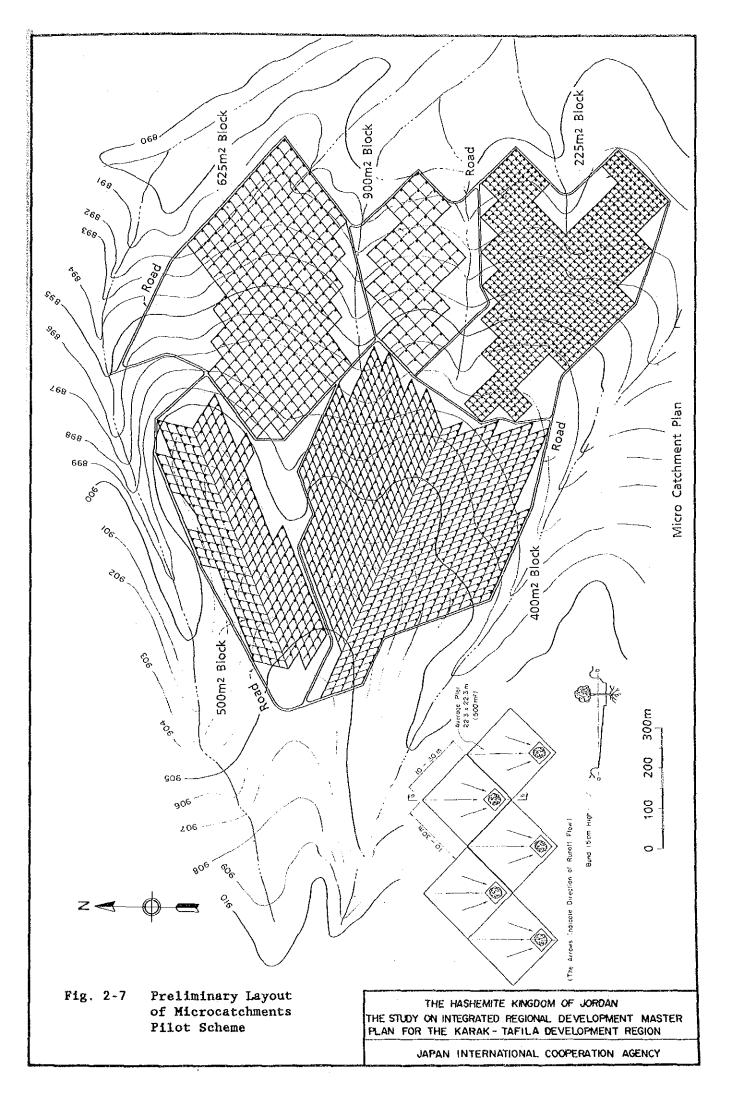


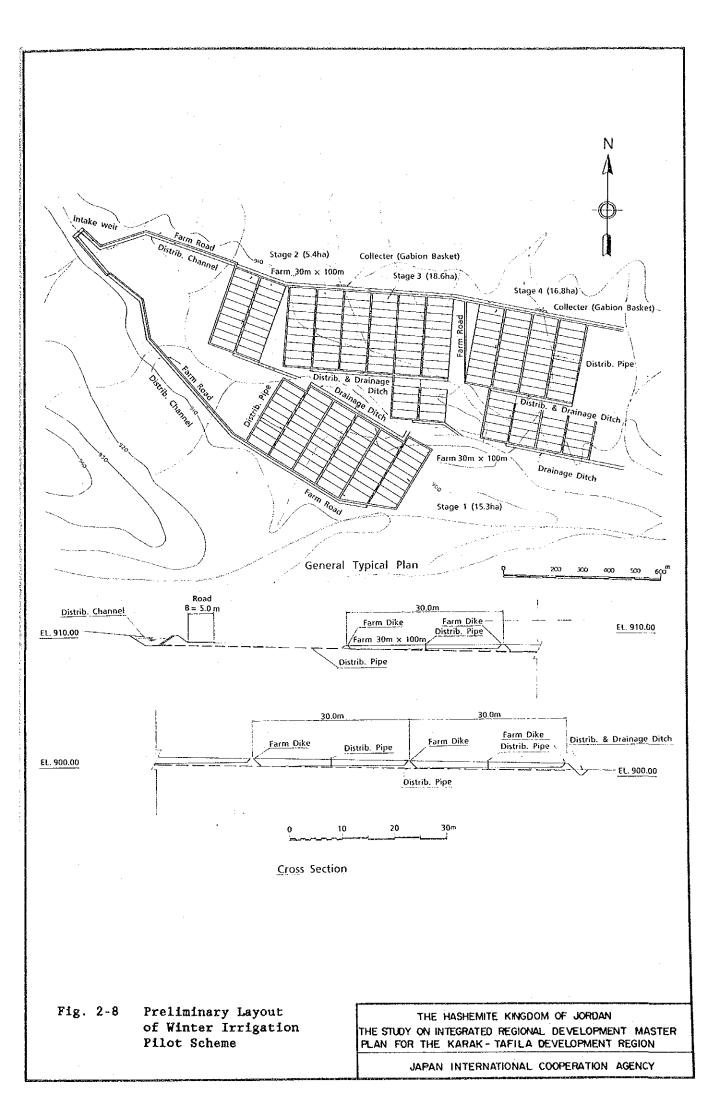


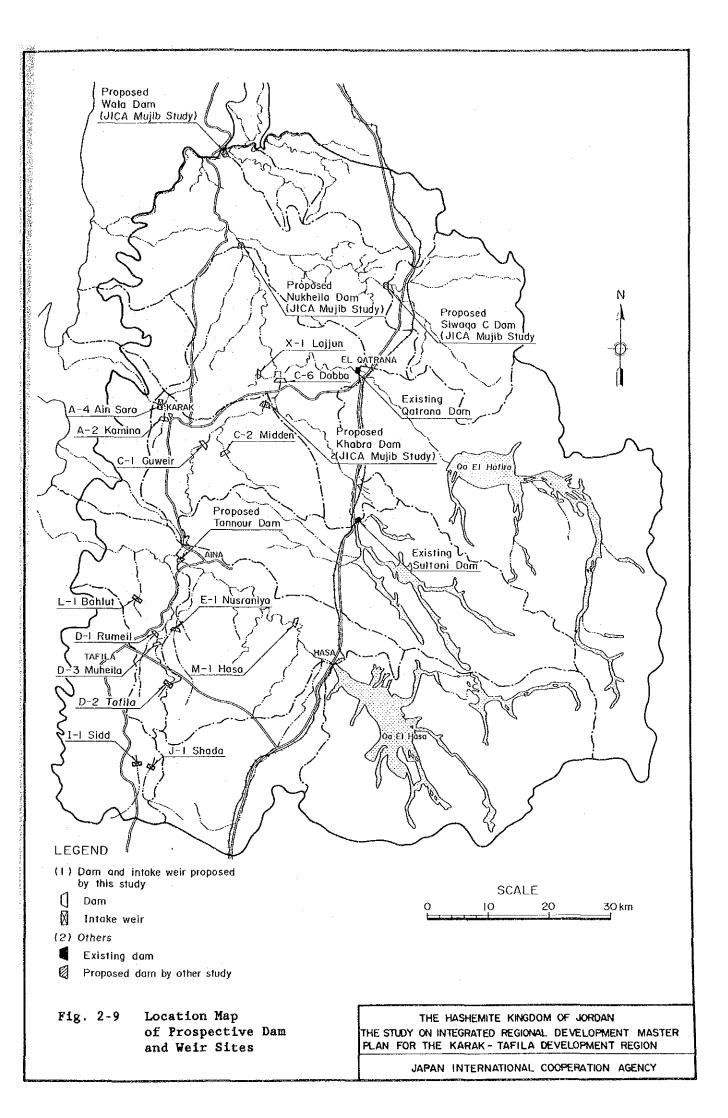


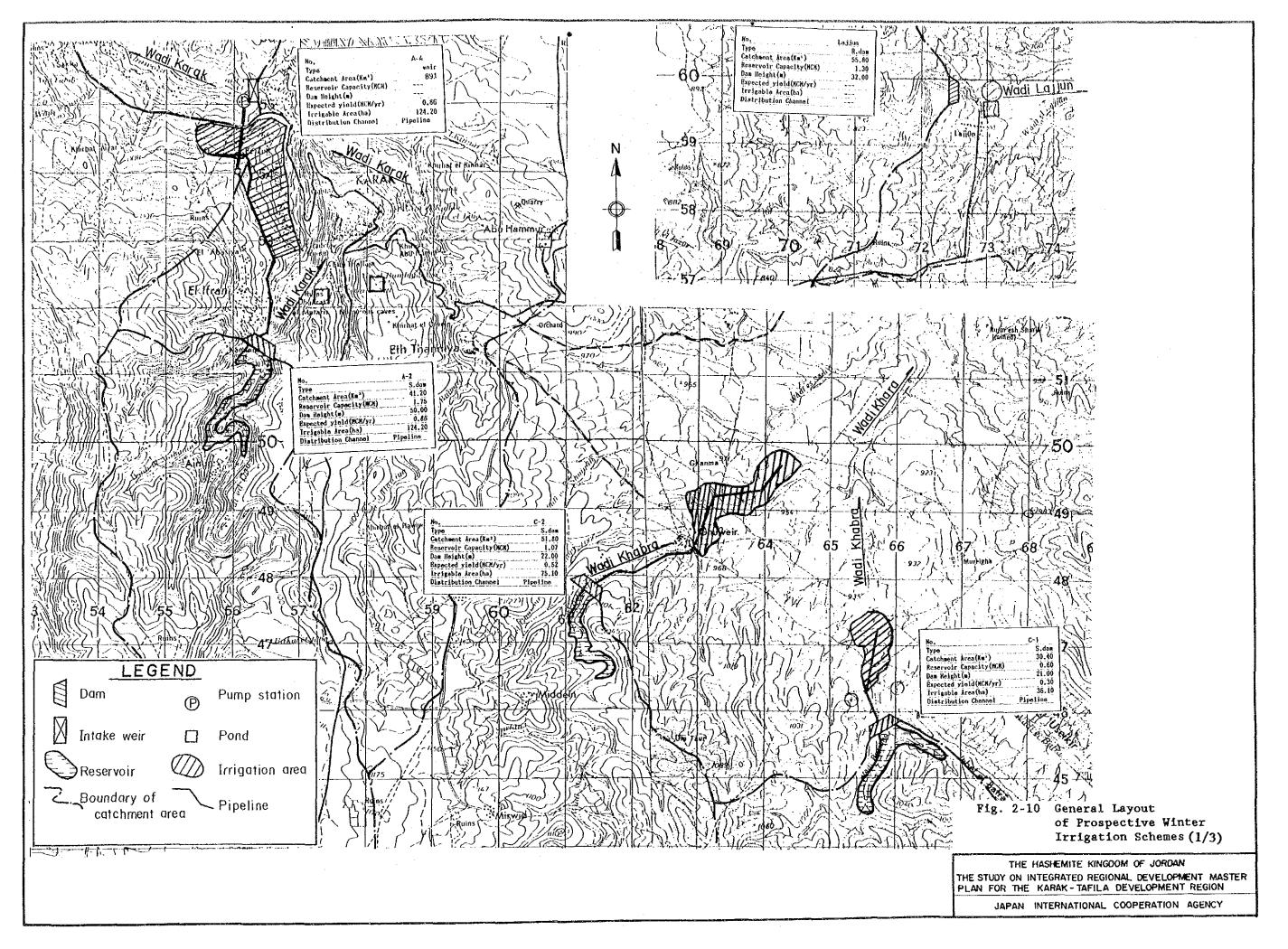


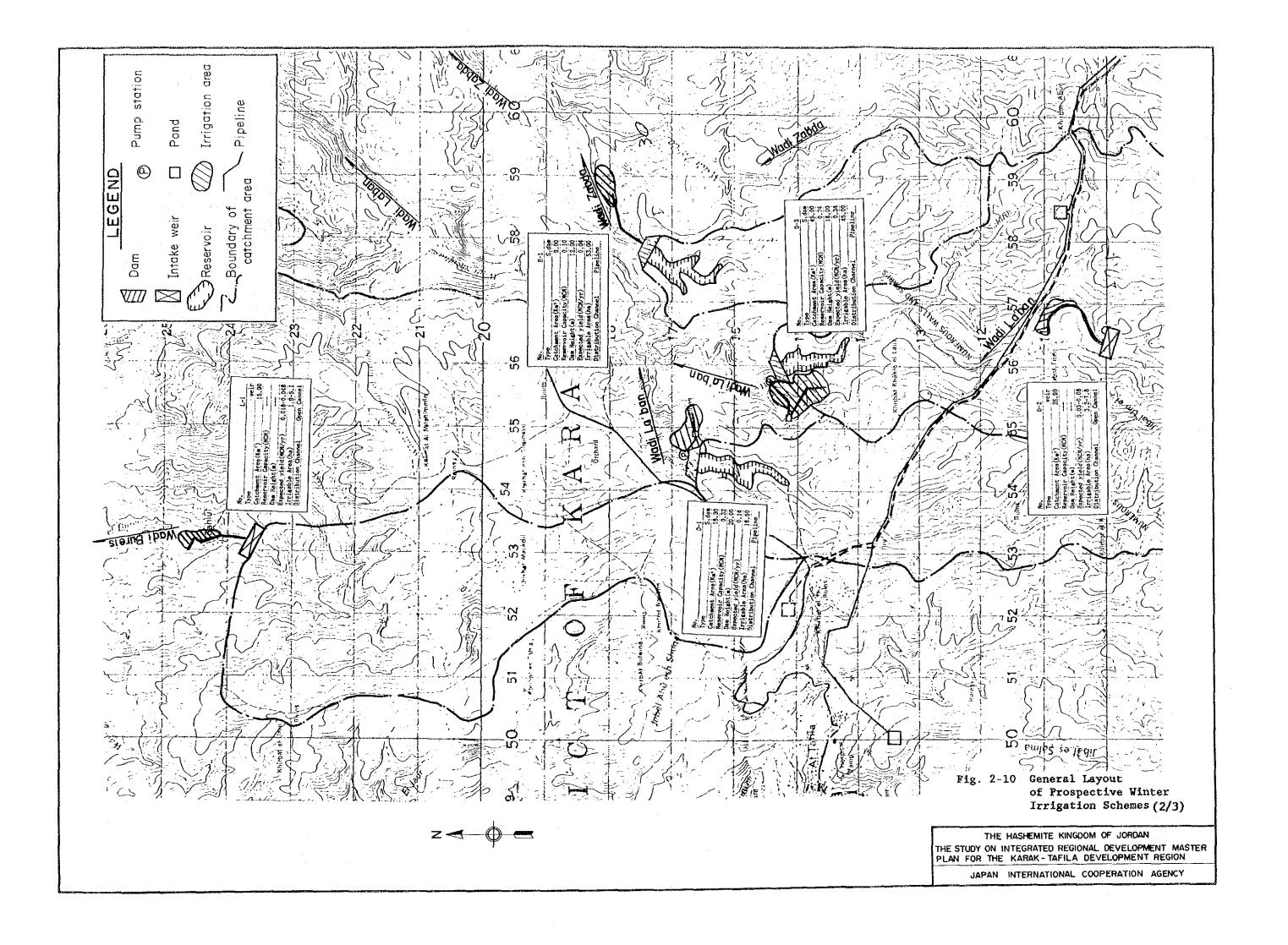
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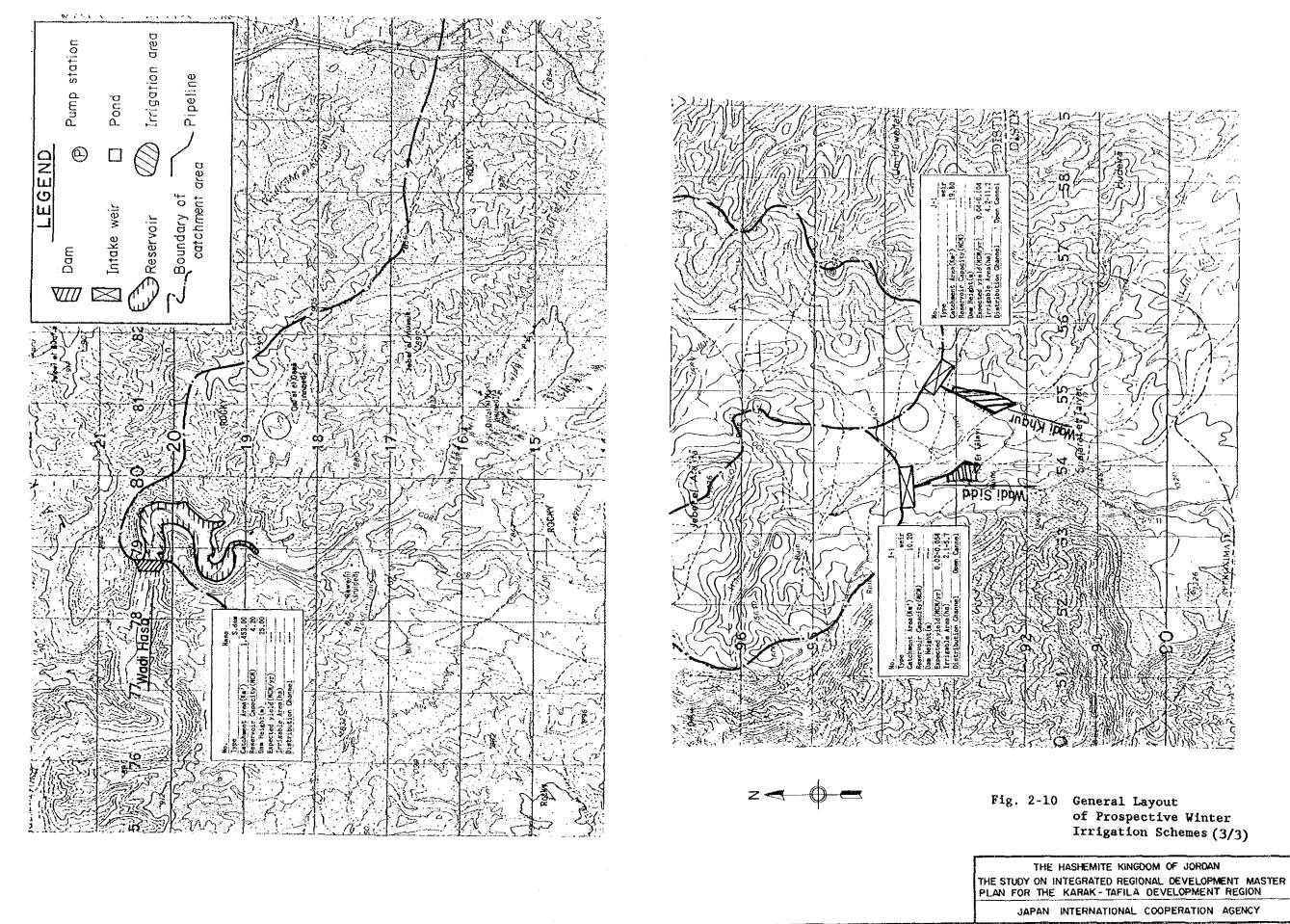


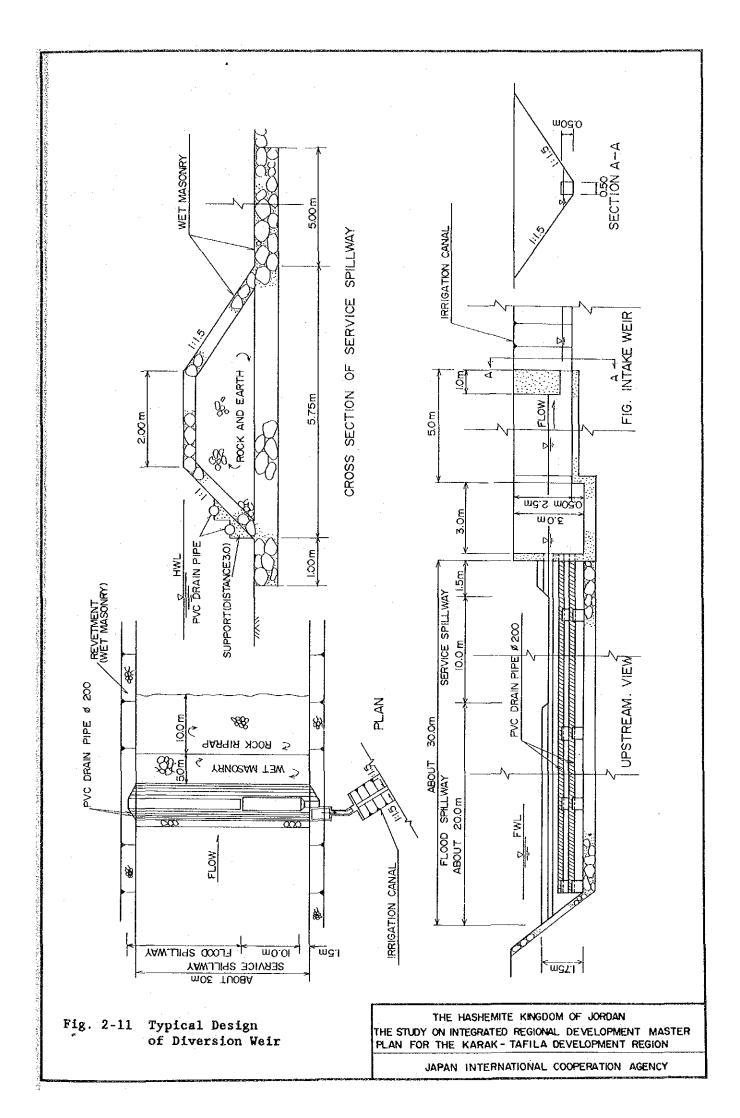


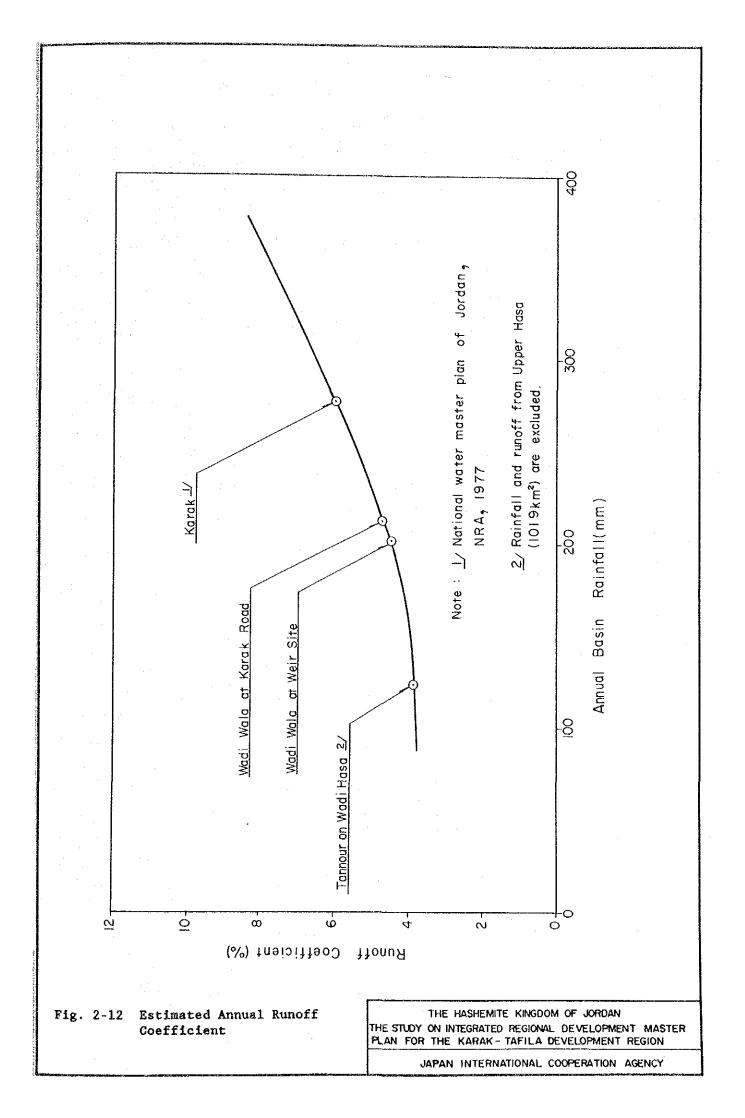




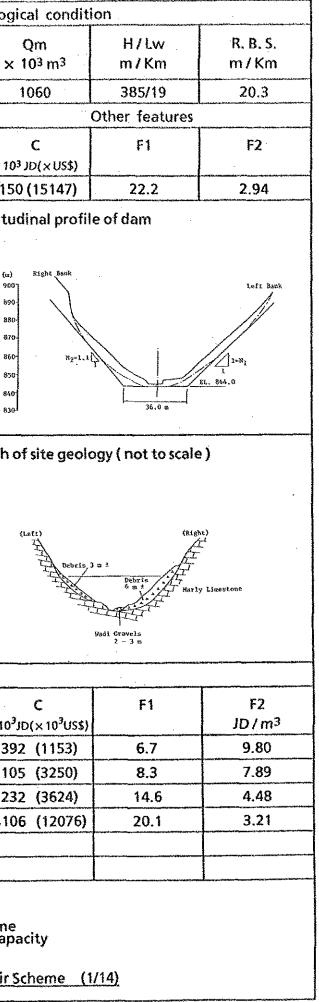




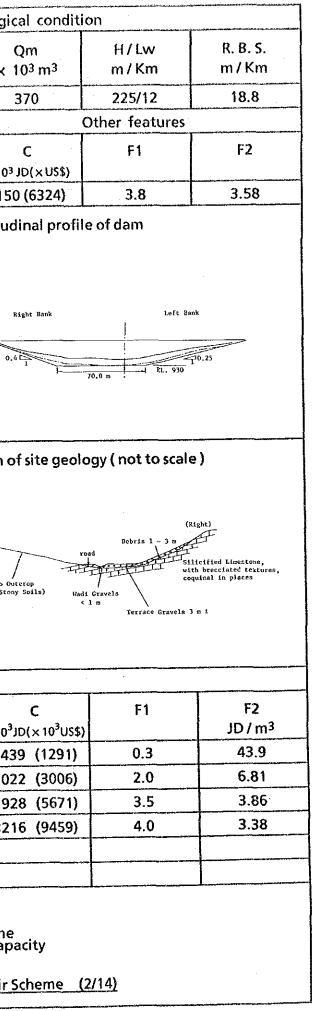




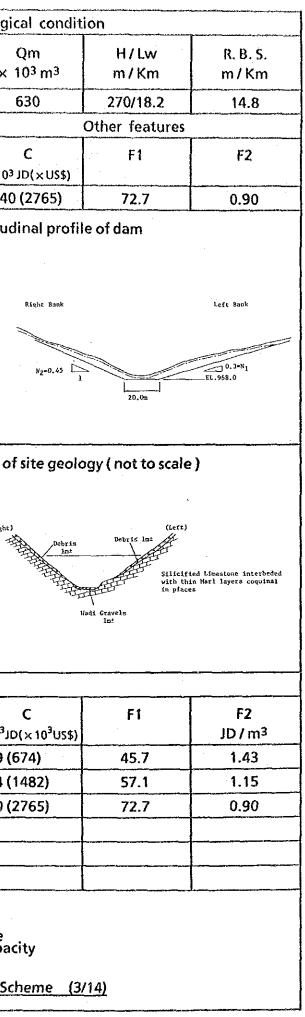
		н -		Contraction of the second s	Loca	ation				Hydrolog
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longitude	Altitude m	C. A. Km²	Rm mm	×
A-2	Kaminna	Karak	Concrete gravity	Karak	31°10.0′	35°41.1'	845	41.8	-340	1
	Features	of dam			Features o	of reservoir		Features w	vater use	****
Crest El. m	Hd	Crest L. m	Vd x 10 <sup>3</sup> m <sup>3</sup>	HWL	R. A. x 10 <sup>3</sup> m <sup>2</sup>	Vs x 10 <sup>3</sup> m <sup>3</sup>	Ve x 10 <sup>3</sup> m <sup>3</sup>	Yield x 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	
894	50	104	78.7	891	130	1750	700	860	124.2	×10 515
Features of site	e topography and	geology	**************************************		<b>,</b> , ,	Curve	of El R. A. and	El Vs		Longitu
the reservoi lands on dow downward far Features of sut	is about 1 ha c r can be transmi nward slopes by mlands, soil dep	itted to farmi gravity flow oth is about 7	lands around El y, According t O cm.	Ifranji by pu o a sounding t	mping or to factor in the set made in the set will be requ	arm- this Curve	60 60 60 60 50 60 60 50 60 60 50 60 60 60 60 60 60 60 60 60 6	0.000 0.043 0.000 0.215 0.070 0.659 0.120 1.521 0.550 4.440 3.0 4.0 5.0 6.0 orage (10 <sup>6</sup> m <sup>3</sup> ) Fill Bap 0 4,000 5,000 6,000 7,000 uction Cost (C) (30 1,0	00}	5800 850 840 830
Calculation tal	ble			· · · · · · · · · · · · · · · · · · ·	, 					
Crest El. m	Hd m	Crest L. m	Vd x 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. x 10 <sup>3</sup> m <sup>2</sup>	Vs x 10 <sup>3</sup> m <sup>3</sup>	Ve × 10 <sup>3</sup> m <sup>3</sup>	Yield × 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	× 10 <sup>3</sup>
860	16	67	6	857	4	40				39
870	26	86	16.9	867	20	140	- <b> </b>			110
880	36	105	35.6	877	56	520				123
890	46	124	63.7	887	104	1280	230			410
₩₩₩₩ <sup>₩</sup> ₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩				·			· ####################################	- -		
Rm A Om A Lw W R. B. S. Ri Crest EL C	atchment area nnual average rai nnual average rur /ater course lengt /er bed slope rest elevation eight above lowes	nfall off h	L Crest L Vd HWL R. A. Vs Ve am I. A.	; Dam volu	th me of reservoir sur area rge capacity storage capacity area	face	C F1 F2 Fig. 2 - 13	Construction co Initial storge ca Construction co Site Characteristi	pacity / Dar st / Initial si	



					Loca	ition				Hydrologic
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longituc	e Altitude m	C. A. Km²	Rm mm	x 1
C - 1	Ghuweir	Kebra	Fill	Karak	31°13.1′	35°47.0	935	30.4	237	· · · · · · · · · · · · · · · · · · ·
an a	Features	of dam			Features o	f reservoir	and a second	Features v	water use	
Crest El.	Hd	Crest L.	Vd	HWL	R.A.	Vs	Ve	Yield	I. A.	
m	m	m	× 10 <sup>3</sup> m <sup>3</sup>	m	× 10 <sup>3</sup> m <sup>2</sup>	x 10 <sup>3</sup> m	3 × 10 <sup>3</sup> m <sup>3</sup>	× 10 <sup>3</sup> m <sup>3</sup>	ha ha	× 10 <sup>3</sup>
951	21	211	159.3	948	70	600	320	300	36.1	2150
Features of site	e topography and	geology	· ·			Cu	rve of El R. A. and	El Vs		Longitud
upper slope at 5 m thick are 5 m or m and thin rec Features of irri		of damsite. L lope of left b i beds are com s.	ower slope of ank consists of posed of terra	cight bank is c stony, thick ce gravels at 5	covered by deb soil covers wh 5 m or more th	oris nich nick	970 980 Area Cur 970 5 960 5 950 950 940 940 935	0     0       0.031     0.031       0.231     2.469       1.131     15.095	0 3)	(m) 990 970- 960- 950- 950- 950- 930- 0.
thick, Some	ial land exists land is used races could eas fore, not only	for rainfed fa	rming, but the acted for stor:	ing flood water	diverted fro		rve of Hd - C			Sketch o
be required	ndwater well ex in the reservoi	ists at about r area.	200 m to the e	ast. Little c	ompensation w	ould	Image: Specific construct Image: Specific construct Image: Specific construct   Image: Specific construct Image: Specific construct Image: Specific construct	Fill Dam Fill Dam 0 4,000 5,000 6,000 7,000 on Cost (C)	1,000)	(Left) No Out (Stony
Calculation ta	1				P A	Vs	Ve	Yield	I. A.	
Crest El.	Hd	Crest L. m	Vd x 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. x 10 <sup>3</sup> m <sup>2</sup>	x 10 <sup>3</sup> n	4	x 10 <sup>3</sup> m <sup>3</sup>	ha	× 10 <sup>3</sup> J
m	10 m	135	32.5	937	5	10				43
940	15	168	75.7	942	25	150				102
945	20	200	142.8	947	60	500	220			192
955	25	233	238.2	952	110	950	670			321
Note C. A. C Rm A Qm A Lw V R. B. S. R Crest El. C Hd ; H	atchment area nnual average ra nnual average ru Vater course leng iver bed slope rest elevation leight above lowe	infall noff th est foundation d	Crest Vd HVVL R. A. Vs Ve am I. A.	Elevation Reservoir	of reservoir sur area rge capacity storage capacit		C F1 F2 Fig. 2 - 13	Construction Initial storge Construction Site Characteri		

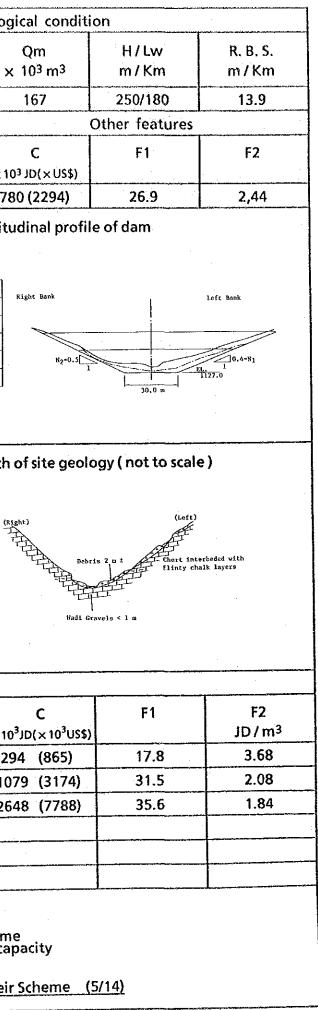


					Loca	ation				<b>.</b>	Hydrologic
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longi	tude	Aititude m	C. A. Km²	Rm	×
C-2	Midden	Kabra	Concreté gravity	Karak	31°08.1'	35°44	4.4'	970	51.8	237	
and a first hit parameters of the state of the	Features '	· · · · · · · · · · · · · · · · · · ·	1		Features c	. Langer and the second se			Features v	L	
Crest El.	Hd	Crest L.	Vd	HWL	R. A.	V	 S	Ve	Yield	I. A.	
m	m	m	x 10 <sup>3</sup> m <sup>3</sup>	m	× 10 <sup>3</sup> m <sup>2</sup>	× 10		× 10 <sup>3</sup> m <sup>3</sup>	$\times 10^3 \mathrm{m}^3$	ha	x 10 <sup>3</sup>
990	22	142	14.3	987	126	104	10	460	520	75.1	940
Features of site	e topography and	geology					Curve o	of El R. A. and	El Vs		Longitud
exposes at 1 N60 <sup>0</sup> E and di	weakly jointed, ower slopes of ps up to 18° to Wadi sediments gable area	both right a N. Debris c	nd left banks o overs both uppe	of damsite. I er slopes of d	Limestone stri amsite at 1 m	ikes	Elevation	000 010 000 90 560	4 0.3 0.2 0.1 0 rea Curve Storage Curve		(5) 1020 1010 1000 5 990 990 970 970 980
tains many st	nds exist downst ones and is not and could be irr	suitable for	agriculture. H	lowever, land l	ocated higher	up -	Curve o	of Hd - C	(10°m²	<b>)</b> :	Sketch of
<u>Features of sub</u> <u>C-2</u> : The way	omergedarea li forms a deep	valley having	a V-shaped sect	tion.		· · · · · · · · · · · · · · · · · · ·	Dam Reisht	50 40 30 20 10 1,000 2,000 3,000 4 Construct	000 5,000 6,000 7,000 (JD 1 fon Cost (C)	1,009)	(Rfght) 野
Calculation tal	ole	······································			· · · · · · · · · · · · · · · · · · ·						
Crest El.	Hd	Crest L.	Vd	HWL	R. A.	V	5	Ve	Yield	I.A.	
m	<u>m</u> .	m	× 10 <sup>3</sup> m <sup>3</sup>	m	× 10 <sup>3</sup> m <sup>2</sup>	× 10		× 10 <sup>3</sup> m <sup>3</sup>	× 10 <sup>3</sup> m <sup>3</sup>	ha	× 10 <sup>3</sup> JD
980	12	87	3.5	977	40	16			·		229 (6
985	17	114	7.7	982	80	44		·			504 (1
990	22	142	14.3	987	126	104	10	460			940 (2
Note C. A. ; Ca			Croctil	· Cract lana	th		<u></u>		Construction co	Dist	
R. B. S. Rd Hd	atchment area nnual average rair nnual average run 'ater course lengti ver bed slope rest elevation eight above lowes	nfall off t foundation da	Crest L. Vd HWL R. A. Vs Ve am I. A.	Dam volui Elevation Reservoir Initial stor Ultimates Irrigable a	th me of reservoir sur area ge capacity storage capacity area	face /		C F1 F2 Fig. 2 - 13	Initial storge ca Construction co Site Characterist	apacity / Dan ost / Initial st	

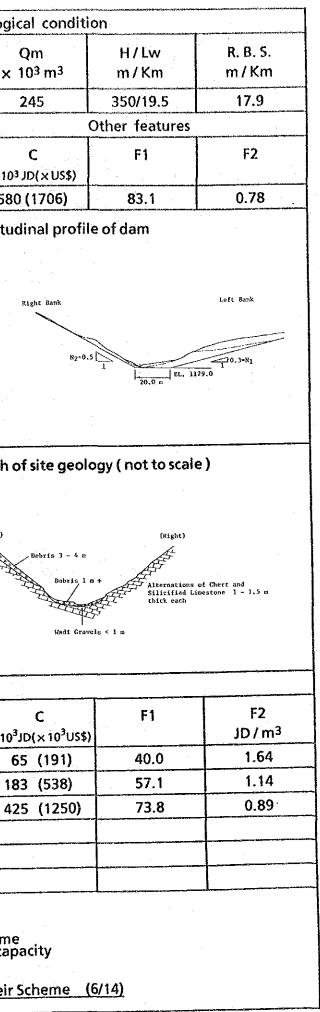


					Loca	tion			H	ydrological conditio	)	
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longitude	Altitude m	C. A. Km²	Rm mm	Qm × 10 <sup>3</sup> m <sup>3</sup>	H/Lw m/Km	R. B. S. m / Km
X - 1	Lajjun	Lajjun	Concrete gravity	Karak	31°14.4'	35°51.4′	715	55.8	251	761	285/14	20.4
	Features	of dam			Features o	f reservoir		Features w	ater use	0	ther features	
Crest El. m	Hd m	Crest L. m	Vd × 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. x 10 <sup>3</sup> m <sup>2</sup>	Vs × 10 <sup>3</sup> m <sup>3</sup>	Ve x 10 <sup>3</sup> m <sup>3</sup>	Yield x 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	C ×10 <sup>3</sup> JD(×US\$)	F1	F2
745	32	180	35.2	742	110	1300	470	620		2300 (6765)	36.9	1.77
	e topography and	aeoloav				Curve	of El R. A. and I	El Vs		Longitudinal profile	of dam	
Tayers. Do Features of irr	ebris is very thi igable area	LII ON DOTH VAJ	liey slopes of d	ausite.			730 720 720 720 77	(10)     Area     Receipt       15     0     0       20     0.013     0.031       30     0.044     0.313       40     0.105     1.0655       50     0.173     2.446       60     0.284     4.735       70     0.806     9.196       5.0     6.0     7.0     8.0     9.0     10       Storage     (10)     100     100     100     100	0 5 <del>0</del> 3)	(m) 780 770 760 9750 740 740 730 730 $N_2=0.6$	EL, 717	.0
	· .					Curve	of Hd - C			Sketch of site geolog	y ( not to scal	e)
X-1: Laii	bmerged area un Spring is use sed for groundwa	d for irrigat ter rechargin	ion of farmlands g.	spreading dow	mstream. Thi	cht (Hd)	40 30 20 10 0 1, <del>cos</del> 2, <u>obo</u> 3, <u>obo</u> 4, <u>ob</u>	Fill Dan Fill Dan 60 5,000 6,000 7,000 8,000 9 wetion Cost (C) (				
Calculation ta	able	<del>.</del>	<u></u>						· · · · · · · · · · · · · · · · · · ·			-1
	Hd m	Crest L. m	Vd × 10 <sup>3</sup> m <sup>3</sup>	HWL	R. A. x 10 <sup>3</sup> m <sup>2</sup>	Vs x 10 <sup>3</sup> m <sup>3</sup>	Ve × 10 <sup>3</sup> m <sup>3</sup>	Yield x 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	C × 10 <sup>3</sup> JD(× 10 <sup>3</sup> US\$)	F1	F2 JD/m
Crest El.		105	7.2	727	30	150				471 (1385)	20.8	3.14
Crest El. m	17	155	22.7	737	80	800	-	· · ·		1485 (4368)	35.2	1.86
Crest El.	27		52.1	747	150	2000	1170			3407 (10020)	38.4	1.70
Crest El. m 730		205	54.3		225	3950	3120		· · · · · · · · · · · · · · · · · · ·	6540 (19235)	39.5	1.66
Crest El. m 730 740	27	205 255	100.0	757	235					i		ł
Crest El. m 730 740 750	27 37			757	233		· · · · · · · · · · · · · · · · · · ·					

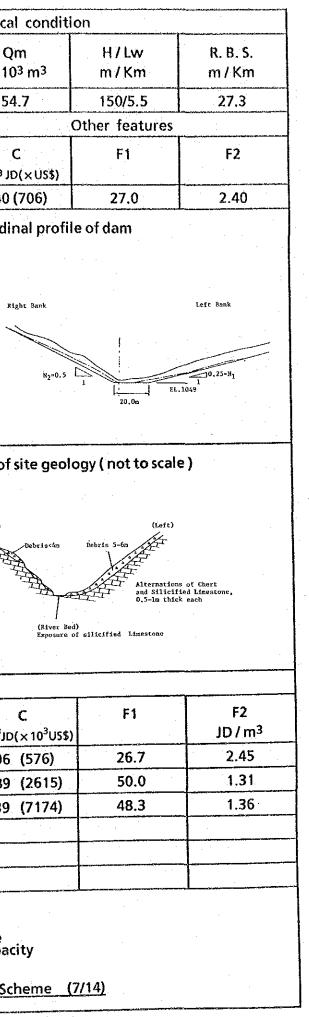
المنظومة بالانتراب <u>والمسا</u> فر ويتعارف والمنظوم والمنظر المنظري المنظري المنظر المنظر المنظر المنظر والمنظر والم					Loca	tion			1	lydrologi
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longitude	Altitude m	C. A. .Km²	Rm mm	×
D - 1	Rumeila	La'ban	Concrete gravity	Tafila	30°47.7'	35°34.4'	1130	18.3	201	
and and a second se	Features	of dam			Features o	f reservoir		Features w	ater use	
Crest El. m	Hđ	Crest L. m	Vd × 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. x 10 <sup>3</sup> m <sup>2</sup>	Vs x 10 <sup>3</sup> m <sup>3</sup>	Ve x 10 <sup>3</sup> m <sup>3</sup>	Yield × 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	× 10 <sup>3</sup>
1147	20	120	11.9	1144	40	320	120	140	18.5	780
Features of site	e topography and						of El R. A. and			Longitud
N80 <sup>0</sup> E strike 3 m thick.	y of damsite co and 5 <sup>o</sup> S dip. Do Wadi beds are c wadi gravels.	ebris mainly co	overs lower slo	pe of left ban	k, which is 2	to and	1190 1180 1170 Storage Curve 1160 1150 1140 1140 1160 0 1160 0 1160 0	Area Curve	· · · · · · · · · · · · · · · · · · ·	1180 1170 - R 1160 - 5 1150 - 5 1140 - 1130 - 1120 -
<u>D-1</u> : The wa For irrigat static head	adi develops tou ion of farmland will be require ough the topogn	ds located ups ed. This upstr	tream from the eam land may b	e site, pumpir e irrigated by	ng of 50-80 m a diversion v	n in weir <b>Curve</b>	0 1.0 2.0 3.0 Store of Hd - C	4.0 5.0 <u>6.0</u> 7.0 8.0 gc (10 <sup>6</sup> m <sup>3</sup> )		Sketch o
<u>Features of sul</u> <u>D-1</u> : Part	bmerged area of the upstream	n farmlands wil	1 be submerged.			Dam Height (Hd)	10	()) Daes	000 <u>)</u>	
Calculation ta	<u>ble</u>			· · · · · · · · · · · · · · · · · · ·	1					
Crest El. m	Hd	Crest L. m	Vd × 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. × 10 <sup>3</sup> m <sup>2</sup>	Vs x 10 <sup>3</sup> m <sup>3</sup>	Ve x 10 <sup>3</sup> m <sup>3</sup>	Yield × 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	× 10 <sup>3</sup>
1140	13	89	4.5	1137	16	80	-			294
1150	23	134	16.5	1147	52	520	320	;.		107
1160	33	179	40.5	1157	116	1440	1240			264
					· ]					
				·						
Note C. A. ; C Rm , A Qm , A Lw , R. B. S. ; F Crest El. ; C Hd ; H	Catchment area Annual average ra Annual average ru Mater course leng River bed slope Crest elevation Height above lowe	infall inoff th est foundation d	Crest I Vd HWL R. A. Vs Ve am I. A.	: Elevation	gth ime of reservoir sur rarea orge capacity storage capacit area	-face y	C F1 F2 <u>Fig. 2 - 13</u>	Construction co Initial storge ca Construction co Site Characterist		



					Loca	ition		And the first state of the porty of the second state of the		Hydrologic
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longitude	Altitude m	C. A. Km²	Rm mm	( x 1
D-3	Muheima	La'ban	Concrete gravity	Tafila	30°50.5'	35°40.3′	1130	26.9	201	
and an and a second	Features	of dam		and the second	Features o	f reservoir		Features w	vater use	
Crest El.	Hd	Crest L.	Vd	HWL	R. A.	Vs	Ve	Yield	I. A.	
m	m	m	× 10 <sup>3</sup> m <sup>3</sup>	m	× 10 <sup>3</sup> m <sup>2</sup>	× 10 <sup>3</sup> m <sup>3</sup>	× 10 <sup>3</sup> m <sup>3</sup>	× 10 <sup>3</sup> m <sup>3</sup>	ha	× 10 <sup>3</sup> J
1147	18	116	8.9	1144	106	740	260	340	45	580
Features of site	e topography and	geology		•	 	Curv	e of El R. A. and	El Vs		Longitud
5 m thick in	50 <sup>0</sup> W strike and n maximum and on i sediments are gable area	ly small outer	ops of silicif	ied limestone a	ered by debri	s or .ower	1130	EL (m) And R0555 1130 0 0 1140 0.065 0.313 1160 0.394 4.676 3.0 4.0 5.0 6.0 7	.0 0 <sup>6</sup> <i>a</i> <sup>3</sup> )	(m) 1170 1160 5 1159 8 1140 8 1140 1130 1120
of about 30	is no farmland: -50 m in static stream from D-3	head will be a	bank but a li cequired. A di	ttle in the le version weir s	ft bank. Pum cheme needs t	o be	ve of Hd - C			Sketch of
Features of sul	omerged area						50 40 FB 30 Concrete Gr 52 20 Fill Da 0 1,000 2,000 Constr		10 1,000)	(Left)
	· · · · · · · · · · · · · · · · · · ·							n an		
Calculation ta Crest El. m	Hd	Crest L. m	Vd × 10 <sup>3</sup> m <sup>3</sup>	HWL	R. A. × 10 <sup>3</sup> m <sup>2</sup>	Vs × 10 <sup>3</sup> m <sup>3</sup>	Ve x 10 <sup>3</sup> m <sup>3</sup>	Yield x 10 <sup>3</sup> m <sup>3</sup>	I.A. ha	× 10 <sup>3</sup> J
1135	m6	52	1	1132	8	40				65
1133	11	79	2.8	1137	36	160				183
1150	16	105	6.5	1142	80	480				425
									<u> </u>	
Note C. A. ; C Rm ; A Qm ; A Lw ; V R. B. S. ; F Crest El. ; C Hd ; H	Catchment area Annual average ra Annual average ru Vater course leng liver bed slope Crest elevation leight above lowe	infall noff th est foundation d	Crest Vd HWL R. A. Vs Ve am I. A.	L. ; Crest len ; Dam volu ; Elevatior ; Reservoir ; Initial sto ; Ultimate ; Irrigable	gth Ime of reservoir su rarea orge capacity storage capacit area	rface ty	C F1 F2 <u>Fig. 2 - 13</u>	Construction c Initial storge c Construction c Site Characteris		



لانام به برای میکند. و دود کنند های معاملی میکند و این					Loca	tion		a na mana ang sa		lydrologica
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longitude	Altitude m	C. A. Km²	Rm mm	Q x 10
E - 1	Nusrănia	Zabda	Concrete gravity	Tafila	30°51.6'	35°41.5'	1050	9.0	151	54
	Features	of dam	L		Féatures o	f reservoir		Features w	vater use	
Crest El.	Hd	Crest L.	Vd	HWL	R. A.	Vs	Ve	Yield	I. A. ha	( × 10 <sup>3</sup> JC
m	12 m	92	× 10 <sup>3</sup> m <sup>3</sup>	1058	x 10 <sup>3</sup> m <sup>2</sup> 20	× 10 <sup>3</sup> m <sup>3</sup>	× 10 <sup>3</sup> m <sup>3</sup> 30	× 10 <sup>3</sup> m <sup>3</sup> 40	5.3	240
1061 Features of situ	topography and		3.7	1030			of El R. A. and	ll		Longitudir
Debris on ri fully covere	hation of chert ght bank partly d by thick debr icified limestor	covers slope is which is ea	at 1 to 3 m stimated to be	thick. Slope 4 to 5 m in t	of left bank	is ard,	1100 1090 Storage Curv 1080 [1 1070 1 1060 1	Area 6.5 0.4 0.3 0.2 0.1 e Area Curve (0) 6.33 1525 050 0 0 050 0 0 050 0 0 0157 020 0.191 2.283 100 0.419 8.284	· •	(m) 1100 1090 8 1080 1070 1060 1050
Features of irri	<u>gable area</u>							4.0 5.0 5.0 7.0 8.0 Storage	<u> </u>	1040
	tial land exist er irrigation by				igated by gra		of Hd-C			Sketch of
						COIVE				
							(m) 60			(Right)
Features of sub	omerged area						224 224 224 20 10 0 0 1,000 2,000 3,000 Concrete Gravity 20 0 0 0 0 0 0 0 0 0 0 0 0 0	Fill Dam	,000)	
		• • •		н. 1919 г. – С.					······································	
Calculation ta	ble						· ·	-	T	
Crest El. m	Hd	Crest L. m	Vd × 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. × 10 <sup>3</sup> m <sup>2</sup>	Vs × 10 <sup>3</sup> m <sup>3</sup>	Ve × 10 <sup>3</sup> m <sup>3</sup>	Yield × 10 <sup>3</sup> m <sup>3</sup>	I.A. ha	× 10 <sup>3</sup> JD
1060	11	86	3	1057	18	80	10			196
1070	21	146	13.6	1067	72	680	610			889
1080	31	206	37.3	1077	152	1800	1730	· ·		2439
M <sup>a</sup> ndynchan a construction an								-		
· · · · · · · · · · · · · · · · · · ·										
				1						
Note C. A. C Rm A Qm A Lw V R. B. S. R Crest El. C Hd H	atchment area nnual average rai nnual average rui Vater course lengt iver bed slope rest elevation leight above lowe	nfall noff h st foundation da	Crest I Vd HWL R. A. Vs Ve am I. A.	Elevation	gth ime of reservoir sur area orge capacity storage capacit area	rface y	C F1 F2 <u>Fig. 2 - 13</u>	Construction c Initial storge c Construction c Site Characteris		



ان موادی کار این کار این این با این این با با این این و این با این این این این این این این این این ای		y Charles - Angelen and a state of a second	Υτορία το ξ. μ. βιράτιγομα, μ. μ. του διατικού δαταλιατικό δαταδιατικό δαταδιατικό δαταδιατικό δαταδιατικό δα Γ		Loca	tion	<u></u>		H	ydrologica
Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longitude	Altitude m	C. A. Km²	Rm mm	Q x 10
E - 2	Zabda	Zabda	Concrete gravity	Tafila	30°49.9'	35°42.7'	1100	21.3	151	1
ani ani ( <u>مربعة معرومة من من المربعة من المربعة معرومة من المربعة من المربعة من المربعة من المربعة من المربعة م</u>	Features	of dam	an 19 Agung (14 6 Agung ang An Ang Ang Ang Ang Ang Ang Ang Ang An		Features o	f reservoir		Features w	vater use	
Crest El. m	Hd m	Crest L. m	Vd × 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. × 10 <sup>3</sup> m <sup>2</sup>	Vs × 10 <sup>3</sup> m <sup>3</sup>	Ve × 10 <sup>3</sup> m <sup>3</sup>	Yield × 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	× 10 <sup>3</sup> JI
1109	12	.78	3.1	1106	28	280	80	100		203

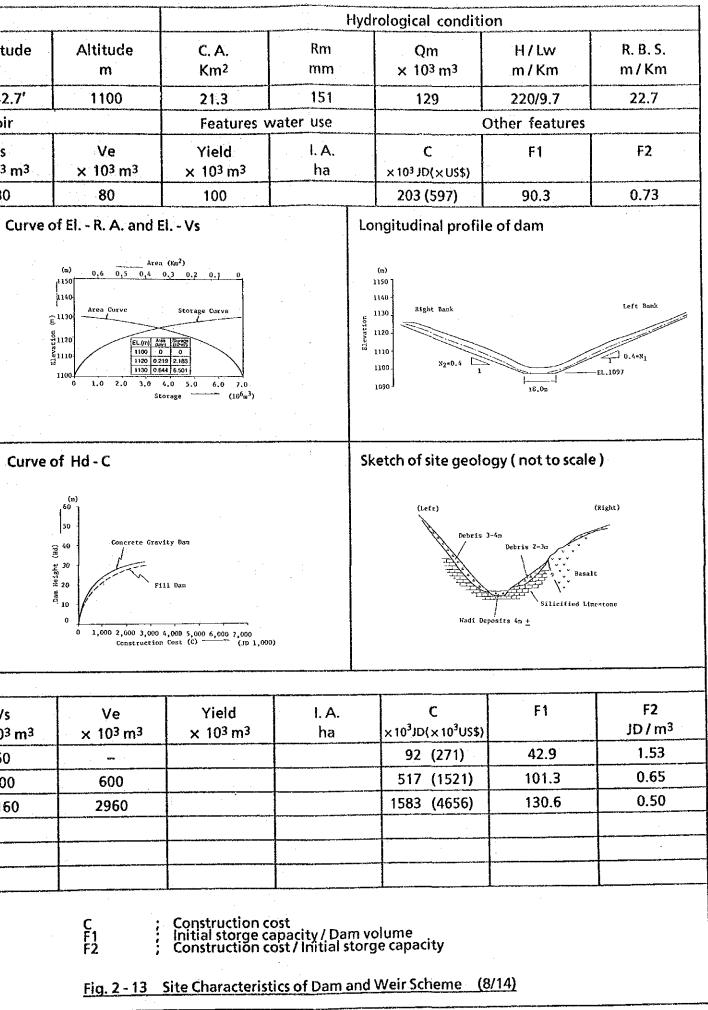
## Features of site topography and geology

E-2: Hard, weakly jointed, silicified limestone with E-W strike and 8°S dip is found at foot of slope of right bank. Upper slope of right bank consists of outcrops of basalt. Debris composed of dominant basalt stones covers lower slope of right bank at 2 to 3 m thick. Slope of left bank is fully covered by debris composed of silicified limestone gravels and soils which is estimated at 4 to 5 m thick in maximum. Wadi beds are composed of stony fine soils, which is estimated at 4 m or more thick. Basalt body might intrude into limestone, which is found in the hills along right bank of wadi.

## Features of irrigable area

Features of submerged area

<u>E-2</u>: There is about 1 ha of farmland at about 1 km downstream from E-2 site. At around the confluence with the wadi of E-1, there are potential lands which can be irrigated by gravity flow although it needs a ditch of about 2 km long. In the right bank upstream from the site, there are farmlands which need pumping for irrigation.



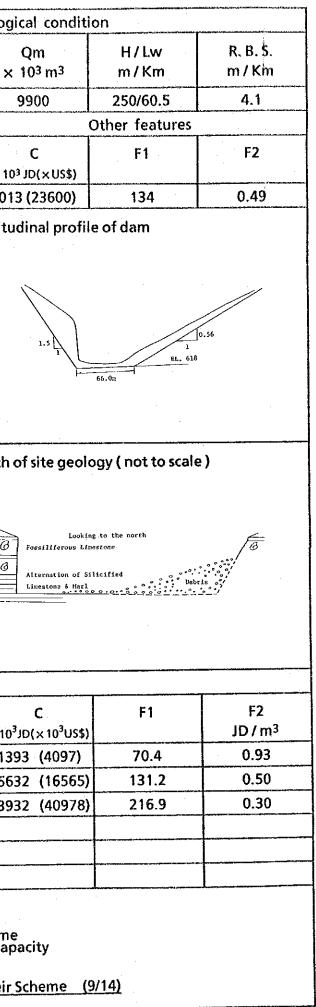
Crest El. m	Hd	Crest L.	Vd x 10 <sup>3</sup> m <sup>3</sup>	HWL m	R. A. × 10 <sup>3</sup> m <sup>2</sup>	Vs × 10 <sup>3</sup> m <sup>3</sup>	Ve x 10 <sup>3</sup> m <sup>3</sup>	Yield x 10 <sup>3</sup> m <sup>3</sup>	I. A. ha	× 10 <sup>3</sup>
1105	8	58	1.4	1102	6	60				9
1115	18	108	7.9	1112	80	800	600			51
1125	28	158	24.2	1122	308	3160	2960	······································		158
I										

C. A. Rm Qm Lw R. B. S. Crest El. Hd

Vd HWL R. A. ٧s Ve ĬĂ.

Dam volume Elevation of reservoir surface Reservoir area Initial storge capacity Ultimate storage capacity Irrigable area

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Dam No.	Dam Name	Wadi	Dam type	Governorate	Latitude	Longitude	Altitude m	C. A. Km²	Rm mm	×
C-6	Dabba	Dabba	Concrete gravity	Karak	31°15.0′	35°53.6'	618	1462	165	The state of the s
<u> </u>	Features	of dam			Features o	of reservoir		Features w	vater use	
Crest El.	Hd	Crest L.	Vd	HWL	R.A.	Vs	Ve	Yield	I. A.	
m	m	m	× 10 <sup>3</sup> m <sup>3</sup>	m	× 10 <sup>3</sup> m <sup>2</sup>	x 10 <sup>3</sup> m <sup>3</sup>	× 10 <sup>3</sup> m <sup>3</sup>	x 10 <sup>3</sup> m <sup>3</sup>	ha	×10
668	50	232	122.5	665	1330	16500	6500	8130		801
Features of site	e topography and	geology	3 · · · · ·			Cur	ve of El R. A. and	El Vs		Longitu
alternation of and dips sli	ea is underla of cherty rock, ghtly to the so on the wadi-f gable area	silicified li outh. The west	mestone and mar ern side is of	rl, which trend a cliff and a	ds north-easte alternative ro	erly ocks	(km <sup>2</sup> ) (m) 5 4 3 700 680 5torage Curve 5 660 5 640 620 0 10 20	2 1 0 Area Curve 2 30 40 500 torage (10 <sup>6</sup> m		
								torage (10 <sup>6</sup> a)	3)	
						Cu	ve of Hd - C			Sketch o
		• • •					(α) 50	анан алар 1910 - Алар		
Features of sub	omerged area	<u>an in the second s</u>					40 Concrete Gravity Jan 10 20	Fill Dam		
								4,000 5,000 6,000 7,000 on Cost (C) (JD 1,000	))	
			· · ·		·					
Calculation ta	ble							-1	<u> </u>	
Crest El.	Hd	Crest L.	Vd	HWL	R. A.	Vs.	Ve		1	× 10 <sup>3</sup>
m	m	m					× 103 m3	X 105 ms	11a	139
							1300			563
								· · ·		139
683	63	223	215.0	080	2002	40200				
Crest El. m 643 663 683 Note	Hd	m 123 173 223	x 10 <sup>3</sup> m <sup>3</sup> 21.3 86.1 213.0	m 640 660 680 L. ; Crest len Dam volu	R. A. × 10 <sup>3</sup> m <sup>2</sup> 150 825 2662 gth Jme of reservoir sur r area orge capacity storage capacit area	x 10 <sup>3</sup> m 1500 11300 46200	Construct le Ve X 10 <sup>3</sup> m <sup>3</sup> - 1300 36200 C F1 F2	Yield × 10 <sup>3</sup> m <sup>3</sup>	I. A. ha ost apacity / Da ost / Initial s	



-	Altitude (m)	640		Vd (× 10 <sup>3</sup> m <sup>3</sup> )	0.24	1 1e )		(takt)	Stavels > 15 m > 15 m > 15 m > 15 m > 15 m > 2 m >	· ·			-
	ongitude	35°46.1'	Features of Weir	Weir L. (m)	27	Sketch of site geology (not to scale	· · · · ·		A A A A A A A A A A A A A A A A A A A		Length of weir Weir Volume	(†	
Location				(m) bH	2.0	Sketch of site g		(34 <sup>g</sup> he)	Landslidde Landslidde Deposette including huge stanes		Weir L. ; Leng Vd ; Wei	Scheme (10/14)	
-	Latitude	31,10.0		R. B. S. (m / km)	37.8	limestone exposes It bank and forms		basements. Wadi is site could not nstraint	and vegetables are to an interview, summer. New irri- ds existing in the 1 for A-2 site) to ow is available in	be examined if Diversion weir a main stream.	a river bed	acteristics of Dam and Weir Scheme	
	Governorate	Xarak	on.	H (m) / L <sub>W</sub> (km)	510/13.5		osits including d thick terrace	0	conting the second of the seco	the to	Water course length River bed slope Height of weir above river bed	haracteristics of	-
- Inchar	IDPAA	Karak	Hydrological condition	Qm (× 10 <sup>3</sup> m <sup>3</sup> )	2260	<u>Karak)</u> : Hard, e and lower slop	landslide der of damsite an	so overlie on limes to 4 m in thickness. Stion due to geologic	from Ain Sara, fruit tr of Wadi Karak. Accor winter while shortage ceivable for higher far (the same land as conce in winter when more bas	i the Southern is made also sposits if com	H R B.S.	Fig. 2 - 13 Site Char	٠,
Woir Namo	ANDA NAA	Ain Sara	Hy and the second second Hy	Rm (mm)	340	<u>Ain Sara (Wadi Karak)</u> : ight bank slope and lo	cliff of 4 m high. Thick landslide deposits incl mainly compose right bank of damsite and thick te	including ration stones also overlie o gravels are estimated at 3 to 4 m in th be suitable for dam construction due to	<u>A-4</u> : With spring water from Ain Sara, fruit cultivated in both banks of Wadi Karak. A there is excess water in winter while short gation by pumping is conceivable for higher left bank of Wadi Karak (the same land as c utilize the excess water in winter when more addition to the spring flow.	Water use balance with the Southern Ghor needs irrigation by pumping is made also in summer. d soon be filled with deposits if constructed on	Catchment area Annual average rainfall Annual average runoff		
Weir No.		A-4		C. A. (km <sup>2</sup> )	2	Downstream of at foot of ri	cliff of 4 m mainly compo	gravels are ( be suitable f	<u>A-4</u> : With sp cultivated ir there is exce gation by pum left bank of utilize the e addition to t	<u>A-4</u> : Water u new irrigati( would soon be	Note C.A. ; Cat Rm ; Ani Qm ; Ani		-

				n <sup>3</sup> )						
	Altitude (m)	1230		Vd ( $\times 10^3 m^3$ )	0.54	. (				
	Longitude	35°41.0′	Features of Weir	Weir L. (m)	9	Sketch of site geology (not to scale)				; Length of weir ; Weir Volume
Location	Lor	35		Hd (m)	2:0	tch of site ge				Weir L. ; Leng Vd ; Weir
12	Ð	•				Ske				Wei Vd
	Latitude	30°48.0′		R. B. S. (m/km)	19.2		: at right bank : than 1 m. No y debris at 4 m estimated at 6			e river bed
	Governorate	Tafila	lition	H (m) / Lw (km)	250/13		e occurs at less vered by ents is			Water course length River bed slope Height of weir above river bed
	Wadi	La'ban	- Hydrological condit	Qm ( × 10 <sup>3</sup> m <sup>3</sup> )	245	Apolog	d, silícified lin n, which covers ank slope, which of gravely wadi			H R L W
	Weir Name	Tafila	۲H .	Rm (mm)	201	Features of site topography and geology	<u>D-2</u> : Hard, weakly jointed, silicified limestone slope. Debris is very thin, which covers slope outcrop of rocks at left bank slope, which is co or more thick. Thickness of gravely wadi sedime m or more.	able area		Catchment area Annual average rainfall Annual average runoff
	weir No.	D-2		C. A. (4m <sup>2</sup> )	26.9	Features of site 1	<u>D-2</u> : Hard, we slope. Debris outcrop of rocl or more thick. m or more.	Features of irrigable area		Note C. A. ; Catt Rm ; Ann Qm ; Ann

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Fig. 2 - 13 Site Characteristics of Dam and Weir Scheme (11/14)

	Aititude (m)	1380		Vd (×10 <sup>3</sup> m <sup>3</sup> )	0.27						
	Longitude Aiti	35°38.6′	Features of Weir	Weir L. (m)	30	Sketch of site geology (not to scale)				; Length of weir ; Weir Volume	4)
Location				(m) bH	5.0	Sketch of site ge				Weir L. ; Leng Vd ; Wei	r Scheme (12/14)
	Latitude	30,39.0,		R. B. S. (m/km)	45.7		at left bank slope. y stony soils, which ss of stony soils is atile gravel bed at e thick.	from I-l site and condition is not	crest length will be	th ove river bed	Site Characteristics of Dam and Weir Scheme
	Governorate	Tafila	tion	H (m) / L <sub>W</sub> (km)	160/3.5		<u>I-1</u> : Hard, massive, silicified limestone occurs at left Very gently slope of right bank is fully covered by stony overlies on older fluviatile gravel beds. Thickness of st estimated at 3 m or more and that of older fluviatile g more than 10m. Recent wadi gravels are 2 m or more thick.		long weir in crest	Water course length River bed slope Height of weir above river bed	Characteristics o
:	Wadı	Sidd	Hydrological condition	Qm (× 10 <sup>3</sup> m <sup>3</sup> )	167	geology	rd, massive, silicified limestone occurs a ly slope of right bank is fully covered by on older fluviatile gravel beds. Thicknes 1 at 3 m or more and that of older fluvia 1 l0m. Recent wadi gravels are 2 m or more	sstream a flow.	đ	fail R.B.S.	Fig. 2 - 13 Site
	Weir Name	Sidd		Rm (mm)	275	Features of site topography and geology	massive, sili slope of right older fluviati : 3 m or more m. Recent wad	of irrigable area armlands exist both u irrigated by gravity	the riverbed is wide,	Catchment area Annual average rainfall Annual average runoff	
	Weir No.	- -		C. A. (km <sup>2</sup> )	10.2	Features of site	<u>I-1</u> : Hard, ma Very gently sl overlies on ol estimated at 3 more than 10m.	<u>Features of irrigable area</u> <u>I-1</u> : Farmlands exis can be irrigated by good.	<u>I-1</u> : Since required.	Mote RR C. A. Qm X X X X X X X X X X X X X X X X X X	

					1 acation		
Weir No	Weir Name	Wadi		,	LOCATION		
		IDBAA	Governorate	Latitude		Longitude	Altitude (m)
J-1	Kerbat Shada	Khaur	Tafila	30°38.5′	33	35°39.5'	1360
	Η	Hydrological condition	tion			Features of Weir	
C. A. (km <sup>2</sup> )	Rm (mm)	$Qm (\times 10^3 m^3)$	H (m) / L <sub>W</sub> (km)	R. B. S. (m/km)	Hd (m)	Weir L. (m)	Vd ( × 10 <sup>3</sup> m <sup>3</sup> )
19.8	275	323	220/8.5	25.9	3.0	22	0.95
Features of site	Features of site topography and geology	teology			Sketch of site ge	Sketch of site geology (not to scale)	(
<u>J-1</u> : Hard, s slope of ri stones. Thic Broad wadi be	<u>J-1</u> : Hard, strongly jointed basalt occurs at left bar slope of right bank is covered by soils bearing stones. Thickness of these stony soils is estimated Broad wadi beds consist of stony soils which are 4 to	ed basalt occur covered by so e stony soils stony soils wh		k slope. Gentle domínant basalt at 3 m or more. 5 m thíck.			· · · · · · · · · · · · · · · · · · · ·
<u>Features of irrigable area</u>	<u>jable area</u>						
<u>J-1</u> : Farmlan can be irriga	<u>J-l</u> : Farmlands exist both upstream and can be irrigated by gravity flow.	upstream and flow.	downstream from the site	the site and			
<u>J-1</u> : Since t required. A	Since the riverbed is wide, a ed. A reservoir area is wide	s wide, a long a is wide to su	wide, a long weir in crest length will is wide to submerge wide farmlands.	length will be mlands.			
<u>Note</u> C. A. ; Cat Rm ; An Qm ; An	Catchment area Annual average rainfall Annual average runoff	all R.B.S.	Water course length River bed slope Height of weir above river bed	r ve river bed	Weir L. ; Leng Vd ; Weir	; Length of weir ; Weir Volume	

Fig. 2 - 13 Site Characteristics of Dam and Weir Scheme (13/14)

					Location		
Weir No.	Weir Name	Wadi	Governorate	Latitude		Longitude	Altitude (m)
۲ - ۲ ۲	Bahlut	Bureis	Karak	30°55.1′		35°38.6′	840
		Hydrological condit	ition			Features of Weir	
C. A. (km <sup>2</sup> )	Rm (mm)	$Qm (\times 10^3m^3)$	H (m) / L <sub>W</sub> (km)	R. B. S. (m / km)	(m) hH	Weir L. (m)	Vd ( $\times 10^{3}$ m <sup>3</sup> )
15.9	201	145	320/8.5	376	2.0	36	0.32
Features of sit	Features of site topography and geology	geology			Sketch of site ge	Sketch of site geology (not to scale)	e )
<u>L-1</u> : Slope limestone. rocks at ri composed of	<u>L-1</u> : Slope of left bank consists of weathered, limestone. Debris covers slope at 1 to 2 m rocks at right bank slope, which is covered composed of stony soils at more than 15 m thick	whists of weath slope at 1 to , which is cove more than 15 m 1	by th:	strongly jointed marly thick. No outcrop of y landslide sediments Wadi beds consist of			
gravels at	gravels at 5 m or more.						
Features of irrigable area	rigable area						
							-
Aote A A.	Catchment area Annual average rainfall Annual average runoff	all R.B.S.	Water course length River bed slope Height of weir above river bed	n ve river bed	Weir L. ; Length of weir Vd ; Weir Volume	Length of weir Weir Volume	

Fig. 2 - 13 Site Characteristics of Dam and Weir Scheme (14/14)

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	Items	on	<u>Karak and Tafila H</u> <u>Dam Schemes</u> - Detailed design	J	ect design and p	и Б С	2-14		•
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	Work	Scheme sailed istruct berimen	<u>thility</u> k and T Schemes sasic de betailed	lanc fang istr	<u>rall Proje</u> Basic desi Detailed d Financing	Str			
		Pilot - Det - Con - Exp	<u>Karak</u> Dam Sc - Det	F JT Art Cor	Bas Det Fir	COL			
		<b>H</b> .,,	Kara Dan Dan	1			,		
	Item No.	(1)	(Z) (Z)	· .	(†)				
Fig. 2-14	. <b>□.</b>		ſ		HE HASHEMIT				·····
Preliminary	Imple	mentation Sc vesting Deve	neuure [	HE STUDY OF	n integrated 'He Karak -	REGION	DEVELOPM	PMENT SENT REC	MASTER
for the Wat Project	er nar	ACOLTING DEAC		JAI	PAN INTERNA	TIONAL.	COOPERAT	ION AGE	NCY