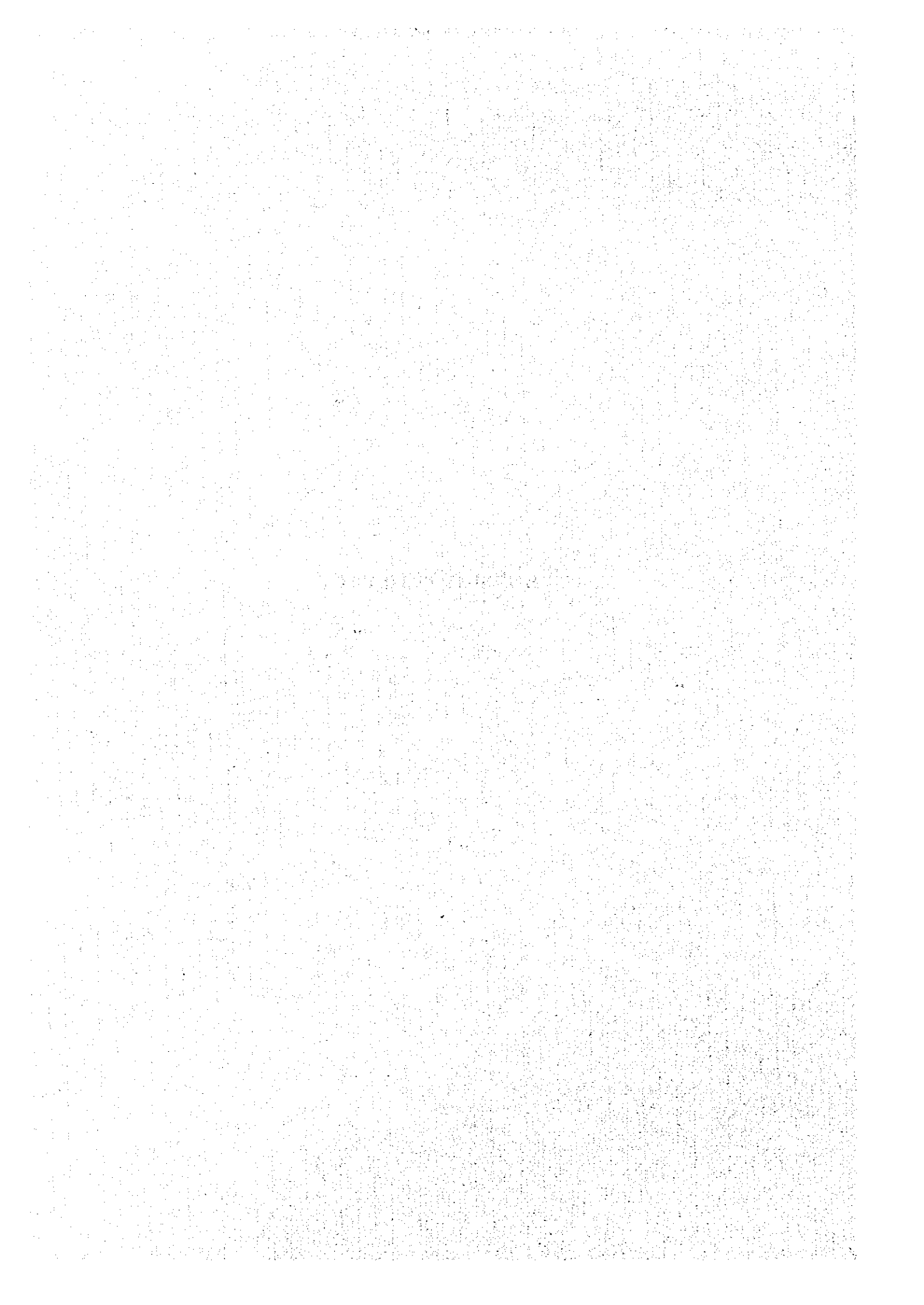


## **Tableaux et figures**



## Tableaux et figures

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Tableau 3.1.5.1 Propriétés physiques du sol

Code No.	Name of Oasis	Depth of Horizon (cm)	Boundary	Form of Boundary	Colour		Texture	Particle size			Structure			Consistence			Remarks	
					Wet	Dry		Clay (%)	Silt (%)	Sand (%)	Grade	Dye	Size	Wet	Moist	Dry		
GF-1	Kaaba	0-100<	na	na	2.5Y 3/1	2.5Y 5/2	SL	4	24	72	na	na	na	na	na	na	na	na
GF-2	Sud Ouest	0-100<	na	na	5YR 5/3	5YR 8/2	SL	14	20	66	na	na	na	na	na	na	na	na
GF-4	Lala	0-100<	na	na	7.5YR 4/2	7.5YR 5/2	LS	1	16	83	na	na	na	na	na	na	na	na
GF-6	Oued Shili	0-100<	na	na	10YR 6/6	10YR 8/3	LS	2	16	82	na	na	na	na	na	na	na	na
GF-8	Seggoud	0-100<	na	na	10YR 6/6	5YR 7/2	SL	2	28	70	na	na	na	na	na	na	na	na
TZ-1	Tozeur	0-100<	na	na	2.5Y 3/2	2.5Y 6/2	SL	3	26	71	na	na	na	na	na	na	na	na
TZ-11	Nefla	0-100<	na	na	2.5Y 3/3	2.5Y 5/3	LS	1	11	88	na	na	na	na	na	na	na	na
TZ-15	Draa Sud	0-100<	na	na	10YR 7/4	2.5Y 8/3	SL	1	31	68	na	na	na	na	na	na	na	na
TZ-21	Codada	0-100<	na	na	10YR 5/5	2.5Y 8/3	LS	2	24	74	na	na	na	na	na	na	na	na
TZ-26	Tamerza	0-100<	na	na	2.5Y 8/3	2.5Y 5/2	S	0	7	93	na	na	na	na	na	na	na	na
KD-1	Bechin	0-150<	na	na	10YR 7/5	2.5Y 7/3	SL	3	47	50	na	na	na	na	na	na	na	na
KD-17	Mansour	0-150<	na	na	10YR 4/2	2.5Y 6/2	SL	3	23	74	na	na	na	na	na	na	na	na
KD-24	Oum El Perth	0-150<	na	na	7.5YR 6/6	7.5YR 7/4	L	3	53	44	na	na	na	na	na	na	na	na
KD-44	Ailet	0-40	na	na	10YR 7/6	10YR 8/4	SI	1	82	17	na	na	na	na	na	na	na	na
KD-60	Faoura 1	0-150<	na	na	7.5YR 6/4	10YR 8/4	SI	2	91	7	na	na	na	na	na	na	na	na
GD-6	Gabes	0-45	A	S	7.5YR 4/4	10YR 7/3	L	10	45	45	na	na	na	na	na	na	na	na
GD-7	Limsoua 1	0-45	A	S	7.5YR 6/6	7.5YR 7/4	SL	1	37	62	na	na	na	na	na	na	na	na
GD-19	Cherchou 1	0-150<	na	na	2.5YR 3/4	5YR 7/4	SIL	5	50	45	na	na	na	na	na	na	na	na
GD-30	Arnan	0-150<	na	na	5YR 6/8	5YR 8/3	SI	6	72	22	na	na	na	na	na	na	na	na
GD-42	Ketana 3	0-150<	na	na	5YR 5/6	5YR 8/3	SL	2	37	61	na	na	na	na	na	na	na	na

Source: Determined by JICA study team

Tableau 3.1.5.2 Propriétés chimiques du sol

Code No.	Name of Oasis	pH	EC (ds/m)	Organic Matter (%)	Total N (%)	CEC (meq/100g)	Exchangeable Cation			Water Soluble			ESP (%)
							Ca (meq/100g)	Mg (meq/100g)	Na (meq/100g)	K (meq/100g)	Cl (meq/100g)	S <sub>04</sub> (meq/100g)	
GF-1	Kaaba	8.8	80	3.64	0.13	1.2	29.5	4.3	2.3	0.6	2.2	2.5	6.3
GF-2	Sud Ouest	8.1	22	3.52	0.06	2.3	49.0	7.4	2.7	1.2	5.6	3.8	4.5
GF-4	Lala	8.1	22	4.00	0.05	1.2	32.0	13.6	2.7	2.7	1.5	0.9	5.3
GF-6	Oued Shili	8.4	350	0.78	0.01	0.5	42.5	3.4	6.8	0.9	52.1	12.1	12.2
GF-8	Seggoud	8.3	225	1.64	0.06	1.3	49.0	7.4	4.6	1.2	5.6	3.8	7.4
TZ-1	Tozeur	8.2	280	5.34	0.16	1.4	43.0	7.4	3.4	1.4	80.6	1.1	6.2
TZ-11	Nefla	8.2	88	0.60	0.03	0.6	34.4	3.3	1.3	0.5	7.7	1.1	3.3
TZ-15	Draa Sud	8.9	25	0.64	ND	0.3	24.2	2.4	1.9	0.6	18.1	5.1	6.5
TZ-21	Codada	8.7	85	1.20	0.10	0.1	48.0	6.7	3.7	1.3	1.5	3.0	6.2
TZ-26	Tamerza	9.3	60	0.04	ND	0.2	39.0	4.3	1.2	0.6	0.8	1.0	2.7
KD-1	Bechin	8.0	230	1.68	0.08	0.9	35.0	1.6	2.1	0.2	212.5	4.8	5.4
KD-17	Mansour	8.3	360	6.62	0.13	1.6	33.7	4.6	4.2	0.9	53.7	5.6	9.7
KD-24	Oum El Perth	8.4	460	1.26	0.06	0.6	34.0	4.6	4.8	1.0	11.2	0.4	10.8
KD-44	Ailet	8.6	520	1.78	ND	0.6	33.2	4.4	3.8	1.2	125.0	14.1	8.9
KD-60	Faoura 1	8.2	85	0.70	0.03	1.7	23.5	5.3	0.9	1.7	18.2	0.7	2.9
GD-6	Gabes	8.5	240	2.42	0.01	0.5	53.0	7.1	3.3	1.3	22.5	2.2	5.1
GD-7	Limsoua 1	8.5	245	3.24	0.04	0.9	47.0	7.4	4.2	1.1	3.5	2.9	7.9
GD-19	Cherchou 1	8.4	65	3.16	0.06	1.2	46.0	6.6	4.7	1.0	1.1	1.5	8.1
GD-30	Arnan	8.9	14	1.30	0.04	0.9	48.0	5.0	3.6	1.4	0.7	1.5	6.2
GD-42	Ketana 3	8.3	59	2.12	0.06	1.5	45.0	7.1	4.7	1.2	1.1	1.5	8.1

Source: Determined by JICA study team

Tableau 3.2.2.1 Divisions administratives et statistiques démographiques de la Tunisie (1994)

Gouvernorat	No. of Delegation	No. of Imada	Total Area (km <sup>2</sup> )	Population 1984	Population (1994)		Growth Rate (1984 - 94)	Population Density (per km <sup>2</sup> )	Number of Family	Family Size
					Male	Female				
1. Tunis	21	159	288	774,364	453,092	434,711	1.4%	3,082.6	195,557	4.54
2. Ariana	12	83	1,592	374,192	291,855	277,439	4.3%	357.6	110,622	5.15
3. Ben Arous	12	75	687	246,193	189,757	181,988	4.2%	541.1	76,947	4.83
4. Nabeul	16	98	2,837	461,405	296,563	282,055	2.3%	204.0	118,041	4.90
5. Zaghouan	6	48	2,833	118,743	71,456	71,580	1.9%	50.5	26,888	5.32
6. Bizerte	14	102	3,751	394,670	245,812	237,274	2.0%	128.8	97,101	4.98
7. Béja	9	101	3,887	274,706	153,198	150,655	1.0%	78.2	59,973	5.07
8. Jendouba	8	91	3,075	359,429	202,144	202,639	1.2%	131.6	78,722	5.14
9. Le Kef	11	87	5,081	247,672	135,845	136,507	1.0%	53.6	54,021	5.04
10. Siliana	10	86	4,642	222,038	122,672	122,238	1.0%	52.8	44,196	5.54
11. Kairouan	11	114	6,603	421,607	269,161	263,548	2.4%	80.7	92,973	5.73
12. Kasserine	13	106	8,251	297,959	195,063	191,845	2.6%	46.9	68,498	5.65
13. Sidi Bouzid	12	111	7,379	288,528	190,440	186,703	2.7%	51.1	64,101	5.88
14. Dousse	14	103	2,669	322,491	220,430	213,279	3.0%	162.5	88,845	4.88
15. Monastir	13	77	1,033	278,478	185,382	178,519	2.7%	352.3	72,564	5.01
16. Mahdia	11	99	2,873	270,435	165,082	170,662	2.2%	116.9	62,918	5.34
17. Sfax	15	125	7,008	577,992	374,076	359,611	2.4%	104.7	150,436	4.88
18. Gafsa	11	74	7,360	255,729	155,241	152,272	2.7%	41.8	54,330	5.66
19. Tozeur	5	36	6,159	67,943	44,917	44,138	2.7%	14.5	16,590	5.37
20. Kébili	5	40	22,454	95,371	66,381	65,533	3.3%	5.9	21,316	6.19
21. Gabes	9	72	7,505	240,016	156,400	155,313	2.6%	41.5	56,431	5.52
22. Médenine	9	93	9,333	295,889	194,263	191,922	2.7%	41.4	70,443	5.48
23. Tataouine	7	64	38,266	100,329	68,111	67,592	3.1%	3.5	22,672	5.99
Total	254	2,044	155,566	6,966,173	4,447,341	4,338,023	2.3%	56.5	1,704,185	5.16
Study Area	30	222	43,478	639,053	422,939	417,256	2.8%	19.3	148,667	5.65
	11.8%	10.9%	27.9%	9.2%	9.5%	9.6%		8.7%		

Sources : Annuaire Statistique de la Tunisie, Mai 1994, Institut National de la Statistique, Ministère du Plan et du Développement Regional  
Recensement General de la Population (Population par division administrative), 1994



Tableau 3.2.2.2 Population et nombre de ménages de la zone de l'étude

Governorate / Délégation	Population			Household	
	Urban	Rural	Total	Number (H.H.) (per family)	
<b>Gafsa</b>					
1. Gafsa Sud	71,107	4,924	76,031	14,265	5.33
2. Guetar	14,053	7,297	21,350	3,777	5.65
3. Ksar	26,003	2,460	28,463	5,316	5.35
4. Métalaoui	38,086	1,989	40,075	7,323	5.47
5. Redeyef	26,944	1,834	28,778	4,508	6.38
Sub-total	176,193	18,504	194,697	35,189	5.53
<b>Tozeur</b>					
1. Tozeur	28,979	6,630	35,609	6,751	5.27
2. Nefta	18,993	213	19,206	3,643	5.27
3. Hazoua	0	3,467	3,467	528	6.57
4. Deguèche	13,370	11,932	25,302	4,706	5.38
5. Tamerza	1,951	3,520	5,471	962	5.69
Sub-total	63,293	25,762	89,055	16,590	5.37
<b>Kebili</b>					
1. Souk Lahad	18,726	8,597	27,323	4,550	6.01
2. Kebili Nord	10,518	17,280	27,798	4,920	5.65
3. Kebili Sud	11,846	14,333	26,179	4,242	6.17
4. Douz	31,108	7,140	38,248	5,648	6.77
5. Faouar	0	12,366	12,366	1,956	6.32
Sub-total	72,198	59,716	131,914	21,316	6.19
<b>Gabes</b>					
1. Gabes Est	89,787	408	90,195	17,870	5.05
2. Gabes Ouest	21,076	5,959	27,035	4,932	5.48
3. Ghannouch	19,232	0	19,232	2,891	6.65
4. Metouia	17,372	6,118	23,490	4,361	5.39
5. El Hamma	32,155	26,718	58,873	9,762	6.03
6. Mareth	13,848	43,450	57,298	10,025	5.72
7. Matmata	2,244	4,529	6,773	1,477	4.59
Sub-total	195,714	87,182	282,896	51,318	5.51
<b>Total</b>	<b>507,398</b>	<b>191,164</b>	<b>698,562</b>	<b>124,413</b>	<b>5.61</b>

Source de inform Reusement general de lu population et des logement, Mai 1994  
Institut National de la Statistique, TUNIS









Tableau 3.3.4.1 Prix du marché et prix au producteur des produits agricoles (1994/95)

(Unit: D/kg)

Crops	Gafsa		Tozeur		Kebili		Gabès		Average	
	Market Price 1994/95	Farmgate Price Sep. 1995 (%)	Market Price 1994/95	Farmgate Price Sep. 1995 (%)	Market Price 1994/95	Farmgate Price Sep. 1995 (%)	Market Price 1994/95	Farmgate Price Sep. 1995 (%)	Market Price 1994/95	Farmgate Price Sep. 1995 (%)
1. Arboriculture (Fruit)										
1.1 Palmiers dattiers (Date Palm, deglat)	1.400	1.200 0.86	1.200	0.900 0.75	1.250	0.900 0.72	1.246	1.100 0.88	1.274	1.025 0.80
1.2 Oliviers à huile (Olive)	0.450	0.400 0.89	0.500	0.400 0.80	0.400	0.350 0.88	0.500	0.450 0.90	0.463	0.400 0.86
1.3 Grenadiers (Pomegranate)	0.250	0.200 0.80	0.338	0.250 0.74	0.400	0.300 0.75	0.380	0.350 0.92	0.342	0.287 0.84
1.4 Abricotiers (Apricot)	0.300	0.250 0.83	0.567	0.500 0.88	0.825	0.750 0.91	0.656	0.600 0.91	0.587	0.493 0.84
1.5 Figuiers (Fig)	0.150	0.130 0.87	0.550	0.500 0.91	0.460	0.400 0.87	0.671	0.600 0.89	0.458	0.385 0.84
		Average 0.82		Average 0.82		Average 0.82		Average 0.90		Average 0.84
2. Mar. d'hiver + printemps (Vegetables)										
2.1 Carrots (Carrot)	0.200	0.180 0.90	0.111	0.100 0.90	0.091	0.080 0.88	0.110	0.090 0.82	0.128	0.109 0.85
2.2 Navet (Turnip)	0.100	0.090 0.90	0.307	0.250 0.81	0.279	0.250 0.90	0.258	0.200 0.78	0.236	0.201 0.85
2.3 Oignon (Onion)	0.100	0.090 0.90	0.315	0.250 0.79	0.222	0.200 0.90	0.235	0.200 0.85	0.218	0.186 0.85
2.4 Fèves verts (Kidney Bean)	0.150	0.130 0.87	0.485	0.400 0.82	0.711	0.650 0.91	0.392	0.350 0.89	0.435	0.370 0.85
2.5 Piments (Pepper)	1.300	1.200 0.92	0.943	0.750 0.80	0.901	0.800 0.89	0.960	0.850 0.89	1.026	0.874 0.85
2.6 Tomates (Tomato)	0.400	0.350 0.88	0.369	0.300 0.81	0.396	0.300 0.76	0.291	0.250 0.86	0.364	0.310 0.85
		Average 0.89		Average 0.82		Average 0.87		Average 0.85		Average 0.85
3. Four Annuels (Fodder)										
3.1 Luzerne (Lucern)	0.030	0.025 0.83	0.057	0.050 0.88	0.080	0.070 0.88	0.080	0.070 0.88	0.062	0.053 0.86
4. Culture Industrielles										
4.1 Henna (Henna)							2.160	1.900 0.88	2.160	1.839 0.85

Sources : Arr. des Etudes et Statistiques Agricole, Division des Etudes et du Développement Agricole, Gafsa, Tozeur, Kebili and Gabès CRDA  
Farm Economy Survey by JICA Study Team, September 1995

Tableau 3.3.4.2 Prix du marché et prix au producteur des équipements agricoles (1994/95)

(Unit : D.)

Description	Unit	Market Price				Average	Farmgate Price			
		Gafsa	Tozeur	Kebili	Gabes		T.C.*	Total	Estimated Price	
						(a)	(b)	(a + b)		
							(10%)			
<b>A. SEEDLING / SEED</b>										
<b>1. Arboriculture</b>										
1.1	Date Palm	Seedling	1.500	1.200	1.000	1.500	1.300	0.130	1.430	1.500
1.2	Olive	Seedling	1.500	2.000	2.500	1.200	1.800	0.180	1.980	2.000
1.3	Pomegranate	Seedling	0.400	0.500	0.300	0.400	0.400	0.040	0.440	0.500
1.4	Apricot	Seedling	0.850	0.700	0.750	0.520	0.705	0.071	0.776	0.800
1.5	Fig	Seedling	0.400	0.300	0.800	0.350	0.463	0.046	0.509	0.500
1.6	Apple	Seedling	1.200	2.000	1.100	1.200	1.375	0.138	1.513	1.500
1.7	Grape	Seedling	1.500	0.500	0.500	1.200	0.925	0.093	1.018	1.000
<b>2. Vegetables</b>										
		(Seed)						(5%)		
2.1	Carrot	Kg	24.000	25.800	18.000	24.000	22.950	1.148	24.098	24.100
2.2	Turnip	Kg	13.000	12.600	14.000	12.000	12.900	0.645	13.545	13.500
2.3	Onion	Kg	65.000	54.000	54.000	52.000	56.250	2.813	59.063	59.000
2.4	Kidney Beans	Kg	1.600	1.450	1.000	1.600	1.413	0.071	1.483	1.500
2.5	Pepper	Kg	120.000	145.000	105.000	225.000	148.750	7.438	156.188	156.200
2.6	Tomato	Kg	54.000	75.000	80.000	67.000	69.000	3.450	72.450	72.500
<b>3. Fodder Crops</b>										
		(Seeds)								
3.1	Lucern	Kg	4.200	4.560	3.500	4.000	4.065	0.203	4.268	4.300
<b>4. Industrial Crops</b>										
		(Seed)								
4.1	Henna	Kg				2.000	2.000	0.100	2.100	2.100
<b>B. FARM INPUTS</b>										
<b>1. Fertilizers</b>										
								(10%)	(per kg)	
1.1	FYM / Compost	ton								10.000
1.2	Ammonite	50 kg	10.500	10.700	10.500	10.000	10.425	1.043	11.468	11.500
1.3	Super 45 (TSP)	50 kg	10.500	11.000	11.000	10.500	10.750	1.075	11.825	11.900
1.4	Sulfate de Potash	50 kg	19.350	19.500	19.000	19.000	19.213	1.921	21.134	21.100
1.5	Nitrate de Potash	50 kg	38.000	39.000	45.000	38.000	40.000	4.000	44.000	44.000
<b>2. Insecticides</b>										
								(5%)		
2.1	DCES EC 25	lit	22.000	19.500	20.500	22.000	21.000	1.050	22.050	22.100
2.2	THIODAN	lit		12.700	13.200		12.950	0.648	13.598	13.600
2.3	FATEK	lit	7.200	6.600	8.000	6.500	7.075	0.354	7.429	7.500
2.4	PERIMOR	lit	30.000	30.000	32.000	32.000	31.000	1.550	32.550	32.600
Estimated average										
18,700										
<b>3. Fungicides</b>										
								(5%)		
3.1	PELT 44	kg	18.000	6.900/0.3g	20.600	22.660	20.420	1.021	21.441	21.500
3.2	CUIVOX 50	kg	4.300/lit	4.070			4.070	0.204	4.274	4.300
3.3	BENLATE	kg	45.930	10.800/0.3g	51.000	66.000	54.310	2.716	57.026	57.000
3.4	MANEBE	kg	6.500	5.700	8.600	6.700	6.875	0.344	7.219	7.200
Estimated average										
25,200										
<b>C. OTHERS</b>										
<b>1. Water Charge</b>										
		m3	0.025	0.017	0.020	0.017	0.020			0.020
		per ha	202.000	239.000	150.000	160.000	187.750			188.000
<b>2. Labor Charge</b>										
2.1	Casual Worker	man-day	4.600	4.160	5.500	6.500	5.190			5.200
2.2	Pollinisation (Date)	man-day	4.600	4.160	8.000	6.500	5.815			5.800
2.3	Harvesting	man-day	4.600	8.000	8.000	6.500	6.775			6.800

Sources : Arr. des Etudes et Statistiques Agricole, Division des Etudes et du Development Agricole, Gafsa, Tozeur, Kebili and Gabes CRDA

Farm Economic Survey by JICA Study Team, September 1995

Remarks : T.C.\* ; Transportation cost from market to farm including handling charge and other cost.

Tableau 3.3.5.1 Frais de production actuels par produit et frais de production nets

(Unit : D./ha)

Description	Gross Income		Production Cost				Net Return (a - b)
	Yield* (ton)	Unit Price (D./kg)	Amount (a)	Farm Inputs	Labor Cost	Others	
1. Arboriculture							
1.1 Date Palm	5.86	1.025	4.702 *	357	571	46	974 *
1.2 Olive	6.05	0.400	1.896 *	219	522	37	778 *
1.3 Pomegranate	10.31	0.287	2.320 *	391	591	49	1.031 *
1.4 Apricot	11.80	0.493	4.561 *	363	726	55	1.144 *
1.5 Fig	4.21	0.385	1.271 *	249	600	56	905 *
2. Vegetables							
2.1 Carrot	21.00	0.109	2.289	381	1.144	76	1.601
2.2 Turnip	20.00	0.201	4.020	374	1.144	76	1.594
2.3 Onion	21.36	0.186	3.973	437	1.248	84	1.769
2.4 Kidney Beans	10.43	0.370	3.859	309	1.076	70	1.455
2.5 Pepper	9.29	0.874	8.119	681	1.196	94	1.971
2.6 Tomato	21.10	0.310	6.541	400	1.196	79	1.675
3. Fodder Crops							
3.1 Lucern	54.85	0.053	2.907	250	738	49	1.038
4. Industrial Crops							
4.1 Henna	1.47	1.839	2.703	371	827	59	1.257

Sources : Farm economic survey by JICA Team, 1995

Remark : (\*); Figures of arboriculture crops are estimated average yield and annual cost of 25 years.

Ref. : ANNEX-E, Tables E.3.10.1 (1), (2), (3) and (4)



Tableau 3.3.5.2 Montant total actuel de la production agricole dans la zone de l'étude (153 oasis)

Description	Unit	Gafsa Gouvernorat	Tozeur Gouvernorat	Kebili Gouvernorat	Gabes Gouvernorat	Total
<b>I. Arboriculture (Unit Prices)</b>						
1.1 Date Palm	1.025 D/kg					
- Planted Area	(ha)	812	5,036	6,566	3,113	15,527
- Yield	(kg/ha)	7.34	5.82	5.68	5.93	5.86
- Production	(tons)	5,958	29,329	37,289	18,470	91,046
- Gross Income	(D., '000)	6,106.8	30,062.2	38,221.6	18,931.8	93,322.4
1.2 Olive	0.400 D/kg					
- Planted Area	(ha)	2,221	177	194	1,727	4,319
- Yield	(kg/ha)	8.04	2.71	4.63	3.98	6.05
- Production	(tons)	17,854	480	898	6,879	26,111
- Gross Income	(D., '000)	7,141.5	191.8	359.2	2,751.8	10,444.4
1.3 Pomegranate	0.287 D/kg					
- Planted Area	(ha)	150	145	161	1,788	2,244
- Yield	(kg/ha)	8.20	2.30	3.21	11.78	10.31
- Production	(tons)	1,230	334	517	21,065	23,145
- Gross Income	(D., '000)	353.0	95.9	148.3	6,045.6	6,642.7
1.4 Apricot	0.493 D/kg					
- Planted Area	(ha)	125	51	49	122	347
- Yield	(kg/ha)	19.15	2.64	2.52	11.83	11.80
- Production	(tons)	2,394	135	124	1,444	4,096
- Gross Income	(D., '000)	1,180.1	66.5	60.9	711.6	2,019.1
1.5 Fig/ Others	0.385 D/kg					
- Planted Area	(ha)	124	213	243	383	963
- Yield	(kg/ha)	7.74	2.52	2.69	4.97	4.21
- Production	(tons)	960	537	654	1,903	4,054
- Gross Income	(D., '000)	369.6	206.8	251.9	732.5	1,560.8
Sub-total	(ha)	3,432	5,622	7,213	7,133	23,400
	(D., '000)	15,151.1	30,623.2	39,041.9	29,173.2	113,989.4
<b>2. Vegetables</b>						
2.1 Tunip/ Carrot	0.201 D/kg					
- Planted Area	(ha)	166	125	457	392	1,140
- Yield	(kg/ha)	29.43	13.15	13.49	28.23	20.84
- Production	(tons)	4,885	1,644	6,163	11,066	23,757
- Gross Income	(D., '000)	981.8	330.4	1,238.8	2,224.2	4,775.3
2.2 Onion	0.186 D/kg					
- Planted Area	(ha)	166	123	541	408	1,238
- Yield	(kg/ha)	26.69	14.58	14.94	29.73	21.36
- Production	(tons)	4,431	1,794	8,085	12,128	26,438
- Gross Income	(D., '000)	824.2	333.6	1,503.8	2,255.9	4,917.5
2.3 Kindey Beans	0.370 D/kg					
- Planted Area	(ha)	167	58	263	64	552
- Yield	(kg/ha)	14.66	6.82	6.98	16.89	10.43
- Production	(tons)	2,447	396	1,835	1,081	5,759
- Gross Income	(D., '000)	905.5	146.3	678.9	400.0	2,130.8
2.4 Pepper	0.874 D/kg					
- Planted Area	(ha)	319	168	558	413	1,458
- Yield	(kg/ha)	9.96	6.81	6.99	12.87	9.29
- Production	(tons)	3,176	1,144	3,903	5,315	13,538
- Gross Income	(D., '000)	2,776.2	999.5	3,411.3	4,645.4	11,822.4
2.5 Tomato	0.310 D/kg					
- Planted Area	(ha)	223	94	248	208	773
- Yield	(kg/ha)	29.61	14.58	17.00	19.81	21.10
- Production	(tons)	6,603	1,370	4,217	4,120	16,309
- Gross Income	(D., '000)	2,046.8	424.8	1,307.2	1,277.0	5,055.8
Sub-total	(ha)	1,041	568	2,067	1,485	5,161
	(D., '000)	7,534.5	2,234.6	8,140.0	10,802.5	28,711.7
<b>3. Fodder Crops</b>						
3.1 Lucern	0.053 D/kg					
- Planted Area	(ha)	886	311	2,850	1,620	5,667
- Yield	(kg/ha)	53.65	77.63	50.15	59.38	54.85
- Production	(tons)	47,531	24,143	142,936	96,203	310,813
- Gross Income	(D., '000)	2,519.1	1,279.6	2,575.6	5,098.8	16,472.1
<b>4. Industrial Crops</b>						
4.1 Henna	1.839 D/kg					
- Planted Area	(ha)	0	0	0	452	452
- Yield	(kg/ha)				1.47	1.47
- Production	(tons)	0	0	0	662	662
- Gross Income	(D., '000)	0.0	0.0	0.0	1,218.0	1,218.0
<b>Total Planted Area</b>	(ha)	5,359	6,501	12,130	10,690	34,680
<b>Total Gross Income</b>	(D., '000)	25,204.8	34,137.4	54,757.5	46,292.4	160,392.2

Ref. : ANNEX-E, Tables E.3.10.1 and E.3.10.2

Tableau 3.3.5.3 Montant net actuel de la production agricole dans la zone de l'étude (153 oasis)

Description	Unit	Gafsa Gouvernorat	Tozeur Gouvernorat	Kebili Gouvernorat	Gabes Gouvernorat	Total
<b>1. Arboriculture (Production Cost)</b>						
1.1 Date Palm	974 D/ha					
- Planted Area	(ha)	812	5,036	6,566	3,113	15,527
- Gross Income	(D., '000)	6,106.8	30,062.2	38,221.6	18,931.8	93,322.4
- Production Cost	(D., '000)	790.9	4,905.1	6,395.3	3,032.1	15,123.4
- Net Income	(D., '000)	5,315.9	25,157.1	31,826.3	15,899.7	78,199.0
1.2 Olive	778 D/ha					
- Planted Area	(ha)	2,221	177	194	1,727	4,319
- Gross Income	(D., '000)	7,141.5	191.8	359.2	2,751.8	10,444.3
- Production Cost	(D., '000)	1,727.9	137.7	150.9	1,343.6	3,360.1
- Net Income	(D., '000)	5,413.6	54.1	208.3	1,408.2	7,084.2
1.3 Pomegranate	1,031 D/ha					
- Planted Area	(ha)	150	145	161	1,788	2,244
- Gross Income	(D., '000)	353.0	95.9	148.3	6,045.6	6,642.8
- Production Cost	(D., '000)	154.7	149.5	166.0	1,843.4	2,313.6
- Net Income	(D., '000)	198.3	-53.6 *	-17.7 *	4,202.2	4,329.2
1.4 Apricot	1,144 D/ha					
- Planted Area	(ha)	125	51	49	122	347
- Gross Income	(D., '000)	1,180.1	66.5	60.9	711.6	2,019.1
- Production Cost	(D., '000)	143.0	58.3	56.1	139.6	397.0
- Net Income	(D., '000)	1,037.1	8.2	4.8	572.0	1,622.1
1.5 Fig / Others	905 D/ha					
- Planted Area	(ha)	124	213	243	383	963
- Gross Income	(D., '000)	369.6	206.8	251.9	732.5	1,560.8
- Production Cost	(D., '000)	112.2	192.8	219.9	346.6	871.5
- Net Income	(D., '000)	257.4	14.0	32.0	385.9	689.3
<b>2. Vegetables</b>						
2.1 Turnip* / Carrot	1,594 D/ha					
- Planted Area	(ha)	166	125	457	392	1,140
- Gross Income	(D., '000)	981.8	330.4	1,238.8	2,224.2	4,775.2
- Production Cost	(D., '000)	264.6	199.3	728.5	624.8	1,817.2
- Net Income	(D., '000)	717.2	131.1	510.3	1,599.4	2,958.0
2.2 Onion	1,769 D/ha					
- Planted Area	(ha)	166	123	541	408	1,238
- Gross Income	(D., '000)	824.2	333.6	1,503.8	2,255.9	4,917.5
- Production Cost	(D., '000)	293.7	217.6	957.0	721.8	2,190.1
- Net Income	(D., '000)	530.5	116.0	546.8	1,534.1	2,727.4
2.3 Kidney Beans	1,455 D/ha					
- Planted Area	(ha)	167	58	263	64	552
- Gross Income	(D., '000)	905.5	146.3	678.9	400.0	2,130.7
- Production Cost	(D., '000)	243.0	84.4	382.7	93.1	803.2
- Net Income	(D., '000)	662.5	61.9	296.2	306.9	1,327.5
2.4 Pepper	1,971 D/ha					
- Planted Area	(ha)	319	168	558	413	1,458
- Gross Income	(D., '000)	2,776.2	999.5	3,411.3	4,645.4	11,832.4
- Production Cost	(D., '000)	628.7	331.1	1,099.8	814.0	2,873.6
- Net Income	(D., '000)	2,147.5	668.4	2,311.5	3,831.4	8,958.8
2.5 Tomato	1,675 D/ha					
- Planted Area	(ha)	223	94	248	208	773
- Gross Income	(D., '000)	2,046.8	424.8	1,307.2	1,277.0	5,055.8
- Production Cost	(D., '000)	373.5	157.5	415.4	348.4	1,294.8
- Net Income	(D., '000)	1,673.3	267.3	891.8	928.6	3,761.0
<b>3. Fodder Crops</b>						
3.1 Lucern	1,038 D/ha					
- Planted Area	(ha)	886	311	2,850	1,620	5,667
- Gross Income	(D., '000)	2,519.1	1,279.6	7,575.6	5,098.8	16,473.1
- Production Cost	(D., '000)	919.7	322.8	2,958.3	1,681.6	5,882.4
- Net Income	(D., '000)	1,599.4	956.8	4,617.3	3,417.2	10,590.7
<b>4. Industrial Crops</b>						
4.1 Henna	1,257 D/ha					
- Planted Area	(ha)	0	0	0	452	452
- Gross Income	(D., '000)	0.0	0.0	0.0	1,218.0	1,218.0
- Production Cost	(D., '000)	0.0	0.0	0.0	568.2	568.2
- Net Income	(D., '000)	0.0	0.0	0.0	649.8	649.8
<b>Total :</b>						
- Planted Area	(ha)	5,359	6,501	12,130	10,690	34,680
- Gross Income	(D., '000)	25,204.6	34,137.4	54,757.5	46,292.6	160,392.1
- Production Cost	(D., '000)	5,651.9	6,756.1	13,529.9	11,557.2	37,495.1
- Net Income	(D., '000)	19,552.7	27,381.3	41,227.6	34,735.4	122,897.0
153 Oasis Area	(ha)	3,467	5,622	7,213	7,133	23,435
Cropping Intensity		154.6%	115.6%	168.2%	149.9%	148.0%
- Net Income per ha	(D./ha)	5,639.7	4,870.4	5,715.7	4,862.7	5,244.2

Ref. : ANNEX-E, Tables E.3.10.1, E.3.10.2, and E.3.10.3



Tableau 3.3.8.2 Bilan économique moyen actuel des fermes

Description	Maraichers Orais / Kebabli				Autres Orais / Kebabli				Orais de Gabres / Gabres				Limonaire 1 et 2 / Gabres					
	Cropped Area (ha)	Yield (ton/ha)	Production (tons)	Amount (D.)	Cropped Area (ha)	Yield (ton/ha)	Production (tons)	Amount (D.)	Cropped Area (ha)	Yield (ton/ha)	Production (tons)	Amount (D.)	Cropped Area (ha)	Yield (ton/ha)	Production (tons)	Amount (D.)		
<b>A. FARM LAND</b>																		
<b>B. GROSS INCOME</b>																		
Farm Income:																		
- Date	0.25	5.37	1.2	1,025	1,238	9	9	9	0.25	4.04	2.7	1,025	2,795	0.25	5.81	0.1	1,025	60
- Olive	0.01	4.28	0.0	0.400					0.19	3.90	0.0	0.400	8	0.16	3.87	0.6	0.400	248
- Pommeprune									0.02	3.08	0.1	0.287	18	0.09	11.77	1.0	0.287	266
- Appréci									0.01	2.41	0.0	0.493	12	0.01	11.71	0.1	0.493	29
- Fig / Other Fruits	0.02	2.46	0.0	0.385	14	14	14	14	0.01	2.60	0.1	0.385	40	0.01	4.88	0.0	0.385	9
Fodder Crops																		
- Lucerne	0.11	45.54	5.0	0.053	265	265	265	265	0.22	48.11	10.6	0.053	561	0.05	58.56	2.8	0.053	146
Winter Season Vegetables																		
- Tomate / Carrot	0.01	12.30	0.1	0.201	25	25	25	25	0.14	12.99	1.8	0.201	368	0.01	27.84	0.1	0.201	28
- Oignon	0.01	13.66	0.1	0.186	25	25	25	25	0.14	14.43	2.0	0.186	376	0.01	29.31	0.1	0.186	27
- Kidney beans	0.01	6.33	0.0	0.270	12	12	12	12	0.10	6.74	0.7	0.270	249	0.01	16.61	0.1	0.270	31
Summer Season Vegetables																		
- Pepper	0.01	6.38	0.0	0.874	28	28	28	28	0.03	6.74	0.2	0.874	139	0.01	12.70	0.1	0.874	55
- Tomate	0.01	15.48	0.1	0.310	24	24	24	24	0.02	16.36	0.2	0.310	76	0.01	19.54	0.1	0.310	30
Industrial Crops																		
- Henna / Tobacco																		
Subtotal	0.29 ha	155.62	(Cropping Intensity)	1,640 (a)	2,502 (b)	2,502 (b)	2,502 (b)	2,502 (b)	1.29 ha	181.52	(Cropping Intensity)	4,622 (a)	1,000 (b)	1,000 (b)	1,000 (b)	1,000 (b)	1,000 (b)	1,000 (b)
<b>C. GROSS OUTGOING</b>																		
Production Cost																		
- Arborescence	0.25			974	219	4	4	4	0.25			974	637	0.25			974	185
- Date	0.23			778					0.19			778		0.19			778	
- Olive	0.01								0.01					0.01				
- Pommeprune									0.09					0.09				
- Appréci									0.01					0.01				
- Fig / Other Fruits	0.02			905	14				0.04					0.01				
Fodder Crops																		
- Lucerne	0.11			1,038	114				0.22					0.03				
Winter Season Vegetables																		
- Tomate / Carrot	0.01			1,594	16				0.14					0.01				
- Oignon	0.01			1,769	18				0.14					0.01				
- Kidney beans	0.01			1,455	7				0.10					0.01				
Summer Season Vegetables																		
- Pepper	0.01			1,971	10				0.03					0.01				
- Tomate	0.01			1,675	8				0.02					0.01				
Industrial Crops																		
- Henna / Tobacco																		
Subtotal	0.29 ha			410 (c)	3,241 (d)	3,241 (d)	3,241 (d)	3,241 (d)	1.29 ha			1,583 (e)	1,583 (e)	0.44 ha			1,227	94
Farm Expenses**																		
- Food	261.1	45.5%	103.9	18.1%	387	1,475	1,475	1,475	261.1	45.5%	103.9	18.1%	387	261.1	45.5%	103.9	18.1%	387
- Housing	103.9	18.1%	69.3	12.1%	392	244	244	244	103.9	18.1%	69.3	12.1%	392	103.9	18.1%	69.3	12.1%	392
- Clothing	69.3	12.1%	43.1	7.5%	206	206	206	206	69.3	12.1%	43.1	7.5%	206	69.3	12.1%	43.1	7.5%	206
- Hygiene	43.1	7.5%	36.3	6.3%	247	247	247	247	43.1	7.5%	36.3	6.3%	247	43.1	7.5%	36.3	6.3%	247
- Transportation / Communication	36.3	6.3%	16.6	2.9%	94	94	94	94	36.3	6.3%	16.6	2.9%	94	36.3	6.3%	16.6	2.9%	94
- Education / Culture	16.6	2.9%	32.0	5.6%	446	446	446	446	16.6	2.9%	32.0	5.6%	446	16.6	2.9%	32.0	5.6%	446
- Others	32.0	5.6%							32.0	5.6%				32.0	5.6%			
Subtotal				410 (c)	3,241 (d)	3,241 (d)	3,241 (d)	3,241 (d)				1,583 (e)	1,583 (e)				1,227	94
<b>D. NET RESERVE</b>																		
Total Gross Outgoing	(b+c+d)				(b+c+e)				(b+c+f)				(b+c+g)					
Total Gross Income	(a+b)				(a+b)				(a+b)				(a+b)					
Net Reserve	486				462				373				2,022					

Sources : Enquete National sur le Budget des Agriculteurs (ENBA) 1995  
 Remarques : (\*) : Ces chiffres sont calculés à partir de la moyenne des fermes de la région.  
 (\*\*) : Consommation par personne (par an) estimée basée sur la moyenne des fermes de la région.  
 (\*\*\*) : Taille moyenne des fermes estimée basée sur la moyenne des fermes de la région.  
 Ref. : ANNEX-C, Tables E3.10.1, E3.11.1 et E3.11.2

Tableau 3.4.5.1 Méthodes d'irrigation et capacité des canaux par gouvernorat

Governorate	Service area of secteur (ha)	Service area of hydrant (ha)	System Cap. of secteur (l/sec)	Duration of application (hr/ha)	Irrigation interval		System Operation Time (hrs/day)	*)Designed maximum net water requirement at parcel (mm/day)	**)Estimated maximum net water requirement at parcel (mm/day)	Attainment ratio of present irrigation facilities (%)
					Range	Average				
Gafsa	52	8.8	30	2.8	5-14	***)13/7	20	2.3	7.9	29
Tozeur	28	3.5	31	3.8	5-11	7	20	3.1	8.6	37
Kebili	31	3.1	21	10.0	15-60	21	20	2.6	8.8	30
Gabes	44	2.4	22	7.0	10-40	16	21	2.0	6.4	31

(note)

\*) Irrigation efficiency is evaluated by oases sample survey

\*\*) Estimated values by JICA

\*\*\*) tree/vegetable

Governorate	Number of secteur (nos)	System capacity of secteur (lit./se)	System operation time (hrs/day)	Maximum cap. of irrigation facilities at hydrant ('000 m <sup>3</sup> /year)	Actually consumed water volume at pump station ('000 m <sup>3</sup> /year)	Utilization ratio of irrigation facilities (%)
Gafsa	67	30	20	52,566	28,376	54
Tozeur	204	31	20	148,613	89,529	60
Kebili	235	21	20	130,842	113,279	87
Gabes	164	22	21	99,388	66,193	67

Tableau 3.5.1.1 Prise en charge de la maintenance des installations hydrauliques

	Operation		Maintenance		
	CRDA	AIC	CRDA	AIC	Governorate
<b>1. Irrigation</b>					
1) Gafsa					
- Raguba Irri. System	○	-	○	-	-
- Others	-	○	○	-	-
2) Tozeur	○	△	○	△	-
3) Kebili					
- Well	○	-	○	-	-
- Pumping Sta.	△	○	○	△	-
- Canal system	-	○	○	△	-
4) Gabes	-	○	○	△	-
<b>2. Drainage</b>					
1) Gafsa					
- Principal	○	-	○	-	-
- Secondary	○	-	○	-	-
- Tertiary	-	○	-	○	-
2) Tozeur					
- Principal	○	-	○	-	△
- Secondary	○	-	○	-	-
- Tertiary	○	-	○	-	-
3) Kebili					
- Principal	○	-	○	-	△
- Secondary	-	○	-	○	-
- Tertiary	-	○	-	○	-
4) Gabes					
- Principal	○	-	○	-	△
- Secondary	-	○	-	○	-
- Tertiary	-	○	-	○	-

Legend:

○: main executor

△: sub executor

Tableau 3.5.2.1 Décomposition des frais de maintenance

	Gafsa	Tozeur	Kebili	Gabes	Average
1. Total OM cost					
1.1 Unit cost (TD/ha)	202	327	228	168	231
1.2 Sharing rate of OM cost (%)					
- AIC	67	71	67	75	70
- CRDA	33	29	33	25	30
2. OM cost of AIC					
2.1 Unit cost (TD/ha)	135	232	151	125	161
2.2 Distribution of OM cost (%)					
- Personnel charges	12	4	28	36	20
- Electric charges	47	82	67	50	62
- Water charge by CDRA	37	0	0	0	9
- Repairing cost	4	14	4	10	8
- Others	0	0	1	4	1
Total	100	100	100	100	100

Tableau 3.5.2.2 Aperçu des Associations d'Intérêt Collectif (AIC) et des frais de maintenance

Gouvernorate	Num. of Oasis (Nos) (1)	Num. of AIC (Nos) (2)	*) Average OM cost of AIC (DT/ha/year)	Num. of Oasis without AIC (Nos) (3)	Num. of AIC with baguetary deficit (Nos) (4)	No. of oasis with badgetary deficit				Total (nos)
						Insufficiency rate to OM cost				
						L.T. 15% (nos)	15-50% (nos)	50-100% (nos)	100% (nos)	
Gafsa	8	8	135	0	6	1	1	0	1	3
Tozeur	30	44	232	7	18	3	2	1	12	18
Kebili	67	69	151	0	19	11	2	1	4	18
Gabes	48	48	125	0	3	3	0	0	0	3
Total	153	169	(Ave. 161)	7	46	18	5	2	17	42

Note)

\*) These value does not include OM cost of CRDA.





Tableau 4.4.3.2 Evaluation générale des oasis pour le Projet de développement agricole

Description	Gafsa		Tozeur		Kebili		Gabes		Total	
	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)	No.	Area (ha)
153 Oases Area	8	3,467	30	5,622	67	7,213	48	7,133	153	23,435
1. Irrigation Facilities										
1.1 ○ : Satisfy the design criteria	0	0	3	837	6	480	1	58	10	1,375
1.2 ○ : Mostly satisfy the design criteria	0	0	6	403	5	538	1	180	12	1,121
1.3 X : Not satisfy the design criteria	8	3,467	21	4,382	56	6,195	46	6,895	131	20,939
2. Drainage Facilities										
2.1 ○ : Satisfy the design criteria	6	3,185	3	338	4	348	2	128	15	3,999
2.2 ○ : Mostly satisfy the design criteria	0	0	4	909	7	572	2	238	13	1,719
2.3 X : Not satisfy the design criteria	2	282	23	4,375	56	6,293	44	6,767	125	17,717
3. Tourism										
3.1 ○ : Very important for tourism	0	0	5	205	0	0	0	0	5	205
3.2 ○ : Relatively important for tourism	0	0	2	1,001	0	0	0	0	2	1,001
3.3 X : Unimportant for tourism	8	3,467	23	4,416	67	7,213	48	7,133	146	22,229
4. Economic Evaluation (EIRR)										
2.1 ○ : above 20%	6	2,702	5	1,578	18	1,725	5	1,914	34	7,919
2.2 ○ : 20 - 14 %	1	700	5	1,941	20	2,353	19	2,847	45	7,841
2.3 △ : 14 - 7.5 %	1	65	11	863	22	2,554	20	2,194	54	5,676
2.4 X : below 7.5%	0	0	9	1,240	7	581	4	178	20	1,999
5. Ranking for Agricultural Development										
5.1 A : Higher ranking	1	217	5	1,578	14	1,414	5	1,914	25	5,123
5.2 B : High ranking	6	3,185	5	1,941	23	2,548	18	2,667	52	10,341
5.3 C : Medium ranking	1	65	11	863	23	2,670	21	2,374	56	5,972
5.4 D : Low ranking	0	0	9	1,240	7	581	4	178	20	1,999

Tableau 4.4.3.3 Oasis objets du projet, surface et estimation générale

Gouvernorat/Délégation	Oasis		Total			
	No.	Area	A	B	C	D
<b>1. Gafsa</b>						
1.1 Gafsa Sud	2	1,401	0	2	0	0
1.2 Guetar	1	450	0	1	0	0
1.3 Ksar	2	1,278	0	2	0	0
1.4 Metalaoui	2	121	0	1	1	0
1.5 Redeyef	1	217	1	0	0	0
<u>Sub-total</u>	<u>8</u>	<u>3,467</u>	<u>1</u>	<u>6</u>	<u>1</u>	<u>0</u>
<b>2. Tozeur</b>						
2.1 Tozeur	10	1,860	1	3	5	1
2.2 Nefta	5	1,602	1	0	1	3
2.3 Hazoua	4	436	2	0	2	0
2.4 Degache	6	1,519	1	2	3	0
2.5 Tamerza	5	205	0	0	0	5
<u>Sub-total</u>	<u>30</u>	<u>5,622</u>	<u>5</u>	<u>5</u>	<u>11</u>	<u>9</u>
<b>3. Kebili</b>						
3.1 Souk Lahad	14	1,824	4	7	3	0
3.2 Kebili Nord	12	1,306	1	7	4	0
3.3 Kebili Sud	18	1,987	8	2	8	0
3.4 Douz	13	1,265	1	2	4	6
3.5 Faoaur	10	831	0	5	4	1
<u>Sub-total</u>	<u>67</u>	<u>7,213</u>	<u>14</u>	<u>23</u>	<u>23</u>	<u>7</u>
<b>4. Gabes</b>						
4.1 Gabes Est	5	750	0	2	3	0
4.2 Gabes Ouest	5	1,096	2	2	1	0
4.3 Ghahhouch	5	1,085	1	3	1	0
4.4 Metouia	3	763	1	1	1	0
4.5 El Hamma	11	1,555	1	5	5	0
4.6 Mareth	17	1,794	0	5	10	2
4.7 Matmata	2	90	0	0	0	2
<u>Sub-total</u>	<u>48</u>	<u>7,133</u>	<u>5</u>	<u>18</u>	<u>21</u>	<u>4</u>
<u>Total</u>	<u>153</u>	<u>23,435</u>	<u>25</u>	<u>52</u>	<u>56</u>	<u>20</u>

Ref. : 表 4.4.3.1, 4.4.3.2







Tableau 6.3.1.1 Quantité de travaux à effectuer dans chaque oasis

(1) Gafsa Governorate

Cord No.	Name of Oasis	Planned Area (ha)	No. of Sample	Sample Area (ha)	Planned A. Capa. (l/s)	Facility Dimension	Improved Channel		Pipeline		Drains (m)		Irrigation Drains		
							Length (m)	Turn-out	Length (m)	Turn-out	Field Collector	Field Collector	(m/ha)	(m/ha)	(m)
GF- 1	Kasba	698	4	46.320	15.1	30 25 x 25	5230	162				113	0	78811	0
GF- 2	Sud Ouest	703	3	41.750	16.8	30 25 x 25	6275	148				150	0	105660	0
GF- 3	El Guettar	450	1	46.400	9.7	33 30 x 25	8200	250				177	0	79526	0
GF- 4	Lalla	700	4	46.030	15.2	30 25 x 25	6815	174				148	0	103639	0
GF- 5	El Ksar	578	3	44.620	13.0	30 25 x 25	5820	164				124	0	71505	0
GF- 6	Oued Shilli	56	1	4.620	12.1	40 $\phi$ 200			740	19		160	0	8970	0
GF- 7	Thelja	65	1	2.560	25.4	30 $\phi$ 160			330	9	235	129	150	8379	9775
GF- 8	Segdoud	217	2	15.360	14.1	20 20 x 20	1900	50			1510	450	124	26842	27690
	Total	3,467	19	247.680	14.0	30	33940	948	1070	28	1745	141	35	483333	37465

(2) Tozeur Governorate

Cord No.	Name of Oasis	Planned Area (ha)	No. of Sample	Sample Area (ha)	Planned A. Capa. (l/s)	Facility Dimension	Improved Channel		Pipeline		Drains (m)		Irrigation Drains			
							Length (m)	Turn-out	Length (m)	Turn-out	Field Collector	Field Collector	(m/ha)	(m/ha)	(m)	(m)
TZ- 1	Rozeur	929	5	24.330	38.1	30 $\phi$ 160			4180	92	780	250	171	42	159145	39215
TZ- 2	Kastilia	50	1	3.200	15.6	35 $\phi$ 200			480	12			150	0	7500	0
TZ- 3	Oued El Koucha	62	1	4.000	15.5	54 30 x 25	535	15			320		134	80	8293	4960
TZ- 4	Neflayette	72	1	5.400	13.3	30 $\phi$ 160			965	20	225		179	42	12867	3000
TZ- 5	Chemsa	90	1	5.920	15.2	26 $\phi$ 160			825	18	480		139	81	12542	7297
TZ- 6	Helba Est	75	1	4.950	15.2	55 30 x 25	1045	21			220	120	211	69	15833	5152
TZ- 7	Helba Ouest	50	1	4.095	12.2	55 30 x 25	275	8			345		67	84	3358	4212
TZ- 8	Jhim 1	40	1	8.000	5.0	40 30 x 25	855	26			525	255	107	98	4275	3900
TZ- 9	Jhim 2	167	1	6.000	27.8	30 25 x 25	595	20			395	235	99	105	16561	17535
TZ- 10	Ibn Chabbat 3(*)	325	1	9.600	33.9	30 25 x 25	1800	112			760	238	188	104	60938	33786
TZ- 11	Nefta	852	4	26.388	32.3	25 25 x 20	3190	91			525	330	121	32	102997	27606
TZ- 12	Ghardgaya	40	1	4.725	8.5	40 30 x 25	775	16			200	110	164	66	6561	2624
TZ- 13	Ibn Chabbat 1 (*)	240	1	6.810	35.2	25 25 x 20	190	54			200	300	28	73	6696	17621
TZ- 14	Ibn Chabbat 2 (*)	272	1	7.470	36.4	25 25 x 20	1170	77			185	305	157	66	42602	17842
TZ- 15	Draa Sud	198	2	10.800	18.3	20 20 x 20	140	34			0	0	13	0	2567	0
TZ- 16	Hazoua 1	72	2	6.645	10.8	27 25 x 25	600	16	840	20	720	175	217	135	15603	9698
TZ- 17	Hazoua 2	48	2	4.030	11.9	19 $\phi$ 140	900	28	615	14	250	155	153	100	7325	4824
TZ- 18	Hazoua 3	238	4	19.346	12.3	27 25 x 25			970	32	1570	633	97	114	23005	27102
TZ- 19	Oued Loghrissi	78	1	4.100	19.0	23 $\phi$ 160			540	16	200	200	132	98	10273	7610

17- 20 Tazrarit	48	1	4.340	11.1	38	30 x 25	495	16	780	400	103	114	116	5475	5563	
17- 21 Cedada	55	1	4.250	12.9	45	φ200			780	15	350	184	116	10094	6406	
17- 22 Dghoumes	104	2	6.320	16.5	25	25 x 20	710	36		600	210	112	128	11684	13329	
17- 23 Degache	822	3	26.500	31.0	45	30 x 25	4080	92		1025	60	154	41	126557	33655	
17- 24 Chakmou	90	1	7.700	11.7	27	φ160			1460	32	-	190	0	17065	0	
17- 25 El Hamma	400	2	9.900	40.4	30	25 x 25	1020	38		660	75	103	74	41212	29697	
17- 26 Tamerza	80	1	6.680	12.0	-	Amenity C.	720	21		370	540	108	166	8623	13293	
17- 27 Chebika	23	1	1.380	16.7	-	Amenity C.	225	6		150	-	163	109	3750	2500	
17- 28 Foun El Khanga	48	1	1.380	34.8	-	Amenity C.	205	4		230	-	149	167	7130	8000	
17- 29 Mides	29	1	2.500	11.6	22	Amenity C.	100	8		70	98	40	67	1160	1949	
17- 30 Ain El Karma	25	1	1.910	13.1	-	Amenity C.	150	7		230	85	79	165	1963	4123	
Total	5.622	47	238.729	23.5	31		19775	746	11655	271	12185	4622	131	85	753653	352500

(3) Kebili Governorate

Cord No.	Name of Oasis	Planned Area (ha)	No. of Sample	Sample Area (ha)	Sample A./Planned A. Capa. (1/s)	System	Facility Dimension	Improved Channel		Pipeline		Drains (m)		Irrigation Drains	
								Length (m)	Turn-out	Length (m)	Turn-out	Field	Collecto	(m/ha)	(m/ha)
KB- 1	Bechri	162	1	4.480	36.2	21	25 x 20	795	18	265	193	177	102	28748	16582
KB- 2	Bouabdallah	270	2	16.510	16.4	21	25 x 20	2750	62	1040	320	167	82	44973	22241
KB- 3	Fatnassa	205	2	12.260	16.7	15	20 x 20	1780	42	290	300	145	48	29763	9865
KB- 4	El Gliaa	94	1	6.550	14.4	25	φ160			1130	25	545	173	18217	11050
KB- 5	Menchia	140	1	9.240	15.2	22	25 x 20	1690	40	625	530	183	125	25606	17500
KB- 6	Nagga	181	2	9.940	18.2	20	φ140			1580	33	555	56	28771	10106
KB- 7	Oum Soma	162	1	10.010	16.2	21	φ160			1655	40	705	121	26784	19550
KB- 8	Oued Zira	176	1	9.600	18.3	22	φ160			1740	35	440	54	31900	9442
KB- 9	Ouled Touati	62	1	5.720	10.8	25	φ160			1470	28	260	45	15934	2818
KB- 10	Tenchig	54	1	3.520	15.3	15	φ140			435	14	325	124	6673	6520
KB- 11	Zaouiet El Anes	125	1	5.060	24.7	20	20 x 20	425	19	295	-	84	58	10499	7288
KB- 12	Zaouiet El Harth	81	1	8.870	9.1	20	φ140			1630	35	735	106	14885	8566
KB- 13	Ziret Loubichi	86	1	5.100	16.9	22	φ160			955	19	400	78	16104	6745
KB- 14	Chouchet Nagga	26	1	2.000	13.0	25	φ160			300	8	200	100	3900	2600
KB- 15	Guataya	150	2	9.540	15.7	20	φ140			1300	34	185	19	20440	2909
KB- 16	Jedida	133	1	10.500	12.7	18	φ140			2020	41	640	125	25587	16657
KB- 17	Mansoura	86	2	4.100	21.0	18	φ140			1270	44	510	124	26639	10698
KB- 18	Rabta	162	2	9.470	17.1	20	φ160			1750	36	660	185	29937	16337
KB- 19	Telmime	240	2	14.140	17.0	21	φ160			2450	55	630	87	41584	20792
KB- 20	Tembib	118	1	7.070	16.7	22	φ160			1180	26	410	58	19694	6843
KB- 21	Tombar	127	2	4.400	28.9	25	φ160			1020	24	570	130	29441	16452
KB- 22	Limagues	57	1	3.270	17.4	25	25 x 20	660	14	225	-	202	69	11505	3922

KB-23	Mazraa Nejl	66	1	3,000	22.0	26	ø160			400	12	300	150	133	150	8800	9900
KB-24	Oum El Farth let2	55	1	6,840	8.0	27	25 x 25	450	11			200		66	29	3618	1608
KB-25	Stiftimi	82	1	3,600	22.8	25	25 x 20	505	10					140	0	11503	0
KB-26	Saidane	30	1	2,000	15.0	25	ø160			350	8	100		175	50	5250	1500
KB-27	Barghouthia	52	1	6,230	8.3	25	ø160			825	20	300		132	48	6886	2504
KB-28	Bazma	146	2	9,480	15.4	25	ø160			1320	36	915		139	97	20329	14092
KB-29	B chelli	135	3	8,960	16.7	22	ø160			1525	48	610		189	76	25543	10217
KB-30	Blidette	75	1	4,530	16.6	15	ø140			500	16	400		110	88	8278	6623
KB-31	Zarcine	70	1	5,500	12.7	15	ø140			775	21	340		141	62	9854	4327
KB-32	Jenna	112	1	6,640	16.9	25	25 x 20	260	5			150		39	23	4386	2530
KB-33	Mtouria	81	1	6,260	12.9	20	20 x 20	630	21			310		101	50	8152	4011
KB-34	Msaïd	95	1	6,106	15.6	25	ø160			1040	23	520		170	85	16181	8090
KB-35	Rahmat	85	1	4,310	19.7	22	25 x 20	750	16			400		174	93	14791	7889
KB-36	Ras El Ain	268	2	15,010	17.9	25	25 x 20	2800	60			1205		187	80	49993	21515
KB-37	Souk El Balez	65	1	3,890	16.7	27	ø160			475	13	360		122	93	7937	6015
KB-38	Ben Zitoun let2	147	2	7,390	19.9	21	25 x 20	850	23			530		115	82	16908	12035
KB-39	Bourzine	94	2	6,440	14.6	22	ø160			845	22	200		131	47	12334	4452
KB-40	Gueliada	103	1	6,960	14.8	25	ø160			800	24	400		115	57	11839	5920
KB-41	Kelwamen	47	1	2,060	22.8	15	ø140			430	10	130		209	102	9811	4791
KB-42	Klibia	92	1	5,050	18.2	22	ø160			700	16	400		139	79	12752	7287
KB-43	Sidi Hamed	100	1	7,890	12.7	27	ø160			600	24	615		76	78	7605	7795
KB-44	Atilet	220	3	16,100	13.7	26	ø160			3280	101	1220		204	76	44820	16671
KB-45	Douz	280	3	14,830	18.9	26	25 x 20	1290	52			805		87	67	24356	18692
KB-46	El Ghoula (*)	75	1	4,710	15.9	27	ø160			750	57			159	0	11943	0
KB-47	El Golaa (*)	65	1	2,350	27.7	27	ø160			215	12	105		91	87	5947	5670
KB-48	Grad (*)	111	1	6,980	15.9	25	ø160			1230	87	620		176	120	19560	13358
KB-49	El H say	90	1	5,700	15.8	26	ø160			450	18			79	0	7105	0
KB-50	Nouiel	97	1	6,720	14.4	22	ø160			980	20	280		146	50	14146	4835
KB-51	Zafrane	101	1	4,620	21.9	27	ø160			240	14			52	0	5247	0
KB-52	Bouhanza	80	1	6,200	12.9	26	ø160			865	22	310		140	75	11161	6000
KB-53	Ksar Ghilane	100	1	5,200	19.2	22	25 x 20	550	16			400		106	126	10577	12596
KB-54	Sakkouma (*)	80	1	4,110	19.5	26	ø160			725	42	200		176	85	14112	6813
KB-55	Tarfaya (*)	77	1	4,620	16.7	25	ø160			690	32	430		149	93	11500	7167
KB-56	Dhomrana	45	1	2,200	20.5	18	ø140			200	6	200		91	136	4091	6136
KB-57	Suida	64	1	4,700	13.6	27	ø160			535	16	200		114	65	7285	4153
KB-58	Ghidma	80	1	4,580	17.5	22	25 x 20	275	16			400		60	87	4803	6987
KB-59	Sabria	60	1	3,000	20.0	26	ø160			400	11	300		133	152	8000	9100
KB-60	El Faouar 1	87	1	6,840	12.7	15	ø140			705	21	440		103	96	8967	8395
KB-61	El Faouar 2	80	1	6,650	12.0	20	ø140			1310	36	510		197	77	15759	6135



GB- 62	Bechni	100	2	8.630	11.6	25	25 x 20	30	1090	64	390	160	113	64	11298	6373	
GB- 63	Darsine (*)	72	1	4.730	15.2	20	φ140		495	16	400	100	230	63	16892	4567	
GB- 64	Matrouha	100	1	4.000	25.0	15	φ140		625	16	400	105	156	126	12375	12500	
GB- 65	Regim Matroug 1	104	1	4.000	26.0	20	φ140		790	24	600	-	132	100	16250	13130	
GB- 66	Regim Matroug 2	96	1	6.000	16.0	18	φ140		150	7	200	50	73	122	12640	9600	
GB- 67	Tarfayet Elma	52	1	2.050	25.4	25	φ160		48195	1412	27605	6539	147	80	3806	6341	
Total		7,213	86	438.116	16.5	22		17435	455	48195	1412	27605	6539	147	80	1080632	573782

(4) Gabes Governorate

Cord No.	Name of Oasis	Planned Area (ha)	No. of Sample	Sample Area (ha)	Sample A./System Planned A. Capa. (l/s)	Facility Dimension	Improved Channel Length (m)	Turn-out Length (m)	Pipeline Length (m)	Turn-out Field Collecto (m/ha)	Drains (m)	Irrigation Brains (m/ha)	Irrigation Brains (m)
GB- 1	Ain Zrig	140	2	8.840	15.8	18 20 x 20	635	31	200	11	420	94	13224
GB- 2	Femoula 1	40	1	3.220	12.4	17 20 x 20	315	12			260	98	3913
GB- 3	Femoula 2	20	1	1.080	18.5	11 φ140			125	6	100	65	2315
GB- 4	Zrig Dakhlania	30	1	2.230	13.5	24 φ160			350	11	140	50	4709
GB- 5	Teboulbou	520	4	36.090	14.4	22 25 x 20	4855	115	1540	33	2700	705	92142
GB- 6	Oasis de Gabes	734	6	49.600	14.8	25 25 x 20	5585	192	2370	67	920	320	82649
GB- 7	Limaoua 1 et 2	148	3	13.850	10.7	26 φ160					355	175	25326
GB- 8	M dou	40	1	4.070	9.8	37 30 x 25	580	13			95	105	5700
GB- 9	Chott El Ferik	31	1	4.570	6.8	18 20 x 20	480	17	740	21	415	79	11281
GB- 10	Bouchamma	143	1	9.380	15.2	20 φ140			2090	50	1885	115	58193
GB- 11	Mahjoub	374	5	24.390	15.3	27 25 x 25	1705	52	1330	33	605	-	15960
GB- 12	Salem	99	1	8.250	12.0	36 φ200			765	17	345	135	12991
GB- 13	Sboui	72	1	4.240	17.0	25 φ160			695	16	1280	320	40087
GB- 14	Faycal	260	3	14.950	17.4	19 20 x 20	1610	38			45	1475	53464
GB- 15	M'ziraa Ghannouch	280	2	18.330	15.3	22 25 x 20	1370	35	2130	45	1475	613	40352
GB- 16	Methouia	268	3	14.080	19.0	25 25 x 20	1155	28	965	20	1010	-	46417
GB- 17	Ouedhref	263	3	13.910	18.9	26 25 x 20	1165	28	1290	28	1190	168	25676
GB- 18	Aouinette	232	2	17.940	12.9	18 20 x 20	1745	38	1325	32	780	275	39701
GB- 19	Chenchou 1	57	1	4.000	14.3	27 25 x 25	545	15			380	100	7766
GB- 20	Chenchou 2	40	1	3.970	10.1	25 φ160			630	16	405	125	6348
GB- 21	Tekouri	32	1	1.700	18.8	16 φ140			425	11	180	68	8000
GB- 22	Hamma Oasis	400	5	19.440	20.6	18 φ140			2845	73	1345	358	58539
GB- 23	Mziraa Hama	80	2	6.660	12.0	16 φ140			1120	25	530	223	13453
GB- 24	Bechima 1	280	2	15.420	18.2	15 20 x 20	2130	72			1170	378	38677
GB- 25	Bechima 2	290	1	16.050	18.1	15 20 x 20	2135	74			1190	605	38576
GB- 26	Khebayet	96	1	6.660	14.4	41 30 x 25	450	16			400	-	6486
GB- 27	Ben Ghilouf	180	2	10.330	17.4	14 20 x 20	600	24			300	-	10455

GB- 28	Glib Dokhane	70	1	5.420	12.9	23	25 x 20	900	25							166	0	11624	0
GB- 29	Oued Nekhla	30	1	2.420	12.4	18	20 x 20	195	8							81	87	2417	2603
GB- 30	Arram	163	1	11.210	14.5	22	25 x 20	1290	49							115	126	18757	20502
GB- 31	Mareth 1	100	2	5.920	16.9	30	25 x 25	970	26							164	138	16385	13767
GB- 32	Mareth 2	180	2	9.290	19.4	26	25 x 20	1635	45							176	129	31679	23212
GB- 33	Mareth 3	30	1	2.250	13.3	14	φ140			355						158	92	4733	2773
GB- 34	Mareth 5	115	1	6.620	17.4	36	30 x 25	1414	30							214	151	24563	17337
GB- 35	Mareth 6	88	1	5.000	17.6	17	20 x 20	610	16							122	101	10736	8853
GB- 36	Zarat 2	174	1	6.040	28.8	22	25 x 20	835	26							138	132	24055	23046
GB- 37	Zerkine 1 et 3	116	1	6.480	17.9	20	20 x 20	425	24							66	93	7608	10830
GB- 38	Zerkine 2	156	1	6.240	25.0	25	25 x 20	1195	29							192	61	29875	9460
GB- 39	Ayoume Zerkine	30	1	2.490	12.0	18	φ140			615						247	0	7410	0
GB- 40	Madssia (*)	58	1	3.380	17.2	15	20 x 20	460	40							136	118	7893	6890
GB- 41	Kettana 1	98	1	7.000	14.0	23	φ160			1230						176	113	17220	11032
GB- 42	Kettana 3	140	2	8.420	16.6	19	20 x 20	1025	25							122	148	17043	20701
GB- 43	Kettana 4	125	1	6.610	18.9	20	20 x 20	780	30							118	131	14750	16415
GB- 44	Sidi Sellam	120	1	6.870	17.5	26	25 x 20	950	24							138	68	16594	8210
GB- 45	Zrig Barrania	71	1	4.760	14.9	25	25 x 20	670	22							141	84	9994	5966
GB- 46	Ghandri	30	1	3.300	9.1	20	φ140			550						167	94	5000	2818
GB- 47	Laaradh 1	35	1	2.320	15.1	22	φ160			465						200	116	7015	4073
GB- 48	Laaradh 3	55	1	2.380	23.1	28	φ160			340						143	181	7857	9937
Total		7,133	81	447.670	15.9	22		40414	1219	24490	598	31785	8205	146	96	1033191	649682		





Tableau 7.2.2.1 Décomposition du coût du projet

(Unit: 000' D)

Item	1st Year	2nd Year	3rd Year	4th Year	5nd Year	6nd Year	Total
(1) Direct Cost							
(irr. and drain. facilities)	0	11,416	18,661	19,946	11,578	3,417	65,018
(2) Land Acquisition and Compensation	212	367	355	232	86	0	1,254
(3) Administration (1.5% of (1))	0	158	283	297	177	61	975
(4) Engineering Services	640	1,480	1,534	1,264	709	244	5,871
(5) Physical Contingency (10% of (1)+(2)+(3)+(4))	85	1,342	2,083	2,173	1,254	372	7,309
(6) Price Contingency (4% of (1)+(2)+(3)+(4)+(5))	37	1,204	2,861	4,061	2,990	1,086	12,239
Total	974	15,967	25,777	27,973	16,794	5,180	92,666

Tableau 9.1.1 Evaluation financière et économique des produits et des équipements agricoles

Description	Unit	Farm Products		Farm Inputs	
		Financial Price (D.)	Economic Price (D.)	Financial Price	Economic Price
<b>A. FARM PRODUCTS</b>					
1. Arboriculture					
1.1 Date Palm	Kg	1.025	1.180	1.500	1.500
1.2 Olive	Kg	0.400	0.625	2.000	2.000
1.3 Pomegranate	Kg	0.287	0.294	0.500	0.500
1.4 Apricot	Kg	0.493	0.505	0.800	0.800
1.5 Fig	Kg	0.385	0.394	0.500	0.500
2. Vegetables					
2.1 Carrot	Kg	0.109	0.113	24.100	24.100
2.2 Turnip	Kg	0.201	0.208	13.500	13.500
2.3 Onion	Kg	0.186	0.192	59.000	59.000
2.4 Kidney Beans	Kg	0.370	0.383	1.500	1.500
2.5 Pepper	Kg	0.874	0.904	156.200	156.200
2.6 Tomato	Kg	0.310	0.321	72.500	72.500
3. Fodder Crops					
3.1 Lucern	Kg	0.053	0.055	4.300	4.300
4. Industrial Crops					
4.1 Henna	Kg	1.839	1.904	2.100	2.100
<b>B. FARM INPUTS</b>					
1. Fertilizers					
1.1 FYM / Compose	ton	10.000	8.500	10.000	8.500
1.2 Ammonite	50 kg	11.500	9.700	11.500	9.700
1.3 Super 45 (TSP)	50 kg	11.900	13.250	11.900	13.250
1.4 Sulfate de Potasse	50 kg	21.100	13.800	21.100	13.800
1.5 Nitrate de Potash	50 kg	44.000	26.100	44.000	26.100
2. Insecticides	lit	18.700	18.700	18.700	18.700
3. Fungicides	kg	25.200	25.200	25.200	25.200
4. Water Charge	m <sup>3</sup>	0.020	0.020	0.020	0.020
5. Labor Charge			( x 0.85)		
2.1 Casual Worker	man-day	5.200	4.420	5.200	4.420
2.2 Pollinisation (Date)	man-day	5.800	4.930	5.800	4.930
2.3 Harvesting	man-day	6.800	5.780	6.800	5.780

Sources : Arr. des Etudes et Statistiques Agricole, Division des Etudes et du Development Agricole, Gafsa, Tozeur, Kebili and Gabes CRDA

Farm Economic Survey by JICA Study Team, September 1995  
Remarks : T.C.\* ; Transportation cost from market to farm including handling charge and other costs.

Ref.: ANNEX-K, Tables K.2.1.1, K.2.1.2 and K.2.1.3

Tableau 9.2.1 Frais de production et profits avec et sans le projet

(Unit : D./ha)

Description		Gross Income			Production Cost				Net Return (a - b)
		Yield* (ton)	Unit Price (D./kg)	Amount (a)	Farm Inputs	Labor Cost	Others	Total (b)	
1. Arboriculture									
1.1 Date Palm	Without Project	4.55	1.180	5,367	351	501	42	894	4,473
	With Project	5.18		6,108	475	536	50	1,061	5,047
	Increment	0.63		741				167	574
1.2 Olive	Without Project	4.78	0.625	2,990	215	449	33	697	2,293
	With Project	5.33		3,333	286	421	35	742	2,591
	Increment	0.55		343				45	298
1.3 Pomegranate	Without Project	7.90	0.294	2,328	329	476	40	845	1,483
	With Project	9.25		2,720	390	462	43	895	1,825
	Increment	1.35		392				50	342
1.4 Apricot	Without Project	9.88	0.505	4,987	343	569	46	958	4,029
	With Project	10.98		5,543	405	569	48	1,022	4,521
	Increment	1.10		556				64	492
1.5 Fig	Without Project	3.37	0.394	1,326	244	476	49	769	557
	With Project	3.77		1,484	371	462	62	895	589
	Increment	0.40		158				126	32
2. Vegetables									
2.1 Turnip* /Carrot	Without Project	20.00	0.208	4,160	370	972	67	1,409	2,751
	With Project	22.50		4,680	414	1,048	72	1,534	3,146
	Increment	2.50		520				125	395
2.2 Onion	Without Project	21.00	0.192	4,032	432	1,061	75	1,568	2,464
	With Project	23.80		4,570	476	1,092	79	1,647	2,923
	Increment	2.80		538				79	459
2.4 Kindey Beans	Without Project	10.40	0.383	3,983	261	915	59	1,235	2,748
	With Project	11.70		4,481	344	1,012	68	1,424	3,057
	Increment	1.30		498				189	309
2.5 Pepper	Without Project	9.20	0.904	8,317	1,043	1,017	103	2,163	6,154
	With Project	10.30		9,311	1,080	1,083	108	2,271	7,040
	Increment	1.10		994				108	886
2.6 Tomato	Without Project	20.90	0.321	6,709	624	1,017	82	1,723	4,986
	With Project	23.40		7,511	668	1,083	87	1,838	5,673
	Increment	2.50		803				115	688
3. Fodder Crops									
3.1 Lucern	Without Project	54.40	0.055	2,992	249	628	44	921	2,071
	With Project	65.30		3,592	344	685	52	1,081	2,511
	Increment	10.90		600				160	440
4. Cash Crops									
4.1 Henna	Without Project	1.40	1.904	2,666	386	703	55	1,144	1,522
	With Project	1.70		3,237	481	751	62	1,294	1,943
	Increment	0.30		571				150	421

Remark : Figures of arboriculture crops are estimated average yield and annual cost of 25 years.

Ref. : ANNEX-K, Tables K.2.2.1 (i) to (7)

Tableau 9.2.2 Bénéfices annuels de l'irrigation dus à l'exécution du projet dans les 4 gouvernorats

Description	Unit	Gaza Governorate		Toway Governorate		Kheili Governorate		Guben Governorate		Total	
		W/O Project	With Project	W/O Project	With Project	W/O Project	With Project	W/O Project	With Project	W/O Project	With Project
<b>1. Agriculture</b>											
<b>1.1 Date Palm (664 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	812	812	5,036	5,036	6,596	6,596	3,113	3,113	15,527	15,527
- Gross Production Value	(D,000)	6,933.8	7,957.0	3,261.4	4,307.9	48,131.4	53,960.0	21,278.5	24,257.7	104,861.2	118,587.5
- Production Cost	(D,000)	725.9	861.5	4,502.2	5,243.3	6,935.5	8,065.5	2,783.0	3,303.2	13,881.1	16,463.5
- Net Income (Increment Benefit)	(D,000)	6,207.9	7,095.5	29,373.3	32,858.1	38,926.4	41,275.2	18,495.5	20,954.5	90,980.1	102,124.0
<b>1.2 Olive (742 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	2,221	2,221	177	177	194	194	1,727	1,727	4,319	4,319
- Gross Production Value	(D,000)	11,176.9	12,206.9	330.0	45.2	845.8	616.3	4,153.2	4,782.3	16,163.7	18,032.5
- Production Cost	(D,000)	1,348.0	1,440.0	123.4	71.9	135.2	8.3	3,010.3	3,284.2	3,010.3	3,284.2
- Net Income (Increment Benefit)	(D,000)	9,828.9	10,766.9	206.6	27.3	710.6	628.0	2,891.5	3,500.2	13,153.4	14,748.3
<b>1.3 Pomegranate (895 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	150	150	145	145	161	161	1,788	1,788	2,244	2,244
- Gross Production Value	(D,000)	361.2	397.1	55.2	109.1	147.2	165.5	5,982.7	6,944.1	6,366.3	7,616.1
- Production Cost	(D,000)	126.8	134.3	92.3	94.9	136.0	143.5	1,510.9	1,581.3	1,660.0	1,724.4
- Net Income (Increment Benefit)	(D,000)	234.4	262.8	26.9	14.2	111.2	122.0	4,471.8	5,362.8	4,706.3	5,891.7
<b>1.4 Apricot (905 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	125	125	51	51	49	49	125	122	347	347
- Gross Production Value	(D,000)	1,200.4	1,307.6	66.5	74.4	60.8	67.8	702.1	814.0	2,033.8	2,263.8
- Production Cost	(D,000)	119.8	127.8	48.9	52.6	46.9	49.8	116.9	124.9	332.5	355.1
- Net Income (Increment Benefit)	(D,000)	1,080.6	1,179.8	17.6	21.8	13.9	18.0	585.2	689.1	1,701.3	1,908.7
<b>1.5 P/B/Other (709 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	174	174	213	213	243	243	383	383	903	903
- Gross Production Value	(D,000)	377.1	411.0	33.9	294.2	250.9	279.3	727.8	835.7	1,502.4	1,760.2
- Production Cost	(D,000)	85.4	110.3	103.8	164.8	186.9	212.0	284.5	361.3	740.6	846.6
- Net Income (Increment Benefit)	(D,000)	291.7	300.7	43.1	49.4	64.0	67.3	443.3	474.4	761.8	913.6
<b>2. Vegetables</b>											
<b>2.1 Tomato (1,469 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	166	166	125	125	457	457	392	392	1,140	1,140
- Gross Production Value	(D,000)	1,025.5	1,230.0	346.2	377.7	1,251.4	1,401.9	2,233.7	2,560.2	4,942.8	5,487.8
- Production Cost	(D,000)	233.9	256.6	176.1	193.8	643.9	697.8	552.3	608.8	1,666.2	1,744.0
- Net Income (Increment Benefit)	(D,000)	791.6	973.4	170.1	183.9	607.5	704.1	1,681.4	1,951.4	3,276.6	3,743.8
<b>2.2 Onion (1,566 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	164	166	123	123	341	341	406	406	1,238	1,238
- Gross Production Value	(D,000)	844.8	932.4	338.2	381.0	1,510.7	1,704.7	2,259.2	2,590.2	4,953.4	5,608.3
- Production Cost	(D,000)	280.3	273.2	191.9	283.3	848.3	983.3	630.7	672.3	1,941.2	2,094.8
- Net Income (Increment Benefit)	(D,000)	564.5	659.2	146.3	197.7	662.4	721.4	1,628.5	1,917.9	3,012.2	3,513.5
<b>2.3 Kidney Beans (1,235 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	167	167	58	58	263	263	64	64	552	552
- Gross Production Value	(D,000)	935.1	1,056.9	146.7	167.7	685.4	786.6	401.3	458.9	2,170.5	2,430.1
- Production Cost	(D,000)	206.1	237.8	71.6	81.9	324.8	373.0	70.0	91.3	681.5	784.0
- Net Income (Increment Benefit)	(D,000)	729.0	819.1	75.1	85.8	360.6	413.6	331.3	367.6	1,489.0	1,646.1
<b>2.4 Potato (2,148 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	319	319	108	108	558	558	413	413	1,458	1,458
- Gross Production Value	(D,000)	2,895.8	3,172.6	1,014.5	1,145.2	3,433.0	3,849.3	4,859.1	5,339.5	12,024.4	13,506.6
- Production Cost	(D,000)	600.0	721.7	303.4	381.1	1,207.0	1,286.7	893.3	972.2	3,153.7	3,307.7
- Net Income (Increment Benefit)	(D,000)	2,295.8	2,450.9	711.1	764.1	2,226.0	2,562.6	3,965.8	4,367.3	8,870.7	10,198.9
<b>2.5 Turnip (1,723 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	223	223	94	94	248	248	208	208	773	773
- Gross Production Value	(D,000)	2,117.5	2,303.5	431.5	486.8	1,212.0	1,400.8	1,282.3	1,469.4	5,152.3	5,796.7
- Production Cost	(D,000)	384.2	410.0	162.0	172.3	427.5	454.9	358.4	381.5	1,331.9	1,418.7
- Net Income (Increment Benefit)	(D,000)	1,733.3	1,893.5	269.5	314.5	784.5	945.9	923.9	1,087.9	3,820.4	4,378.0
<b>3. Poultry (931 D/A) (W/P Cost) (0,000)</b>											
<b>3.1 Laying (885 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	886	886	311	311	2,850	2,850	1,620	1,620	5,667	5,667
- Gross Production Value	(D,000)	2,816.3	3,166.4	1,006.1	1,473.5	7,048.1	8,549.7	5,166.8	5,875.5	16,906.8	19,002.9
- Production Cost	(D,000)	816.0	937.7	266.4	335.6	2,074.8	2,662.1	1,497.0	1,751.0	5,219.2	6,104.4
- Net Income (Increment Benefit)	(D,000)	2,000.3	2,228.7	739.7	1,137.9	5,073.3	5,887.6	3,669.8	4,124.5	11,727.6	12,928.5
<b>4. Industrial Crops (1,144 D/A) (W/P Cost) (0,000)</b>											
<b>4.1 Hemp (1,144 D/A) (W/P Cost) (0,000)</b>											
- Planned Area	(ha)	452	452	452	452	452	452	452	452	452	452
- Gross Production Value	(D,000)	1,210.0	1,463.0	244.0	244.0	1,210.0	1,463.0	1,210.0	1,463.0	1,210.0	1,463.0
- Production Cost	(D,000)	571.1	566.4	67.3	67.3	571.1	566.4	571.1	566.4	571.1	566.4
- Net Income (Increment Benefit)	(D,000)	638.9	896.6	176.7	176.7	638.9	896.6	638.9	896.6	638.9	896.6
Total Fruits Area											
Total Gross Production Value											
Total Production Cost											
Total Irrigation Benefit											

Ref.: Tables K.2.2.1, K.2.2.2 and K.2.2.3  
Remark: W/O Project, Without Project Condition







Tableau 9.4.2 Taux de profit économique interne dû au coût économique du projet et aux bénéfices de l'irrigation (total)

- All Project, 153 Oases -

(Unit: D., '000)

No	Year	Project Cost	O/M Cost	Total	Irrigation Benefit	Balance	
		(a)	(b)	(a + b = c)	(d)	(c - d)	
1	1997	711.0	0.0	711.0	0.0	-711.0	
2	1998	14,330.0	0.0	14,330.0	0.0	-14,330.0	
3	1999	22,439.0	129.0	22,568.0	597.0	-21,971.0	
4	2000	23,566.0	360.4	23,926.4	2,264.4	-21,662.0	
5	2001	13,653.0	603.4	14,256.4	5,055.8	-9,200.6	
6	2002	4,069.0	747.9	4,816.9	8,516.0	3,699.1	
7	2003		798.1	798.1	12,208.2	11,410.1	
8	2004		798.1	798.1	15,303.5	14,505.4	
9	2005		798.1	798.1	17,328.4	16,530.3	
10	2006		798.1	798.1	18,229.3	17,431.2	
11	2007		798.1	798.1	18,461.4	17,663.3	
12	2008		798.1	798.1	18,461.4	17,663.3	
13	2009		798.1	798.1	18,461.4	17,663.3	
14	2010		798.1	798.1	18,461.4	17,663.3	
15	2011		798.1	798.1	18,461.4	17,663.3	
16	2012		798.1	798.1	18,461.4	17,663.3	
17	2013		798.1	798.1	18,461.4	17,663.3	
18	2014		798.1	798.1	18,461.4	17,663.3	
19	2015		798.1	798.1	18,461.4	17,663.3	
20	2016		798.1	798.1	18,461.4	17,663.3	
21	2017		798.1	798.1	18,461.4	17,663.3	
22	2018		798.1	798.1	18,461.4	17,663.3	
23	2019		798.1	798.1	18,461.4	17,663.3	
24	2020		798.1	798.1	18,461.4	17,663.3	
25	2021		798.1	798.1	18,461.4	17,663.3	
Project Area :		23,435 ha		<u>NPV</u>	<u>Cost</u>	<u>Benefit</u>	<u>B - C</u>
Project Cost :		78,768 x ,000 D.		10% =	61,127	91,860	30,733
		3,361 D./ha		7.5% =	67,346	124,106	56,760
Sensitivity data:				5% =	74,816	171,730	96,914
Item	(%)	Cost Up (%)	Benefit Down (%)			B/C	
			-10	0	20		
Cost	0	-10	18.9%	17.3%	13.9%	1.50	
Up		-5	18.0%	16.5%	13.1%	1.84	
Benefit	0	0	17.1%	15.7%	12.4%	2.30	
Down		5	16.4%	14.9%	11.8%		
		10	15.7%	14.2%	11.2%		
EIRR	15.7%	20	14.4%	13.0%	10.0%		



Tableau 9.5.1 Frais de production agricole et profit net sur la base du prix financier

(Unit : D/ha)

Description		Gross Income			Production Cost				Net Return (a - b)
		Yield* (ton)	Unit Price (D./kg)	Amount (a)	Farm Inputs	Labor Cost	Others	Total (b)	
1. Arboriculture									
1.1 Date Palm	Without Project	4.55	1.025	4,662	357	199	27	583	4,079
	With Project	5.18		5,305	475	278	37	790	4,515
	Increment	0.63		643				207	436
1.2 Olive	Without Project	4.78	0.400	1,914	217	158	19	394	1,520
	With Project	5.33		2,133	296	174	24	494	1,639
	Increment	0.55		219				100	119
1.3 Pomegranate	Without Project	7.90	0.287	2,273	348	265	31	644	1,629
	With Project	9.25		2,655	412	292	36	740	1,915
	Increment	1.35		382				96	286
1.4 Apricot	Without Project	9.88	0.493	4,869	363	371	37	771	4,098
	With Project	10.98		5,411	429	420	43	892	4,519
	Increment	1.10		542				121	421
1.5 Fig	Without Project	3.37	0.385	1,296	249	265	39	553	743
	With Project	3.77		1,450	349	292	51	692	758
	Increment	0.40		154				139	15
2. Vegetables									
2.1 Turnip* /Carrot	Without Project	20.00	0.201	4,020	374	348	36	758	3,262
	With Project	22.50		4,523	419	406	41	866	3,657
	Increment	2.50		503				108	395
2.2 Onion	Without Project	21.00	0.186	3,906	437	348	39	824	3,082
	With Project	23.80		4,427	482	348	41	871	3,556
	Increment	2.80		521				47	474
2.4 Kindey Beans	Without Project	10.40	0.370	3,848	263	348	31	642	3,206
	With Project	11.70		4,329	374	464	42	880	3,449
	Increment	1.30		481				238	243
2.5 Pepper	Without Project	9.20	0.874	8,041	1,047	348	70	1,465	6,576
	With Project	10.30		9,002	1,086	406	34	1,526	7,476
	Increment	1.10		961				61	900
2.6 Tomato	Without Project	20.90	0.310	6,479	628	348	49	1,025	5,454
	With Project	23.40		7,254	673	406	54	1,133	6,121
	Increment	2.50		775				108	667
3. Fodder Crops									
3.1 Lucern	Without Project	54.40	0.053	2,883	250	348	30	628	2,255
	With Project	65.30		3,461	345	406	38	789	2,672
	Increment	10.90		578				161	417
4. Cash Crops									
4.1 Henna	Without Project	1.40	1.839	2,575	387	261	32	680	1,895
	With Project	1.70		3,126	482	348	41	871	2,255
	Increment	0.30		552				191	361

Remark : Figures of arboriculture crops are estimated average yield and annual cost of 25 years.

Ref. : Tables K.3.1.1 (1)to (8)

Tableau 9.5.2 Bilan économique des fermes "avec le projet"

Description	Kasba Oasis / Casba			Oued Shili Oasis / Casba			Tozeur Oasis / Tozeur			Hizoua 3 Oasis / Tozeur		
	Area (ha)	Production (tons)	Amount (D.)	Area (ha)	Production (tons)	Amount (D.)	Area (ha)	Production (tons)	Amount (D.)	Area (ha)	Production (tons)	Amount (D.)
A. Farm Land	1.06			3.11			1.38			1.00		
B. Farm Income	1.71		8,923	2.33		16,281	1.65		10,419	1.06		5,510
Arboriculture	1.06	10.63	5,019	1.78	14.24	14,596	1.38	9.15	9,230	1.00	5.33	5,241
Fodder crops	0.25	16.38	868	0.39	19.38	1,027	0.10	8.61	456	0.02	1.74	92
Winter vegetables	0.23	6.05	1,360	0.16	2.41	658	0.09	1.30	365	0.02	0.31	60
Summer vegetables	0.17	3.51	1,676				0.08	0.86	478	0.02	0.24	117
Industrial crops												
D. Off-farm Incomes												500
Total Gross Income			8,923			16,281			10,419			6,010
E. Production Cost	1.71		1,238	2.33		1,853	1.65		1,351	1.06		815
Arboriculture	1.06		611	1.78		1,406	1.38		1,081	1.00		784
Fodder crops	0.25		197	0.39		307	0.10		79	0.02		16
Winter vegetables	0.23		196	0.16		140	0.09		79	0.02		18
Summer vegetables	0.17		234				0.08		113	0.02		27
Industrial crops												
F. Living Expenses	5.33 persons/family		2,052	5.42 persons/family		3,140	5.22 persons/family		3,024	5.33 persons/family		3,720
Total Gross Outgoing			4,290			4,993			4,375			4,615
G. Net Reserve (Capacity to Pay)			4,633			11,288			6,044			1,395
H. Repayment Amount			(4.8%)			(9.5%)			(8.2%)			(32.4%)
- Construction Cost	1,817 D. per ha			2,964 D. per ha			3,107 D. per ha			3,899 D. per ha		
- Repayment per year			223			1,068			497			452
Balance (G - H)			4,410			10,220			5,547			943

Description	Mansoura Oasis / Kebili			Atitot Oasis / Kebili			Oasis de Gabès / Gabès			Linaoune 1 et 2 Oasis / Gabès		
	Area (ha)	Production (tons)	Amount (D.)	Area (ha)	Production (tons)	Amount (D.)	Area (ha)	Production (tons)	Amount (D.)	Area (ha)	Production (tons)	Amount (D.)
A. Farm Land	0.25			0.25			0.29			1.25		
B. Farm Income	0.40		2,013	1.39		5,326	0.41		2,250	1.92		8,591
Arboriculture	0.25	1.55	1,540	0.75	3.35	3,286	0.29	2.50	1,647	1.25	11.36	3,831
Fodder crops	0.11	6.01	318	0.22	12.14	614	0.05	3.11	165	0.19	12.69	673
Winter vegetables	0.02	1.86	61	0.38	8.53	1,136	0.01	0.31	63	0.28	8.83	1,777
Summer vegetables	0.02	0.99	124	0.04	0.42	260	0.01	0.14	125	0.20	3.26	2,154
Industrial crops							0.08	0.14	250	0.05	0.09	156
D. Off-farm Incomes			2,500			1,000			2,000			
Total Gross Income			4,513			6,326			4,250			8,591
E. Production Cost	0.40		226	1.39		1,151	0.41		356	1.92		1,591
Arboriculture	0.25		194	0.75		589	0.29		224	1.25		872
Fodder crops	0.11		87	0.22		173	0.05		37	0.19		150
Winter vegetables	0.02		18	0.38		331	0.01		9	0.28		244
Summer vegetables	0.02		27	0.04		58	0.01		16	0.20		281
Industrial crops							0.08		70	0.05		44
F. Living Expenses	5.33 persons/family		3,241	6.17 persons/family		3,512	5.48 persons/family		3,145	5.48 persons/family		3,145
Total Gross Outgoing			3,570			4,663			3,501			4,785
G. Net Reserve (Capacity to Pay)			943			1,633			749			3,855
H. Repayment Amount			(17.1%)			(21.1%)			(11.5%)			(15.9%)
- Construction Cost	5,744 D. per ha			3,964 D. per ha			2,569 D. per ha			4,243 D. per ha		
- Repayment per year			166			344			85			614
Balance (G - H)			807			1,289			664			3,241

Remarks: Repayment condition for construction cost; annual interest 10% and 20 years of repayment  
Ref.: ANNEX-K, Table K.3.1.1, K.3.1.2 and K.3.1.3

Figure 3.1.3.1 Stratification standard

ECHELLE LITHOSTRATIGRAPHIQUE

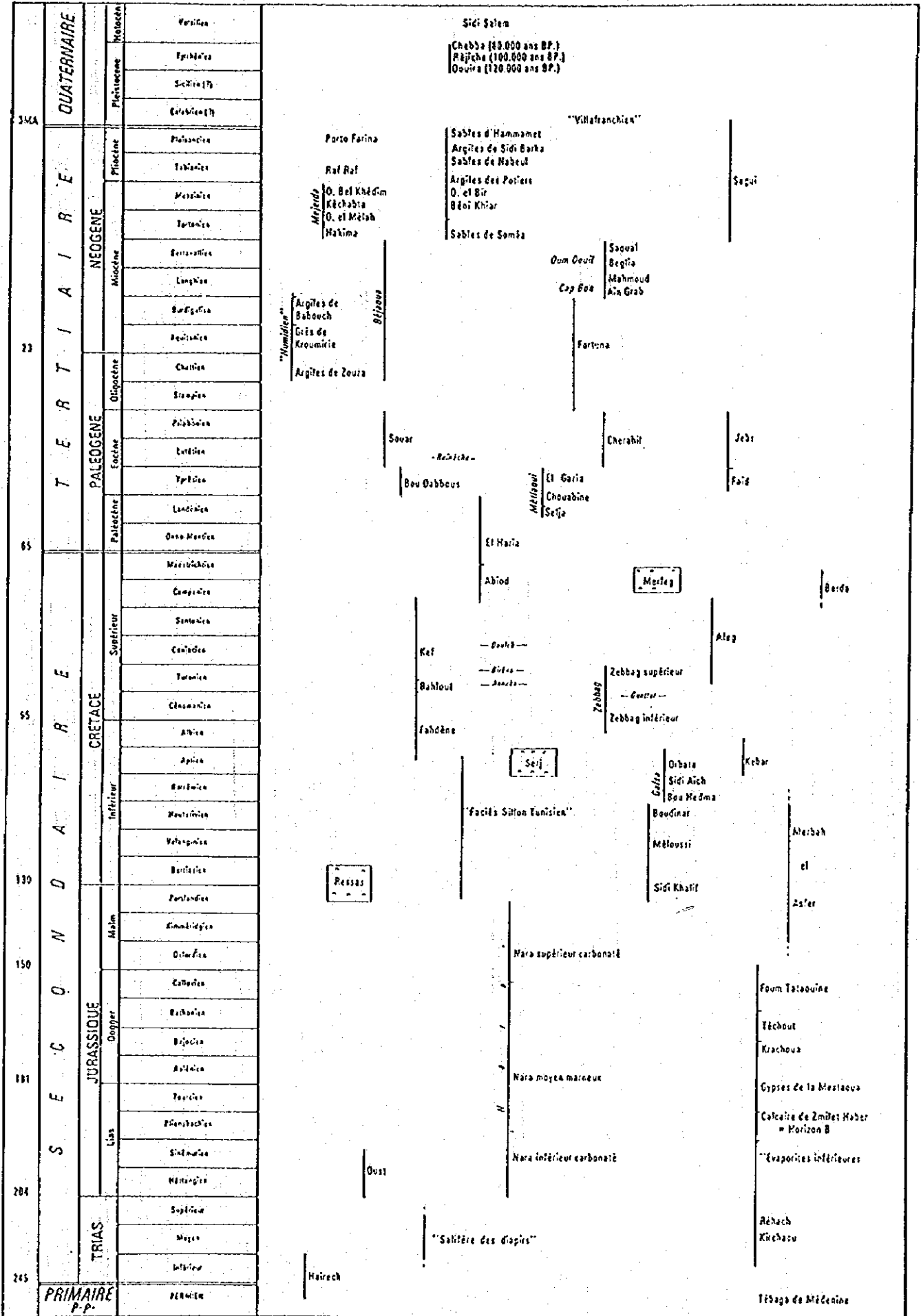
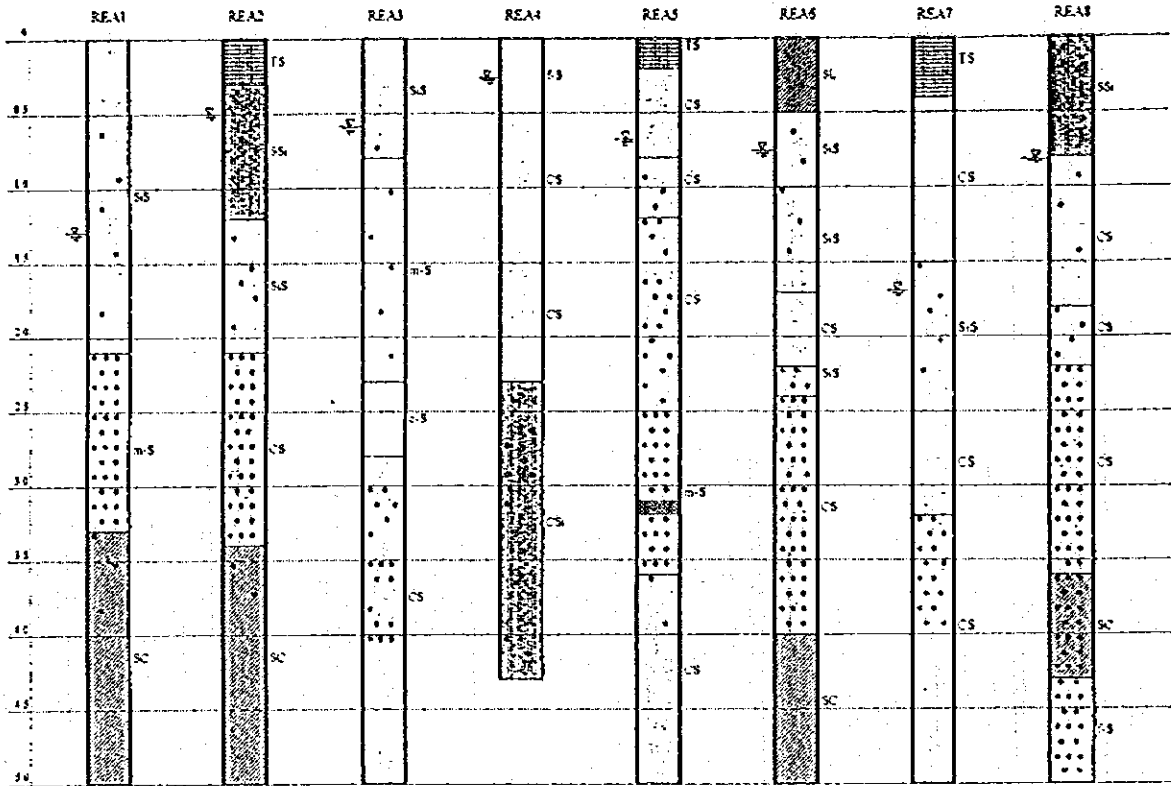


Figure 3.1.3.2 Résultat du creusement par tarière manuelle

(Ras El Ain Oasis)



(Mazraa Neji Oasis)

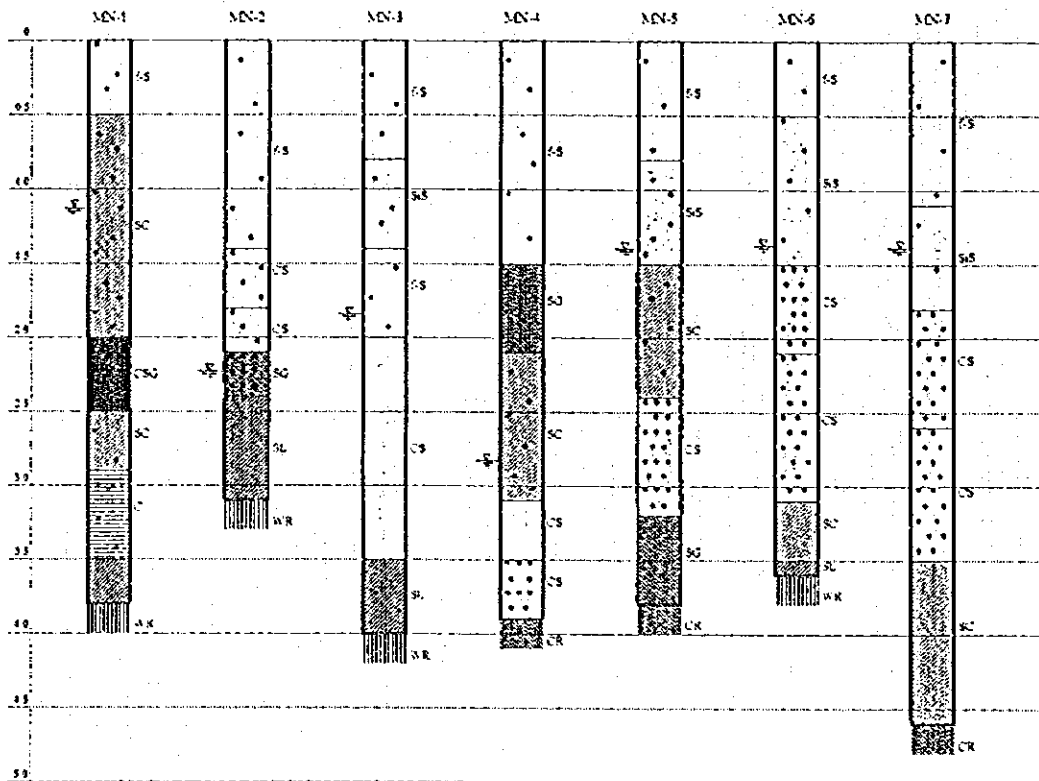
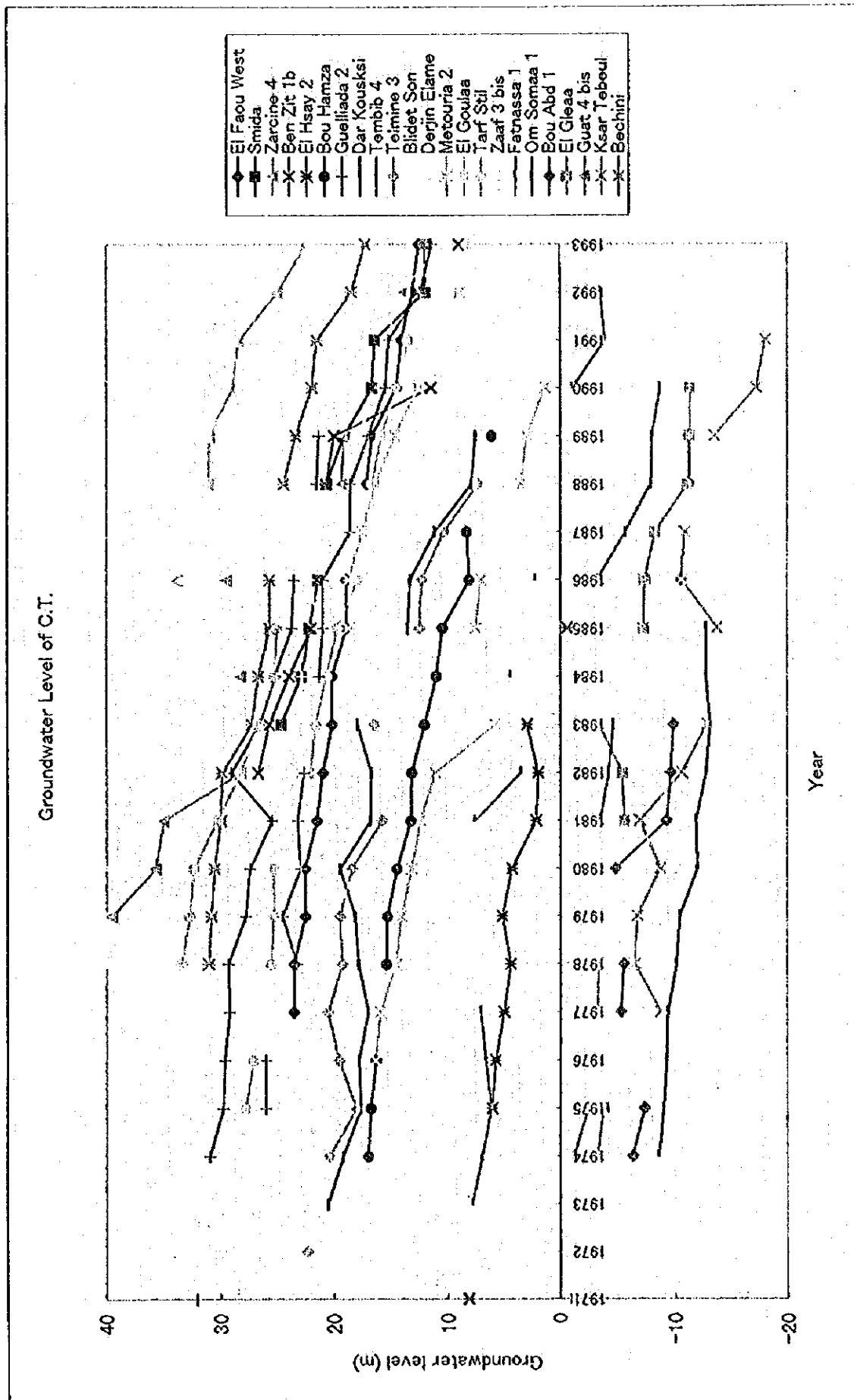
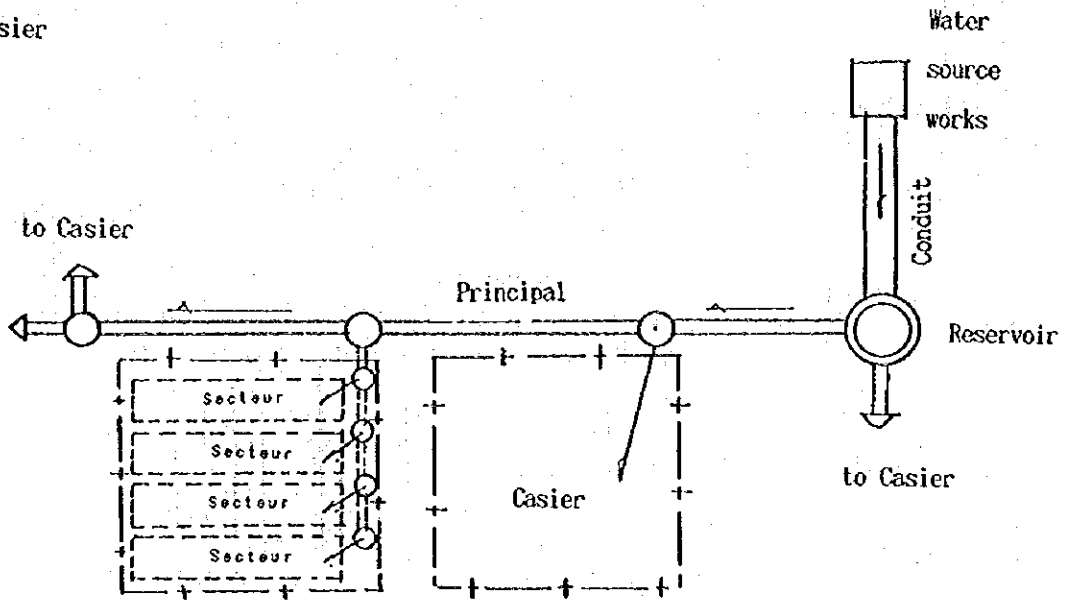




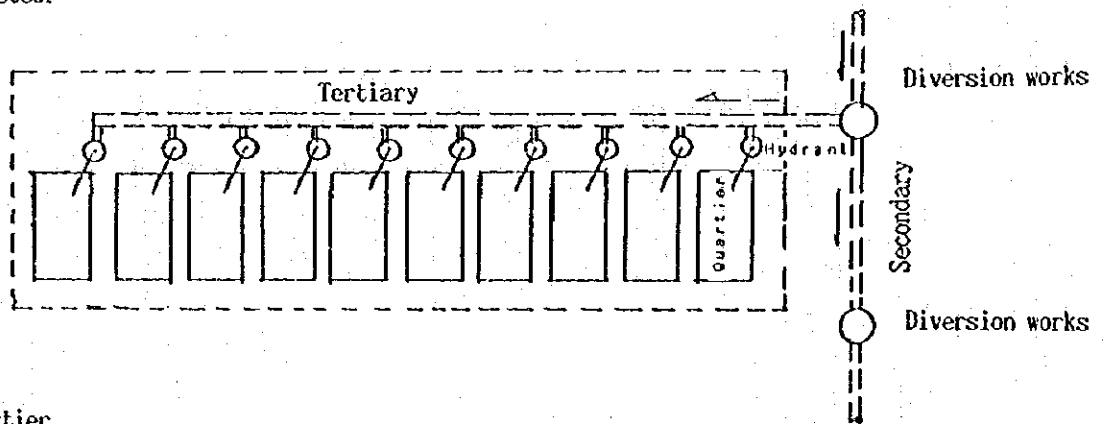
Figure 3.1.4.1 Variation séculaire de la surface piézométrique des forages sur le C.T.



1. Casier



2. Secteur



3. Quartier

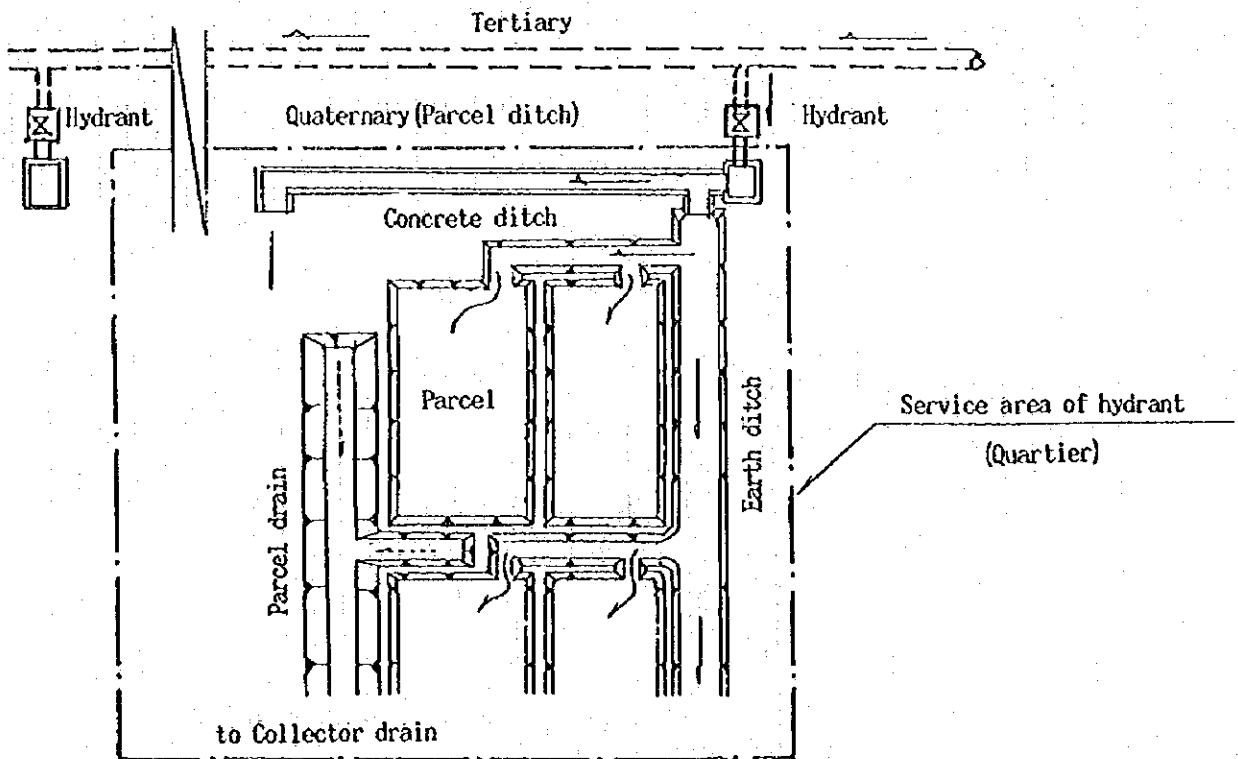


Figure 3.4.4 Modèle et vocabulaire des installations hydrauliques

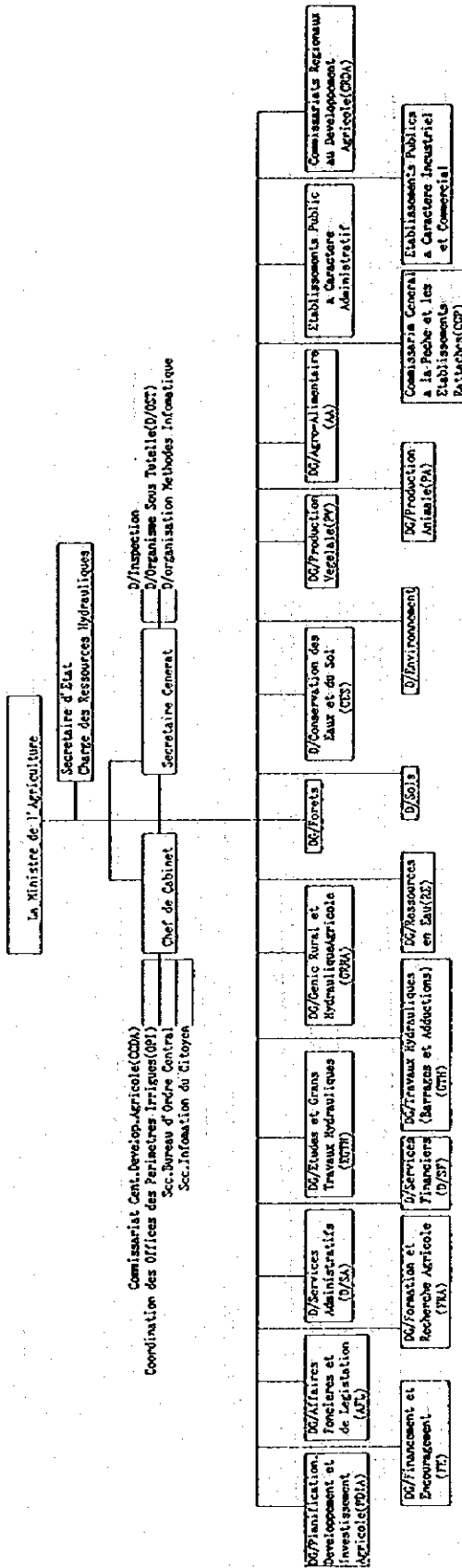
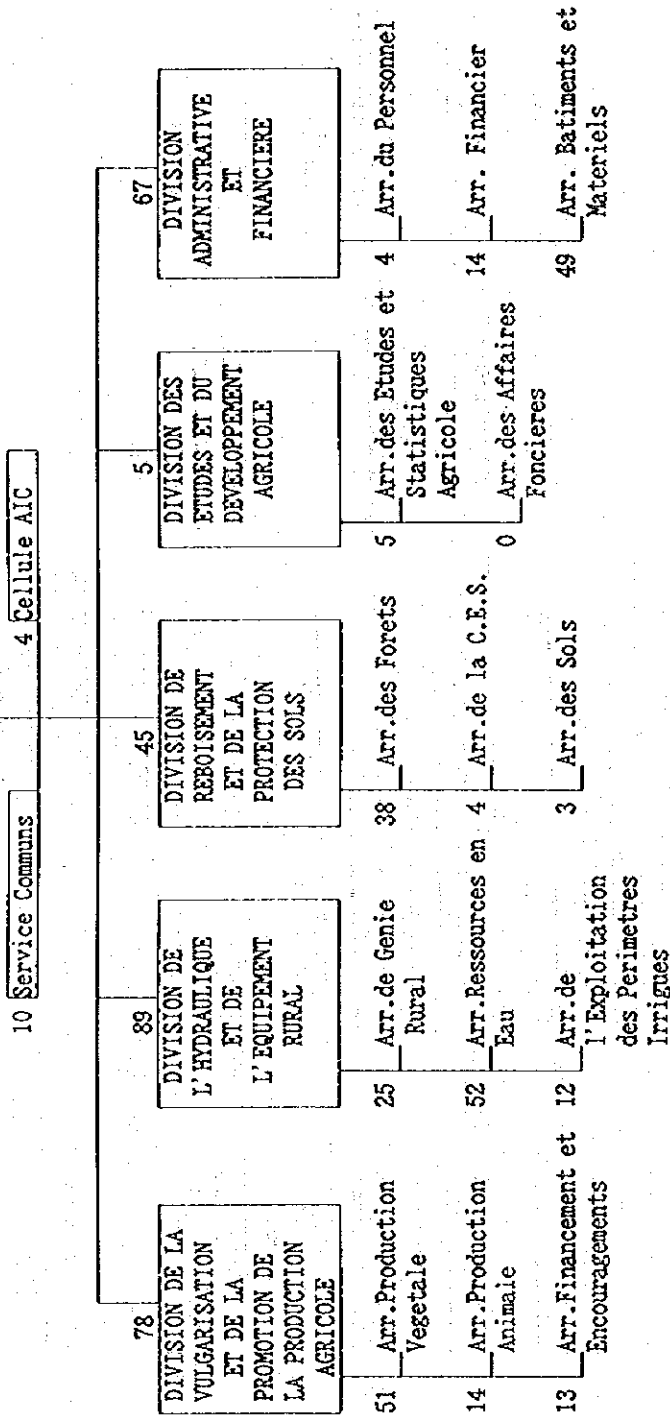


Figure 3.5.1.1 Organigramme du Ministère de l'Agriculture

**\*129 LE DIRECTEUR GENERAL DU COMMISSARIAT**



Notice)

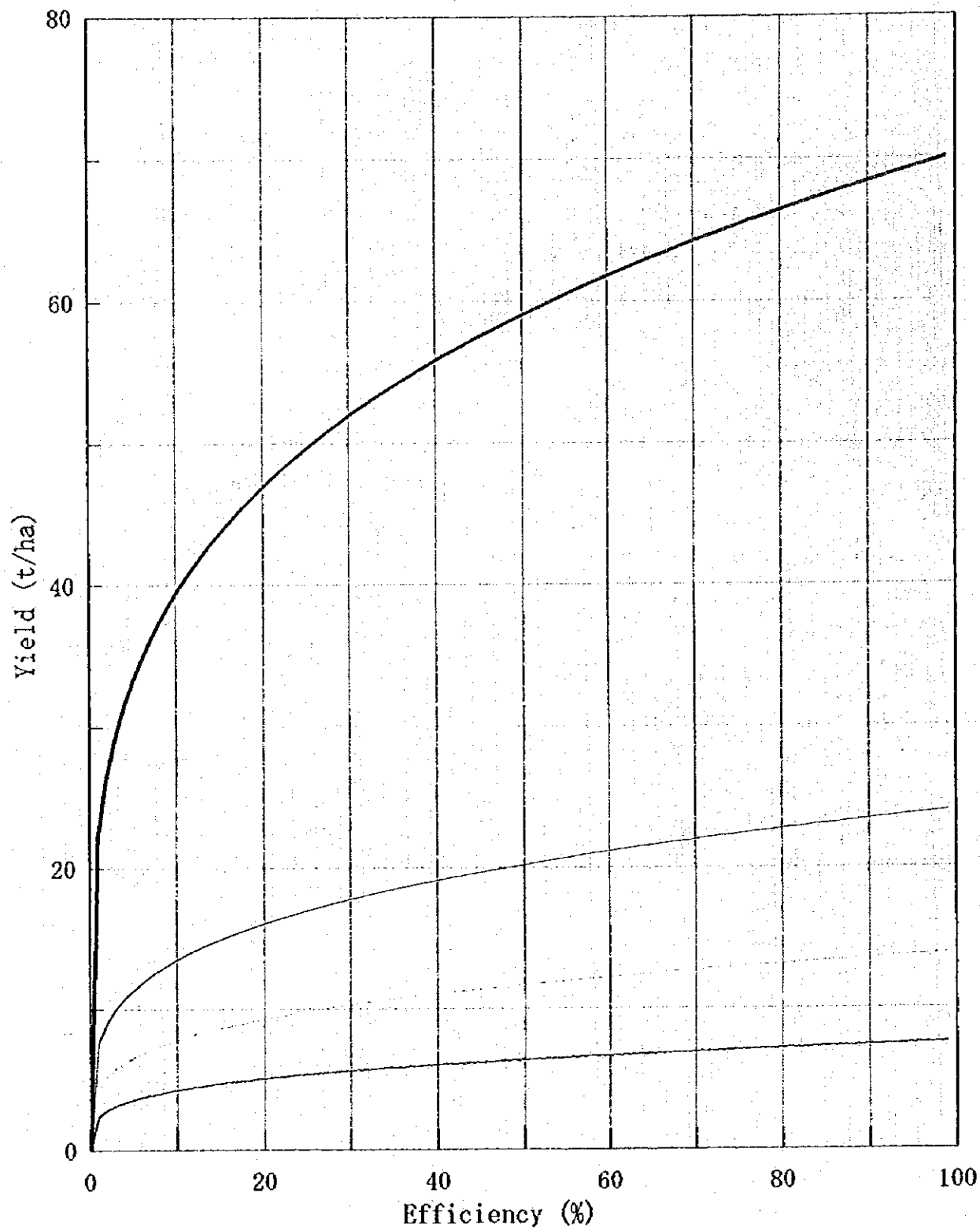
\*) Number of Staff

Decret n° 89 - 834 du 29 juin 1989

CRDA : Commissariat Regional au Developpement Agricole

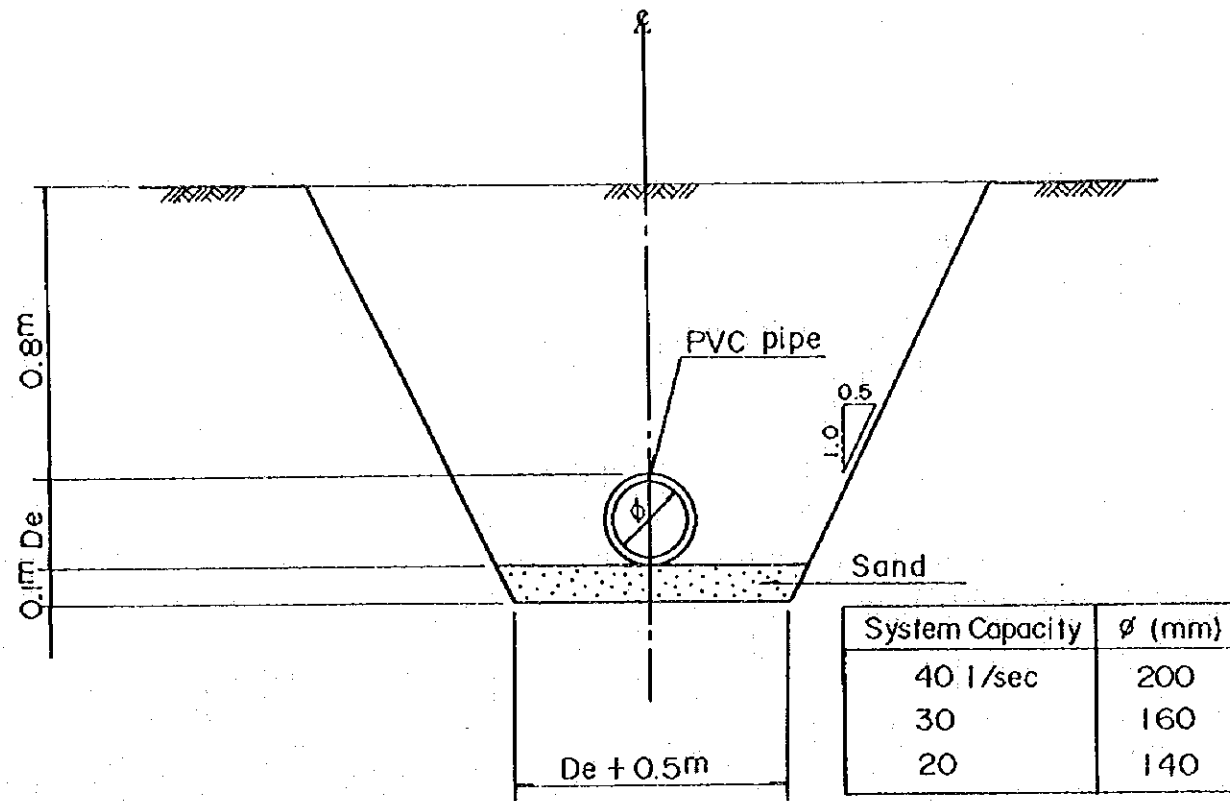
Figure 3.5.1.2 Organigramme des CRDA

Figure 5.1.1 Relation entre la production et le taux d'irrigation

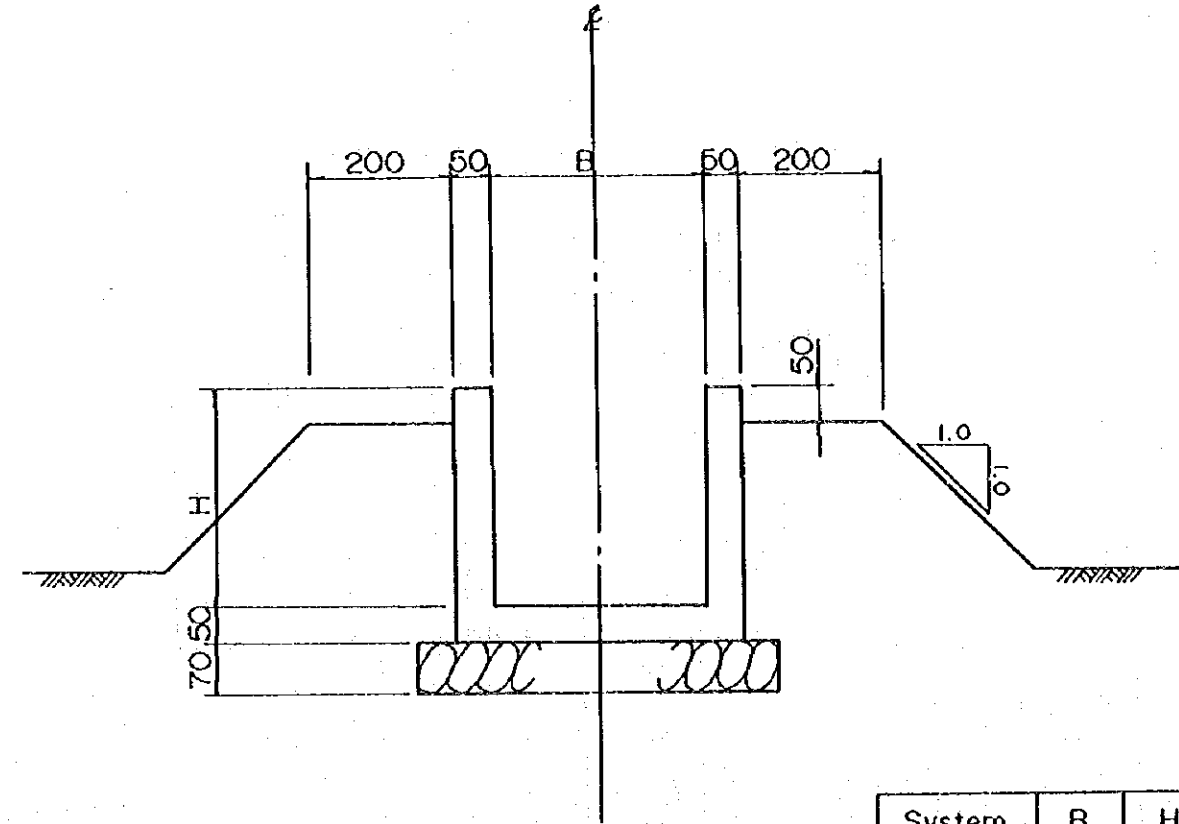


- Lucern      - Vegetable      Fruite      - Date/Olive

Typical cross section of PVC pipe S = 1:20



Typical cross section of concrete channel S = 1:10



Typical cross section of amenity canal S = 1:20

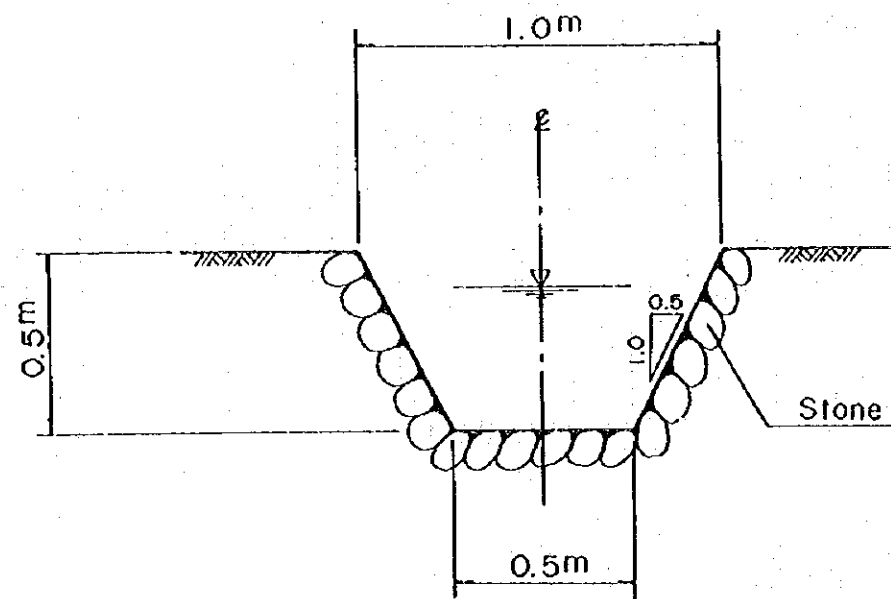
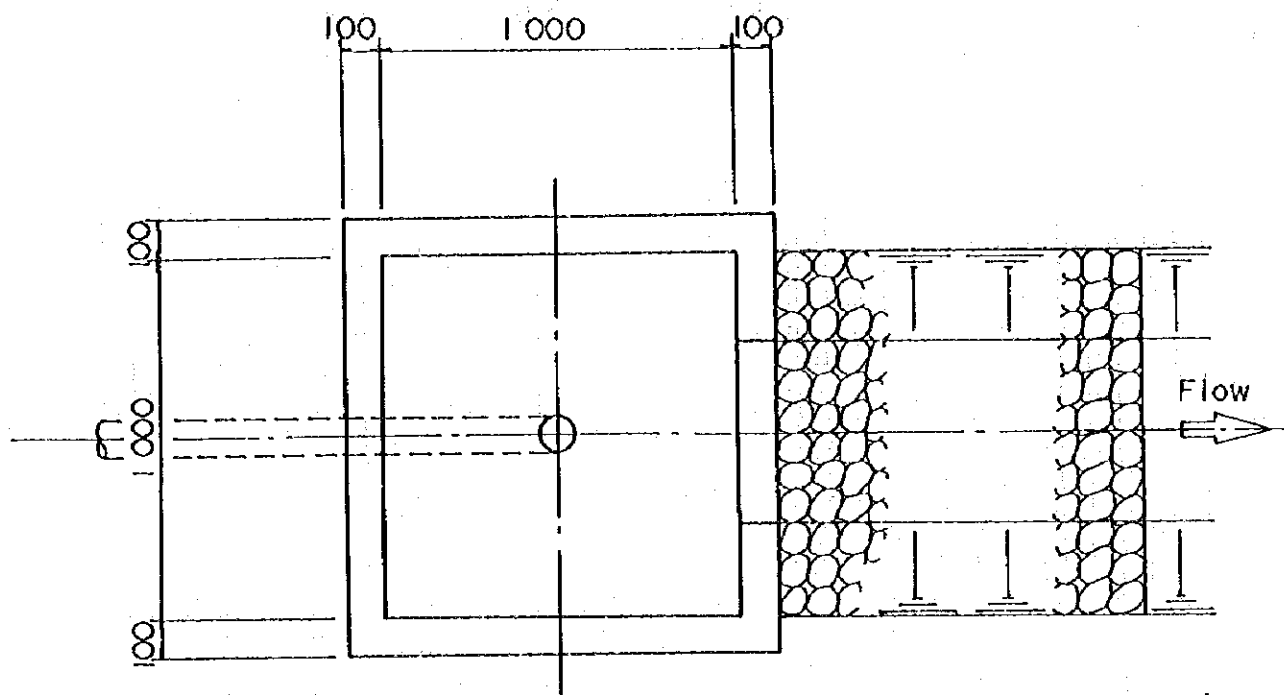
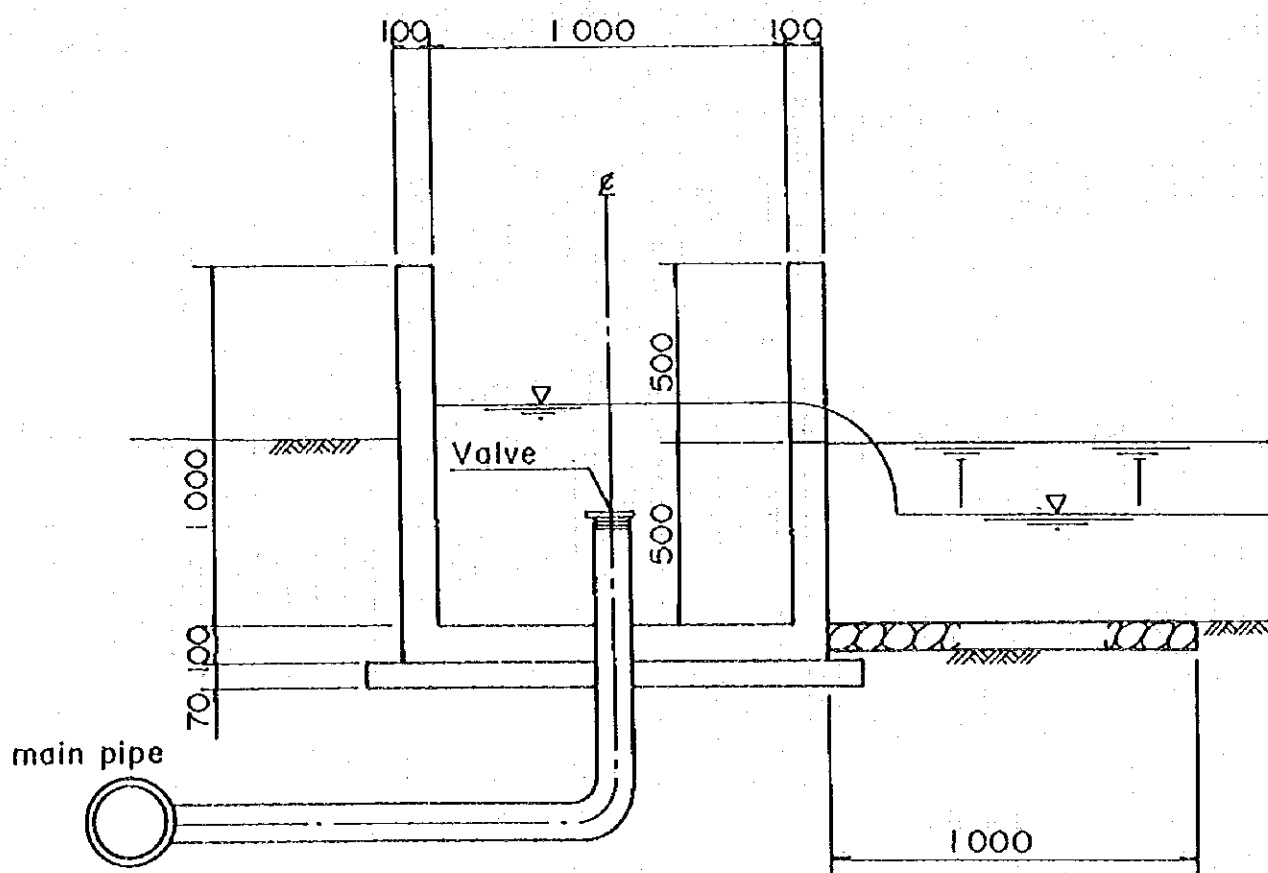


Figure 6.2.1 Plan standard de canal

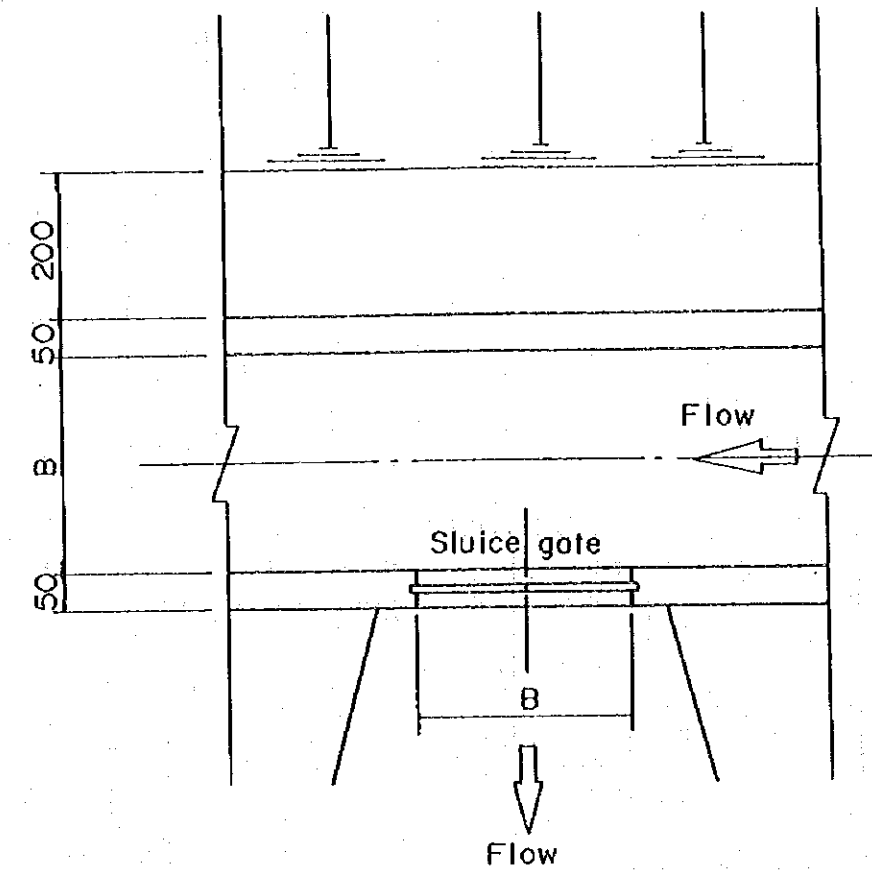
Plan of turn-out (Type 1) S = 1 : 20



Typical cross section of turn-out (Type 1) S = 1 : 20



Plan of concrete channel and turn-out (Type 2) S = 1 : 10



System Capacity	B (mm)	H (mm)
40 l/sec	300	250
30	250	250
26	250	200
20	200	200

Typical cross section of turn-out (Type 2) S = 1 : 20

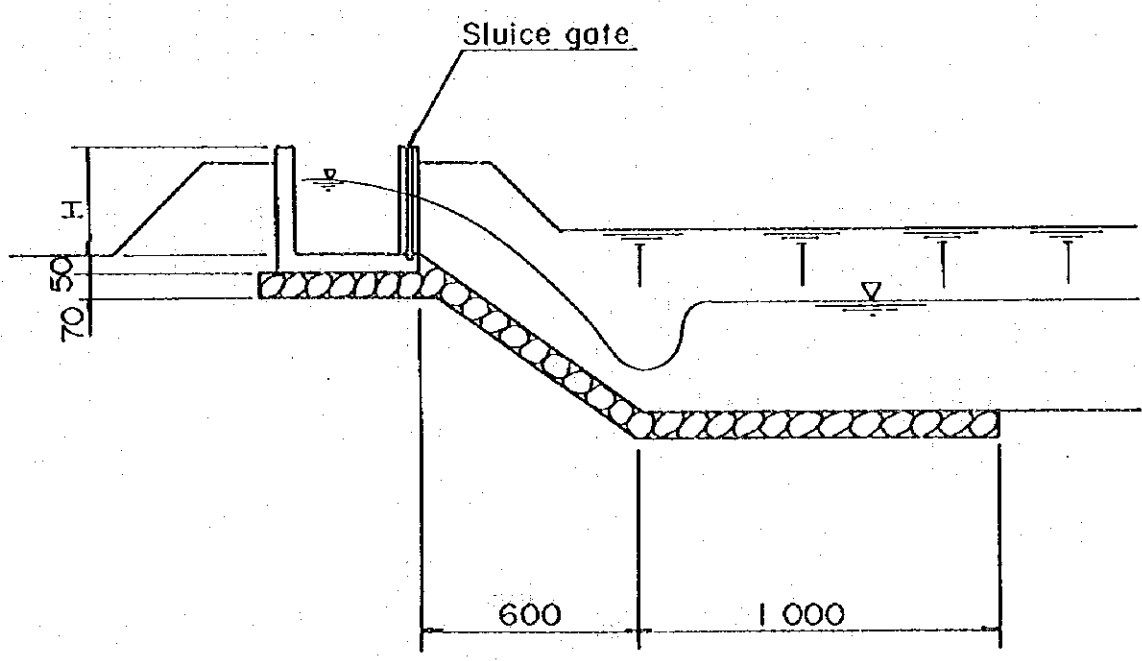
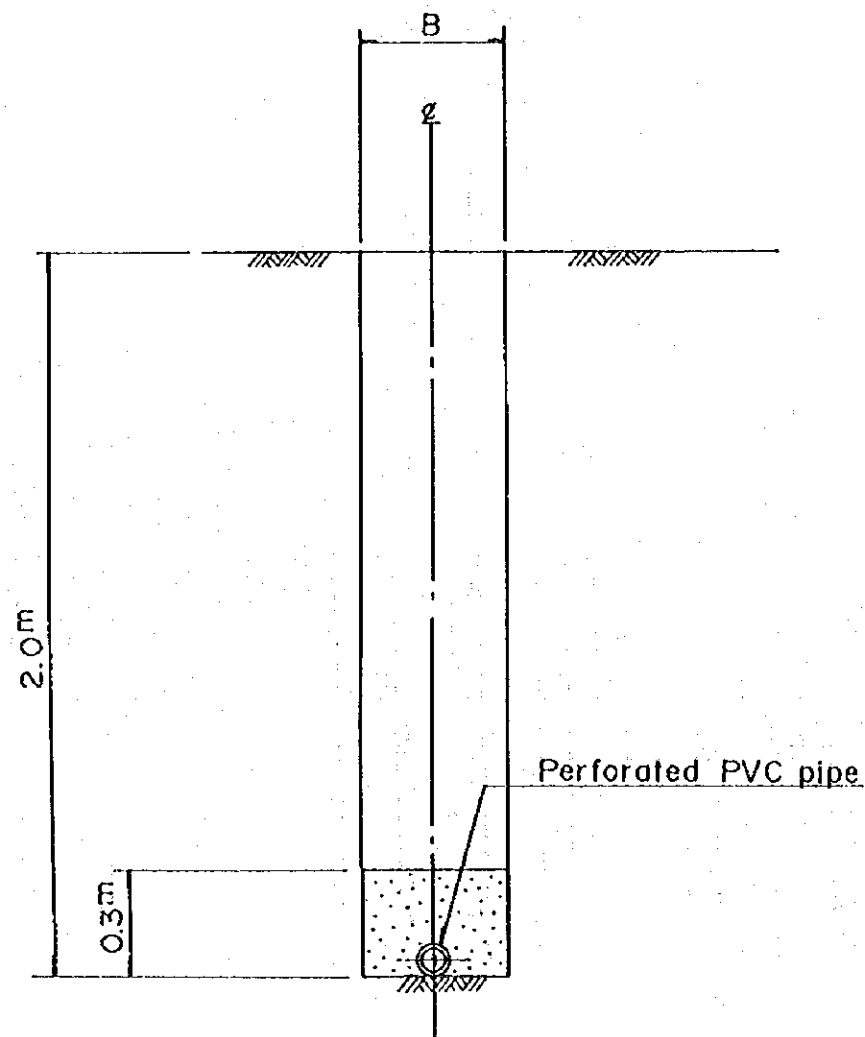


Figure 6.2.2 Plan standard d'ouvrage de distribution d'eau

Typical cross section of field drain S = 1 : 20



PVC $\phi$ (mm)	B (cm)
58/65	30
71.5/80	40

Typical cross section of collector drain S = 1 : 30

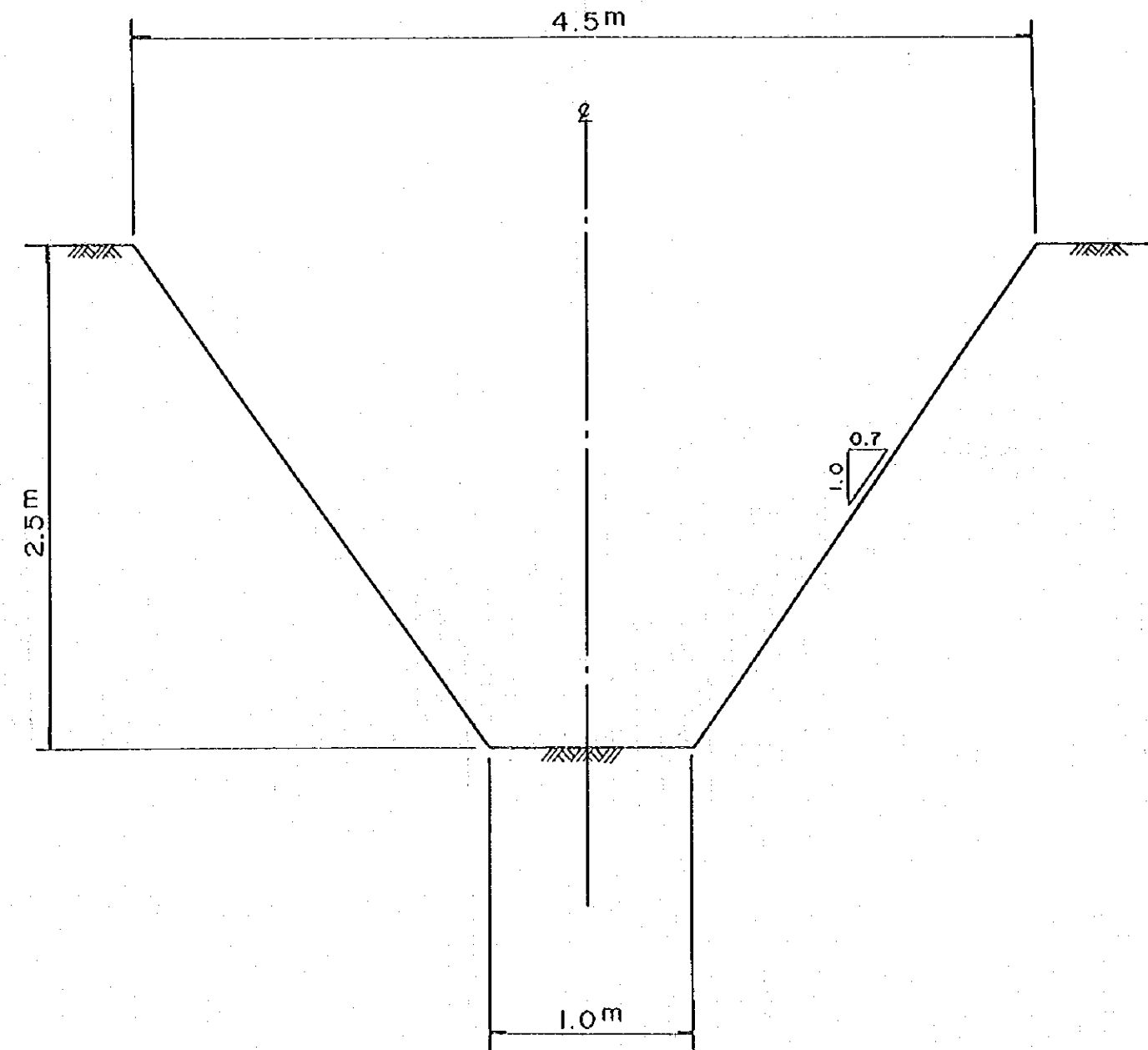
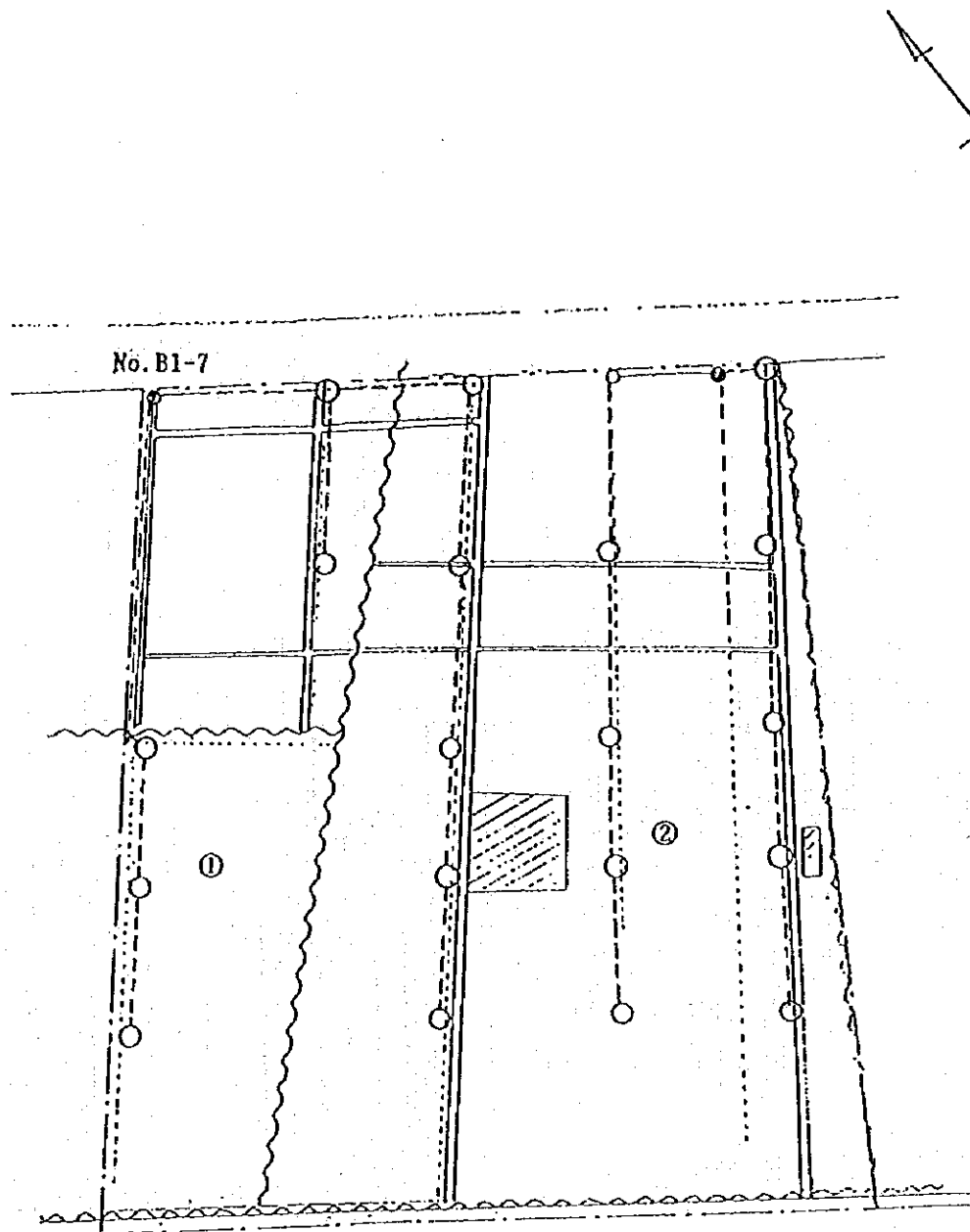


Figure 6.2.3 Plan standard de canal de drainage





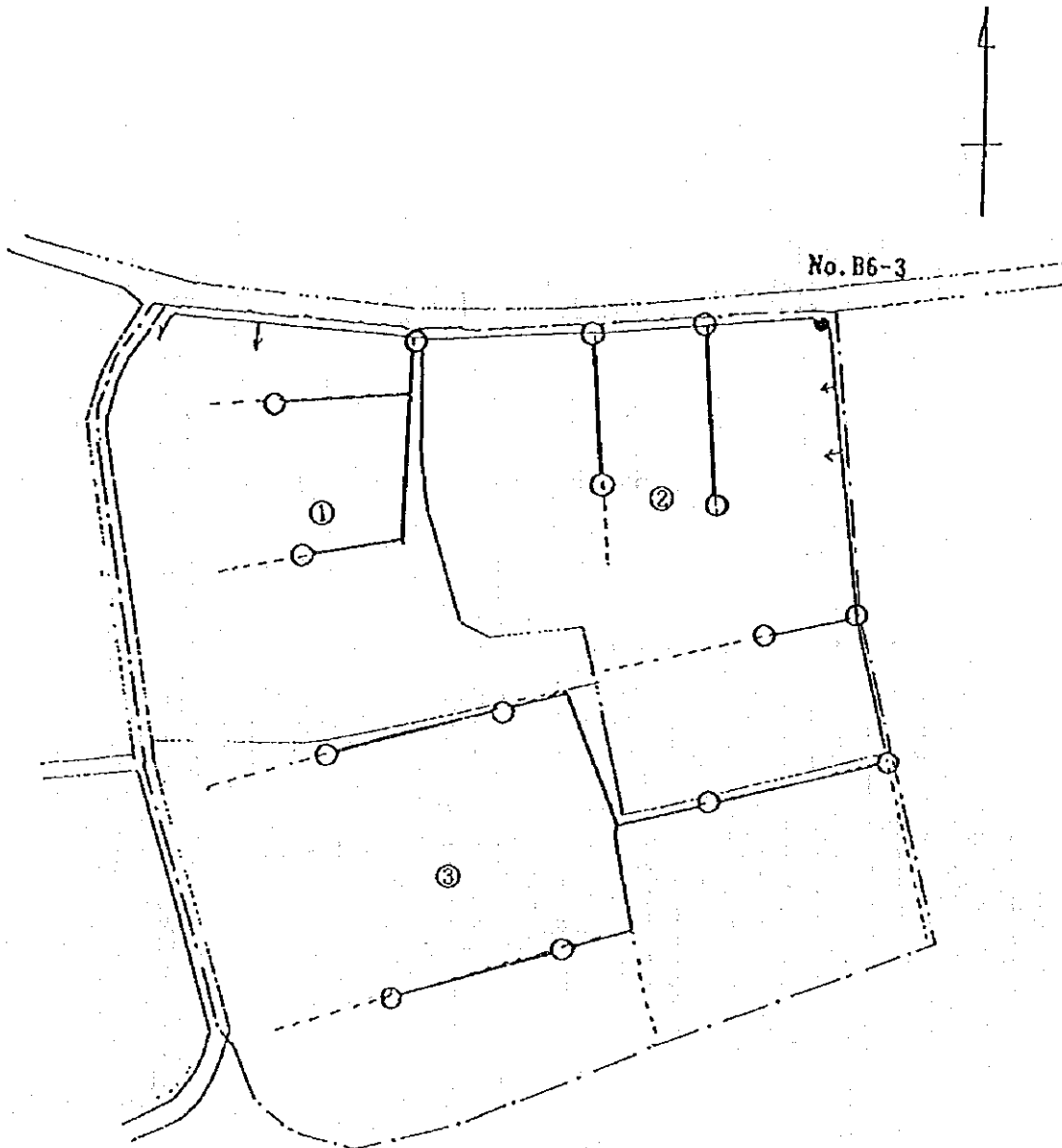
Figure 6.2.4 Plan horizontal du projet des installations terminales (Oued Shili)



LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
.....	Pipe Line
- - -	Earth Canal
~~~~~	Drainage Canal

Gross area	4.620 ha
Inrig canal	0.150 ha
Drain canal	0.190 ha
Road	0.340 ha
Others	0.090 ha
Net area	3.850 ha
Ratio	0.830

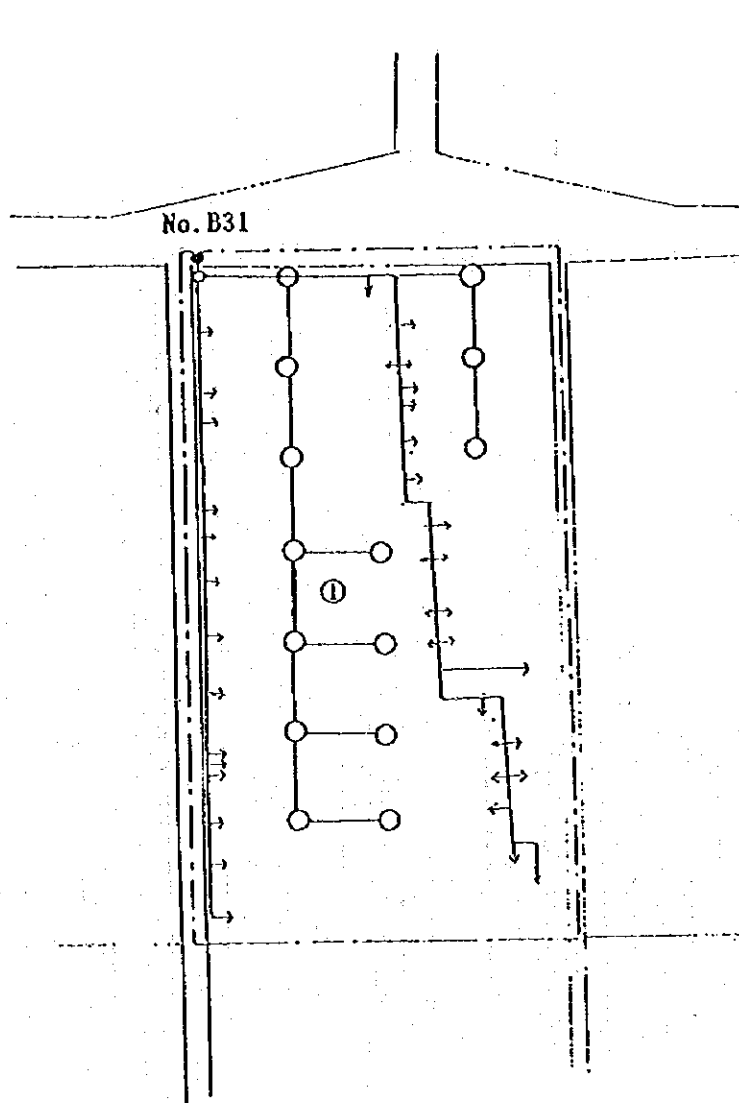
Figure 6.2.5 Plan horizontal du projet des installations terminales (Kasuba)



LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
-----	Pipe Line
- - - -	Earth Canal
~~~~~	Drainage Canal

Gross area	4.400 ha
Irrig canal	0.140 ha
Drain canal	0.000 ha
Road	0.020 ha
Others	0.000 ha
Net area	4.240 ha
Ratio	0.960

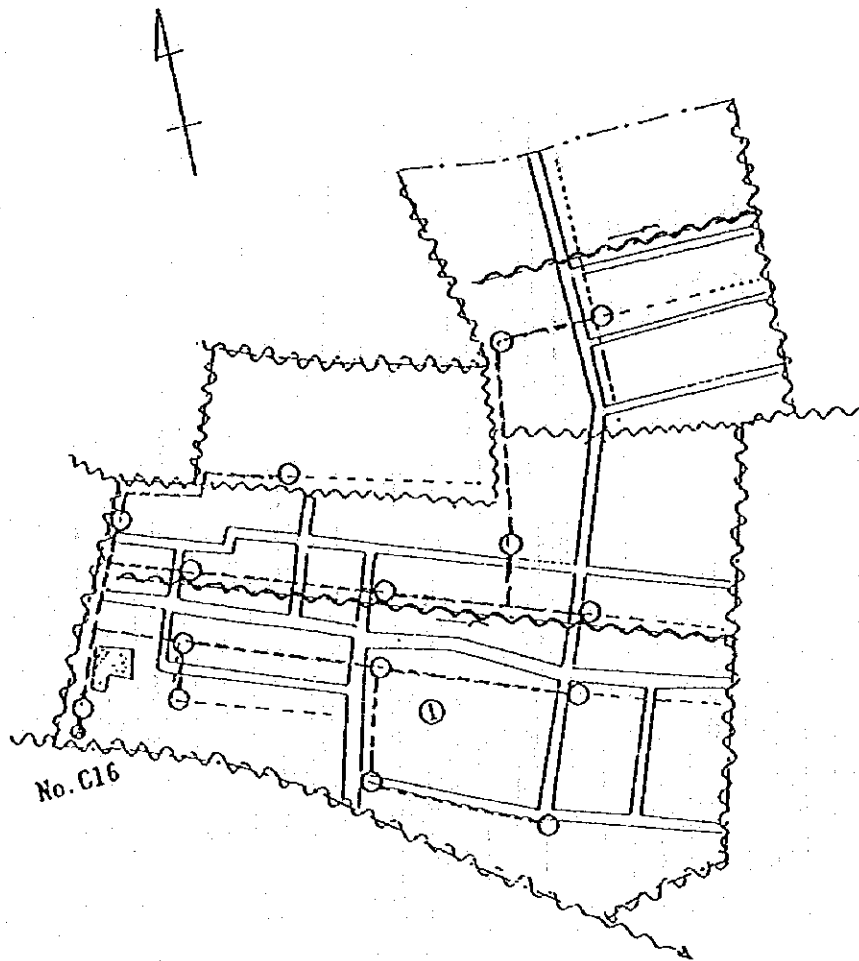
Figure 6.2.6 Plan horizontal du projet des installations terminales (Draa Sud)



LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
.....	Pipe Line
- - - - -	Earth Canal
~~~~~	Drainage Canal

Gross area	2.000 ha
Irrig canal	0.050 ha
Drain canal	0.000 ha
Road	0.120 ha
Others	0.000 ha
Net area	1.830 ha
Ratio	0.920

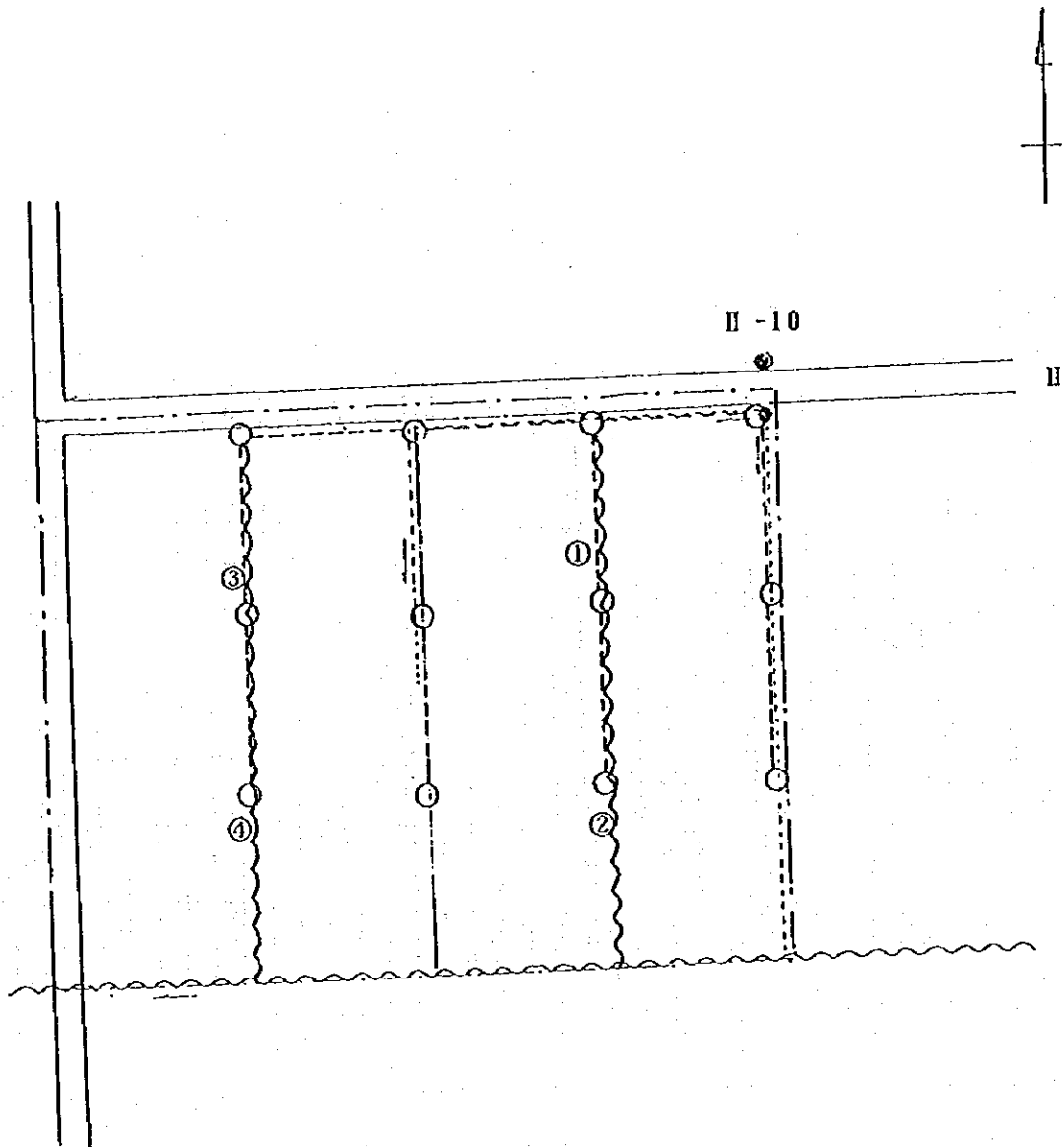
Figure 6.2.7 Plan horizontal du projet des installations terminales (Tozeur)



LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
-----	Pipe Line
- - - - -	Earth Canal
~~~~~	Drainage Canal

Gross area	2.760 ha
Irrig canal	0.110 ha
Drain canal	0.070 ha
Road	0.140 ha
Others	0.010 ha
Net area	2.430 ha
Ratio	0.880

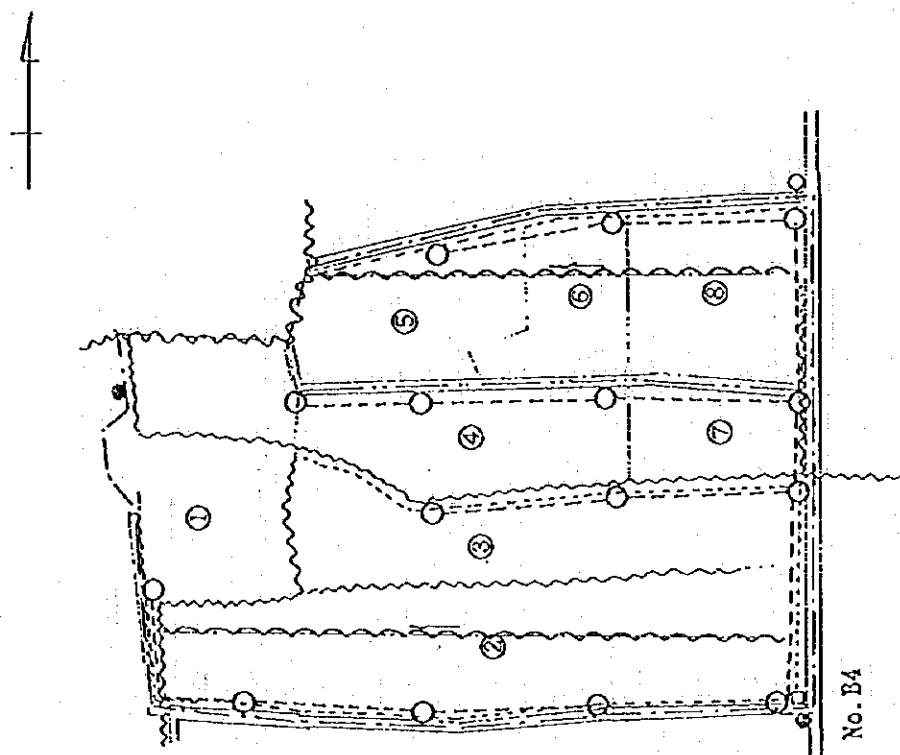
Figure 6.2.8 Plan horizontal du projet des installations terminales (Atilet)



LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
.....	Pipe Line
- . - . - .	Earth Canal
~~~~~	Drainage Canal

Gross area	3.250 ha
Irig canal	0.050 ha
Drain canal	0.050 ha
Road	0.210 ha
Others	0.000 ha
Net area	2.940 ha
Ratio	0.900

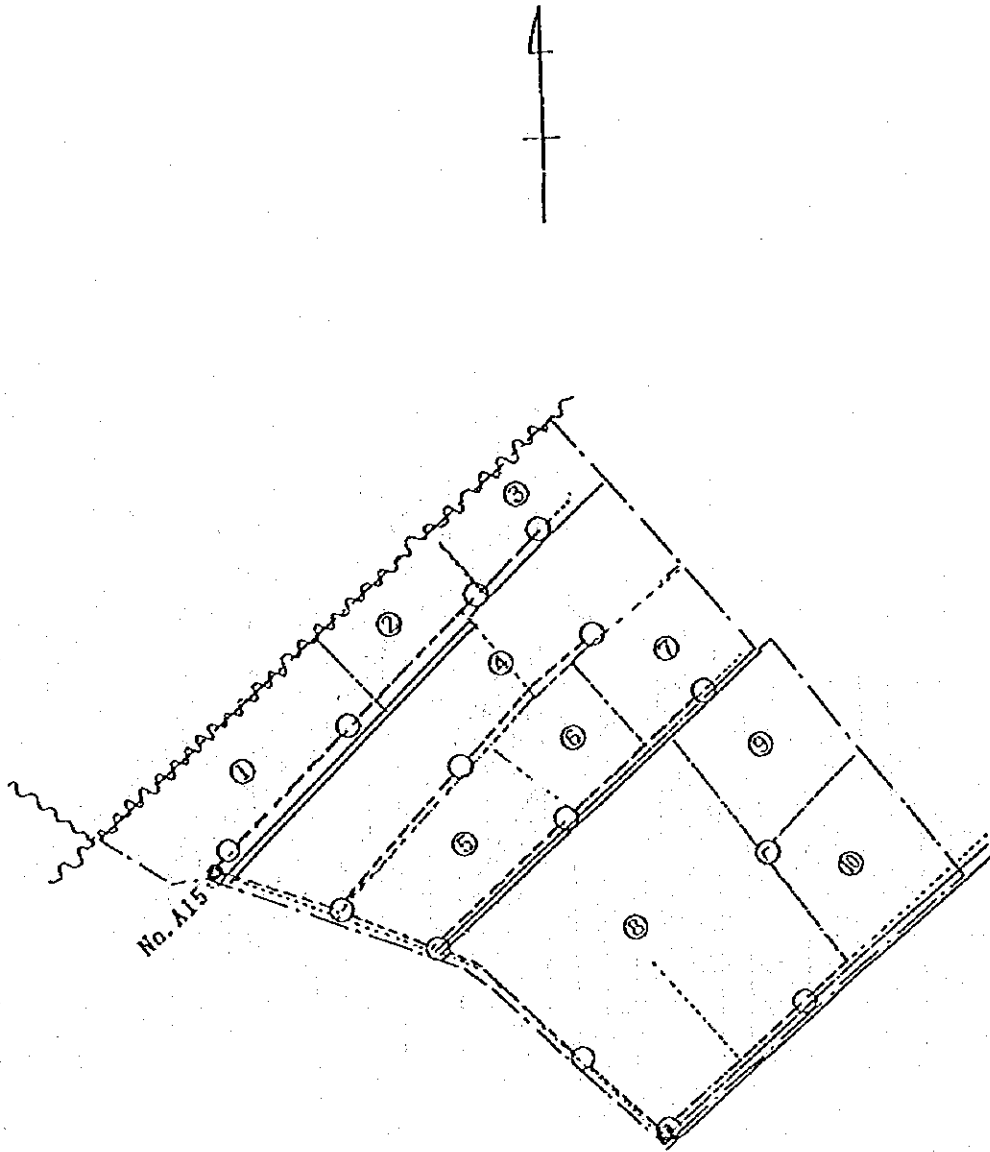
Figure 6.2.9 Plan horizontal du projet des installations terminales (Mansoura)



LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
-----	Pipe Line
- - - -	Earth Canal
~~~~~	Drainage Canal

Gross area	2.390 ha
Irrig canal	0.080 ha
Drain canal	0.090 ha
Road	0.120 ha
Others	0.000 ha
Net area	2.100 ha
Ratio	0.880

Figure 6.2.10 Plan horizontal du projet des installations terminales (Limaoua)

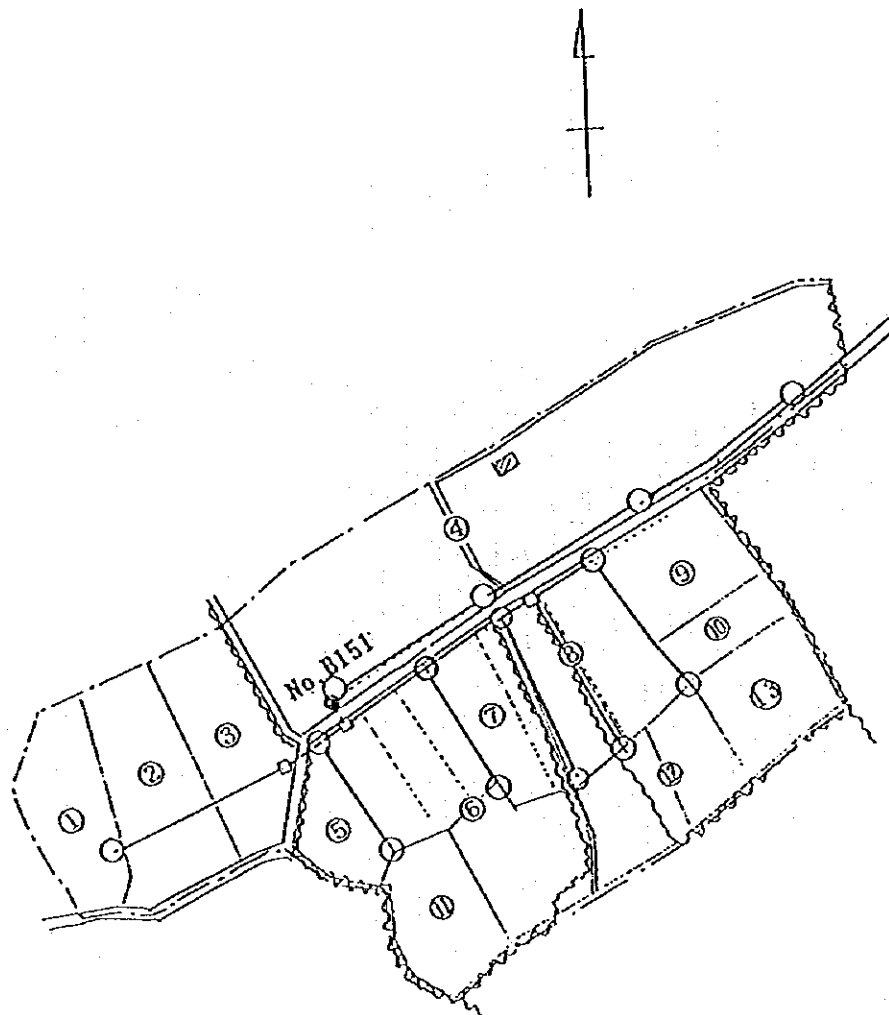


LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
.....	Pipe Line
- - - -	Earth Canal
~~~~~	Drainage Canal

Gross area	2.180 ha
Irrig canal	0.120 ha
Drain canal	0.020 ha
Road	0.050 ha
Others	0.000 ha
Net area	1.990 ha
Ratio	0.910



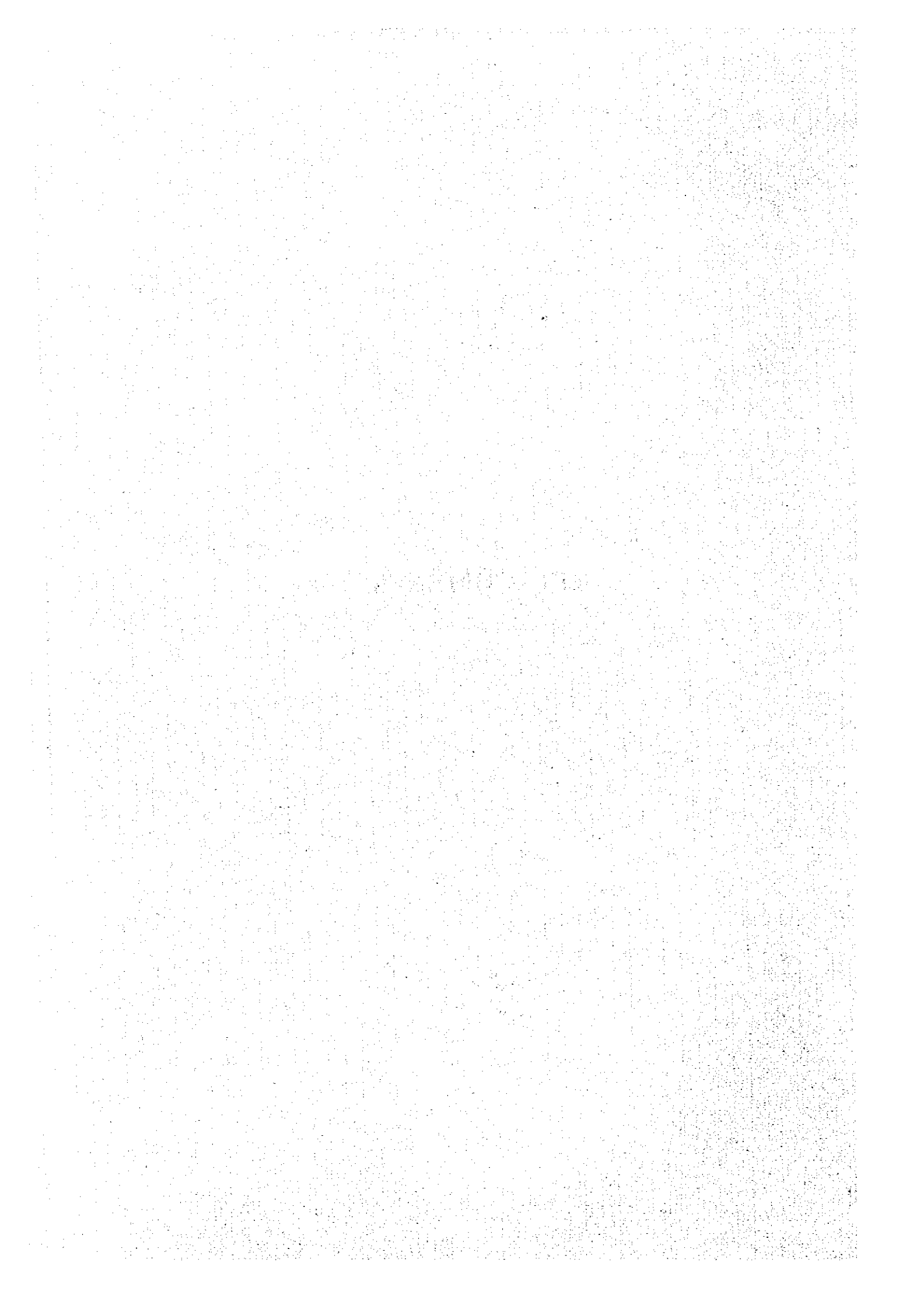
Figure 6.2.11 Plan horizontal du projet des installations terminales (Gabes)



LEGEND	
●	Hydrant
○	Turn-out
-----	Concrete Canal
-----	Pipe Line
- - - - -	Earth Canal
~~~~~	Drainage Canal

Gross area	2.260 ha
Irig canal	0.080 ha
Drain canal	0.090 ha
Road	0.160 ha
Others	0.000 ha
Net area	1.930 ha
Ratio	0.850

## **ATTACHMENTS**



## **Attachments**

- Attachment - 1 List of Participants**
- Attachment - 2 List of Data and Information Collected**
- Attachment - 3 Assignment Schedule of the Study Team**
- Attachment - 4 Soil and Water Quality Test**
- Attachment - 5 Minutes of Meeting on Preliminary Study**
- Attachment - 6 Scope of Work**
- Attachment - 7 Minutes of Meeting on Scope of Work**
- Attachment - 8 Minutes of Meeting on Inception Report**
- Attachment - 9 Minutes of Meeting on Implementing Report for Phase 2**
- Attachment - 10 Minutes of Meeting on Progress Report(2)**
- Attachment - 11 Minutes of Meeting on Draft Final Report**



## **Attachment - 1**

### **List of Participants**



## LIST OF PARTICIPANTS

### Ministry of Agriculture

M. HAMADANE Abdelkader	Directeur Général Direction générale du Génie Rural (DGGR)
Mme. BOUTITI Raqya	Directeur, - do.-
Mme. GHARBI Najet	Chef, Service, - do.-
M. BELHAJ Kamel	Ingénieur Principal, - do.-

### Commissariat Régional au Développement Agricole (CRDA) de Gafsa

M. ZNAZEN Salah	Directeur Général
M. BELARBI Abdelhafidh	Chef, Arrondissement des Périmètres
M. HAJJI Abdelhamid	Chef, Arrondissement des études et Statistiques
M. KADRI Ridha	I. A Arrondissement des Périmètres Irrigués
M. BELARBI Abdelhafid	Chef Arrondissement des Périmètres Irrigués
Mlle. OTHMAN Aicha	Ingénieur Agronome de Arrondissement des Périmètres Irrigués
M. BEN MARAI Mohamed	Ingénieur Pédologue des Sols Agricoles

### CRDA de Tozeur

M. HAMZA Mekki	Directeur Général
M. KLILA Mohamed	Chef Arrondissement de Génie Rural
M. GAEIB Mohamed Ali	Chef Arrondissement de Forêts
M. HDIDAN Mohamed	Chef Arrondissement de Périmètres
Mme. ABIDI Leila	Chef Arrondissement de Conservation des Couches et du Sol
M. CHEBBI Mohamed	Etudes Statistiques
M. HARAFHI Jonaidi	Génie Rural



CRDA de Kebili

M. ABDALLAH Ridha	Directeur Général
M. GHRISSI Mohamed	Ingénieur en Chef du Service de Statistiques
M. KLILA Habib	Ingénieur Chef de Service de Ressources en eau
M. JARBOUI Mohamed	Ingénieur Principal de Génie Rural
M. HAJJI Mosbah	Chef d'Arrondissement des Périmètres Irrigués

CRDA de Gabes

M. TOUMIA Mohamed Lamine	Directeur Général
M. FTIRICH Amar Kilani	Chef d'Arrondissement des Etudes et Statistiques
M. FEKI Mohamed	Ingénieur Principal Agro-économiste
M. OUNIS Mohamed	Ingénieur à l'Arrondissement des Périmètres Irrigués
M. LIMAM Lazhari	Chef d'Arrondissement du Génie Rural
M. OMRANI Abdallah	Chef d'Arrondissement des Périmètres Irrigués
M. ZOUARI Ridha	Chef d'Arrondissement de la Production Agricole
M. SAIED Adel	Chef d'Arrondissement des Sols

## **Attachment - 2**

### **List of Data and Information Collected**



Domaine	Code	Nom du document
A) Informations générales /cartes /statistiques	1	Carte de la Tunisie (S=1:500.000)
	2	Sciences naturelles
	3	Assemblage des cartes (1/100.000 et 1/200.000)
	4	Surface, population et population active par emploi de chaque gouvernorat. 1989
B) Mesures gouvernementales / Economie	1	The VIIIth Plan in brief 1992-1998, 1992
	2	VIIe Plan de développement économique et social 1992 - 1996 Développement agricole et sécurité alimentaire
	3	Associations d'intérêt collectif
	4	La stratégie nationale pour la création et le suivi des Associations d'intérêt collectif d'eau potable, DGR, MDA, 1992
	5	Investment Coordination Committee (ICC) Guidelines and Procedures
	6	ICC Projet Evaluation Procedures and Guidelines
	7	ICC Technical Board Mini-workshop on Methodology for Project Review
C) Météorologie et hydrologie /sol	1	Carte des étages bioclimatiques
	2	Pluviométrie (carte hypsométrique des précipitations annuelles moyennes)
	3	Températures moyennes annuelles Période (1901 - 1995), I.N.M. (carte hypsométrique des températures annuelles moyennes)
	4	Températures moyennes du mois le plus chaud, I.N.M. (carte hypsométrique des températures mensuelles maximales)
	5	Températures moyennes du mois le plus froid, I.N.M. (carte hypsométrique des températures mensuelles minimales)
	6	Pluies moyennes annuelles en mm, Période (1901 - 1990 (carte hypsométrique des précipitations annuelles moyennes)
	7	Institut national de la météorologie, 1994 (inclut des données climatiques générales mensuelles de points représentatifs du Pays)
	8	Données d'observation des températures mensuelles moyennes (gouvernorats de Kébili Tozeur, Gabès, et Gafsa), période 1970 - 89
	9	Particularités climatiques de Gabès
	10	Carte pédologique de la Tunisie, S = 1:100.000, Division des sols, 1971
D) Economie agricole	1	Coût à la production d'un hectare
	2	Frais annuels d'entretien d'un EA, arboriculture en irrigué
	3	Production, prix et distribution des dattes
	4	Résultats de l'enquête suivi de la Campagne agricole (1992-93)
	5	Annuaire des statistiques agricoles, 1992
E) Organisation	1	Organigramme du Ministère de l'Agriculture, 1988
	2	Organigramme du Ministère de l'Agriculture
	3	Organigramme de la DGGR
	4	Organigramme du Ministère de la protection de l'environnement et du territoire
	5	Ministère de l'Agriculture, Journal officiel de la République Tunisienne, 1990
	6	Etat du personnel de la Division hydraulique, CRDA
F) Rapport d'étude	1	Ressources en eaux du Sahara septentrional, 1992
	2	Abrégé du Plan Directeur des Eaux du Sud (P.D.E.S)

	3 Plan Directeur des eaux du sud, volumes I et II, 1983
	4 Enquête sur les oasis, 1992
	5 Etude comparative entre l'irrigation traditionnelle & la Cuvette et le système aux sources multiples, 1988
	6 Fiche Projet (oasis)
	7 Suivi de projet
	8 Projet d'exécution de rénovation et création de Gafsa, Oasis de Lalla, Avant-projet, 1986, DGR, M.D.A.
	9 Projet d'économie de l'eau du périmètre irrigué de Douz
	10 Programme de détartrage des conduites de distribution des refroidisseurs par maillage du réseau, 1986, DGR, M.D.A.
	11 Fiche d'identification d'un périmètre irrigué
G) Ressources en eau / installations de source	1 Liste des oasis et plan de localisation (gouvernorat de Kébili, Tozeur, Gabès et Gafsa)
	2 Plan de localisation des oasis objets de l'étude (gouvernorats de Kébili, Tozeur, Gabès et Gafsa)
	3 Liste des forages et puits (gouvernorats de Kébili, Tozeur, Gabès et Gafsa)
	4 Economie d'eau dans la Nefzaoua
	5 Ressources en eau de Gabès
	6 Ressources en eau du Sud Tunisien
	7 Evolution de l'exploitation (1973-92)
	8 Sauvegarde des oasis du gouvernorats de Gabès, Etat de la salure des oasis, 1989, CRDS Gabès
	9 Carte des ressources en eau de la Tunisie S = 1:500.000, 1991 DGRE, MDA
	10 Noté sur la salinité des sols dans les oasis de Nefzaoua
H) Irrigation /installations d'irrigation	1 Aménagement parcellaire avec Seguias bétonnés ou maçonnés
	2 Suivi de l'évolution des sols sous irrigation, DDS, MDA, 1993
	3 Aperçu de l'irrigation dans le gouvernorat de Gabès
	4 Stratégie d'économie d'eau dans les périmètres irrigués du gouvernorat de Gabès
	5 Plan d'ensemble
	6 Carte du système des réseaux d'eau (oasis de Zauete el Anes et Novel, Kebil CRDA)
	7 Situation de l'oasis de Tozeur et du périmètres de Drea Sud
I) Eaux souterraines /qualité des eaux	1 A propos des eaux souterraines en Tunisie (Japonais)
	2 Schémas des couches géologiques (gouvernorat de Kéburi)
	3 Annuaire de l'exploitation des nappes profondes, 1992, DGRE, M.D.A.
	4 Petroleum Geology of Tunisia, 1990, Entreprise tunisienne d'activités pétrolières
	5 Utilisation des eaux usées traitées à des fins agricoles
	6 Spécifications physico-chimiques et biologiques
	7 Chimie de l'eau des forages CI et CT à Kébili
J) Environnement	1 Rapport national, l'état de l'environnement 1993, MEAT
K) Divers	1 Liste des Bureaux d'études

Domaine	Code	Nom du document
A) Cartes	1	Cartes topographiques de la zone de l'étude (échelle: 1/100.000), total 45 unités
	2	Cartes topographiques de la zone de l'étude (échelle: 1/50.000) total 87 unités
B) Hydrogéologie	1	Carte hydrogéologique, plan sectionnal hydrogéologique documents sur l'hydrogéologie
	2	Plan des forages
	3	Inventaire des forages
	4	Relevés d'observation du niveau des eaux souterraines
	5	Relevés d'observation de la qualité des eaux souterraines
C) Système de refroidissement des eaux géothermales	1	Aperçu de la capacité des installations existantes
	2	Etude de la survenance de dépôts
	3	Etude de l'état de la maintenance des installations

**Attachment - 3**

**Assignment Schedule of the Study Team**

### Membres de la mission

Domaine	Nom	Société d'appartenance	1995				1996				1996				Note								
			1995				1996				1996												
			1	2	3	4	5	6	7	8	9	10	11	12		1	2	3	4	5	6	7	8
Synthèse	Hironori Takahashi	Sanyu Consultants Inc.	25	3	2	16	20	4	3	3	18	18	16	16	20	28							
			25	3	2	16	20	4	3	3	18	18	17	16	20	28							
Irrigation et drainage	Kenjiro Yatabe	Nippon Koei Co., Ltd.	25	3	2	16	20	4	3	3	18	18	17	16	20	26							
			25	3	2	16	20	4	3	3	18	18	17	16	20	26							
Conception des installations d'irrigation et de drainage	Toshinobu Nakano	Sanyu Consultants Inc.	25	3	2	16	20	4	3	3	18	18	16	16	20	28							
			25	3	2	16	20	4	3	3	18	18	17	16	20	28							
Système de gestion de l'eau	Toyotaka Niwa	Sanyu Consultants Inc.	3	16			20	4	3	3	18	18	16	16	20	28							
			3	16			20	4	3	3	18	18	17	16	20	28							
Eaux souterraines/qualité des eaux	Ryoichi Kawasaki	Sanyu Consultants Inc.	25	3	2	17	20	4	3	3	24	23	23	23	22	5							
			25	3	2	17	20	4	3	3	24	23	23	23	22	5							
Refrondissement des eaux géothermales	Yutaka Yoshida	Nippon Koei Co., Ltd.*					22	18			18	16											* Geothermal Engineering Co., Ltd.
							22	18			18	16											
Agriculture et sol	Genshichi Wada	Nippon Koei Co., Ltd.	25	3	2	16	20	4	3	3	18	17	17	17									
			25	3	2	16	20	4	3	3	18	17	17	17									
Agro-économie, organismes de soutien des fermiers	Fumihiko Nagao	Nippon Koei Co., Ltd.	3	17			20	4	3	3	14	14	16	16									
			3	17			20	4	3	3	14	14	16	16									
Environnement et WID	Sachie Oikawa	Sanyu Consultants Inc.	3	17			20	4	3	3	17	17											
			3	17			20	4	3	3	17	17											
Coordinateur	Tadao Maruyama	Sanyu Consultants Inc.**	3	29	21	16	4	18	23	12	28	12	17	17	20	28							** Techno Staff Co., Ltd.
			3	29	21	16	4	18	23	12	28	12	17	17	20	28							
Présentation du rapport			△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
Total																							

Légende: ■ Opération sur le terrain    □ Opération au Japon    △/R: rapport de commencement    D/R: avant-projet de rapport final  
 P/R(1): rapport d'avancement    P/R(2): rapport final