

*L'étude de Faisabilité Pour Le Développement des Ressources En Eau  
Par Les Barrages Moyens Dans Le Milieu Rurale Au  
Royaume Maroc  
Rapport Final  
Volume III Rapport de Soutien (1) sur Étude de Base  
Rapport de Soutien V  
Sols, Agriculture et Irrigation*

***Tables***

Table VI.1.1 Caractéristiques typiques du sol au Maroc classification

Moroccan Soil Classification	Profile	Typical Feature	Other Soil Classification or Common soil name
1) Sol Minéraux Bruts	(A)C, (A)R or R	Organic matter almost absent in A horizon	Entisols, Lithosols, Regosols, Dunes
2) Sol peu Evolues	AC	A horizon 10-30 cm, in which organic matter may be relatively abundant	Entisols, Aridisols, Rankers, Grey sub-desert soils
3) Sol Vertisols	A(B)C, A(B)gC, A(B)Cg	Dark, heavy, clay soils with 2:1 -type clay minerals; prismatic structure, deep cracking when dry, swelling, self-mulching when wet	Vertisol
4) Sol Andosols	A(B)C	Volcanic soils with high allophane content in the colloidal fraction and high organic matter content	Inceptisol, Andosol
5) Sol Calcimagnésiques	AR, AC, A(B)r or A(B)C	Stable humus in A horizon and characteristic dominance of Ca or Mg.	Inceptisols, Mollisols, Rendzina, Brown Calcareous soils, Gypsiferous soils
6) Sol Isohumiques	A(B)C, sometimes ABC	High calcium saturation; humus penetration into at least the upper half of the profile or at least 30-40 cm deep.	Inceptisols, Mollisols, Brown and Red-Brown soils, Brunizems, Chernozems, Sierozems, Chestnut
7) Sol Brunifiers	A(B)C, ABC	Mull or moder type of humus. Brown eutrophic soil, brown soil with B-structure (with weak A2 and B texture)	Inceptisols, Alfisols, Grey Forest soils
8) Sol Podzolises	ABC	Mor or moder type of humus. A horizon ash-grey, strongly leached and impoverished; pronounced textural/ferrous B horizon	Spodosols, Podzols, podzolic soils
9) Sol a Sesquioxydes de Fer	ABC, A(B)C	Rich in sesquioxides and hydroxides, oxides mostly of Fe and Mn, silica:alumina ratio greater than 2	Alfisols, Red brown Mediterranean soil
10) Sol Ferrallitiques		Associated with higher annual rainfall and forest cover. Strongly weathered, red and porous soils. Sesquioxides coating and cementing of clay particles (Pseudo-texture). Silica: alumina ratio less than 2; low CEC. Chemical fertility of these soils is low	Oxisols
11) Sol Hydromorphes		Development and characteristics dominated by temporary or permanent waterlogging; elev and/or near formation	Alfisols, Inceptisols
12) Sol Sodiques		Soils that contain an excess of salts or exchangeable Na, or both. ECe >7 mmhos/cm Sols alkalis: ESP >10%	Aridisols, Inceptisols, Entisols

Source: Ministry of Agriculture, Rural Development and Fisheries  
Agricultural Compendium, Elsevier, 1981

**TableV1.1.2 Critère standard de la classification des terres convenables**

Slope			
Symbol	Level (%)	Class	
		Gravity	Sprinkler
Pe6	> 8	V	IV
Pe5	4 - 8	V	III
Pe4	2 - 4	IV	I
Pe3	1.5-2	III	I
Pe2	1-1.5	II	I
Pe1	< 1	I	I

Flood condition		
Symbol	Risk of Flood	Class
I1	None	I
I2	Light	II
I3	Moderate	III
I4	Important	IV
I5	Very Important	V

Salinity		
Symbol	Level (mmho/cm in ext.)	Class
R1	>32	V
R2	16-32	IV
R3	8 - 16	III
R4	4 - 8	II
R5	<4	I

Hydraulic Erosion		
Symbol	Condition	Class
Eh5	No use	V
Eh4	Strong erosion	IV
Eh3	Moderate erosion	III
Eh2	Low erosion	II
Eh1	No erosion	I

Micro topography			
Symbol	Relief Level (cm)	Class	
		Gravity	Sprinkler
M1	0-15	I	I
M2	15-30	II	I
M3	30-60	III	II
M4	60-120	IV	III
M5	>120	V	IV

Active Limestone	
Class	Level (%)
Ca1	< 7
Ca2	7 - 15
Ca3	15 - 25
Ca4	>25

Alkalinity		
	Level (Na/CEC)	Class
A5	>30%	V
A4	20-30	IV
A3	15-20	III
A2	11 - 15	II
A1	<10%	I

Permeability			
Symbol	Level K:cm/h	Class	
		Gravity	Sprinkler
K5	<0.5	V	IV
K4	0.5-1	IV	II
K3	1 - 2	III	I
K1	2 - 10	I	I
K2	10 - 20	II	II
K4	20<	IV	IV

Drainage			
Symbol	K	Condition	Class
D1	>2m/day	Normal purification	I
D2	1 - 2	Important purification	II
D3	0.1 - 1	Very import. purification	III
D4	0.05 - 0.1	Normal drainage	IV
D5	>0.05	Intensive drainage	V

Texture			
Symbol	Texture	Class	
		Gravity	Sprinkler
T4	S	IV	III
T3	SL	III	II
T2	SiL	II	II
T1	SC, SCL, L, LS, SiLS	I	I
T2	C, CL, LC, SiCL	II	I
T3	HC	III	II
Tg2	Gravel (10-25%)	II	II
Tg3	Gravel (25-50%)	III	III
Tg4	Gravel (50-75%)	IV	IV

Gravel : 2mm – 9cm

Condition in profile	Soil depth (cm) and Class				
	P4 0-20	P3 20-40	P2 40-60	P1 60-80	P'1 >80
Z					
S	IV	III	II	I	I
H	V	IV	III	II	I

Z: Rough material >75%, no reinforced pan

S: The area where limestone, thickness >30cm, contents >50%

H: The area where found hard limestone within 10cm

Stony						
	Stone (%)	S/SS	C1(SS)	C2(SS)	C3(SS)	C4(SS)
C1	0-10	C1(S)	I	II	III	IV
C2	10-25	C2(S)	II	II	III	IV
C3	25-50	C3(S)	III	III	III	IV
C4	50-75	C4(S)	IV	IV	IV	IV
Z	>75	-	-	-	-	-

S/SS: Surface (0-20)/Sub-surface (20-40)

Table V2.1.1: Afforestation et forêt naturelle au Maroc

(Unit: ha)

	Existing Afforested Area 1996-97											Total Forest Area
		Conifer				Hard Wood (1998)					Sub-Total	
		Cedar	Thuja	Pine	Juniper	Green Oak	Cork Ork	Zene Ork	Argan			
<b>Zone I</b>												
Al Hoceima	19,991	8,637	4,632	119	13	13,401	45,315	16,814	-	-	62,129	95,521
Boulemane	1,175	6,196	12,916	2,179	7,086	28,377	53,849	94	-	-	53,943	83,495
Chefchaouen	20,164	2,857	6,080	1,676	40	10,653	32,739	71,724	3,135	-	107,598	138,415
El Hajeb	8,698	49	1,538	-	-	1,587	21,000	317	560	-	21,877	32,162
Fes	1,472	1,541	20,572	-	-	22,113	48,569	-	40	-	48,609	72,194
Ifrane	7,535	37,969	79	-	341	38,389	52,444	60	690	-	53,194	99,118
Meknes	2,880	-	-	-	-	-	-	-	-	-	-	-
Sidi Kacem	7,645	-	-	-	-	-	-	4,597	-	-	4,597	-
Taounate	10,237	-	-	26	-	26	19,195	37,149	103	-	56,447	66,710
Taza	25,262	8,050	30,373	39,520	34,111	112,054	151,982	15,440	1,208	-	168,630	305,946
Sefrou	7,235	-	-	-	-	-	-	-	-	-	-	-
<b>Zone II</b>												
Ben Slimane	8,967	-	9,175	-	-	9,175	90	38,519	-	-	38,609	56,751
Casablanca	3,046	-	-	-	-	-	-	-	-	-	-	-
Khemisset	46,653	-	43,363	-	241	43,604	50,139	66,730	-	-	116,869	207,126
Rabat-Sale	8,882	-	3,714	-	-	3,714	-	23,702	-	-	23,702	36,298
<b>Zone III</b>												
Azilal	8,014	1,032	25,618	14,455	20,510	61,615	152,829	37	-	-	152,866	222,495
Beni Mellal	4,967	2,196	904	12,294	6,759	22,153	111,658	163	-	-	111,821	138,941
El Jadida	25,825	-	-	-	1,497	1,497	582	-	-	-	582	27,904
El Kelaa Des Straghna	2,946	-	-	-	-	-	-	-	-	-	-	-
Essaouira	13,090	-	95,570	-	12,847	108,417	13,695	-	-	131,671	145,366	266,873
Khouribga	10,834	-	21	-	-	21	13,331	1,068	-	-	14,399	25,254
Marrakech	9,853	-	36,864	1,535	44,830	83,229	136,011	77	-	5,961	142,049	235,131
Safi	13,467	-	-	-	-	-	-	-	-	351	351	-
Settat	9,625	-	5,861	-	-	5,861	819	1,186	-	-	2,005	17,491
Chichaoua	3,227	-	-	-	-	-	-	-	-	-	-	-
<b>Zone IV</b>												
Agadir	4,526	-	65,190	-	1,385	66,575	22,998	-	-	220,759	243,757	314,858
Ouarzazate-Zagoura	1,510	-	-	-	4,809	4,809	17,661	-	-	-	17,661	23,980
Tiznit	1,163	-	61,423	-	-	61,423	8,447	-	-	141,377	149,824	212,410
Taroudannt	5,378	-	49,582	-	33,960	83,542	103,562	-	-	367,991	471,553	560,473
<b>Zone V</b>												
Er Rachidia	607	356	1,310	-	16,089	17,755	20,161	-	-	-	20,161	38,523
Figuig	10,093	-	-	-	22,546	22,546	152	-	-	-	152	32,791
<b>Total</b>	<b>502,359</b>	<b>133,654</b>	<b>565,798</b>	<b>82,115</b>	<b>244,836</b>	<b>1,026,403</b>	<b>1,415,201</b>	<b>377,481</b>	<b>9,091</b>	<b>871,210</b>	<b>2,672,983</b>	<b>4,201,745</b>

Source: Annuaire Statistique du Maroc, 1999, Ministère de la Prévision Economique et du Plan

**Table V2.1.2: Zone cultivée et production du blé (Dur)The Cultivated**

Province g/	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
<b>Zone I</b>									
Al Hoceima	5.4	5.2	1.0	4.7	3.5	0.8	2.6	3.0	1.2
Boulemane	8.7	7.4	0.9	8.3	6.8	0.8	8.3	5.9	0.7
Chefchaouen	7.0	8.5	1.2	2.5	1.6	0.6	7.1	6.5	0.9
El Hajeb	13.4	25.3	1.9	6.1	6.5	1.1	11.4	22.2	2.0
Fes	52.2	99.7	1.9	36.5	32.5	0.9	40.6	71.6	1.8
Ifrane	22.1	29.4	1.3	17.0	15.6	0.9	22.0	24.4	1.1
Meknes	7.3	14.8	2.0	17.3	17.7	1.0	4.7	8.1	1.7
Kenitra*	40.8	55.8	1.4	32.4	32.3	1.0	27.6	48.5	1.8
Sidi Kacem	82.7	124.9	1.5	55.5	45.5	0.8	69.6	98.1	1.4
Taounate	79.0	132.7	1.7	65.6	55.1	0.8	80.3	124.5	1.6
<b>Zone II</b>									
Ben Slimane	47.0	107.2	2.3	30.0	29.7	1.0	38.5	78.9	2.1
Casablanca	11.8	32.1	2.7	8.4	6.7	0.8	9.2	13.0	1.4
Khemisset	47.9	86.7	1.8	30.9	24.1	0.8	40.0	67.2	1.7
Rabat	3.5	5.4	1.5	3.1	1.6	0.5	2.8	2.2	0.8
<b>Zone III</b>									
Azilah	23.9	37.0	1.5	19.9	16.1	0.8	26.3	23.0	0.9
Ben Mellal	52.3	122.2	2.3	47.1	61.2	1.3	35.1	70.3	2.0
El Jadida	94.0	209.6	2.2	69.2	106.9	1.5	85.4	134.0	1.6
El Kalaï des Straghna	80.0	149.5	1.9	79.3	73.5	0.9	82.5	105.9	1.3
Essaouira	8.1	11.0	1.4	7.6	3.6	0.5	9.6	8.2	0.9
Khouribga	30.6	42.8	1.4	27.3	17.8	0.7	22.0	18.9	0.9
Marrakech	66.5	108.8	1.6	53.0	28.7	0.5	42.5	17.4	0.4
Safi	95.6	134.8	1.4	72.8	45.9	0.6	92.1	81.1	0.9
Settat	191.5	463.4	2.4	134.5	122.4	0.9	179.5	346.4	1.9
<b>Zone IV</b>									
Agadir	7.8	22.1	2.8	6.9	10.0	1.5	9.7	15.2	1.6
Ouarzazate	1.5	2.6	1.8	1.3	1.7	1.3	0.1	0.2	1.9
Tiznit	0.5	0.6	1.2	0.1	0.0	0.2	0.6	0.1	0.1
<b>Zone V</b>									
Er Rachidia	11.5	29.7	2.6	11.1	23.3	2.1	10.2	17.9	1.8
Figug	2.6	3.7	1.4	1.9	1.3	0.7	1.3	1.2	0.9
<b>Total in Morocco</b>	<b>1,248.9</b>	<b>2,269.8</b>	<b>1.8</b>	<b>972.1</b>	<b>881.6</b>	<b>0.9</b>	<b>1,126.5</b>	<b>1,544.4</b>	<b>1.4</b>

Note: g/: The data shows only for provinces related to the area of Zone  
Source: Annuaire Statistique du Maroc, 1999, Ministère de la Prévision Economique et du Plan

**Table V2.1.3: Zone cultivée et production du blé (Tendre)**

Province g/	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
<b>Zone I</b>									
Al Hoceima	15.5	21.1	1.4	10.0	5.5	0.6	13.4	14.1	1.1
Boulemane	7.3	6.4	0.9	4.7	5.1	1.1	4.5	2.6	0.6
Chefchaouen	32.0	45.1	1.4	20.7	13.5	0.7	38.6	39.0	1.0
El Hajeb	28.5	49.6	1.7	18.4	22.1	1.2	45.7	109.2	2.4
Fes	77.3	140.7	1.8	55.5	53.8	1.0	87.3	179.8	2.1
Ifrane	19.6	28.4	1.5	10.5	10.0	1.0	16.7	15.4	0.9
Meknes	93.7	214.6	2.3	44.7	48.3	1.1	84.1	143.0	1.7
Kenitra*	254.7	443.7	1.7	180.1	197.9	1.1	199.7	394.1	2.0
Sidi Kacem	91.2	152.3	1.7	65.3	58.1	0.9	102.6	164.2	1.6
Taounate	26.5	34.2	1.3	19.2	18.4	1.0	32.4	40.8	1.3
<b>Zone II</b>									
Ben Slimane	54.1	122.8	2.3	25.0	28.8	1.2	55.9	134.7	2.4
Casablanca	19.8	54.4	2.7	12.8	11.9	0.9	26.4	61.3	2.3
Khemisset	149.8	311.6	2.1	120.0	117.6	1.0	145.0	268.3	1.9
Rabat	18.3	39.9	2.2	13.3	8.7	0.7	25.7	29.0	1.1
<b>Zone III</b>									
Azilah	12.1	20.1	1.7	10.1	11.5	1.1	15.3	14.5	0.9
Ben Mellal	173.3	424.2	2.4	157.7	196.5	1.2	173.1	353.0	2.0
El Jadida	83.4	181.1	2.2	60.6	109.1	1.8	83.6	107.8	1.3
El Kalaï des Straghna	156.2	255.8	1.6	160.1	107.0	0.7	182.3	188.8	1.0
Essaouira	11.4	12.5	1.1	11.0	4.8	0.4	11.7	6.7	0.6
Khouribga	61.1	92.9	1.5	40.6	35.3	0.9	45.6	49.7	1.1
Marrakech	70.9	115.0	1.6	62.5	22.0	0.4	58.6	24.8	0.4
Safi	105.5	136.1	1.3	98.0	52.9	0.5	94.8	65.4	0.7
Settat	135.0	336.2	2.5	85.9	91.9	1.1	142.5	219.5	1.5
<b>Zone IV</b>									
Agadir	56.8	132.1	2.3	52.1	52.0	1.0	63.3	41.0	0.6
Ouarzazate	23.3	31.7	1.4	22.1	35.4	1.6	17.3	28.6	1.7
Tiznit	8.0	15.0	1.9	6.9	1.8	0.3	14.5	2.0	0.1
<b>Zone V</b>									
Er Rachidia	8.5	18.7	2.2	5.7	13.0	2.3	5.1	7.3	1.4
Figug	6.1	7.8	1.3	5.7	5.3	0.9	1.1	-	-
<b>Total in Morocco</b>	<b>1,963.5</b>	<b>3,645.0</b>	<b>1.9</b>	<b>1,520.8</b>	<b>1,434.9</b>	<b>0.9</b>	<b>1,959.8</b>	<b>2,834.1</b>	<b>1.4</b>

Note: g/: The data shows only for provinces related to the area of Zone  
Source: Annuaire Statistique du Maroc, 1999, Ministère de la Prévision Economique et du Plan

**Table V2.1.4: Zone cultivée et production de l'orge**

Province g/	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
<b>Zone I</b>									
Al Hoceima	71.4	123.5	1.7	57.2	48.1	0.8	68.8	75.7	1.1
Boulemane	19.1	33.2	1.7	15.3	13.6	0.9	11.5	10.9	1.0
Chefchaouen	20.0	27.4	1.4	18.1	10.0	0.6	17.8	15.7	0.9
El Hajeb	13.3	22.5	1.7	6.1	8.1	1.3	9.9	14.1	1.4
Fes	39.7	64.8	1.6	31.4	31.1	1.0	38.0	48.6	1.3
Ifrane	27.6	45.5	1.7	21.3	22.4	1.1	21.8	16.4	0.8
Meknes	9.2	15.1	1.6	5.3	4.5	0.9	7.4	10.7	1.5
Kenitra*	23.7	33.3	1.4	15.8	14.1	0.9	17.7	18.0	1.0
Sidi Kacem	39.1	55.5	1.4	42.7	35.9	0.8	49.5	47.5	1.0
Taounate	123.0	220.2	1.8	86.7	62.4	0.7	108.4	122.5	1.1
<b>Zone II</b>									
Ben Slimane	22.3	45.5	2.0	18.5	19.4	1.1	18.5	28.5	1.5
Casablanca	14.3	27.3	1.9	10.3	8.5	0.8	11.4	17.0	1.5
Khemisset	65.7	124.8	1.9	45.5	33.7	0.7	58.5	72.0	1.2
Rabat	12.3	17.6	1.4	12.0	5.5	0.5	5.9	6.4	1.1
<b>Zone III</b>									
Azilah	91.8	147.4	1.6	85.0	61.0	0.7	85.3	70.0	0.8
Ben Mellal	46.8	88.2	1.9	40.8	35.8	0.9	44.5	46.1	1.0
El Jadida	110.8	164.3	1.5	102.7	95.9	0.9	141.3	114.3	0.8
El Kalaï des Straghna	165.9	242.1	1.5	159.9	81.3	0.5	232.2	171.7	0.7
Essaouira	194.0	277.4	1.4	148.7	86.3	0.6	170.3	103.9	0.6
Khouribga	123.9	232.9	1.9	105.5	92.8	0.9	106.4	137.3	1.3
Marrakech	249.2	404.2	1.6	211.7	88.0	0.4	234.9	99.2	0.4
Safi	182.4	266.3	1.5	176.2	112.8	0.6	192.6	131.0	0.7
Settat	172.8	335.2	1.9	121.3	105.5	0.9	167.1	259.0	1.6
<b>Zone IV</b>									
Agadir	125.2	160.2	1.3	96.3	42.9	0.4	155.6	54.8	0.4
Ouarzazate	26.0	49.9	1.9	25.6	33.3	2.1	25.6	32.0	1.3
Tiznit	85.8	151.9	1.8	60.7	19.4	0.3	94.9	8.5	0.1
<b>Zone V</b>									
Er Rachidia	8.0	13.8	1.7	2.9	3.6	1.2	4.0	6.6	1.7
Figug	13.9	19.3	1.4	10.8	9.3	0.9	6.9	1.9	0.3
<b>Total in Morocco</b>	<b>2,430.3</b>	<b>3,828.4</b>	<b>1.6</b>	<b>1,996.0</b>	<b>1,324.2</b>	<b>0.7</b>	<b>2,426.0</b>	<b>1,970.0</b>	<b>0.8</b>

Note: g/: The data shows only for provinces related to the area of Zone  
Source: Annuaire Statistique du Maroc, 1999, Ministère de la Prévision Economique et du Plan

**Table V2.1.5: Zone cultivée et production de la fève**

Province a/	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
<b>Zone I</b>									
Al Hoceima	2.1	1.1	0.5	1.6	0.2	0.2	1.9	0.7	0.4
Boulemane	1.9	4.0	2.1	3.0	1.2	0.4	3.3	2.0	0.6
Chefchaouen	3.1	2.9	0.9	2.8	0.8	0.3	2.4	0.9	0.4
El Hajeb	2.3	1.2	0.5	2.0	1.0	0.5	2.8	2.0	0.7
Fes	14.6	13.1	0.9	17.0	6.5	0.4	20.1	8.2	0.4
Ifrane	0.3	0.1	0.3	3.3	3.0	0.9	0.7	0.4	0.6
Meknes	4.4	2.6	0.6	2.9	1.3	0.5	4.6	2.0	0.4
Kenitra-Sidi Kacem	6.4	4.2	0.7	10.4	2.6	0.2	4.9	1.9	0.4
Taounate	34.4	26.8	0.8	33.1	9.9	0.3	37.5	21.4	0.6
Taza	22.5	34.0	1.5	10.1	4.2	0.4	24.3	21.4	0.9
<b>Zone II</b>									
Ben Slimane	0.9	0.8	0.8	3.7	3.3	0.9	2.3	2.1	0.9
Casablanca	0.5	0.6	1.1	0.3	0.1	0.5	0.8	0.4	0.5
Khemisset	2.0	1.4	0.7	2.4	0.5	0.2	7.3	3.7	0.5
Rabat	0.2	0.1	0.7	0.4	0.1	0.4	0.2	0.1	0.4
<b>Zone III</b>									
Azilal	0.6	1.1	1.9	0.8	1.1	1.4	0.9	1.6	1.8
Beni Mellal	5.1	5.2	1.0	12.7	15.8	1.2	4.8	6.3	1.3
El Jadida	6.0	6.6	1.1	5.3	1.8	0.3	1.1	1.1	1.0
El Kalaa des Straghna	7.8	11.6	1.5	14.5	16.8	1.2	12.4	11.4	0.9
Essaouira	-	-	-	2.3	0.2	0.1	3.7	0.4	0.1
Khouribga	-	-	-	-	-	-	-	-	-
Marrakech	2.6	2.6	1.0	3.1	0.8	0.3	1.9	0.9	0.5
Safi	2.5	2.2	0.9	6.0	3.8	0.6	6.6	4.6	0.7
Settat	9.7	9.7	1.0	9.5	8.3	0.9	11.5	9.1	0.8
<b>Zone IV</b>									
Agadir	0.6	0.2	0.4	0.7	1.0	1.5	0.1	0.1	0.6
Ouarzazaate	2.3	8.9	3.9	2.2	5.5	2.5	0.9	1.9	2.1
Tiznit	-	-	-	-	-	-	-	-	-
<b>Zone V</b>									
Er Rachidia	1.2	2.0	1.6	1.6	2.1	1.3	1.9	2.5	1.3
Figuig	-	-	-	0.2	0.3	1.4	0.2	0.1	0.4
<b>Total</b>	<b>135.1</b>	<b>143.5</b>	<b>1.1</b>	<b>153.2</b>	<b>93.0</b>	<b>0.6</b>	<b>160.9</b>	<b>107.7</b>	<b>0.7</b>

Note: a/ : The data shows only for provinces related to the area of Zone

Source:Annuaire Statistique du Maroc, 1999, Ministère de la Prevision Economique et du Plan

**Table V2.1.6: Zone cultivée et production du petit poids**

Province a/	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
<b>Zone I</b>									
Al Hoceima	0.5	0.4	0.9	1.2	0.1	0.1	1.3	0.3	0.2
Boulemane	-	-	-	0.1	0.0	0.3	-	-	-
Chefchaouen	1.2	0.5	0.4	0.6	0.2	0.3	0.5	0.3	0.5
El Hajeb	0.5	0.2	0.5	0.1	0.1	0.5	0.9	0.6	0.7
Fes	4.4	3.1	0.7	2.8	0.4	0.2	2.5	1.3	0.5
Ifrane	0.1	0.0	0.3	0.1	0.1	0.8	-	-	-
Meknes	0.3	0.2	0.6	4.4	1.8	0.4	1.7	0.9	0.5
Kenitra-Sidi Kacem	0.4	0.1	0.3	1.4	0.7	0.5	0.8	0.2	0.2
Taounate	2.0	2.2	1.1	2.3	0.3	0.1	2.6	1.4	0.5
Taza	-	-	-	-	-	-	-	-	-
<b>Zone II</b>									
Ben Slimane	0.4	0.4	1.0	1.6	0.7	0.4	2.9	1.2	0.4
Casablanca	0.1	0.1	1.2	0.7	0.2	0.2	0.4	0.2	0.5
Khemisset	2.0	0.9	0.5	2.5	0.8	0.3	4.5	1.8	0.4
Rabat	-	-	-	-	-	-	-	-	-
<b>Zone III</b>									
Azilal	0.8	1.2	1.5	0.6	0.6	1.0	0.9	0.6	0.7
Beni Mellal	1.2	1.2	1.0	1.5	0.6	0.4	1.6	0.8	0.5
El Jadida	6.4	8.0	1.3	5.4	0.7	0.1	-	-	-
El Kalaa des Straghna	0.1	0.1	0.7	1.9	2.3	1.2	3.7	3.3	0.9
Essaouira	-	-	-	-	-	-	-	-	-
Khouribga	-	-	-	-	-	-	-	-	-
Marrakech	0.9	0.7	0.8	-	-	-	1.3	0.6	0.5
Safi	4.8	3.7	0.8	6.5	3.6	0.6	7.9	5.5	0.7
Settat	3.0	3.5	1.2	3.3	2.5	0.8	3.5	2.2	0.6
<b>Zone IV</b>									
Agadir	0.2	0.6	3.1	-	-	-	0.5	0.4	0.7
Ouarzazaate	-	-	-	0.1	0.1	1.4	-	-	-
Tiznit	-	-	-	-	-	-	-	-	-
<b>Zone V</b>									
Er Rachidia	-	-	-	-	-	-	-	-	-
Figuig	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>30.0</b>	<b>27.6</b>	<b>0.9</b>	<b>37.5</b>	<b>15.8</b>	<b>0.4</b>	<b>38.3</b>	<b>21.8</b>	<b>0.6</b>

Note: a/ : The data shows only for provinces related to the area of Zone

Source:Annuaire Statistique du Maroc, 1999, Ministère de la Prevision Economique et du Plan

**Table V2.1.7: Zone cultivée et production de la lentille**

Province a/	1995-96			1996-97			1997-98		
	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)	Area (x1000ha)	Product. (ton)	Yield (ton/ha)
<b>Zone I</b>									
Al Hoceima	2.0	1.7	0.9	1.5	1.7	1.2	1.8	0.4	0.2
Boulemane	1.0	0.6	0.6	0.8	0.5	0.6	1.1	0.6	0.5
Chefchaouen	0.4	0.1	0.4	0.8	0.2	0.3	1.0	0.3	0.3
El Hajeb	1.1	0.7	0.6	2.5	1.1	0.5	2.1	1.1	0.5
Fes	0.9	0.7	0.8	1.1	1.2	1.1	2.0	1.1	0.6
Ifrane	0.1	0.0	0.4	1.5	-	-	1.7	0.6	0.4
Meknes	3.5	2.5	0.7	2.0	0.7	0.4	2.7	1.6	0.6
Kenitra-Sidi Kacem	1.7	0.4	0.2	-	8.5	-	-	-	-
Taounate	3.4	2.7	0.8	2.4	1.1	0.5	3.8	2.1	0.6
Taza	2.9	3.5	1.2	1.6	0.3	0.2	6.4	2.2	0.4
<b>Zone II</b>									
Ben Slimane	3.7	3.4	0.9	7.6	3.8	0.5	4.8	2.3	0.5
Casablanca	-	-	-	0.3	0.2	0.6	-	-	-
Khemisset	12.0	7.2	0.6	18.4	-	-	14.3	5.7	0.4
Rabat	-	-	-	-	-	-	-	-	-
<b>Zone III</b>									
Azilal	1.7	1.7	1.0	1.6	0.7	0.4	2.1	1.5	0.7
Beni Mellal	-	-	-	-	-	-	-	-	-
El Jadida	0.1	0.0	0.4	-	-	-	-	-	-
El Kalaa des Straghna	0.1	0.2	2.0	-	0.9	-	-	-	-
Essaouira	-	-	-	-	-	-	0.2	0.1	0.4
Khouribga	-	-	-	-	-	-	-	-	-
Marrakech	2.0	0.5	0.3	0.7	0.1	0.2	0.4	0.1	0.3
Safi	1.0	0.7	0.7	0.9	0.5	0.6	0.8	0.2	0.3
Settat	7.7	8.6	1.1	8.0	5.1	0.6	9.2	5.0	0.5
<b>Zone IV</b>									
Agadir	-	-	-	-	-	-	-	-	-
Ouarzazaate	0.1	0.1	0.8	-	-	-	-	-	-
Tiznit	-	-	-	-	-	-	-	-	-
<b>Zone V</b>									
Er Rachidia	-	-	-	-	-	-	-	-	-
Figuig	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>16.0</b>	<b>12.5</b>	<b>0.8</b>	<b>13.5</b>	<b>7.4</b>	<b>0.5</b>	<b>15.6</b>	<b>6.8</b>	<b>0.4</b>

Note: a/ : The data shows only for provinces related to the area of Zone

Source:Annuaire Statistique du Maroc, 1999, Ministère de la Prevision Economique et du Plan



Table V2.1.9: Zone cultivée et production marichère (1998/1999)

Crops	Cultivated Area (ha)				Production (ton)			
	Open Field in Spring	Greenhouse	Open Field in Winter	Total	Open Field in Spring	Greenhouse	Open Field in Winter	Total
Potato	51,715		10,500	62,215	945,780		195,000	1,140,780
Tomato	12,235	3,630	1,750	17,615	301,410	464,000	92,000	857,410
Onion	27,550			27,550	523,410			523,410
Carrot	9,695			9,695	220,850			220,850
Radish	7,745			7,745	118,220		3,500	121,720
Pepper	6,520	416	100	7,036	136,080	34,000		170,080
Sweet Melon	19,395	1,320		20,715	419,210	48,000		467,210
Water Melon	10,875			10,875	229,905			229,905
Squash	5,920	100	210	6,230	75,185	5,950	7,500	88,635
Green Bean	1,340	180	1,120	2,640	10,360	4,600	16,400	31,360
Green Peas	15,480			15,480	47,110			47,110
Garlic	1,935			1,935	9,940			9,940
Artichoke	2,165			2,165	28,330			28,330
Cauliflower	2,030			2,030	39,870			39,870
Cabbage	1,655			1,655	36,920			36,920
Cucumber	545	200		745	9,520	16,500		26,020
Sweet Potato	545			545	7,290			7,290
Mint	2,400			2,400	80,740			80,740
Board Bean	10,505		35	10,540	119,200		700	119,900
Eggplant	2,030		490	2,520	25,640		12,300	37,940
Beets	315			315	4,360			4,360
Strawberry		1,475		1,475		58,150		58,150
Hot Pepper		115	70	185		5,850	1,400	7,250
Asparagus			45	45			1,380	1,380
Others	17,305	320	410	18,035	230,150	14,850	5,320	250,320
<b>Total</b>	<b>209,900</b>	<b>7,756</b>	<b>14,730</b>	<b>232,386</b>	<b>3,619,480</b>	<b>651,900</b>	<b>335,500</b>	<b>4,606,880</b>

Source: Ministry of Agriculture, Rural Development and Fisheries, 2000

**Table V2.1.10: Production de Fruits au Maroc**

Crops			90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Olive	Production	(1,000 ton)	369.0	550.0	380.0	418.0	450.0	350.0	800.0	550.0	650.0	400.0
	Area	(x1,000 ha)	365.0	380.0	395.0	412.0	430.0	450.0	480.0	500.0	520.0	540.0
Apple	Production	(1,000 ton)	248.8	278.0	309.0	210.0	310.0	364.0	384.0	284.8	292.2	300.0
	Area	(x1,000 ha)	22.0	23.6	25.6	26.4	26.6	26.8	27.0	28.0	28.0	27.8
Pear	Production	(1,000 ton)	30.9	31.0	30.0	29.2	26.0	30.0	39.7	31.1	50.2	29.8
	Area	(x1,000 ha)	3.0	3.2	3.4	3.4	3.4	3.5	3.6	4.0	4.0	3.8
Stone apple	Production	(1,000 ton)	24.5	24.5	24.0	28.6	20.0	25.0	24.5	29.5	30.9	20.0
	Area	(x1,000 ha)	2.4	2.4	2.7	2.8	2.7	2.8	2.8	2.9	2.9	2.9
Almond	Production	(1,000 ton)	13.4	11.0	9.4	6.1	9.4	6.7	17.4	12.0	16.0	13.0
	Area	(x1,000 ha)	110.0	117.1	119.8	124.9	127.3	132.3	134.6	139.0	139.0	138.0
Apricot	Production	(1,000 ton)	92.2	66.0	115.0	88.2	78.0	88.4	103.7	116.8	106.4	119.6
	Area	(x1,000 ha)	13.9	13.5	14.4	14.6	13.7	14.1	13.9	13.9	13.9	13.9
Peach	Production	(1,000 ton)	25.0	33.0	34.2	35.6	30.0	35.0	33.7	38.7	45.3	48.0
	Area	(x1,000 ha)	3.5	3.7	4.0	4.1	3.6	3.8	3.9	4.1	4.1	4.1
Plum	Production	(1,000 ton)	40.9	5.2	41.0	58.0	33.0	48.0	46.5	40.9	51.4	39.0
	Area	(x1,000 ha)	6.6	7.1	7.4	7.4	6.8	6.9	7.0	6.9	6.9	6.9
Cherry	Production	(1,000 ton)	2.7	4.5	2.3	2.1	1.4	3.2	7.1	7.2	7.1	5.4
	Area	(x1,000 ha)	0.6	0.6	0.7	0.7	0.8	0.9	0.9	1.3	1.3	1.3
Dates	Production	(1,000 ton)	106.7	81.9	113.0	62.0	97.6	80.0	110.6	85.1	72.6	74.0
	Area	(x1,000 ha)	43.7	44.3	44.4	44.5	44.8	45.2	45.4	46.4	46.4	46.7
Walnut	Production	(1,000 ton)	0.8	2.0	4.0	1.5	1.7	3.5	3.3	5.0	80.0	9.0
	Area	(x1,000 ha)	4.5	4.8	5.0	5.2	7.6	8.0	7.5	5.3	5.3	5.5
Fig	Production	(1,000 ton)	60.0	45.0	50.0	650.0	67.0	40.4	51.2	68.0	820.0	68.0
	Area	(x1,000 ha)	40.0	40.0	40.0	40.0	45.3	44.0	42.0	44.6	44.6	44.5
Citrus fruits	Production	(1,000 ton)	1,468.0	1,110.0	1,230.0	1,324.0	997.0	1,400.0	1,194.0	1,591.0	1,303.0	1,400.0
	Area	(x1,000 ha)	72.7	73.5	74.3	74.8	74.8	74.5	74.6	75.7	75.7	76.0
Grapes	Production	(1,000 ton)	259.1	294.5	230.4	281.9	173.8	193.1	242.0	261.7	334.8	252.6
	Area	(x1,000 ha)	50.1	49.5	49.8	51.0	49.0	48.4	49.4	49.2	49.5	49.6
Avocado	Production	(1,000 ton)	2.5	4.5	5.7	6.8	7.8	8.3	10.3	11.0	11.9	13.1
	Area	(x1,000 ha)	0.5	0.6	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3
Others	Production	(1,000 ton)	28.8	31.5	30.6	32.4	32.4	31.5	33.3	34.2	33.2	39.0
	Area	(x1,000 ha)	3.6	3.5	3.4	3.6	3.6	3.7	3.7	3.9	3.9	4.0

Source: Direction de la Production Vegetale, Ministere de l'Agriculture, du Developpement Rural et des Peches Maritimes, 2001

**Table V2.1.11: Nombre du bétail par province dans le perimetre du projet**

Province a/	Cows			Sheep	Goat
	Improved	Local	Total		
<b>Zone I</b>					
Al Hoceima	6.9	32.7	39.6	142.5	81.3
Boulemane	0.2	12.3	12.5	511.7	144.9
Chefchaouen	8.1	66.9	75.0	89.2	263.2
El Hajeb	16.9	12.9	29.8	180.9	21.1
Fes	10.0	34.2	44.2	327.9	88.4
Ifrane	10.3	18.3	28.6	527.2	63.8
Meknes	8.0	18.7	26.7	124.1	8.4
Kenitra	105.6	139.0	244.6	937.2	20.7
Taounate	2.0	94.0	96.0	308.0	28.3
Taza	7.8	75.8	83.6	748.1	290.9
<b>Zone II</b>					
Ben Slimane	28.3	22.3	50.6	200.9	22.7
Casablanca	40.6	1.9	42.5	100.8	1.3
Khemisset	55.2	75.5	130.7	647.1	131.9
Rabat	21.8	9.1	30.9	103.7	9.4
<b>Zone III</b>					
Azilal	12.6	32.9	45.5	430.9	365.6
Beni Mellal	87.7	18.4	106.1	562.7	69.4
El Jadida	222.5	4.5	227.0	563.7	3.9
El Kalaa	116.7	37.9	154.6	887.8	49.4
Essaouira	0.8	53.6	54.4	511.9	358.3
Khouribga	6.1	32.2	38.3	670.6	50.0
Marrakech	32.4	105.2	137.6	894.8	393.2
Safi	26.4	84.7	111.1	984.0	39.0
Settat	57.7	51.1	108.8	1,020.1	20.7
<b>Zone IV</b>					
Agadir	68.9	70.9	139.8	660.2	521.7
Ouarzazaate	5.4	77.2	82.6	554.0	489.6
Tiznit	4.5	40.2	44.7	179.9	169.9
<b>Zone V</b>					
Er Rachidia	3.1	36.6	39.7	425.3	398.0
Figuig	0.3	7.9	8.2	739.4	137.2
<b>Total</b>	<b>1,118.7</b>	<b>1,441.1</b>	<b>2,559.8</b>	<b>16,576.4</b>	<b>5,114.4</b>

Note: a/ : The data shows only for provinces related to the area of Zone

Source: Elevage en Chiffres, 1999, Service du Suivi et de l'Evaluation Juillet 2000



Table V2.1.13: Production du traitement du sucre

	(Ton/year)							
	1990	1991	1992	1993	1994	1995	1996	1997
Sugar Beet Factory								
SUNAB	205,034	185,429	102,872	139,243	194,060	130,400	117,400	
SUNAG-Ksiri	275,067	259,060	133,238	233,954	288,739	446,115	269,966	491,288
SUNAG-Tazi	272,348	241,410	138,792	218,231	310,892			
SUNABEL	187,460	226,100	285,380	325,325	370,940	149,256	181,013	
SUBM	333,500	329,865	298,212	262,899	288,767	250,831	293,331	
SUTA	231,798	211,820	163,426	182,200	144,386	173,385	209,789	872,910
SUNAT	418,854	424,886	317,697	319,723	248,239	300,888	368,547	
DOUKKALA	457,541	484,676	595,100	631,000				
ZEMAMRA	377,304	476,082	558,485	658,000				
SUCRAFOR	139,626	139,450	93,000	90,943	107,275	158,500	208,100	238,000
Sub-total	2,898,532	2,978,778	2,686,202	3,061,518	1,953,298	1,609,384	1,648,146	1,632,198
Sugarcane Factory								
SUNACAS	245,699	250,652	299,610	249,241	241,936	251,323	218,164	
SURAC	383,645	383,109	378,718	371,169	383,590	428,507	384,277	726,297
SUCRAL	333,020	332,576	334,147	276,953	254,928	321,940	267,925	
SUCRAFOR	45,060	59,435	51,270	46,237	22,762	29,493	28,749	17,350
Sub-total	1,007,424	1,025,772	1,063,745	943,600	903,216	1,031,263	899,115	743,647
	3,905,956	4,004,550	3,749,947	4,005,118	2,856,514	2,640,647	2,547,261	2,375,845

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

**Table V2.1.14: Capacité du traitement de l'huile**

<b>Factory</b>	<b>(ton/year)</b>	<b>Factory</b>	<b>(ton/year)</b>
LESIEUR CRYSTAL	190,000	C.M.H	12,000
OLEOR	18,000	Huileries of the Souss	20,000
SEPO	55,000	Huileries of Oujda	20,000
SICO	9,000	SUDEXPORT	6,000
SOMIO	12,000	SIKAF	6,000
Huileries of Meknes	33,000	SOMATAZI	12,000
SIOF	12,000		
Total Capacity of Oil Processing			317,000

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

**Table V2.1.16: Production de lait et du traitement de lait**

<b>Year</b>	<b>Fresh Milk (10<sup>6</sup> liter)</b>	<b>Sterilized (10<sup>6</sup> liter)</b>	<b>Batter (ton)</b>	<b>Cheese (ton)</b>	<b>Powder (ton)</b>
1990	370	325	3,121	7,839	478
1991	390	334	3,242	8,200	1,182
1992	440	383	3,908	8,600	1,408
1993	475	401	4,676	10,000	1,029
1994	490	390	5,600		1,400

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

**Table V2.1.15: Production et export de l'huile d'olive**

<b>Year</b>	<b>Production (ton)</b>	<b>Export (ton)</b>
1991	55,000	2,000
1992	38,000	4,500
1993	40,000	400
1994	45,000	0
1995	35,000	6,450
1996	80,000	14,160
1997	50,000	33,700

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

**Table V2.1.17: Capacité du traitement des moulins par région économique**  
(Unit: ton)

<b>Economic</b>	<b>No. of Factory</b>	<b>Processing</b>
Centre	21	123,000
Nord Ouest	17	68,100
Centre Nord	17	65,550
Tensift	11	50,700
Cebtre Sud	9	35,700
Oriental	7	29,700
Sud	6	27,500
	88	400,250

Source : Homepage of Ministry of Agriculture, Rural Development and Fisheries

Table V2.1.18: Import et Export des marchandises agricoles au Maroc

Items	Import Amount (Million ton)					Items	Import Value (million DH)				
	1994	1995	1996	1997	1998		1994	1995	1996	1997	1998
Milk Products	46	45	42	33	35	Milk Products	759	814	730	538	644
Seedling Potatoes	51	54	111	38	39	Seedling Potatoes	190	311	111	112	137
Coffee	22	20	23	27	28	Coffee	349	514	383	433	479
Tea	34	38	28	35	51	Tea	681	695	501	655	749
Wheat	1,191	2,549	2,240	2,055	2,581	Wheat	1,491	3,997	4,137	3,486	3,728
Sugar	455	478	513	586	562	Sugar	1,164	1,320	1,349	1,521	1,490
Tobacco	13	9	14	10	9	Tobacco	828	509	577	565	619
Other	624	1,615	944	1,109	2,029	Other	1,886	3,470	3,435	2,839	3,547
Total	2,436	4,808	3,915	3,893	5,334	Total	7,348	11,630	11,223	10,149	11,393

  

Items	Export Amount (Million ton)					Items	Export Value (million DH)				
	1994	1995	1996	1997	1998		1994	1995	1996	1997	1998
Fishes	32	29	30	35	30	Fishes	742	763	811	969	835
Shell Fish	112	111	98	91	108	Shell Fish	3,521	4,310	4,110	3,843	3,940
Fresh Freezeded Veget.	30	25	25	39	46	Fresh Freezeded Veget.	359	394	332	451	380
Fresh Tomato	151	156	153	189	207	Fresh Tomato	404	612	719	865	1,020
Potatoes	87	97	53	50	30	Potatoes	245	415	224	181	125
Dried Vegetables	7	6	5	11	21	Dried Vegetables	40	58	49	77	131
Citrus	499	414	632	516	632	Citrus	1,384	1,716	2,700	2,377	2,725
Canned Fish	59	68	61	61	64	Canned Fish	1,440	1,542	1,535	1,664	1,829
Canned Vegetables	65	83	78	91	64	Canned Vegetables	845	1,098	1,167	1,223	929
Caned Fruits / Jerry	15	18	16	14	20	Caned Fruits / Jerry	133	210	179	174	213
Other	253	215	178	162	208	Other	1,290	1,275	1,253	1,266	1,575
Total	1,310	1,222	1,329	1,259	1,430	Total	10,403	12,393	13,079	13,090	13,702

Source: Annuaire Statistique de Maroc 1999, Direction de la Statistique, Ministère de la Prevision Economique et de Plan

**Table V2.1.19: rd des entrées requises par la recolte sous la condition “avec Projet”**

	Unit	Cereals	Corn Grain	Sugar beat	Potato	Carrot	Tomato	Water Melon	Pepper	Green beans	Legumes green	Alfalfa	Bersim	Summer fodder a/	Apple
Seed	kg/ha	120	30	15	2000	3	0.5	3	0.5	60	100	360 DH b/	25	80	-
Manure	ton/ha	10 c/	20	-	30	10	30	-	20	20	15	-	-	-	-
Fertilizer															
N	kg/ha	120	90	80	90	105	92	210	120	33	21	46	32	100	180
P2O5	kg/ha	84	45	65	90	135	90	210	140	110	70	135	70	70	250
K2O	kg/ha	90	90	150	170	150	120	150	100	150	95	100	100	110	135
Agricultural Chemicals	DH/ha	50	50	-	200	100	600	600	400	200	100	-	-	-	600
Mechanization															
Tractor c/	hr/ha	12 / 6.5	- / 6.5	- / 9.5	- / 12.5	- / 12.5	- / 9.5	- / 9.5	- / 9.5	- / 9.5	- / 9.5	- / -	- / 7.5	- / 6.5	- / 4.5
Animal Traction c/	day/ha	2 / 5	- / 8	- / 6	- / 19	- / 19	- / 38	- / 38	- / 21	- / 21	- / 20	- / 18	- / 12	- / 8	- / 10
Baler	hr/ha	- / 4	-	-	-	-	-	-	-	-	-	-	-	-	-
Harvester	hr/ha	2 / -	-	-	-	-	-	-	-	-	-	-	-	-	-
Labor Force	day/ha	10 / 23	- / 55	- / 120	- / 120	- / 120	- / 200	- / 155	- / 117	- / 194	- / 71	- / 144	- / 66	- / 35	- / 140
Other (bags, case, etc) d/	%	10	10	10	15	15	20	15	15	15	15	10	10	10	20

Note: a/ Fodder is taken as an basis for counting

b/ Installation costs seedlings (25kg), Manure (20t); Soil preparation and sowing is 1,450DH/4years = 360DH/ha/year

c/ Mechanized / semi-mechanized; mechanized>5ha; semi-mechanized <5ha

d/ In % of production costs not including labor

e/ Recommendation from the Study Team

Source: The Development of Small and Medium Scale Irrigation Project

Collected data from Rural Engineering Administration, Ministry of Agriculture, Rural Development and Fisheries

**Table V2.1.20: Coût du labour du ORMVAs (DH/day)**

ORMVA	Gharb	Loukkos	Doukkala	Haouz	Souss-Massa	Talda	Moulouya	Average
Plowing	40			39	40	50	50	43.8
Cover cropping	36	30		44	49	50	47	42.7
Light hallow	39		40		39	34	50	40.4
Seeding	30	29	41	39	39	35	49	37.4
Planting	30	25	34	35	38	34	50	35.1
Soil fertilization	32	32	41	38	40	36	49	38.3
Surface fertilization	31	30	38	37	39	34	48	36.7
Treatment	35	30	41	41	39	34	49	38.4
Weeding	33	37	39	40	38	34	48	38.4
Ridging	33		31	41	40	70	47	43.7
Covering	28	33	40	38	40	35	49	37.6
Harrowing	29	28	35	40	39	33	48	36.0
Clearing out	23		37	56	35	32	50	38.8
Harvest	29			75		55		53.0
Threshing	25			69	47	51	50	48.4
Baling	30	33	47	55	41	35	51	41.7
Harvest / Threshing	31	34	49	65	43	39	52	44.7
Harvest / Threshing /	42	38	58	53			58	49.8
Average	32	32	41	47	40	41	50	41.4

Source: Enquete budget de Ferme dans les Zones d'intervention des ORMVA, DPAE/AGR Bebruary 1998

**Table V2.1.21: Coût des unités opérationnelles ou ORMVAs (DH/ha)**

ORMVA	Gharb	Loukkos	Doukkala	Haouz	Souss-Massa	Talda	Moulouya	Average
Plowing	287	267	304	324	405	321	319	318.1
Cover cropping	135	176	166	146	123	131	148	146.4
Raking		203	200					201.5
Hallowing	140	113	145			109	151	131.6
Seeding	110	105	202	168	95		249	154.8
Ridging	111	163	219	91	147	119	171	145.9
Earthing up	178	324						251.0
Harrowing	92							92.0
Deep fertilization	67		197	60	108		135	113.4
Shallow fertilization	80		171		36		120	101.8
Weeding	59		50		110		117	84.0
Chemical treatment	86	148	131	241	117		132	142.5

Source: Enquete budget de Ferme dans les Zones d'intervention des ORMVA, DPAE/AGR Bebruary 1998

**Table V2.1.22: Prix des fertilisants au ORMVAs (DH/100kg)**

ORMVA	Gharb	Loukkos	Doukkala	Haouz	Souss-Massa	Talda	Moulouya	Average
14-28-14	251	253	244	262	256	247	257	252.9
Urea	269	282	277	254	280	269	272	271.9
TSP	288		180	194	219	214	226	220.2
Potassium Sulphate	270		255	246	271	252	221	252.5
ASP (19-38-0)	265		250	240	288		291	266.8
Single Super Phosphate	239	260			200			233.0
12-26-13	98		138	80	122		108	109.2
Ammonium Nitrate	202	191	199	202	201	208	206	201.3
Di-ammonium sulphate	140	142	141	185	149	179	158	156.3
Manure	7	16	14	11	29	7	14	14.0

Source: Enquete budget de Ferme dans les Zones d'intervention des ORMVA, DPAE/AGR Bebruary 1998

**Table V2.2.1: Condition des terres et de l'irrigation des communes rurales dans les zones candidates des projets**

Candidate Project	Farm Land				Irrigation/Non-irrigation		
	Farmer	Farm Area	Farm Plot	Average Farm Size	Irrigation	Rainfed	Irrigation
	(No.)	(ha)	(No.)	(ha/farmer)	(ha)	(ha)	(%)
<b>Zone I</b>							
1 Neckor	837	5,994	16,335	7.2	590	5,404	9.8
2 Tizimellal	63	453	579	7.2	2	451	0.4
6 Tazarane	4,120	11,758	26,394	2.9	940	10,818	8.0
14 Adarouch	2,542	25,337	15,730	10.0	5,193	20,144	20.5
17 Azghar	2,393	10,602	15,291	4.4	648	9,954	6.1
19 Aoukai	1,566	4,847	11,125	3.1	14	4,833	0.3
20 Sidi Abbou	2,120	16,680	20,115	7.9	491	16,189	2.9
21 Sidi El Mokhfi	4,332	13,355	23,030	3.1	105	13,250	0.8
<b>Zone II</b>							
4 Ain Kwachiya	1,287	15,926	4,045	12.4	883	15,043	5.5
5(1) N'Fiikh (Downstream)	358	3,979	758	11.1	216	3,763	5.4
5(2) N'Fiikh (Upstream)	2,648	22,534	10,203	8.5	582	21,952	2.6
15 Sidi Omar	795	6,459	2,512	8.1	358	6,101	5.5
18 Boukatkaour	3,222	26,663	13,367	8.3	175	26,488	0.7
<b>Zone III</b>							
3 Ait Baddou	2,868	10,890	19,556	3.8	427	10,463	3.9
7 Amez Miz	1,989	11,213	10,672	5.6	5,178	6,035	46.2
8 Boulaouane	1,429	6,975	8,136	4.9	4,064	2,911	58.3
9 Taskourt	5,536	54,984	27,274	9.9	17,436	37,548	31.7
22 N'Ountz	1,698	14,042	9,135	8.3	1,551	12,491	11.0
<b>Zone IV</b>							
16 Tiwine	1,518	2,048	15,415	1.3	1,813	235	88.5
23 Iguin' Quaqa	2,943	15,161	12,860	5.2	7,561	7,600	49.9
24 Amont Abdel Moumen	1,133	1,360	4,947	1.2	339	1,021	24.9
25 Sidi Abdellah	2,366	9,897	8,107	4.2	5,953	3,944	60.1
<b>Zone V</b>							
10 Timkit	4,786	4,997	38,897	1.0	3,984	1,013	79.7
11 Tadighoust	3,629	2,471	24,377	0.7	2,232	239	90.3
12 Tiouzaguine	1,390	2,359	7,493	1.7	1,283	1,076	54.4
13 Kheng Grou	925	4,756	7,338	5.1	1,265	3,491	26.6

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

**Table V2.2.2: Teneur de la terre des fermes opérationnelles des communes rurales dans les 25 zones candidates des Projets**

Candidate Project	Operating Farm Area (ha)						
	Owner		Tenant		Loan & work		Total
	(No.)	(%)	(No.)	(%)	(No.)	(%)	
<b>Zone I</b>							
1 Neckor	4,506	75.2	27	0.5	1,461	24.4	5,994
2 Tizimellal	405	89.4	0	0.0	48	10.6	453
6 Tazarane	11,371	96.7	297	2.5	90	0.8	11,758
14 Adarouch	27,665	91.9	764	2.5	1,664	5.5	30,093
17 Azghar	9,942	93.8	30	0.3	630	5.9	10,602
19 Aoukai	4,576	94.4	68	1.4	203	4.2	4,847
20 Sidi Abbou	13,799	82.7	872	5.2	2,009	12.0	16,680
21 Sidi El Mokhfi	12,925	96.8	64	0.5	366	2.7	13,355
<b>Zone II</b>							
4 Ain Kwachiya	14,537	91.3	1,247	7.8	142	0.9	15,926
5(1) N'Fiikh (Downstream)	3,264	82.0	203	5.1	152	3.8	3,979
5(2) N'Fiikh (Upstream)	20,006	88.8	1,079	4.8	1,449	6.4	22,534
15 Sidi Omar	5,658	87.6	44	0.7	757	11.7	6,459
18 Boukatkaour	23,465	88.0	994	3.7	2,204	8.3	26,663
<b>Zone III</b>							
3 Ait Baddou	10,069	92.5	178	1.6	643	5.9	10,890
7 Amez Miz	9,580	85.4	195	1.7	1,438	12.8	11,213
8 Boulaouane	5,471	78.4	67	1.0	1,437	20.6	6,975
9 Taskourt	48,805	88.8	204	0.4	5,975	10.9	54,984
22 N'Ountz	13,646	97.1	2	0.0	394	2.8	14,052
<b>Zone IV</b>							
16 Tiwine	1,839	89.8	106	5.2	103	5.0	2,048
23 Iguin' Quaqa	14,489	95.6	303	2.0	369	2.4	15,161
24 Amont Abdel Moumen	1,359	99.9	0	0.0	1	0.1	1,360
25 Sidi Abdellah	9,385	94.8	496	5.0	16	0.2	9,897
<b>Zone V</b>							
10 Timkit	4,801	96.1	46	0.9	150	3.0	4,997
11 Tadighoust	2,244	90.8	112	4.5	115	4.7	2,471
12 Tiouzaguine	2,212	93.8	34	1.4	111	4.7	2,359
13 Kheng Grou	4,735	99.6	19	0.4	2	0.0	4,756

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

**Table V2.2.3: Propriétaire des terres des communes rurales dans les 25 zones candidates des projets**

Candidate Project	Farm land (ha)					Total
	Private	Group	Habous	Guich	Estate farm	
<b>Zone I</b>						
1 Neckor	5,966	1	27	0	0	5,994
2 Tizimellal	453	0	0	0	0	453
6 Tazarane	11,734	0	20	4	0	11,758
14 Adarouch	27,336	2,493	6	27	231	30,093
17 Azghar	10,517	0	68	0	17	10,602
19 Aoukai	4,758	14	75	0	0	4,847
20 Sidi Abbou	16,007	73	51	4	545	16,680
21 Sidi El Mokhfi	13,053	285	17	0	0	13,355
<b>Zone II</b>						
4 Ain Kwachiya	14,663	42	0	0	1,221	15,926
5(1) N'Fiikh (Downstream)	3,626	0	0	0	353	3,979
5(2) N'Fiikh (Upstream)	20,971	331	25	0	1,207	22,534
15 Sidi Omar	6,389	68	0	0	2	6,459
18 Boukatkaour	26,535	32	0	0	96	26,663
<b>Zone III</b>						
3 Ait Baddou	10,541	1	9	1	338	10,890
7 Amezmiz	5,892	5,280	32	0	9	11,213
8 Boulaouane	6,617	168	0	0	190	6,975
9 Taskourt	15,890	25,704	895	12,487	8	54,984
22 N'Ountz	14,042	0	0	0	0	14,042
<b>Zone IV</b>						
16 Tiwine	1,943	0	63	1	41	2,048
23 Iguin' Quaqa	11,381	537	45	0	3,198	15,161
24 Amont Abdel Moumen	542	2	0	0	816	1,360
25 Sidi Abdellah	7,042	1,024	21	0	1,810	9,897
<b>Zone V</b>						
10 Timkit	3,106	75	14	0	0	4,997
11 Tadighoust	2,374	13	84	0	0	2,471
12 Tiouzaguine	2,320	0	39	0	0	2,359
13 Kheng Grou	3,988	768	0	0	0	4,756

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

**Table V2.2.4: Utilisation de la machinerie agricole dans les communes rurales**

Candidate Project	Number of machineries		
	Tractor	Harvester	Pump
<b>Zone I</b>			
1 Neckor			
2 Tizimellal	0	0	2
6 Tazarane	15	1	105
14 Adarouch	114	2	72
17 Azghar	35	4	75
19 Aoukai	2	1	3
20 Sidi Abbou	47	11	163
21 Sidi El Mokhfi	9	2	14
<b>Zone II</b>			
4 Ain Kwachiya	248	17	425
5(1) N'Fiikh (Downstream)	35	2	130
5(2) N'Fiikh (Upstream)	161	14	366
15 Sidi Omar	30	5	90
18 Boukatkaour	181	44	137
<b>Zone III</b>			
3 Ait Baddou	12	5	55
7 Amezmiz	25	2	43
8 Boulaouane	2	0	3
9 Taskourt	82	1	282
22 N'Ountz	17	0	96
<b>Zone IV</b>			
16 Tiwine	6	0	103
23 Iguin' Quaqa	213	6	413
24 Amont Abdel Moumen	0	0	13
25 Sidi Abdellah	119	8	270
<b>Zone V</b>			
10 Timkit	44	0	1,534
11 Tadighoust	10	0	169
12 Tiouzaguine	2	0	8
13 Kheng Grou	10	1	117

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

**Table V2.2.5: Zone cultivée des communes rurales dans les zones candidates des projets**

Candidate Project	Cultivated Area								
	Cereals	Legumes	Vegetable	Oil Plant	Industrial cultivation	Fodder	Fruits	Fallow	Total
Zone I									
1 Neckor									
2 Tizimellal	309	13	2	0	0	0	64	113	501
6 Tazarane	3,387	355	104	2	5,101	375	1,723	1,305	12,352
14 Adarouch	13,709	228	469	0	0	1,438	1,309	8,214	25,367
17 Azghar	7,009	666	92	0	0	48	1,807	2,007	11,629
19 Aoukai	2,268	151	18	2	409	67	1,898	600	5,413
20 Sidi Abbou	12,623	1,614	285	0	8	186	2,067	1,176	17,959
21 Sidi El Mokhfi	6,192	1,060	200	2	0	19	6,714	1,571	15,758
Zone II									
4 Ain Kwachiya	9,100	59	263	7	2	2,798	1,188	2,573	15,990
5(1) N'Fiikh (Downstream)	2,771	24	181	0	1	117	210	935	4,239
5(2) N'Fiikh (Upstream)	19,031	1,034	436	0	1	881	878	2,036	24,297
15 Sidi Omar	4,882	182	204	0	0	27	286	903	6,484
18 Boukatkaour	21,518	3,198	923	0	0	76	101	2,107	27,923
Zone III									
3 Ait Baddou	9,666	137	76	7	0	101	2,060	768	12,815
7 Amez Miz	9,719	74	195	1	1	214	1,488	524	12,216
8 Boulaouane	6,726	16	57	0	0	51	1,545	48	8,443
9 Taskourt	50,015	186	619	0	33	328	3,893	2,186	57,260
22 N'Ountz	8,222	7	195	0	0	132	336	5,217	14,109
Zone IV									
16 Tiwine	1,569	41	116	0	0	394	342	176	2,638
23 Iguin' Quaqa	10,629	41	1,039	0	1	571	3,103	635	16,019
24 Amont Abdel Moumen	1,362	0	7	0	0	1	211	29	1,610
25 Sidi Abdellah	6,031	0	757	0	1	607	2,346	574	10,316
Zone V									
10 Timkit	3,402	74	205	0	88	594	1,330	797	6,490
11 Tadighoust	1,765	46	19	0	0	621	1,102	183	3,736
12 Tiouzaguine	2,070	35	26	0	0	153	172	231	2,687
13 Kheng Grou	2,061	41	44	0	0	88	516	2,122	4,872

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

**Table V2.2.6: Nombre du bétail des communes rurales dans les 25 zones candidates des projets**

Candidate Project	Table Animal (Meat Production)				Draft Animal		
	Cattle	Sheep	Goat	Camel	Horse	Mule	Donkey
Zone I							
1 Neckor	739	3,886	253	0	0	644	438
2 Tizimellal	44	202	11	0	0	26	38
6 Tazarane	5,341	5,301	13,705	0	1	4,982	205
14 Adarouch	3,754	120,058	9,894	61	1,153	2,215	1,763
17 Azghar	3,077	27,832	18,340	7	77	2,213	1,128
19 Aoukai	3,274	5,444	7,082	0	7	1,703	517
20 Sidi Abbou	3,922	19,861	499	6	375	1,561	1,873
21 Sidi El Mokhfi	6,493	14,111	3,966	0	32	2,233	2,075
Zone II							
4 Ain Kwachiya	4,793	30,652	4,944	9	310	124	805
5(1) N'Fiikh (Downstream)	1,016	8,228	172	21	26	19	145
5(2) N'Fiikh (Upstream)	6,763	22,523	1,486	50	503	812	2,109
15 Sidi Omar	972	4,980	1,704	0	139	225	338
18 Boukatkaour	6,218	31,783	8,400	5	584	865	2,913
Zone III							
3 Ait Baddou	2,181	22,446	15,125	85	170	1,106	2,498
7 Amez Miz	3,314	25,012	4,065	0	36	238	2,051
8 Boulaouane	2,730	21,567	9,819	0	53	463	1,413
9 Taskourt	8,608	93,717	15,213	14	109	650	5,408
22 N'Ountz	1,346	22,940	16,022	57	182	1,790	879
Zone IV							
16 Tiwine	2,337	11,645	11,377	5	1	367	829
23 Iguin' Quaqa	6,702	29,368	22,616	0	36	413	2,786
24 Amont Abdel Moumen	1,036	2,405	14,682	0	0	319	657
25 Sidi Abdellah	5,070	19,975	10,627	0	28	323	1,518
Zone V							
10 Timkit	4,293	35,551	38,361	480	2	703	1,641
11 Tadighoust	3,397	23,907	16,760	531	2	220	2,025
12 Tiouzaguine	686	38,979	52,419	52	7	794	2,313
13 Kheng Grou	561	14,411	12,226	31	35	235	805

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

**Table V2.2.7: Travail non agricole des fermiers des communes rurales**

Candidate Project	Farming only	Non-agricultural activities of farmers									(Sub-total)
		Fishing	Energy / Industry	Const- ruction	Handy craft	Services	Officer	Private business	Others		
<b>Zone I</b>											
1 Neckor	764	0	0	7	2	23	13	1	26	72	
2 Tizimellal	31	0	0	11	0	7	2	2	8	30	
6 Tazarane	3,778	2	0	0	28	87	50	38	134	339	
14 Adarouch	2,174	5	3	0	3	68	104	16	169	368	
17 Azghar	2,115	3	3	2	0	30	147	11	78	274	
19 Aoukai	1,273	1	1	1	2	50	80	0	157	292	
20 Sidi Abbou	1,801	0	0	3	5	99	39	0	156	302	
21 Sidi El Mokhfi	3,729	2	3	2	54	98	124	79	236	598	
<b>Zone II</b>											
4 Ain Kwachiya	953	1	6	0	3	65	161	27	65	328	
5(1) N'Fiikh (Downstream)	236	6	9	1	0	14	16	5	65	116	
5(2) N'Fiikh (Upstream)	2,128	5	20	6	7	138	97	40	177	490	
15 Sidi Omar	519	0	0	0	0	17	147	55	46	265	
18 Boukatkaour	2,664	1	16	0	5	122	106	34	274	558	
<b>Zone III</b>											
3 Ait Baddou	2,308	2	2	6	10	68	63	8	400	559	
7 Amezmiz	1,663	1	5	14	6	36	53	101	107	323	
8 Boulaouane	1,293	2	1	1	2	14	9	26	80	135	
9 Taskourt	4,760	3	9	53	59	205	75	83	288	775	
22 N'Ountz	1,572	2	13	0	3	49	12	8	39	126	
<b>Zone IV</b>											
16 Tiwine	1,112	1	14	67	1	49	59	1	213	405	
23 Iguin' Quaqa	2,539	1	11	15	13	132	43	5	183	403	
24 Amont Abdel Moumen	871	2	11	3	11	62	18	2	151	260	
25 Sidi Abdellah	1,991	0	8	17	7	60	53	1	215	361	
<b>Zone V</b>											
10 Timkit	3,505	1	17	510	11	127	123	189	289	1,267	
11 Tadighoust	2,498	0	4	366	18	101	241	151	247	1,128	
12 Tiouzaguine	1,260	0	0	0	0	1	17	1	111	130	
13 Kheng Grou	708	0	1	4	15	28	44	38	86	216	

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001

**Table V2.2.8: Niveau d'éducation des fermiers des communes rurales**

Candidate Project	Illiteracy	Religious school (5-7age)	Primary school (7-12age)	Secondary school (12-15age)	High school (15-18age)	University	Total
1 Neckor	687	77	53	16	0	3	836
2 Tizimellal	37	6	14	2	2	0	61
6 Tazarane	2,824	1,105	118	35	24	8	4,117
14 Adarouch	2,168	58	148	64	56	48	2,542
17 Azghar	2,006	201	105	42	16	19	2,389
19 Aoukai	1,124	285	103	30	16	7	1,556
20 Sidi Abbou	1,757	150	132	37	21	6	2,103
21 Sidi El Mokhfi	3,558	346	287	69	39	28	4,327
<b>Zone II</b>							
4 Ain Kwachiya	853	71	116	45	72	124	1,281
5(1) N'Fiikh (Downstream)	266	14	28	18	10	16	352
5(2) N'Fiikh (Upstream)	2,073	131	187	71	56	100	2,618
15 Sidi Omar	619	64	38	23	28	12	784
18 Boukatkaour	2,648	188	173	94	76	43	3,222
<b>Zone III</b>							
3 Ait Baddou	2,237	397	169	36	20	8	2,867
7 Amezmiz	1,529	241	149	37	15	15	1,986
8 Boulaouane	1,263	98	50	9	5	3	1,428
9 Taskourt	4,682	509	261	40	21	22	5,535
22 N'Ountz	1,563	59	42	21	9	4	1,698
<b>Zone IV</b>							
16 Tiwine	1,126	158	188	22	17	6	1,517
23 Iguin' Quaqa	2,421	210	226	44	16	25	2,942
24 Amont Abdel Moumen	1,007	35	65	5	9	10	1,131
25 Sidi Abdellah	1,936	163	181	33	22	17	2,269
<b>Zone V</b>							
10 Timkit	3,225	552	786	115	60	44	4,782
11 Tadighoust	2,207	488	660	138	86	50	3,629
12 Tiouzaguine	1,258	22	89	7	8	6	1,390
13 Kheng Grou	681	66	118	25	20	14	924

Source: Recensement General de l'Agriculture, Resultats par Commune, Ministère de l'Agriculture de Development Rural et des Peches Maritimes, Janvier 2001