D3.3.3 Soils in Sarbaz

(1) General Description

Sarbaz sub-basin forms the northern slope of the Dena Mountains and gravelly soils are largely extent at the foot slope of the mountains. Four soils are observed in the area, namely 1)Eutric Leptosols in hills, 2)Calcaric Cambisols in hills and plateaus, 3)Haplic Calcisols in plateaus, and 4)Calcaric Regosols in gravelly alluvial fans. Calcaric Cambisols and Haplic Calcisols are slow in permeability and heavy in texture. Soil depths are shallow in higher location and deep to very deep in lower location. Apple trees are planted and cultivated in lower area since 30 years before and recently in higher area. Eutric Loptosols is marly and medium in permeability and texture, and soil depth is very shallow. This soil is largely extent in the hilly area of Noorabad village, and young apple trees are planted recently where soils are relatively deep and irrigation water is available. Calcaric Regosols is gravelly texture and rapid in permeability.

(2) Soil Series and Units in Sarbaz

Soils of Sarbaz area are located on four physiographic units and contain nine soil series as follows:

Table D-3-3-3-1 Soil Series in Sarbaz

Physiography		Soil Se	rics	USDA Soi	I Тахопоту (19	99)	FAO-Unesco	Iranian Fourth
	No.	Area (ha)	%	Family	Subgourp	Order	(1989)	Approximation
Mountains	1	1,085	17%	Clayey-skeletal, mixed, mesic	Typic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
	2			Fine, mixed, mesic	Typic Haploxerolls	Mollisols	Haplic Kastanozems	Brown Forest soils
Hills	3	1,235	19%	Fine, carbonatic, shallow, mesic	Typic Xerorthents	Entisols	Eutric Leptosols	Calcisols
	4	2,434	38%	Fine, carbonatic, shallow, mesic	Typic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
	5			Fine, carbonatic,, mesic	Typic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
Plateaux	6	343	5%	T ,	Fluventic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
	7	416	6%	Fine, carbonatic,, mesic	Typic Calcixerepts	Inceptisols	Haplic Calcisols	Calcic Brown soils
	8	714	11%	Fine, carbonatic,, mesic	Fluventic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
Gravelly Alluvial Fans	9	98	2%	Loamy-skeletal, carbonatic, mesic	Typic Xerothents	Entisols	Calcaric Regosols	Alluvio-Colluvial soils
Miscellaneous	-	146	2%					
Total		6,471	100%			T		

Table D-3-3-3-2 Soil Units in Sarbaz

Physiography	Soil	Soil	Area	Area	Soil 8	Series
	Series	Mapping		Ratio	Area	Ratio
		Unit	(ha)	(%)	(ha)	(%)
Mountain	1	1.1				
	2	2.1				
Hill	3	3,1	1,235	19%	1,235	19%
	4	4.1			176	3%
•		4.2	176	3%		
	5	5.1	104	2%	728	11%
		5.2	371	6%		
		5.3	252	4%		
Plateau	6	6.1	343	5%	- 343	5%
	• 7	7.1	416	6%	416	6%
	- 8	8.1	714	11%	714	11%
G. A. Fan	9	9.1	98	2%	98	2%
Association	1+2	1.1+2.1	1,085	17%	1,085	17%
	4+5	4.1+5.1	1,530	24%	1,530	24%
Miscellaeous	R		134	2%	146	2%
	RW		12	0%		
Total			6,471	100%	6,471	100%

1) No.1 Soil Series

On the map, it has been specified as 1.1, and in the classification it has been classified as:

"Clayey - skeletal, mixed, Typic Haploxerepts".

This soil is deep (80-120cm.) of dark reddish brown color (5 YR 3/3), Clay- silty clay. Fine angular blocky structure, 70% boulders and coarse gravels (0-15 cm, A, ochric epipedon) on a layer of reddish brown color (5 YR 4/3), clay, medium angular blocky structure, 40-50% boulders and coarse gravels (15-50 cm, Cambic horizon) on a layer of reddish brown (5 YR 4/3), clay, medium angular blocky structure, 50-60% boulders and coarse gravels (50-80 cm., Bw2, Cambic horizon) on a layer with more than 75% boulders and coarse gravels (+80 cm, C).

The representative profile of this soil series specifies as No.76 in 30° 51' 49N and 51° 34' 50E. The No.1 soil series contains one separated mapping unit as follows:

- Unit 1.1 No.1 soil series with clay – silty clay surface texture, 35-75% stones and boulders in subsoil and 35-75% boulders in topsoil, more than 75% stones and boulders within depth of 80-120 cm, 12-25% overall and 5-8% transversal slopes, strong micro relief, moderate water erosion.

2) No.2 soil series

On the map, it has been specified as 2.1 and in the classification it has been classified as:

"Fine, mixed, mesic, Typic Haploxerolls".

This soil is very deep of dark reddish brown color (5 YR 3/2), clay loam, granular structure, 30% coarse gravels (0-20 cm, A, mollic epipedon) on a layer of reddish brown color (5 YR 4/3), clay fine angular blocky structure, 30% boulders and coarse gravels (20-65 cm, Bw1, Cambic horizon) on a layer of dusky red (2.5 YR 4/4), clay, moderate angular blocky structure, 15-20% coarse gravels (65-85 cm, Bw2, Cambic horizon) on a layer with 50% boulders, clay, structureless (+85 cm, C)

The representative profile of this soil series specified as No.78 in 30° 57' 05N and 51° 34' 01E. The No.2 soil series contains one-separated mapping units as follows:

 Unit 2.1 No.2 soil series with clay loam surface texture, 15-35% coarse gravels and stones in subsoil and topsoil, 2-5% overall and 5-8% transversal slopes, moderate microrelieif and water erosion.

3) No.3 soil series

On the map, it has been specified as 3.1 and in the classification it has been classified as:

"Fine, carbonatic, shallow, mesic, Typic Xerorthents".

This soil is dark yellowish brown color (10 YR 4/4), clay loam, massive, 15% coarse gravels (0-15 cm, Ap, ochric epipedon) on a layer of pale brown (10 YR 6/3), silty clay loam, massive, weathered calcareous marls (paralithic) (15-60 cm, C1) on a layer of pale brown (10 YR 6/3), silty clay, massive, weathered calcareous marls (paralithic) (60-110 cm, C2) over limestone (+110 cm, R).

The representative profile of this soil series is specified as No.67 in 35° 55' 78N and 51° 35' 29E. The No.3 soil series contains one separated mapping unit as follows:

- Unit 3.1 No.3 soil series with clay loam surface texture, 15-35% coarse gravels in topsoil, weathered calcareous marks within depth of 10-25 cm., 5-8 to 8-12% overall and 5-8% transversal slopes, strong micro relief, moderate water erosion.

4) No.4 soil series

On the map. It has been specified as 4.1, 4.2 and in the classification it has been classified as:

"Fine, carbonatic, shallow, mesic, Typic Haploxerepts".

This soil is dark yellowish brown color (10 YR 4/4), clay loam, massive, 15% coarse gravels (0-20 cm., AP, ochric epipedon) on a layer of brown color (10 YR 5/3), clay, coarse angular blocky structure,

few secondary lime as powdery pockets (20-40 cm., Bw, cambic horizon) on a layer of light gray (10 YR 7/2), silty clay loam, weathered calcareous marls (paralithic (+40 cm., Cr).

The representative profile of this soil series is specified as No.229 in 30° 53' 49N and 51° 40' 35E. The No.4 soil series contains two separated mapping units as follows:

- Unit 4.1 No.4 soil series with clay loam surface texture, 15-35% coarse gravels in topsoil, weathered calcareous marks within depth of 25-50 cm, 2-5% overall and transversal slopes, slight micro relief and water erosion.
- Unit 4.2 No.4 soil series with clay loam surface texture, 15-35% stones in topsoil, weathered calcareous marls within depth of 25-50 cm, 5-8% overall and transversal slopes, moderate micro relief and water erosion.

5) No.5 soil series

On the map, it has been specified as 5.1, 5.2, 5.3 and in the classification it has been classified as:

"Fine, carbonatic, mesic, Typic Haploxerepts"

This soil is brown color (7.5 YR 4/3), clay, fine angular blocky structure, 15% coarse gravels (0-20 cm, Ap, ochric epipedon), on a layer of brown color (10 YR 4/4), clay, moderate angular blocky structure, 15-20% coarse gravels (20-50 cm, Bw, cambic horizon) on a layer of very pale brown color (10 YR 8/2), weathered calcareous marls (+50 cm, Cr)

The representative profile of this soil series specified as No.233 in 30° 53' 41N and 51° 36' 06E. The No.5 soil series contains three separated mapping units as follows:

- Unit 5.1 No.5 soil series with clay surface texture, 15-35% coarse gravels in subsoil and topsoil, weathered calcareous marls within depth of 50-80 cm, 2-5 to 5-8% overall and 2-5% transversal slopes, slight micro relief and water erosion.
- Unit 5.2 No.5 soil series with clay surface texture, 15-35% coarse gravels in subsoil, weathered calcareous marls within depth of 80-120 cm, 2-5 to 8-12% overall and 5-8% transversal slopes, moderate micro relief and water erosion.
- Unit 5.3 No.5 soil series with clay surface texture, 15-35% coarse gravels in subsoil and 35-75% coarse gravels in topsoil, weathered calcareous marls within depth of 80-120 cm, 8-12% overall and 2-5 to 5-8% transversal slopes, moderate micro relief, severe water erosion.

6) No.6 soil series

On the map, it has been specified as 6.1, and in the classification it has been classified as:

"Clayey- skeletal, carbonatic, mixed, Fluventic Haploxerepts".

This soil is reddish brown (5 YR 4/3), clay, fine angular blocky structure, 20-30% coarse gravels (0-15 cm, Ap, ochric epipedon), on a layer of reddish brown color (5 YR 4/3), clay, moderate angular blocky structure, 15-20% coarse gravels (15-30 cm, Bw1, cambic horizon) on a layer of reddish brown color (5 YR 4/4) clay, moderate angular blocky structure, 50% coarse gravels (30-45 cm, Bw2, cambic horizon) on a layer with more than 75% boulders and stones (+45 cm, C)

The representative profile of this soil series specified as No.55 in 30° 57' 09N and 51° 35' 65E. The No.6 soil series contains one-separated mapping unit as follows:

 Unit 6.1 No.6 soil series with clay surface texture, 35-75% gravels, stones and boulders in subsoil and 15-35% coarse gravels in topsoil, more than 75% coarse gravels and stones within depth of 25-50 cm., 2-5% overall and transversal slopes, moderate micro relief and water erosion.

7) No.7 soil series

On the map, it has been specified as 7.1 and in the classification it has been classified as:

"Fine, carbonatic, mesic, Typic calcixerepts".

This soil is very deep of dark yellowish brown color (10 YR 4/4), clay, massive (0-25 cm, Ap, ochric epipedon) on a layer of dark yellowish brown (10 YR 4/4), clay, moderate angular blocky structure (25-50 cm, Bw1, Cambic horizon), on al layer of yellowish brown color (1 YR 5/4), clay, moderate angular blocky structure 10-15% secondary lime as powdery pockets (50-90 cm, Bk1, calcic horizon) on a layer of yellowish brown color (10 YR 5/4), clay loam, moderate angular blocky structure, 30% secondary lime as powdery pockets, many loess dolls (90-150 cm, Bk2, calcic horizon).

The representative profile of this soil series is specified as No.225 in 30° 55' 20N and 51° 38' 68E. The No.7 soil series contains one separated mapping unit as follows:

- Unit 7.1 No.7 soil series with clay surface texture, 2-5% overall and 1-2% transversal slopes, slight micro relief and water erosion.

8) No.8 soil series

On the map, it has been specified as 8.1, and in the classification it has been classified as:

"Fine, carbonatic, mesic, Fluventic Haploxerepts".

This soil is very deep of brown color (10 YR 5/3), clay loam, massive, 2% coarse gravels (0-20 cm, AP, ochric epipedon) on a layer of brown color (10 YR 5/3), silty clay, moderate angular blocky structure, 1-2% coarse gravels (20-45 cm, Bw1, Cambic horizon) on a layer of light olive brown (2.5 Y 5/3), clay, moderate angular blocky structure, (45-80 cm, Bw3, Cambic horizon) on a layer of olive brown to light olive brown (2.5 Y 4.5/4), clay, moderate angular blocky structure (80-150 cm, Bwg, Cambic horizon).

The representative profile of this soil series is specified as No.60 in 30° 55' 84N and 51° 37' 02E. The No.8 soil series contains one separated mapping units as follows:

- Unit 8.1 No.8 soil series with clay loam surface texture, 2-5% overall and 1-2% transversal slopes, slight micro relief and water erosion.

9) No.9 soil series

On the map, it has been specified as 9.1, and in the classification it has been classified as:

"Loamy- skeletal, carbonatic, mesic, Typic Xerorthents".

This soil is brown color (10 YR 4/3), clay loam, massive, 25% coarse gravels (0-20 cm, AP, ochric epipedon) on a layer of brown color (10 YR 4/3), sandy loam, massive, 40-50% coarse gravels (20-45 cm, C1) on a layer with more than 75% gravels, stones and boulders (45-150 cm, C2).

The representative profile of this soil series is specified as No.70 in 30° 56' 97N and 51° 36' 76E. The No.9 soil series contains one-separated mapping unit as follows:

Unit 9.1 No.9 soil series with clay loam surface texture, 35-75% coarse gravels and stones
in subsoil and 15-35% coarse gravels in topsoil, more than 75% coarse gravels and stones
within depth of 25-50 cm., 2-5% overall and 1-2% transversal slopes, slight micro relief and
water erosion.

(3) Soil Properties in Sarbaz

Soils are generally clayey in Sarbaz as show in Table D-3-3-3. Gravel content is generally high except soil series 7 and 8 which are extending in the plateaus nearby the main river. Soil series 8 has relatively high permeability (Rapid-medium by USDA). The pH of soils are alkaline (7.06 - 8.03) and organic matter content is 1.49 % in average.

Table D-3-3-3-3 Soil Properties in Sarbas

				e D-3-			ropert		Sarba	as			
Physiography	Soil	Mapping	Profile		Textur	e (%)		Texture	pН	oc	Depth	Sa	Ib
	series	Unit		Clay	Silt	Sand	Gravel>2		1	(%)	(m)	(g/cm ³)	(cm/hr)
- /- - /-				< 0.002	0.002-0.05	0.05-2	mm						
Hill	3	3.1	56	52	46	2	60	SiC		1.22	0.50		
			62	49	11	40	15	С		1.11	1.50		
		ĺ	64	40	30	30	12.5	C-CL	7.97	0,83	1.10		4.0
			66	32	22	46	15	SaCL		0,77	0.55	L	
			67	40	40	20	15	C-CL	7,81	1,39	1.10		3.5
			68	34	22	44	50	CL		0.92	0.30		
			72.	50	46	4	0			0,96		<u> </u>	
			73	46	42	12	15	SiC		1,56	1.00		
		,	89	60	34	- 6		С		1.71	0.40		<u> </u>
		·	Ave,	45	33	23	27		7.89	1.16	0.83		3.8
	4	4.1						<u> </u>				ļ	
		4.2	237	46	32	- 22	20	С		1,56	0.30		<u> </u>
			255	40	36		40	C-CL		1.49		<u> </u>	
			Ave.	43	34		30			1.53	0.40	<u> </u>	
	5	5.1	81	38	56					2.66	0.50		1.8
	İ		94	50	26		15	SiC		1.41	0.55		L
		<u> </u>	Ave.	44	41	15	38			2.04	0.53		1.8
		5.2	227	62	34		. 0		8.00	1.41	1.50	1.35	
•		· .	228	52	41	7	20			1.66			
			Ave.	57	38					1.54		1.35	
		5.3	234	43	48	9	40	SiC		2.49	1.50		<u> </u>
Plateaus	6	6.1	55	56	26	18	25	С	7.85	2.01	0.45		3.5
	· ·		58	52	22	26	40	C		0.96		<u> </u>	
		1	59	42	38	20	10	С		0.65	0.65		
			65	50	30	20	40	С		0.91	0.35		
	1.		_69	40	36	24	10	C-CL		1.55	1.50	1.29	
			Ave.	48	30	22	25	<u> </u>	7.85	1.22	0.65	1.29	3.5
	7	7.1	225	44	33	23	0	С	7.66	2.29	1.50	1.41	
			226	50	47	3	0			1.46	1.50	L	
			Ave.	47	40		0		7.66	1.88	1.50	1.41	
	8	8.1	60	40	34			C-CL_	8.03	0.81	1.50	1.38	10.7
			61	46	36			С		0.69	1.50	ļ	
·			63	40	36		3			1.32	1.50	[
			230	36	37	27	0		7.80	0.80	1.50	1.35	
		j .	_231	44	38	18				1.68		<u> </u>	
			232	44	37	19	10	С		1.91	1.20		
		}	236	44	- 52	4	2	SiC		0,85	1.50	L	
		 	Ave.	42	39	19	5		7.92	1.15	1.46	1.37	10.7
Gravelly	9	9.1	70	40	40		25	CL	7,99	1.07	0.45	ļ	
Alluvial Fan	,	1	71	40	40		40	SiCL		1.39	0.40	 	
			Avc.	40	40			ļ <u>. —</u>	7.99	1.23	0.43		ļ
Associations	1+2	1.1+2.1	76	56	40	4		C-SiC	7.06	2.30	0.80		
			78	40	40			CL	7.09	1.74		L	
4.5 24		[86	56	38			C	[1.57	1.00		
			87	- 54	32					2.08		 	ļ
			92	26	38					1.30			
			96	52	36		60		<u> </u>	1.43			
* 1	l '. '		97	52	46		50		7.00	2.35	 -		
			Ave.	48	- 39				7.08	1.82		1.00	<u> </u>
	4+5	4.1+5.1	229	38	41	21			7.92	0.58			
	, i		233	44	21	35	15		7.81	3.12			
			238	46	27	27	25		ļ	1.98			<u></u>
*			239	40	31	29				1.79	-		
•			241	46	44	10				1.93	·		
	٠		248	40	39		25			1.00			
			Ave,	42	34	24	23	ļ	7.87	1.73	1.05	1.33	
Miscellaneous					<u></u>	l		L	L			ļ	<u></u>
	RW								لينبا		<u> </u>	<u> </u>	<u> </u>
Total				45	36	19	26		7.76	1.49	0.96	1.35	4.7

(Notes) 1) Soil texture, pH, Organic Carbon Conternt, Specific gravity are for top soil.

When depth is 1.50m or more, actual depth is more than mentioned depth.
 Soil texture abbreviation C: Clay, CL: Clay Loam, SiC: Silty Clay, SiCL: Silty Clay Loam, SiL: Silty Loam, L: Loam, LSa: Loamy Sand, SaC: Sandy Clay, SaCL: Sandy Clay Loam, SaL: Sandy Loam L: LOZIII, Loz. Eventy Sans, Suc.

(4) Laboratory Test Results of Representative Profiles in Sarbaz

Table D-3-3-3-4 Laboratory Test of Soil Profile No. 76 (Soil Series 1) in Sarbaz

Area: SARBAZ (KOLBELUK)

Soil Series: 1

Soil Profile No.: 76

Lab. No.	•	·							ئاد:	شعاره آزمايشة
عن (مغنوش)	. توق	Particle size	classes (mm) (ك (كمار به مايمار)	برمدتراتكا	بات	در صد الثناع	عديت لكزيكي	ر تعش کل شیاع	
Depth (cm)	Horizon	Sand 2 - 0.05	Sift 0.05 - 0,002	Clay < 0.002	Gravel	Texture	SP	(بسي زيمس بر مثر) Ecc*10^3(de/m)	PH ₃	OC%
0-15	A	4	40	56	70	C-SIC	53.3	0.56	7.06	2,3
15-50	Bwl	10	30	60	40-50	С	49.84	0,56	7.45	0.53
50-80	Bw2	10	32	58	50-60	C	51.5	0.45	7.6	0,3
+ 80	С				>75					
عن (ستتبدار)	ټنګ	غائر فالل جنب	بتديرة اللمنب	در مىد عواد	25	مسيد فابان فابات	غرفت تباف كاتيرني	در صد متهد تنظی	نسبت جنب مديم	درمت تشيخ باؤي
Depth (cm)	Total N	Ava P	Ava K	ختش شونده	Gypsum	Ex. Na	C.E.C	Con		
J 17 (3.1.7)		p.p.m	p.p.m	T.N.V %	Meq/10	ىرمىد گرمخات Soil ©g	موشي لكي و الأن	ESP	SAR	85 %
0-15	0.2	60,8	632	7.8			46.22		0.19	
15-50	0.014	26.2	352	6.18			47.48		0.77	
								•		
عن (سنتينز)		الان در ارتر)	محارل (حالي اکي و	كتيرنهاي			لان،درليتر)	يان سعول (ميس کي و ا	أنيرن	
Depth (cm)		Solub	le Cations (med	/ 1)			Solu	ble Anious (meq 1)		
	Ca	%[g++	Na+	K-	Sum	CO3	HC03-	CI-	SO4	Sum
0-15	3.6	1.6	0.32	0.15	5.67	0	4	1	0.66	5.66
15-50	2.4	2	1.14	0.14	5.68	0	2.5	2	1.29	5.79
عر (ستنبنز)	Water Co	nicnt o's o	در مند اب	وژڻ منصرمن	رژنمنسوهن	فرهت	Permeabili	طابيت تفوذ ي	Infiltration F	تفرذ يتبري علما
Depth (cm)	Field moisture	33.3 Кра	1500 Kpa	يشتعري	حثبتى	خترو فزج	سأتبسر يز ساعت	كلاس	مانتيمتز برساعت	كتس
	وطويت مستوجي	غروث زراعي	ەن بۇمرىكى	BD (gr cm3)	PD (21 cm²)	Total Porosity %	awh	Class	cmh	Class
				٠						

Table D-3-3-3-5 Laboratory Test of Soil Profile No. 78 (Soil Series 2) in Sarbaz

SABRAZ (KOLBELUK)

2

Soil Series: Soil Profile No.:

78

Soil & Water La : SCWRC Lab. No. :

Lab. No.	:								گاه :	لتعارد آزمليتها
ع-ق (سانتيمتر)	تن	Particle size	ciusses (mm) (ك (نظر به مېتىتر	درمدذرات	يافت	در صد اتباع	هدايت الكتريكي		نرمد کرون کې
Depth (cm)	Horizon	Sand 2 - 0.05	Silt 0.05 - 0.002	Clay < 0.002	Gravel	Texture	\$P	(نىس زىيىش بىر بىتى) Ecc+10^3(ds/m)	PHs	ØC•4
0-20	A	20	40	40	30	CL	35	0.47	7.09	1,74
20-65	Bwl	16	32	52	30	C	60.5	0.35	7.58	0,78
65-85	Bw2	18 .	22	60	15-20	С	69.01	0.36	8	0.76
85-150	С	20	30	50	50	С	54	0.32	8	0.4
·						<u> </u>				
سق (مقتبستر)	ژن کې	مر نازخت	وتقنور فافل جثب	فرصدمراد	کچ	ستهدفش تبادث	المترفيت تبغل كالتوني	در صد ستيم ئيلالي	أمعت جنب سديم	رمسا تنتاج فالري
Depth (cm)	Total N	Ava ?	Ava. K	خنٹی شرندہ	Сурғит	Ex Na	C.E.C	ESP	SAR	BS 4:
		p.pm	p.p.m	T.N.V %	Meq/10	ىرىمىد گزى غاقد Cg Soil	میٹی اکر و کان		5720	
0-20	0.18	4.5	632	6.18			18.96		0.41	
20-65	0.16	13.2	328	6.64			22,61		0.54	
65-85				14.31			23.65		0.59	
عسق (سالنيمار)		الأدد أيتر)	مطرل (دیلی کی و	كثيرنهاي			لان در ليتر)	پاي معاول (مړلي تکي و او	أبرن	
Depth (cm)		Sciul	ele Cations (mes	γ1)			Solu	ble Anions (meq/l)		
-cpur(um)	Ca	Mg-	Na+	K+	Sum	CO3	нсоз-	CI-	SQ4	Sum
0-20	2.8	1.2	0.59	0.13	4.72	0	2.5	2	0.18	4.68
20-65	2.2	0.6	0.64	0.08	3.52	0	2.5	1	0.08	3.58
65-85	1.6	1.2	0.7	0.12	3.62	0	2	1.5	0.15	3.65
عىق (ماتنيمتر)	Water Co	مر حر≟ ف° Atcrit مر	درصد ک	رڙڻ مقموص	وزنءنصوص	برمند	Permeabili	فابلیت تفوذ ity	Infiltration I	سرد بنیر ی cate
Depth (cm)	Field moisture	33.3 Kpa	1500 Kpa	مثلعري	حقيتي	عندو فزع	سافتيمتر بر ساعت	كلاس	ماتئيمتر بر ساعت	كشن
expur(Gu)	وطويت منعزيي	شرجت زراعي	ه: پژمريگر	BD (gr/cm3)	PD (gricm3)	Total Poresity **	cm/h	Class	спућ	Class
										<u> </u>

Table D-3-3-3-6 Laboratory Test of Soil Profile No. 67 (Soil Series 3) in Sarbaz

Area: SARBAZ Soil Series: 3 Soil Profile No.: 67 Soil & Water La.: SCWRC

Lab. No. : عل (مانئيش) ىرسىد ئرات غاق (قطر به موليمتر) (Particle size classes (mm درسد الباع مدابت تكريكي رتفش کی تنباع Silt Clay (سے زیش پر مثر) Depth (cm) Horizon Texture SP PHs OC% 2 - 0.05 0.05 - 0.002 < 0.002 > 2 Ecc*10^3(ds.m) 0-15 20 Aр 40 40 15 C-CL 45.97 0.5 7.81 1.39 15-60 Cl 13 51 36 SICL 42.5 0.35 8.04 0.44 60-120 C2 16 42 42 SIC 47.71 0.31 8.15 0.2 - 120 R عد (متنومتر) تزت کٹ فسفر فقل جلب وتسيم قائل جنب در مند مراد سننم قائل تُبَكِّلُ خرنيث ثبادل كالبرني درست شداع بازي Ava. P Ava. K خنثي شرنده Gypsum Ex. No C.E.C Depth (cm) Total N ESP SAR BS % T.N.V % مؤتى كلى والإن در صد كرم خائد Meq/100g Soil p.p.m p.p.m 0-15 0.16 29.2 144 54.77 9.91 0.57 15-60 0.012 7.6 104 54.77 7,13 0.49 60-110 54.77 7.65 0.39 يىن (سائلىدى) كاليونهاي مطول (مولي لكي والان در أوتر) کنونهان معارل (میٹی کی والان در ایش) Soluble Cations (meq/l) Soluble Anions (meq 1) Depth (cm) Ca+--Mg++ Na+ K٠ Stem CO3 - -HCO3 -CI-504--0-15 2.5 1.6 0.82 0.09 5.01 0 3.5 1.5 0.06 5.06 15-60 1.7 1.3 0.6 0.03 3.63 0 1.5 0.15 3.65

60-120	1.3	1.3	0.45	0.02	3.07	0	2	1	0.14	3.14
	:									-
							·			
عن (سائلېسلار)	Water Co	مرجود % ntent	يرمد ك	وزن منصومن	رژڻ مغم وهن	نرمد	Permeabili	قَعْلِثُ لَنْرِدُ "g	Infiltration F	تبرد بشري علانا
D. 4.4	Field moisture	33.3 Kpa	1500 Kpa	مثاهري	متوتي	غاټو فرچ	سقتينتز ير ساعت	كنتر	مقتينز بر ماعت	كلاس
Depth (em)	وطوات مسحر ليي	. ظرفوت زراعي	د بڑ مزدگی	BD (gr em3)	PD (gr/cm3)	Total Porosity %	cm/h	Class	conuh	Class
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60-120

Table D-3-3-3-7 Laboratory Test of Soil Profile No. 64 (Soil Series 3) in Sarbaz

Area: Soil Series: SARBAZ

3

Soil Profile No.: Soil & Water La.: SCWRC

64

منطقه : سرې ځك:

آز مایشگاد خاك و آب ؛

شمارد آزمایشگاد : Lab. No.: عن (ستنيش) در مند در ان خاك (قطر به مواوش) Particle size classes (mm) درسد النباع هدايت الكتريكي راكض كل النباع ير من کرين کي (نمي زيملس بر متر) Depth (cm) Horizon Texture SP OCª+ 3 - 9 - 3 0.05 - 0.002 < 0.002 > 2 Ece+10^3(ds/m) 0-20 Ap 30 30 40 10-15 C-CL 48.19 0.27 7.97 0.83 20-60 C135 CL30 35 5-10 38.74 0.24 8.16 0.43 C2 60-110 19 41 40 5-10 SIC 61.04 0.24 8.25 0.35 +110 Z . بسق (سانترمتر) ازتكن أممر فالل جانب متير الأل تناثل ظرفيت تبادل كتيرس وتفحر فغار حث أسنت جنب سديم کچ در صد صديم تبادلي در مد مراد إمرنت تناهدون Ava ? Ava K خنثى شونده Gypsum Ex. Na C.E.C Depth (cm) Total N SAR T.N.V % مبلی کی رالاز درست گرم خاند Meq/100g Soil ρ.ρ.... p.p.m 0-20 0.016 18.2 230 53.84 9.74 0.55 20-60 0.014 88 54.55 6.5 0.4 60-110 50.58 9.91 0.37 أنير نهاي مطول (ميلي الي و الإن در أيتر) عن (ستنسر) ڪنيونهاي مسلول (ميٽي اتر و تار شيز) Saluble Cations (meg/l) Soluble Anions (meq/l) Depth (cm) CO3--HCO3 -C2++ <u>}\{g--</u> Na+ Sum Sum 0-20 1.6 0.4 0.55 0 1.5 į 0.14 2.640.06 2.61 0 2.46 20-60 0.4 1 1 0.46 1.2 8.0 0.02 2.42 0.35 2.35 60-110 0.8 0.37 0.03 2.4 0 1 فنهيت نفرة Permeability نغرذ بنيري Infiltration Rate مڻ (سائينر) عرصت آب مرحوذ و* Water Content رزن متسرس درمتأ سانئونگر بر ساعت ساتتينتر بر ساعت خذرفزج Field moisture 33.3 Kpa 1500 Kpa ظاهري Depth (cm) Class Class BD (gr/cm3) PD (gr/cm3) Total Porosity 's حد بزمر دگی أخريت زوعي

Table D-3-3-3-8 Laboratory Test of Soil Profile No. 229 (Soil Series 4) in Sarbaz

SARBAZ

Soil Series:

Soil Profile No.: Soil & Water La.: SCWRC

229

Lab, No.	:								J	سایت مارد آزمایشهٔ
مق رسانتیس)	الق	Particle size	classes (mm)	د (نظر به میآیمتر)	ىرمىد ئر ك خلا	. بافث	در صد النواع	مدنيت الكثريكي	ر تعنش نگی اشیاع	
Depth (cm)	Horizon	Sand 3 - 0.05	Silt 0.05 - 0.002	Clay < 0.002	Gravel	Texture	SP	(نىس زىدلىس بر متر) Ece*10^3(ds:m)	PHs	OC%
0-20	Ap	21	41	38	15	CL	42.2	0.52	7.92	0.58
20-40	Bw	23	37	40		С	41.35	0.37	8,01	0.74
40-100	Cr	19	44	37		SICL	38,77	0.34	8.27	0.12
عل (ستنبطر)	ۋىت كان	فسقر فالل جنب	وتاسيم فابل جنب	درمية مواد	şś	منزم فافل ثباقل	ظر نوت تبادل كاتبرني	يرمد مقور تبادثي	نست جب سور	رمت تلباع وازي
Depth (cm)	Total N	Ava P	Ava K	عللي لاونده	Gypsum	Ex. Na	C.E.C			
Departent	1001.3	p.p.m	p.p.m	TNV%	Meq/10	ىرمىدگرەخت iio 200	ميلي لكي و الآن ا	ESP	\$ AR	BS 14
0-20	0.014	21.4	136	54.3			24.7		0.27	
20-40	0.016	12.6	160	52.91			27.72		0.38	
40-100				54.54		:	16		0.48	
										
يمرّ (سائنيمتر)		الان در (پتر)	معلول (دیلی اکی ر	كآثيرنهاي			لان در (پتر)	هاي محتول (موثي تکي و ا	انپرن	
Deubland		Solub	le Cations (med	γ1)			Solu	ble Anions (meo l)		
Depth (cm)	Ca→	Mg++	Na+	K-	Sum	CO3	HCO3 -	CI-	so4	Sum
0-20	3.2	1.6	0.43	0.08	5.31	. 0	3.5	1.5	0.39	5.39
20-40	2	1.2	0.49	0.04	3.73	0	2.5	1	0.2	3.7
40-100	1.6	1.2	0.57	0.07	3.44	0	2	1	0.43	3.43
							:		·	
								£**		
مز (مقتبعثر)	Wuer Co	مرجود % sical	درمند آب	رژڻ خسوس	وژڻمنموسن	ورمت	Permeabil	دابلیت تنوذ ty	Infiltration F	ندود پديري ate
D=4 : .	Field moisture	33.3 Kpa	1500 Kpa	عثاهرتي	حنيني	خال و فرج	ستنبشر برماعت	كائس	مىلتكيمتو بز ساعت	צליט.
Depth (cm)	رطوت مسترين	ئار فيت زراعي	بد نژمردگی	BD (gram3)	PD (gricm3)	Total Perosity %	cm/h	Class	ew p -	Class
0-20	20.78	31	14	1.33	2.6	51.15				
20-40	19.61	31	15	1.42	2.77	51.26				
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Table D-3-3-9 Laboratory Test of Soil Profile No. 233 (Soil Series 5) in Sarbaz

SARBAZ

Soil Series:

5

Soil Profile No.: Soil & Water La.: SCWRC

233

أزمايشگاد خُلاه و آبه :

Lab. No.	:		*****						ئاد:	ساره آزمایشا
عل (سانتينزر)	انت	Particle size	classes (mm) (ك زهار په مونيمتر	، در مند ڈر اٹ خا	بانت	ترصد التباع	عدارت تكثريكي	ر تعش کی اشیاع	ىرمىد كرين لي
Depth (cm)	Horizon	Sand 2 - 0.05	Silt 0.05 - 0.002	Clay < 0.002	Gravel	Texnre	SP	(بس زیبلس در متر) (Ecc+10^3(ds/m)	PHs	OC°∘
0-20	Ap	35	21	44	15	С	49.57	0,57	7.81	3,12
20-50	Bw	25	25.	50	15-20	С	55.17	0,44	7.96	0.6
50-100	Cr	33	45	22		L	31.49	0,44	8.25	0.21
									·	
عن (سانترستر)	زتكن	مستر لأبن حثب	يتفهم فابل جثت	در مند مر اد	25	سنيم فعَنْ نَبَادَلُ	طرقيت لبلال كاليوني	در سند منيم تبادثي	تسبت جذب سديم	سـ نــ ځېزي
Depth (cm)	Total N	Ava ?	Ava, K	خنٹي شرتده	- Сур з шт	Ex. Na	C.E.C	ESP	SAR	
z-cpur (u.i.)		р.р.та	p.p.m	T.N.V %	Meq/10	ترسدگردخاك Og Soil	عیثی کلی و کر		2,44	
0-20	0.24	23.2	488	48.03			34.78		0.5	
20-50	0,014	19.6	176	51.51			30.7		0.55	
50-100				54.4			9.91		0.28	
<u>.</u>					·					
من (سلتيمتر)		الازدر المثر)	سطول (مولی کای و	كترنهاي			لان مر اوتر)	هاي محلول (مؤلي لاي و ا	أتبرث	
Depth (cm)		Solut	le Cations (med	γl)			Solu	ble Anions (meq/l)		
	Ca++	Mg+-	Na+	K+	Surn	CO3	HCO3 -	Cl -	SO4	Sum
0-20	2.8	2	0.78	0.22	5.8	0	3.5	1.5	0.84	5.84
20-50	2	1.6	0.75	0.1	4.45	0	2.5	1.5	0.4	4.4
50-100	3.2	0.8	0.4	0.04	4.44	0	2	1.5	0.88	4.38
: : : : : : : : : : : : : : : : : : :										
عن (مانبتر)	Water Co	مرحرد ہ? micni	درمد ب	ِرژڻ مغموس	رژڻمغمرص	ورمند	Penneabil	ity ئىنىڭ ئىزىد	Infiltration l	غوة بنتوي عاها
Depth (cm)	Field moisture	33.3 Kpa	1500 Кра	بظاهري	ستبتي	خٽر فرچ	ماتنينتر يرساعت	عض	ماتقيش پر مناعت	كالمز
	رطوبت منحر في	شرابت زرعي	حد الأمريكي	BD (gr/cm3)	PD (gr/cm3)	Total Porosity * 2	em/h	Class	cm/h	C 155
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Table D-3-3-3-10 Laboratory Test of Soil Profile No. 227 (Soil Series 5) in Sarbaz

SARBAZ

Soil Series :

5

Soil Profile No.: 227 Soil & Water La.: SCWRC نطقه :

سريخك:

شدار د دیدرج مناه : آزمایشگاد خاك و آب :

Lab. No.		SCVAC			····					مایشگاد هان مار د آزمایش
عن (سانتِمار)	نغق	Paniele size	classes (mm) (ك (قطر به ميايمتر)	ترمدنزكما	بانت	درصد الثباع	مدايت الكاريكي	ر تکش کل انجاع	رميد کرين آئي
Depth (cm)	Horizon	Sand	Silt	Clay	Gravel	Texture	SP	(نىسى ژېمئىن بىر مئىر)	777-	
		2 - 0.05	0.05 - 0.002	< 0.003	> 2	Texture	or	Ece+10^3(ds/m)	PHs	00%
0-20	A	4	34	62		С	45.52	0.48	- 8	1.41
20-50	Bwl	5	41	54		C	44.9	0.58	8.07	0.99
50-100	Bw2	7	41	52		C	45.94	0.41	8.12	0.8
100-150	Cr	7	39	54		С	48.11	0.36	8.17	0.69
علق (ئەللىنىد)	زشتن	فسفز فالأرجاب	وتفير فابل جنب	ترمدمواد	کچ	سنيد فغل تباتل	ظر نبت تبادل کتیرنی	درست سنهم تباثلي	فمايت جذب سديم	مــد تشباع بغزي
Depth (cm)	Total N	Ava, P	Ava. K	خظر شراده	Зурашт	Ex. Na	C.E.C		212	D. A.
	10.22.54	p.p.m	p.p.m	T.N.V %	Meq/10	درصد گرمخاله Soil و	ميلي اكي والأن	ESP	SAR	BS %
0-20	0.16	47	470	46.86			35.1		1.12	
20-50	0.016	24.4	350	46.86			32		1.24	
50-100		·		48.96			30,26		0.58	
100-150				54.77			27.22		0.6	
عل (مقتبعر)		ָוֹעָי ע (פֶּתָׁ,)	معاول (ميلي اكي و	كقيرتهاي			لان در اښکر)	پاي معاول (دولي اکي و ا	أثوذ	
Depth (cm)		Solub	ele Cations (med	/ 1)			Solu	ble Anions (meq/l)		
expur(c.ii)	Ca	Mg++	Nat	K+	Sum	CO3	HCO3 -	cı-	\$04	Sum
0-20	2.4	0.8	1.42	0.13	4.75	0	3	1.5	0.29	4.79
20-50	2.8	1.2	1.76	0.17	5.93	0	3.5	2	0.33	5.83
50-100	1.6	1.6	0.74	0.07	4.01	0	2	2	0.03	4.03
100-150	2.4	0.4	0.71	0.04	3.55	0_	2	1.5	0.02	3.52
عق (سَاتَعَارُ)	Water Co	مرجرد ت ^د Atent	يرمدك	رژڻ،خصوعن	وژن منصوعز	درصد	Permeabili	انتَابَت تفرة ty	Infiltration I	تترد پئیری عندا
	Field moisture	33.3 Kpa	1500 Kpa	خاهرني	ستيتر	غالبوقرج	سفتيش پر ساعت	كاتس	مقتومتر بر ساعت	كلاس
Depth (cm)	رهويت مسترجي	غرفيت زرعي	حديزمودكي	BD (grˈcm³)	PD (gr/cm3)	Total Porosity %	cπ√h ·	Class	արհ	Class
0-20	17.5	34	15	1.35	2.56	52.7				
20-50	20.5	33	- 17	1.37	2.6	52.6				
50-100	21.4	34	15	1.35	2.56	52.73				
100-150		33	17	1.37	2.6	52.69				
			<u> </u>							

Table D-3-3-3-11 Laboratory Test of Soil Profile No. 55 (Soil Series 6) in Sarbaz

SARBAZ

بنطفه

Soil Series:

6

Soil Profile No.: Soil & Water La.: SCWRC

55

سري ځك : شمارونيعرخ څلك : آزمارشگاه کُك و آب :

Lab. No.				·					گاه :	مارد آزمایشا
سل (سائیستر)		Particle size	classes (mm) (ه (مار به موابستر)	درمىدنرات غا	بثوت ٠	درسيد للبياع	مدارت الكثريكي	ر تعنث كان لثباع	رمد: کربن آب
Depth (cm)	Horizon	Sand 2 - 0.05	5ilı 0.05 - 0.002	Clay < 0.002	Gravel	Tenue	SP	(بىنى زىشى بر مثر) Ece*10^3(ds/m)	PHs	OC% .
0-15	Ap	18	26	56	20-30	С	62,1	0,48	7.85	2.01
15-30	Bw1	24	24	52	15-20	С	59.3	0.3	7.96	1.89
30-45	Bw2	38	28	44	50	С	72.28	0.43	8.04	0.8
+ 45	С				>75					
						-				
سن (سفتبس)	لرتكاب	مغر افرامند	وتقنوم فالي جثب	ترمدبراد	,7S	مت دیل ایگان	غرفيت تباتف كشوس	ىر <u>مىدىنىم</u> ئى دا ي	تستات جندي معتيم	
Depth (cm)	Total N	Ava ?	AVA K	خنثي شرنده	Gypsum	Ex Xi	C.E.C	423	sar	B\$ ³₀
		p.p.m	b'b'ur	T.N.V %	Meq/10	درست گره خاک Og Soil	عولی کار و لار			
0-15	0.19	21.6	430	47.56			14.6		0.45	
15-30	0.16	26	320	45.7			13.48		0.53	
30-45	0.014	13.4	184	51.51			11.48		0.82	·
	<u> </u>									· ·
· · · · · · · · · · · · · · · · · · ·										
عن (سائتيمتر)		لار در قوتر)	مطول (مولی اکار و	كالهرنهاي	_,		(ن در ارس)	پاي معلول (مطي لکي و آ 	أتووة	
Depth (cm)		Solub	le Cations (med	(íy			Solu	ble Anions (meq/l)		
	Ca++	Мg⊷	Na+	K+	Sum	CO3	HCO3.	cı -	SO4	Sum
0-15	1.6	2.4	0.64	0.09	4.73	0	3	1.5	0.2	4.7
15-30	0.5	1.9	0.58	0.02	3	0	2	1	0.08	3,08
30-45	1.6	1,6	1.04	0.06	4,3	0	2.5	1.5	0.22	4.22
										·
		:							·	
عق (مانتيمتر)	Water Co	مرجر: ڈ [©] Itent	درمند ک	وژڻمنسوس	رژڻ مصوص	درمند	Permeabili	گفتنت تنودَ بع	Intiltration F	تنوڈ پٹھر ي ate
Depth (tm)	Field moisture	33.3 Kpa	1500 Kpa	ظاهري	حثيني	خاروفوج	مالتهمتر بر ساعت	كلاس	ساتتينتر پر ساعت	کٽر
Departenty	وطرنت مستر ايي	غرفت ڈواعق	ىدىزىرىگ _ى	BD (gr/cm3)	PD (g/cm3)	Total Peressivas	cusp	Class	стић	Class
										
										_ i -
			<u> </u>							

Table D-3-3-3-12 Laboratory Test of Soil Profile No. 225 (Soil Series 7) in Sarbaz

SARBAZ

Soil Series:

7

Soil Profile No. :

Soil Profi Soil & W Lab. No.	ater La. :	225 SCWRC							او آب ۽	شماره نیعرخ د آزمایشگاه خاک شمار د آزمایشهٔ
عمل (سائنبش)	.54	Particle size	classes (mm) (ك (قطر به موابعار	در مد درات خا	بانت	درميد لانباع	ىدايث تكاريكي	رفتش گان الاباع	درمىذ كرين كي
Depth (cm)	Horizon	Sand 2 - 0.05	Silt 0.05 - 0.002	Clay < 0.002	Gravel	Texture	SP	(ىمىي زىملىن بر متر) (Ece*10^3(ds/m)	PHs	CC%
0-25	: Ap	23	33	44		С	46.18	0.78	7.66	2.29
25-50	Bw	22	28	50		С	49.46	0.52	8.02	0.58
50-90	Bk1	18	34	48		С	64.47	0.52	8.08	0.44
90-150	Bk2	24	38	38		CL	45.43	0.47	8.14	0.27
								:		
عن (دائيش)	وشكل	غسفر المل جنب	يتضوم قابل جنب	ورمدمود	25	سيم دنى تبادل	طرفيت تباقل كاتيوني	درصت مشيم تبلطي	لنبت جثب معهم	درهب النباع بازي
Depth (am)	Total N	Ava. P	Ava. K	خائر تراده	Çypsum	Ex. Na	C.E.C	cen	CAD	Dot
		ppm	p.p.m	T.N.V %	Meq/10	ىرمىدگرمىنىڭ Soil و0	مولي اكي و الان	ESP	SAR	BS *6
0-25	0.2	31.4	336	54.54			17.74		0.4	
25-50	0.014	25	176	54.7			14.6		0.83	
50-90				54.77			13.22		0.52	
90-150				54.77			14.96		0.5	
عق (سقتيش)		الان در (ينثر)	معارق (مولي اکي و	كاتبرنهاي			لاڻ برلوش)	هاي مسلول (ديني لکي و ا	أنيون	
Depth (cm)		Solub	le Cations (med	/I) .			Solu	ble Anions (meq/l)		<u> </u>
	Ca+-	Мg⊹-	Na+	к-	Sum	CO3	HCO3 -	CI -	SO4	Sum
0-25	4.2	2.6	0.74	0.32	7.86	0	3	2.5	2.41	7.91
25-50	2.4	1.6	1.18	0.1	5.28	0	3	2	0.27	5.27
50-90	4	0.4	0.78	0.06	5.24	0	3	2	0.27	5.27
90-150	2.4	1.6	0.71	0.02	4.73	0	1.5	2	1.18	4.68
محق (مىقتىمدر)	Water Co	مرجرد % citent	درمند أب	وژڻمنسوهن	وژڻ مقدومن	درمد	Permeabili	د ېښت نغر د ري	infiltration i	نغر د ونيور ي Late
Depth (cm)	Field moisture	33.3 Kpa	1500 Kpa	غثغري	ستنيتي	عثرو فزج	ملتينتر ير ماعت	كتبن	ماتتمنز در ساعت	كلاس
	رطوت مستريي	نترنث زراعي	ـــ: پڙمرنگي	3D (gr cm3)	PD (grand)	Total Porosity %	слућ	Class	cra h	Class
0-25	22.77	35	18	1.41	2.57	54.86				
25-50	21.97	36	17	1.4	2.54	55.12				
50-90	23.79	34	15	1.45	2.64	54.92				
90-150	20.78	31	14	1,33	2.6	51.15				

Table D-3-3-3-13 Laboratory Test of Soil Profile No. 60 (Soil Series 8) in Sarbaz

Area: SARBAZ
Soil Series: 8
Soil Profile No.: 60
Soil & Water La.: SCWRC

منطقه : سري ځنگ : شماره نيمرخ ځنگ : آزمايشگاه ځنگ و آب :

Lab. No.	ater La. : :	5011110				-				ازمایشگاه خلا شمار د آزمایشا
عق (ماننهمار)	خزن	Particla size	classes (ınm) (انه (قطر په موايمثر	ىرمدىرك.	ړنۍ	درمند للباع	مدارت الكتريكي	ر تعش کل اشیاع	درهت کزین آئی
5	Vanasa	Sand	Silt	Clay	Gravel	Tuest	en	(سى زىسى رىسى	ptt.	
Depth (cm)	Honzon	2-0.05	0,05 - 0,002	< 0.002	>2	Texture	SP	Ecc*10^3(ds/m)	PHs	OC%
0-20	Ap	26	34	40	2	C-CL	46.18	0.41	8.03	0.81
20-45	Bwl	10	46	44	1-2	SIC	75.3	0.38	8.1	0.62
45-80	Bw2	21	33	46		C	61.8	0.42	8.18	0.44
80-150	Bwg	24	34	42		C	43,54	0.31	8.12	0.37
				1,						
عن (سائينز)	زدن	استر تار ت	يتغيم فابل جنب	در صد مواد	25	منهد فقر تشكل	عترفيت تبادل بالتوني	در صد مديم ثباتلي	نستث جأب مديم	مزمسد فلتائخ بنؤي
David (am)	Total N	Ava ?	Ava K	خلٹی شوندہ	Суряшт	Ex Na	C.E.C	ESP	SAR	93.4
Depth (cm)	ioai.	9 g.m	p.p.m	T.N.V %	Meq/10	درمت گردخاگ Og Sorl	مولي اكن و الان	251	5.40	
0-20	0.016	23.8	304	54.3			9,39		0.37	
20-45	0.014	10.2	248	53.84			9.74		0.67	
45-80				54.3			9.04		0.71	
80-150				54.3			8		0.63	
			·							
عىق (مىقتومتر)		الإن در بيتر)	معلول (مولی اکی و	كأتونهاي			لان در لوکز)	باي محلول (بولي لکي و اا	لنون	
Depth (cm)		Solub	e Cations (med	/i)			Solu	ble Anions (meq/l)		
Expar(Gil)	Ca	7/g—	Nat	K+	Suen	CO3++	нсоз-	cı-	so4	Sum
0-20	1.7	1.7	0.45	0.11	3.96	0	2.5	1.5	0.07	4.07
20-45	2	0.8	0.8	0.11	3.71	0	2.5	1 .	0.25	3.75
45-80	1.6	1.6	0.9	0.08	4.18	0	2.5	1.5	0.21	4.21
80~150	1.2	1.2	0.69	0.06	3.15	0	1.5 ,	1.5	0.12	3.12
	·							·		
صق (سلتبشر)	Water Co	مرجرد ودالتك	ومدك	رزن مغمرمن	رزڻ مقصوص	نرهت	Permeabil	قابلیت تفرد (ity	Intiltration I	فنود بثير تر Raie
Depth (cm)	Field measure	33.3 Kpa	1500 Kpa	ظاهري	حتبثى	المتدووج	ساتتومتر يتر ساعت	كلاس	ستنبش يرمماعت	عتبن
	رمرت مسحر إي	غواجت ؤر ش	۵۰۰ بزمرنگی	BD (gr/cm3)	PD (gr/cnd)	Total Porosity *•	can h	Class	cm/h	Class
0-20	16,01	38	16	1,38	2.54	54.33				·
20-45	16.13	28	13	1.39	2.51	55.38				
45-80	15.72	32	15	1.38	2.5	55.2			<u> </u>	
80-150	15.61	32	17	1.45	2.66	54.51				
									<u></u>	

D3.3.4 Soils in Tang Sorkh

(1) General Descriptions of Soil Series in Tang Sorkh

In Tangsorkh, four soils are observed, namely 1) Eutric Leptosols in hills, 2) Calcaric Cambisols in old alluvial fan and plateaus, 3) Calcaric Regosols in gravelly alluvial fans, and 4) Calcaric Fluvisols in river beds. Eutric Leptosols is observed at hilly area where marl is extensively distributed. This soil contains high percentage of stones and soil depth is very shallow. Young apple trees were recently planted in this soil and irrigated by pump irrigation from the Boshar river. Drip irrigation system was introduced for irrigation due to coarse texture. Calcaric Cambisols is one of major soils in this area, which is forming old alluvial fans and plateaus. Texture of this soil is heavy but it contains high percentage of gravel and stone. Most area of this soil is utilized as rangeland and partly as dry farmland. Carcaric Regosols is also one of major soils in this area and it forms gravelly alluvial fans. Most area of this soil is irrigated by gravity system for wheat and partly apple trees. Calcaric Fluvisols is forming lower river bank terrace of the Boshar river.

(2) Soil Series and Units in Tang Sorkh

Soils of Tang Sorkh area are located on five physiographic units and contain six soil series as follows:

Table D-3-3-4-1 Soil Series in Tang Sorkh

Physiography		Soil Se	ries	USDA Soi	l Taxonomy (199	9)	FAO-Unesco	Iranian Fourth
	No.	Area (ha)	%	Family	Subgourp	Order	(1989)	Approximation
Plateaux	1	87	7%	Fine-loamy, mixed, thermic	Typic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
Gravelly Alluvial Fans	2	268	22%	Loamy-skeletal, carbonatic, thermic	Typic Xerorthents	Entisols	Calcaric Regosols	Alluvio-colluvial soils
Old Alluvial Fans	3	310	25%	Fine-loamy, carbonatic, thermic	Fluventic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
	4		0%	Clayey-skeletal, carbonatic, thermic	Fluventic Haploxerepts	Inceptisols	Calcaric Cambisols	Brown soils
River Beds	5	197	16%	Fine-loamy, carbonatic, thermic	Typic Xerofluvents	Entisols	Calcaric Fluvisols	Stratified Alluvial soils
Hills	6	259	21%	Loamy-skeletal, mixed, (calcareous), thermic	Lithic Xerorthents	Entisols	Eutric Leptosols	Lithosols
Miscellaneous		108	3%					
Total		1,229	34%					

Table D-3-3-4-2 Soil Units in Tang Sorkh

the state of the s				,		
Physiography	Soil	Soil	Area	Area	Soil S	Series
	Series	Mapping	400	Ratio	Area	Ratio
		Unit	(ha)	(%)	(ha)	(%)
Plateau	1	1.1	87	0.07	87	7%
Gravelly	2	2.1	40	3%	268	22%
Alluvial Fan		2.2	154	13%		1
		2.3	73	6%	1000	
Old Alluvial	3	3.1	120	10%	310	25%
Fan	4	4.1	190	15%	100	
River Bed	5	5,1	29	2%	197	16%
e e fille e yelle e	100	5.2	168	14%		1.5
Hill	6	6.1	259	21%	259	21%
Miscellaeous	RW		108	9%	108	9%
Total			1,229	100%	1,229	100%

1) No.1 Soil Series

On the map, it has been specified as 1.1, and in the classification it has been classified as:

"Fine - loamy, mixed, thermic, Typic Haploxerepts".

This soil is deep of brown color (10 YR 4/3), clay loam, structureless, 15-20% coarse gravels (0-20 cm, Ap, ochric epipedon) on a layer of brown color (10 YR 4/3), clay loam, angular blocky structure, 30-40% coarse gravels (20-38 cm, Bw1, cambic horizon) on a layer of brown color (10 YR 4/3), clay loam, angular blocky structure, 5% coarse gravels (38-70 cm, Bw2, cambic horizon) on a layer of yellowish brown (10 YR 5/4), silty clay loam, angular blocky structure (70-105 cm, Bw3, cambic horizon) on a layer of yellowish brown (10 YR 5/4), clay loam, massive, common mycelia of lime (105-150 cm, C).

The representative profile of this soil series is specified as No.25 in 30° 26' 61N and 51° 46' 01E. The No.1 soil series contains one-separated mapping unit as follows:

- Unit 1.1 No.1 soil series with clasy loam surface texture, 15-35% coarse gravels in subsoil and topsoil, 2-5% overall and 5-8% transversal slopes, moderate micro relief and water erosion.

2) No.2 soil series

On the map, it has been specified as 2.1, 2.2, 2.3 and in the classification it has been classified as:

"Loamy- skeletal., carbonatic, thermic, Typic Xerorthents".

This soil is very deep (more than 120 cm), at places deep of dark yellowish brown color (10 YR 4/4), clay loam, massive, 20-30% coarse gravels (0-20 cm, Ap, ochric epipedon) on a layer of dark

yellowish brown color (10 YR 4/4), sandy clay loam, massive, 50-60% coarse gravels (20-55 cm, C1) on a layer of yellowish brown color (10 YR 5/4), sandy clay loam, massive, 40-50% coarse gravels (55-110 cm, C2) on a layer of light olive brown color (2.5 Y 5/4), silty clay loam, massive, 5-10% coarse gravels (110-150 cm, C3).

The representative profile of this soil series is specified as No.27 in 30° 27' 18N and 51° 45' 71E. The No.2 soil series contains three separated mapping units as follows:

- Unit 2.1 No.2 soil series with clay loam surface texture, 35-75% coarse gravels in subsoil and 15-35% coarse gravels in topsoil, 2-5% overall and 1-2% transversal slopes, slight micro relief, moderate water erosion.
- Unit 2.2 No.2 soil series with clay loam surface texture, 35-75% coarse gravels in subsoil and 15-35% coarse gravels in topsoil, 2-5% overall and transversal slopes, slight micro relief, moderate water erosion.
- Unit 2.3 No.2 soil series with clay loam surface texture, 35-75% coarse gravels in subsoil and 15-35% coarse gravels in topsoil, more than 75% coarse gravels within depth of 80-120 cm., 2-5% overall and transversal terraced slopes, moderate and micro relief water erosion.

3) No.3 soil series

On the map, it has been specified as 3.1 and in the classification it has been classified as:

"Fine-loamy, carbonatic, thermic, Fluventic Haploxerepts".

This soil is very deep of dark yellowish brown (10 YR 4/4), clay loam, fine angular blocky structure (0-15 cm, A, ochric epipedon) on a layer of brown color (10 YR 5/4), slity clay loam, angular blocky structure (15-55 cm, Bw1, cambic horizon) on a layer of olive brown color (2.5 Y 4/4), silty clay loam, weak angular blocky structure (55-100 cm, Bw2, cambic horizon) on a layer of weathered shale (100-150 cm, Cr)

The representative profile of this soil series specified as No.30 in 30° 26' 60N and 51° 45' 56E. The No.3 soil series contains one-separated mapping unit as follows:

 Unit 3.1 No.3 soil series with clay loam surface texture, 3-15% coarse gravels in topsoil,2-5% overall and transversal slopes, moderate micro relief and water erosion.

4) No.4 soil series

On the map, it has been specified as 4.1 and in the classification it has been classified as:

"Clayey- skeletal, carbonatic, thermic, Fluventic Haploxerepts".

This soil is moderately deep (50-80 cm) of brown color (7.5 YR 4/4), clay, fine angular blocky structure, 20-30% coarse gravels (0-15 cm., Ap, ochric epipedon) on a layer of brown color (7.5 YR 4/4), clay, medium angular blocky structure, 40-50% coarse gravels (15-35 cm, Bw, cambic horizon) on a layer of brown color (7.5 YR 4/4), clay, massive, 50-60% coarse gravel and stones (35-70 cm, C1) on a layer with more than 75% coarse gravels and stones (+70 cm, C2).

The representative profile of this soil series is specified as No.35 in 30° 27' 90N and 51° 44' 79E. The No.4 soil series contains one-separated mapping units as follows:

- Unit 4.1 No.4 soil series with clay surface texture, 35-75% coarse gravels and stones in subsoil and 15-35% coarse gravels in topsoil, more than 75% coarse gravels and stones within depth of 50-80 cm., 2-5% overall and transversal slopes, moderate micro relief and water erosion.

5) No.5 soil series

On the map, it has been specified as 5.1, 5.2 and in the classification it has been classified as:

"Fine- loamy, carbonatic, thermic, Typic Xerofluvents".

This soil is very deep groundwater table, 1.20-2m, at places 2-3m dark yellowish brown color (10 YR 4/4), loam, massive (0-15 cm, A, ochric epidedon) on a layer of yellowish brown color (10 YR 5/4), clay loam, massive (15-45 cm, C1) on a layer of olive brown color (2.5 Y 4/4) silty clay loam, coarse platy structure, common medium distinct light brown mottles (7.5 YR 6/4) (45-80 cm, Cg1) on a layer of olive brown color (2.5 Y 4/4), loam, massive, many coarse prominent light brown mottles (7.5 YR 5/6) (80-100 cm, Cg2) on a layer of dark yellowish brown color (10 YR 4/4), loam, massive many coarse prominent light brown mottles (7.5 YR 5/6) (100-150 cm, C) on a layer of olive color (5 Y 4/4), loam, massive (150-200 cm, Cg).

The representative profile of this soil series specified as No.43 in 30° 28' 88N and 51° 45' 10E. The No.5 soil series contains two separated mapping units as follows:

- Unit 5.1 No.5 soil series with loam surface texture, 0-2% slope, slight micro relief and water erosion, groundwater table 1.2-2 m., slight hydromorphy and flooding hazards.
- Unit 5.2 No.5 soil series with loam surface texture, 0-2% slope, moderate micro relief and water erosion, groundwater table 2-3m, moderate-flooding hazards.

6) No.6 soil series

On the map, it has been specified as 6.1 and in the classification it has been classified as:

"Loamy- skeletal., mixed (calcareous), thermic, Lithic, Xerorthents".

This soil is very shallow (10-25 cm), olive brown color (2.5 Y 5/4), clay, massive, 60-70% stones and coarse gravels (0-18 cm., A) overlying by weathered shale (paralithic) (+18 cm., Cr).

The representative profile of this soil series specified as No.34 in 30° 26' 27N and 51° 44' 94E. The No.6 soil series contains one-separated mapping unit as follows:

- Unit 6.1 No.6 soil series with clay surface texture, 35-75% coarse gravels in subsoil and 35-75% stones in topsoil, weathered shales within depth of 10-25 cm, 5-8% overall and 8-12% transversal slopes, strong micro relief, moderate water erosion.

(3) Soil Properties in Tang Sorkh

Soils are generally clayey in Tang Sorkh as show in Table D-3-3-4-3. Gravel content is generally high. Soil units 2.2 and 3.1 have relatively high permeability (Rapid-medium by USDA). The pH of soils are alkaline (7.39 - 7.98) and organic matter content is 1.23 % in average.

Table D-3-3-4-3 Soil Properties in Tang Sorkh

Physiography	Soil	Mapping		551		re (%)	Jei ties i	Texture		OC	Depth	Sa	Ib
r ity blogatoriy	series	Unit	1101110	Clay	Silt	Sand	Gravel	TOXEGIO	h11	(%)	(m)	(g/cm³)	(cm/hr)
					0.002-0.05		> 2 mm	11			(,	(8)	
Plateaus	1	1.1	25	40	31	29	17.5	C-CL	7.60	0.81	1.50	1.40	1.21
			28	. 38	32	30	25	CL		0.64	1.00		
		1 1	32	50	28	22	20	C		1.15	1.00		
			Ave.	43	30	27	21		7.60	0.87	1.17	1.40	1.21
Gravelly	2	2.1	29	42	42	16	17.5	SiC		0.92	1.50		0.85
Alluvial Fan		2.2	27	40	34	26	25	C-CL	7.56	0.91	1.50		7.94
		2.3	26	48	34	18	25	С	- 1	2.01	1.50		
	' '		41	47	35	18	50	C	7, 1	0.52	0.80		
			Avc.	48	35	18	38			1.27	1.15		
Old Alluvial	3	3.1	30	40	38	22	10	C-CL	7.98	0.85	0.90	1.0	6.37
Fan	13		33	60	26	. 14	- 30	С		1.07	0.35		
		N 1	Ave.	50	32	18	20			0.96	0.63		6.37
	4	4.1	35	68	28	4	25	C	7.72	1.39	0.70		
		4	36	56	44	- 0	40	SiC		3.75	0.70		
			Ave.	62	36	2	33		7.72	2.57	0.70		· ·
River Bed	5	5.1	43	44	. 34	22	0	L	7.39	1.19	1.50		0.97
	' I	5.2	31	36	30	34	40	CL		1.66	0.70		
* ·			37	27	30	46	0	L		0.79	1.50		
			38	47	33	20	15	С		1.36	1.50		
1			Ave.	37	31	33	18			1.27	1.23		:
Hill	6	6.1	34	56	30	14	- 65	С		1.29	0.18		
			44	52	24	24	1.5	С		0.55	0.15		
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	1.2		Ave.	54	27	19	33			0.92	0.17		
Miscellaneous	RW			L									
Total			7.1	47	33	21	24		7.65	1.23	1.00	1.40	3.47

(Notes)

¹⁾ Soil texture, pH, Organic Carbon Content, Specific gravity are for topsoil.

²⁾ When depth is 1.50m or more, actual depth is more than mentioned depth.

³⁾ Soil texture abbreviation

C: Clay, CL: Clay Loam, SiC: Silty Clay, SiCL: Silty Clay Loam, SiL: Silty Loam, L: Loam, LSa: Loamy Sand, SaC: Sandy Clay, SaCL: Sandy Clay, Loam, SaL: Sandy Loam

(4) Laboratory Test Results of Representative Profiles in Tang Sorkh

Table D-3-3-4-4 Laboratory Test of Soil Profile No. 25 (Soil Series 1) in Tang Sorkh

Area:

TANG SORKH

Soil Series: Soil Profile No. :

1 25

Soil & Water La.: SCWRC

Soil & W Lab. No.		SCWRC								مایشگاه خاک مار د آزمایشا
عن (سانتونزر)	، توز	Particle size	classes (nvn) (ك (تطر په مياپمئر)	ورسدارات	يانت	برمىد للداع	يدايت الكزيكي	ر الخش کل الاباع	مارد ارامارسا درمندکرین آئی
Depth (cm)	Honzon	Sand 2 - 0.05	Sik 0.05 - 0.002	Clay < 0.002	Gravel	Texture	SP	(نس ژینلس بر متر) Ecc*10^3(ds/m)	PHs	oc#
0-20	Ap	29	31	40	15-20	C-CL	42.2	0.38	7.6	0.81
20-38	Bw1	25	39	36	30~40	CL	48.66	0.32	7.57	2,76
38-70	Bw2	25	40	35	5	CL	40.79	0.39	7.75	0.43
70-105	Bw3	20	47	33		SICL	43.04	0.37	7.75	0.25
105-150	C	27	40	33		CL	40.47	0.38	7.95	0.08
عن (سائنیش)	رىد كان	ضائر التأرجاب	يتامور قابل جنب	ترصدمواد	25	ستيم فائل تناث	تارنيت تبادل كاليوني	در محددوم تبادلي	قسيت حثب سيم	رسد الناع بازي
Depth (cm)	Total N	Ava P	Ava. K	خنثي شواده	Сурълп	Ex Na	C.E.C	ESP	SAR	BS %
		p.p.m	p.p.m	T.N.V %	Meq 10	ىرمىدگىم خاك Soil ون	سيلي انكي و الأن	· · · · · · · · · · · · · · · · · · ·		*
0-20	0.016	18.8	200	43.84	·	· ·	22.61		0.55	
20-38	0.18	14.6	420	22.92			26.43		0.37	
38-70				38.26			22.61		0.53	
70-105				45.7			15.65		0.63	
105-150				52.91			16_		0.6	
عق (سائنيىتر)	·	الان در لوتر)	مطول (مولي اکي و	كقيرنهاي			لان در ليئر)	پاي محاول (ميلي لکي و ا	أتوذ	
Depth (can)		Solub	le Cations (mes	yl)		_	Solu	ble Anions (meg/l)		
	C1	Mg++	Na+	К+	Sum	CO3	HCO3.	CI-	\$01	Sum
0-20	2	1	0.68	0.08	3.76	0	0.5	2	1.18	3.68
20-38	2.1	0.5	0.43	0.11	3.14	0	1.5	1.5	0.19	3.19
38-70	1.6	1.6	0.68	0.07	3.95	0	2_	1.5	0.35	3.85
70-105	2.5	0.4	0.76	0.04	3.7	0	2	1.5	0.24	3.74
105-150	2.4	0.4	0.71	0.07	3.58	0	2	1.5	0.14	3.64
سق (سائنستر)	Water Co	مرجرد 65 Inates	برمد آب	رژڻ منسرمن	رژڻ منبسوس	در مــد	Permeabili	قابلينه تفوذ ty	Infiltration I	نفرة بثيري علدة
Depth (cm)	Field moisture	33.3 Kpa	1500 Kpa	ظاهري	حببر	شاق و فرج	ماتئيمتر بر ساعت	كلاس	سقتیمتر بر ساعت	كلاس
~	رطوت محرفي	غرنت زواعي	حد پڑ مردگی	BD (gr/cm3)	PD (gr/cm3)	Total Peresity %	cm/h	Class	om h	Class
38-70	13.54	36	17	1.4	2,59	54.05				
70-105	15.4	35	14	1.39	2.6	53.46				
105-150	15.94	31	13	1.36	2.64	51.52				
									* 4	

Table D-3-3-4-5 Laboratory Test of Soil Profile No. 27 (Soil Series 2) in Tang Sorkh

TANG SORKH

منطقه

Soil Series: Soil Profile No. :

سري ځاك : شمار وتيموخ خلك :

Soil & Water La.: SCWRC

2 27

آزمایشگاد خاک و آب :

Lab. No.	:									رهایسماد هم. معارد آزهایش		
عىل (سائلىسار.)	. ائق	Particle size	टीब्डस्ड (त्तक) (ق (قطر به میانینتر)	ىرمىد ئرات ئ	بلقت	درمند للباع	مدايت الكثريكي	ر اکنش گل اشباع	درمند کرین آئی		
Depth (cm)	Herizon	Sand 2 - 0.05	Silt 0.05 - 0.002	Clay < 0.002	Gravel > 2	Texture	SP	(سىرزىشى برستر) (Ecc+10^3(ds/m)	₽H₃	OC%		
0-20	Ap	26	34	40	20-30	C-CL	40.79	0.73	7.56	0.91		
20-55	C1	60	6	34	50-60	SaCL	35	0,32	8,01	0.1		
55-110	C2	55	10	35	40-50	SaCL	38.84	0.35	8,07	0.12		
110-150	C3	20	40	40	5-10	SiCL	39.22	0,39	8,02	0.083		
						0,02	33,22	0.03				
مق (مانتينتر)	زدن	لسنز الل جنب	يتفرد فافي جنب	ترمد مر اد	25	سديم قابل تبادل	طرفيت تبقل كاتوني	در مد سديم تبادئي	فسبت جنده سديم	ر ــ د تشباع بازي		
		Ava P	J. crA	خاش شراده	Gypsum	Ex. Na	C.E.C					
Depth (cm)	Total N	p.p.m	ppm	TNV%	Meq/10	ىرسىد گرم شاك Og Soil	مولي لکي و الان	ESP	SAR	BS %		
0-20	0.016	56	120	54.07			24.7		0.3			
20-55	0.01	8.6	112	54.3			24.35		0.58			
55-110				53.61			28.17		0.4			
110-150				53.37			27.22		0.47			
سق (مانتيمتر)		الان در آنتر)	معول (مالي اکي و	كقرنهاي،			ان در اوتر)	باي مطول (ميلي لکي و ا	أثيرنا			
		Solut	le Cations (met	γl)		Soluble Amions (meq/l)						
Depth (cm)	Ca++	Mg++	Net	K+	Suzn	CO3	HCO3 -	cı-	SO4	Sum		
0-20	4.7	2	0.55	0.09	7.34	0	2	2	3.3	7.3		
20-55	1.6	0.8	0,64	0.08	3.12	0	2	1	0.14	3.14		
55-110	1.5	1.5	0.5	0.09	3.59	0	2.5	1	0.04	3.54		
110-150	2.8	0.4	0.6	0.11	3.91	1	2.5	- 1	0.33	3.83		
عىق (سائئوش)	Water Co	مرجرد % nicni	برمدك	رزن مقصومن	ولنستعوس	درمند	Permeabil	ئابلېت نفر د يوز	fafiltration i	ننوڈ پٹبري علمة		
Depth (cm)	Field moisture	33.3 Kpa	1500 Kpa	ماعري	٠٠٠٠	خلال و اوج	ملتيمتز يز ساعك	كلاس	سائنينتر پر ساعت	كلان		
c-cpus(cm)	رسويت مسترقي	شرفيت زراعي	ت برمزنکي	8D (gr/cm3)	PD (gr/cm3)	Total Porosity %	cm/h	Class	cm/h	Class		
						:						
							.5					
										· · · · · · · · · · · · · · · · · · ·		
									· · · · · · · · · · · · · · · · · · ·			

Table D-3-3-4-6 Laboratory Test of Soil Profile No. 30 (Soil Series 3) in Tang Sorkh

TANG SORKH 3 30 SCWRC

Area: Soil Series:

Soil Profile No. :

Soil	δŧ	W	ater	La.:	SCWR
f.ah	. N	'n.	•		

Lab. No.	:								کاد :	رسيت. تىمارە آزمايشىا
عل (مانتستر)	الق	Particle size	classes (mm) (ك (تطر به موايمتر)	درمند در کخا	پانت	درمد الباع	مدابت الكاريكي	ولكش أث النباع	در مد کرین گی
Depth (cm)	Horizon	Sand 2 - 0.05	Silt 0,05 - 0,002	Clay < 0.002	Gravel > 2	Texture	SP	(نىپ زىلس بر متر) Ece*10^3(ds/m)	рнь	00%
0-15	Ά	22	38	40	10	C-CL	49.03	0.41	7.98	0.85
15-55	Bwl	9	56	35		SiCL	35,55	0.35	8	0.75
55-100	Bw2	11	55	34		SiCL	30.73	0.35	8.04	0.32
100-150	Cr									
عرق (سقتومتر)	زتک	فسفر فابل جذب	وتاسوم قارل جذب	در صد مواد	ž	مديد قالي تبادل	غرضت ثبان كالنوني	در صد مدیم (تالالی	فميت حثب صديم	در مـد ننباع بازي
Depth (cm)	Total N	Ava P pp.m	Ava. K p.p.ms	ختان شرنده ۲.N.V %	Gypsum Meg 10	Ex, Na درمدگردخات Og Soil	C.E.C	ĒSP	SAR	B\$ *á
0-15	0.016	21.8	112	54.55			15.65		0.49	
15-55	0.014	11.8	112	54.77			15.22		0.54	
55-100	0.011	1,1.5	112	54.55			14.96		0.46	
				34.55			14.50		0.40	
						<u> </u>				
صق (سقتبش)	 	الان در ليتر)	مطول (بولي اکي و	گاټونهاي کاټونهاي		•	اــــــــــــــــــــــــــــــــــــ	پاي معاول (مولي لاي و ا	<u>ا</u> انود	
		Solub	ole Cations (med	γ1)				ble Anions (meq/l)		
Depth (cm)	C2++	Mg++	Na+	K+	Sum	CO3	HCO3 -	CI-	SO4	Sum
0-15	2.2	1.2	0.64	0.09	4.13	0	2.5	1.5	0.12	4.12
15-55	2.4	0.4	0.64	0.07	3.51	0	2	1.5	0.06	3,56
55-100	2	0.8	0.55	0.07	3.42	0	2	1	0.34	3.34
			i i							
عن (مانتينتر)	Water Co	مرجود % instra	ورمند آب	وؤن مقسومان	وڙڻ مغمرهن	درمث	Permeabil	قابلیت نفرد و	Infiltration I	اتود يثيري علد?
Death (-)	Field moisture	33.3 Kpa	1500 Kpa	ظاهري	حقيقي	مثال وافرج	ساتتمز برساعت	عدن	سانتينتر بر ساعت	كلاس
Depth (cm)	ومويث مسعر يير	طرفيت ذراعي	حدوثورنكي	BD (gr/cm3)	PD (gr cm3)	Total Porosity %	cnvh	Class	cur.p	Class
						-				
				1						

Table D-3-3-4-7 Laboratory Test of Soil Profile No. 35 (Soil Series 4) in Tang Sorkh

51.75

كاليونهاي معلول (ويلي اللي والإن در أوتر)

35-70

مَنَ (سَانَيْمَتُر)

0.014

TANG SORKH Area: Soil Series: . 4.. Soil Profile No.: 35 Soil & Water La.: SCWRC آزمایشگاد لهای آب : Lab. No.: عىق (سانتيىتر) بر صد در ات خاله (شار به موابش) Particle size classes (mm) مدأيث لكثريكي واكنش كال اشياع درمد کریڻ آئي Sand (ىسى زىبلس بر متر) Depth (cm) Horizon SP PHs Texture OC% 2-0.05 0.05 - 0,002 < 0.002 >2 Ece+10^3(ds/m) 0-15 Ap 4 28 68 20-30 \mathbf{C} 60.95 0.38 7.72 1.39 18 15-35 Bw 26 56 40-50 C 7.9 52.44 0.3 1.13 35-70 C152 21 27 50-60 C 48.27 14.0 7.92 0.43 +70 C2 >75 سن (سائنستر) **زت**ک ضغر الل جاب وتفيد فافر جنب کچ ستيم قائل تبادل ظرفيت ثبانل كاتبرني در مند مديم تبادلي ثمنيت جاب مديم مزمت الثباع بازي Ava P Ava K خللي شرنده Gypsum Ex Na C.E.C Depth (cm) ESP BS % SAR ميس لكي والان در مسد كرم شاك Meg/100g Suil T.N.V % p.p.m p p m 0-15 0.16 18.8 408 10.38 0.36 56.34 15-35 0.14 17.6 47.48 0.45 240 34,08

32

ليرنهاي مطرل (مولي لكي رايان در ليتر)

0.53

Depth (cm)		Solub	le Cations (mo	q/l)			Selu	ble Anioes (meq/l)	
Debra (cm)	Ca++	Mg++	Na+	K+	Sum	CO3	HCO3 -	CI-	SO4	Sum
0-15	2.8	0.4	0.46	0.07	3.73	0	2	1.5	0.29	3.79
15-35	1.6	0.8	0.5	0.06	2.96	0	1.5	1	0.4	2.9
35-70	2	1.2	0.68	0.04	3.92	0	2	1.5	0.37	3.87
عق(سلنوستر)	Water Co	ntent %	درمت ف	وزنءندوس	رژڻ منصوص	برسد	Penneabil	ئىل <u>ې</u> ت تقرد ي	Infiltration l	ننر: پئیری عدد}
Depth (cm)	Field moistage	33.3 Kpa	1500 Кра	طاهري	ستوتي	خال رفزج	ماتينز بر ماعت	علاس	ب مختبسترین ساعت	كتن
оеры (ып)	ر شویت مندر این	شريب زراعي	ىد بۇمرىگ ى	BD (g/cn3)	PD (gr/cm3)	Total Porosity %	carda	Class	दा√h	Class
								·		
				7						
1:										
				· · · · · · · · · · · · · · · · · · ·			 			

Table D-3-3-4-8 Laboratory Test of Soil Profile No. 43 (Soil Series 5) in Tang Sorkh

TANG SORKH

Soil Series: Soil Profile No.:

5 43

Soil & Water La.: SCWRC

Lab. No.		SCWAC			************					زمارشگاه خات نماره آزمایشا
عمق (مىلئومتر)	ننۍ	Particle size	classes (mm) (ه (قطر په ميليمکر)	ا برمد در ك خا	يافت	درسد للباع	هدايث الكثريكي	ر تعش گل تذباع	برمىد كرين آلي
Depth (cm)	Honzon	Sand	Silt	Clay	Gravel	Texture	SP	(دىسى زىملىن بىر متر)		
		2 - 0.05	0.05 - 0.002	< 0.002	>2	(Came	Gr	Ece*10^3(ds/m)	PHs	00%
0-15	A	44	34	22		L	40.74	0.53	7.39	1.19
15-45	C1	29	42	29		CL	41.7	0,43	7.7	0.83
45-80	Cgl	11	56	33		SiCL	48.5	0,53	7.85	0.58
80-100	Cg2	38	38	24		L	42.4	0.48	7.8	0.58
100-150	С	49	28	23		L	39.44	0.39	8.01	0.5
عن (سائیس)	ز ت کُ	فسفز قابل بولتيه	وتاسوم فابال جند	ترمدمواد	şť	سيېر قابل ئېلال	غرفيت تبادل كالنوني	در مد مديم تبادلي	قمبت حثني منتهم	درمند التباع بآزي
Depth (cm)	Total N	Ava. P	Av2. K	غنثي شونده	Gypsum	Ex Na	C.E.C			-
ocpan (dir)	rotar,4	p.p.m	5-b-w	T.N.V %	Meq/10	الان در مند گرم خاف Meq/100g Soil		ESP	\$.1R	Ð\$ ⁴₊
0-15	0.16	19.8	136	54.3			13.22		0.24	
15-45	0.14	17.2	136	54.77			13.57		0.61	
45-80				54.55		- :	24.35	1	0.35	
80-100				54.77			14.52		0.52	
100-150				54.77			13.22		0.22	
عق (سائتونتر)		الان در (بتر)	مطرل (مولي لاي و	كاتيرنهاي			لان در آپٹر)	هاي معاول (مولى اكي و ا		
Depth (cm)		Schub	le Cations (med	/ 1)			Solu	ble Anions (meq/1)		
Expançany	Cirr+	Mg++	Na+	K+	Sum	CO3 -	HCO3	CI -	\$O4	Sum
0-15	3.8	1.1	0.38	0.14	5.42	0	3.5	1.5	0,49	5.49
15-45	1.6	1.9	0.81	0.06	4,37	0	2.5	1.5	0.38	4.38
45-80	2.2	2.5	0.54	0.09	5.33	1	2.5	1.5	0.28	5.28
80-100	2	2	0.74	0.09	4.83	0	2.5	1.5	0.8	4.8
100-150	1.6	2	0.3	0.07	3.97	0	2	1.5	0.41	3.91
ىمن (سىئىسر)	Water Co	امرجود % ntent	درمداب	وژڻ مضوص	رزڻ مقصومان	در مــد	Permeabil	قابت تفوذ y	Infiltration I	نفرة بذيري عثعا
Depth (cm)	Field moisture	33.3 Kpa	1500 Kpa	مثاعري	ستبقى	خال و فرج	ساتتيمتر بر ساعت	كلاس	سائنيمتر بر ساعت	كلاس
Exper(Gil)	وطرت منعزجي	مترايت زراعي	مد بڑ مردگی	BD (gricmi)	PD (gr/cm3)	Total Porosity %	cm/h	Class	can.h	Class
0-15	16.52	23	11	1.3	2.62	49.62				
15-45	21.64	31	12	1,33	2.59	51.35				
45-80	24.4	32	15	1.37	2.66	51.5				
80-100	19.93	19	10	1.35	2.93	46.08				
100-150	22.18	20	12	1.33	2.67	49.81				

Table D-3-3-4-9 Laboratory Test of Soil Profile No. 34 (Soil Series 6) in Tang Sorkh

TANG SORKH Area: منطقه: Soil Series: 6 سري شك ؛ Soil Profile No.: 34 شماره تيمرح ځاك : Soil & Water La.: SCWRC أزمايشگاد خاك و آب: Lab. No. : شماره آزمایشگاه: عق (سانتينر) در مند در ات خالد (العلم به ميليش) Particle size classes (mm) مدابث الكثريكي برمد کرین کی داکش کان لانباع بانث درعت لاباع Clay Gravel (دىنى زىنتى بر عثر) Depth (cm) Horizon Texture OC% 0.05 - 0.002 2 - 0.05 < 0.002 > 2 Ece*10^3(ds/m) 0-18 14 30 Α 60-70 56 \mathbf{C} 1.29 18-100 Cr shale weathered س (سانتوسر) إيتنيرنال من أسترنك بنب در مبد مر د سديم ذابل تبلال طرقيت تبادل كاليرني درميد سنيم تبادلي فسبت بهذب معديم يزمت للباع باؤي Ava P عنثي شركء Gypsum Total N Depth (cm) ESP SAR BS % ميني لاي و الأن درصد گرم خاك Meq/100g Soil TNV% p.p.m p.p.m سق (سانئومئر) كاليوقه في معنون (ميلي لكي والأن در أيائز) آنیونهای مطول (میلی اکی و الان دو لینز) Soluble Carious (meq.1) Soluble Anions (meo/l) CO3 --SO4 --درمت ک برخود % Water Content قابليت نفرة Permeability ننود پائيري Infiltration Rate رژن منسوهر درمد Depth (cm) Total Porosity % Class Class طرفيت زراعي ىد بۇمرىگى BD (gr/cm3) PD (gr/cm3) cm/h

D3.3.5 Soils in Zeras

(1) General Description

Zeras is formed mostly by very steep slope and flat area is very scarce. Red colour soils are extensively covering this area even at very steep slope so that all area is grazed and dry farming is carried out even at very steep slopes up to approximately 50%. Soil texture of slopes is heavy and depth is generally very deep. Although soil contains high percentage of stone and gravel, permeability is slow due to heavy texture. Since permeability is slow and texture is clayey, surface runoff easily occurs and soils are easily eroded where heavily grazed or improperly cultivated. Severe gully erosions are observed in such areas where land is not properly managed.

(2) Soil Series and Units in Zeras

Soils of Zeras area are located on three physiographic units and contain three soil series as follows:

Table D-3-3-5-1 Soil Series in Zeras

Physiography		Soil Se	ries	USDA Soi	l Taxonomy (199	9)	FAO-Unesco	Iranian Fourth		
	No.	Area (ha)	%	Family	Subgourp	Order	(1989)	Approximation		
Old Alluvial Fans	(159	30%	Clayey-skeletal, carbonatic, hyperthermic	Fluventic Haplustepts	Inceptisols	Calcaric Cambisols	Brown soils		
Plateaux	2	116	22%	Fine, carbonatic, hyperthermic	Typic Haplustepts	Inceptisols	Calcaric Cambisols	Brown soils		
Platcaux & Hills	3	260	49%	Fine, carbonatic, hyperthermic	Typic Calciustepts	Inceptisols	Haplic Calcisols	Calic Brown soils		
Total		535	100%							

Table D-3-3-5-2 Soil Units in Zeras

Physiography	Soil	Soil	Area	Area	Soil S	Series
_	Series	Mapping Unit	(ha)	Ratio (%)	Area (ha)	Ratio (%)
Old Alluvial	i	1.1	56.61	11%	158.48	30%
Fan		1.2	101.87	19%		:
Plateau	2 .	2.1	68.59	13%	115.89	22%
7 1 - 1	•	2.2	47.3	9%	1.1	
· . ·		2.3	*		11	
Plateau &	3	3.1	27.21	5%	259.82	49%
Hill		3.2	24.96	5%		
		3.3	31.29	6%		
	4 1	3.4	100.2	19%		
<u> </u>	- <u>- 1</u>	3.5	76.16	14%		*
Total			534.19	100%		

1) No.1 Soil Series

On the map it has been specified as 1.1, 1.2 and in the classification it has been classified as:

"clayey-skeletal, carbonatic, hyperthermic, Fluventic Haplustepts".

This soil is shallow (25-50 cm.) of dark yellowish brown color (10 YR 4/4), silty clay loam, structureless, 15-35% stones (0-15 cm, Ap, ochric epipedon) on a layer of brown color (7.5 YR 4/4), silty clay, medium angular blocky structure, 40% stones and boulders (15-35 cm., Bw1, cambic horizon), overlying by brown color (7.5 YR 4/4), silty clay, medium angular blocky structure, 1% seconday lime as powdery pockets, more than 75% stones (+35 cm., Bw2, Cambic horizon).

The representative profile of this soil series, specified as No.1 in 31° 34' 52N and 50° 19' 53E. The No.1 soil series contains two separated mapping units as follows:

- Unit 1.1 No.1 soil series with silty clay loam surface texture, 35-75% stones and boulders in subsoil, 15-35% stones in topsoil, more than 75% stones and boulders within depth of 25-50 cm, 2-5% overall and 1-2% transversal slopes, slight micro relief and water erosion.
- Unit 1.2 No.1 soil series with silty clay loam surface texture, 35-75% stones and boulders in subsoil, 15-35% stones in topsoil, more than 75% stones and boulders within depth of 25-50 cm, 2-5% overall and transversal slopes, slight micro relief, moderate water erosion.

2) No.2 soil series

On the map, it has been specified as 2.1, 2.2, 2.3 and in the classification, it has been classified as:

"Fine, carbonatic, hyperthermic, Typic Haplustepts".

This soil is very deep of brown color (10 YR 4/3), silty clay loam, fine angular structure, 3-15% stones (0-20 cm, Ap, ochric epipedon) on a layer of brown (7.5 YR 4/3), silty clay, angular blocky structure (20-45 cm, Bw1, cambic horizon) on a layer of brown color (7.5 YR 4/4), silty clay, angular blocky structure, 1% secondary lime as mycelia (45-80 cm, Bw2, cambic horizon) on a layer of brown color (7.5 YR 4/4), silty clay, angular blocky structure, 1% secondary lime as mycelia (80-150 cm, Bw3, cambic horizon).

The representative profile of this soil series, specified as No.2 in 31° 34' 58N and 50° 20' 98E. The No.2 soil series contains three separated mapping units as follows:

- Unit 2.1 No.2 soil series with silty caly loam surface texture, 3-15% stones in topsoil, 2-5% overall and 1-2% transversal slopes, slight micro relief and water erosion.
- Unit 2.2 No.2 soil series with silty clay loam surface texture, 15-35% stones in topsoil, 5-8% overall and 2-5% transversal slopes, moderate micro relief and water erosion.
- Unit 2.3 No.2 soil series with silty clay loam surface texture, 3-15% coarse gravels in topsoil, 40-70% slope, strong micro relief and water erosion.

3) No.3 soil series

On the map, it has been specified as 3.1, 3.2, 3.3, 3.4, 3.5 and in the classification, it has been classified as:

"Fine, carbonatic, hyperthermic, Typic calciustepts".

This soil is very deep (more than 120 cm.), at places deep (80-120 cm.) of dark yellowish brown color, (10 YR 4/4), silty clay loam, structureless, 15-35% coarse gravels or stones (0-20 cm., Ap, ochric epipedon) on a layer of dark yellowish brown color (10 YR 4/4), silty clay, strong angular blocky structure, 10-15% secondary lime as powdery pockets and concretion (20-60 cm., B_k1, calcic horizon) on a layer of dark yellowish brown color (10 YR 4/4), silty clay, angular blocky structure, 5-8% secondary lime as powdery pockets and concretion (60-100 cm., B_k2, calcic horizon) on a layer of dark yellowish brown color (10 YR 4/4), silty clay, angular blocky structure, 2% lime as powdery pockets (100-200 cm., Bw, cambic horizon).

The representative profile of this soil series, specified as No.7 in 31° 34' 94N and 50° 20' 01E. The No.3 soil series contains five separated mapping units as follows:

- Unit 3.1 No.3 soil series with silty clay loam surface texture, 15-35% coarse gravels in topsoil, 2-5% overall and 1-2% transversal slopes, slight micro relief and water erosion.
- Unit 3.2 No.3 soil series with silty clay loam surface texture, 3-15% stones in topsoil, 2-5% overall and transversal slopes, slight micro relief, moderate water erosion.
- Unit 3.3 No.3 soil series with silty clay loam, 15-35% stones in topsoil, more than 75% coarse gravels and stones within depth of 80-120 cm, 2-5% overall and 5-8% transversal slopes, moderate micro relief and water erosion.
- Unit 3.4 No.3 soil series with silty clay loam surface texture, 15-35% coarse gravels in topsoil, more than 75% coarse gravels and stones within depth of 80-120 cm., 5-8% overall and 8-12% transversal slopes, moderate micro relief and water erosion.
- Unit 3.5 No.3 soil series with silty clay loam surface texture, 15-35% coarse gravels in topsoil, 2-5% overall and 8-12% transversal slopes, strong micro relief and water erosion.

(3) Soil Properties in Zeras

Soils are generally clay loamy in Zeras as show in Table D-3-3-5-3. Gravel content is generally high. Permeability is generally slow. The pH of soils are alkaline (7.69 - 7.91) and organic matter content is low as 0.98 % in average.

Table D-3-3-5-3 Soil Properties in Zeras

Physiography	Soil	Mapping	Profile		Texture	(%)		Texture	pН	oc	Depth	Sa	Ιb
And St.	series	Unit		Clay <0.002	Silt 0.002-0.05	Sand 0.05-2	Gravel >2 mm			(%)	(m)	(g/cm³)	(em/hr)
Old Alluvial	1	1.1	1	34	52	14	25	SiCL	7.69	1.06	0.70		0.72
Fan		1.2											
Plateaus	2	2.1	2	36	58	6	9	SiCL	7.91	1.24	1.50	1,33	1.01
		2.2											
		2.3	12	34	48	18	9	SiCL		0.98	1.70		3.28
			_13	40	58	2	7.5	SiC-SiCL		0.78	1.50		
			14	42	54	4	15	SiC		0.80			
			15	24	30	46	50			2.15			
			16	34	48	18	9			0.81	1.50		
			_17	38	52	10	17.5			0.66			
			18	36	54	10				0.69			
			19	34	52	14	9	SiCL		18.0	1.50		
			20	32	56	. 12	12.5	SiCL	L	0.33			
			22	40	44	16				0.81			
	1.0		23	38	54	8	45		Li	0.81	1.20		* 1. *.
			24	34	40	26		CI		1.35			
			Ave.	36	49	15	21		\blacksquare	0.92	1.48		3.28
Plateaux &	3	3.1	4						$ldsymbol{\sqcup}$				
Hills		3.2	3	36	50	14	9	SiCL		1.00	1.50		
		3.3					<u> </u>						
	100	3.4	9	36	52	12	. 25			0.72	1.20		
		3.5	7	36	58	6	25	SiCL	7.87	0.77	1.50		1.18
			Ave.	36	53	11	20		7.87	0.83	1.40		1.18
Total		15.14		. 36	51	14	20		7.82	0.93	1.38	1.33	1.55

(Notes)

¹⁾ Soil texture, pH, Organic Carbon Conternt, Specific gravity are for top soil.

²⁾ When depth is 1.50m or more, actual depth is more than mentioned depth.

³⁾ Soil texture abbreviation

C: Clay, CL: Clay Loam, SiC: Silty Clay, SiCL: Silty Clay Loam, SiL: Silty Loam, L: Loam, LSa: Loamy Sand, SaC: Sandy Clay, SaCL: Sandy Clay Loam, SaL: Sandy Loam

(5) Laboratory Test Results of Representative Profiles in Zeras

Table D-3-3-5-4 Laboratory Test of Soil Profile No. 1 (Soil Series 1) in Zeras

	700.00						
Area:	ZERAS		•	مطله ا			
Soil Series :	1			سرى خاك :			
Soil Profile No.:	1			سري —- شعاردنيدرغ څاڪ :			
Soil & Water La.:	SCWRC			آزمایشگاد ف ^ی و آب			
Lah No		A Company of the Company		1611			

Depth (em) Public in Pu	Lab. No.	ater La. :	SCWRC								آزمایشگاه خا ^ی شمار د آزمایش
Depth (cm) More 2-0.05 0.05 0.003 0.002 >2 Toole SP Ecc *10*Motor) Phi CC*	عن (سنتبس)	خل	Particle size	classes (mm) (ك (قطر به مظيندر)	درمددركنا	بات	درمند اثباع	مدايث الكثريكي		
O-15 Ap	Depth (cm)	Horizon	Sand	Silt	Clay	Gravel	Texture	SP	(ىسى ژىنتىن بر مىر)	PH ₃	ccs.
15-35 Bwl 11 49 40 40 5IC 36.55 0.5 7.9 0.5 35-70 Bw2 15 43 42 >75 SIC 44.29 0.38 8.1 0.37			2 - 0.05	0.05 - 0.003	< 0.002	>3			Ece*10^3(ds/m)		
المنافذ المنا	0-15	Ap	14	52	34	15-35	SICL	37.62	2.61	7.69	1.06
الري المنافق	15-35	Bw1	11	49	40	40	SIC	36.55	0.5	7.9	0.5
Depth (cm) Popm	35-70	Bw2	15	43	42	>75	SIC	44.29	0.38	8.1	0.37
Depth (cm) Popm			:								
Depth (cm) Popm											
Control Total N Pop in Pop in Pop in T.N.V % Meq/IO(g Soil Als., δ = σ = σ = σ = σ = σ = σ = σ = σ = σ =	عق (ساتوسار)	زدائ	فبقر فالأجث	يتضيروال جنب	در مند مراد	25	مشيد فابل تبلال	ظرفيت تبادل كالفرني	در صد مدیم تبادلی	نت جنب مديم	ىرمىد ئىدغ ياۋىي
المنافق المنا	Denth (cm)	Total	Ava. P	Z. svA	خاش شرك:	Gypsum	Ex. Na	C.E.C			
15-35 0.014 11.8 200 52.21 14.96 0.71 35-70		total ix	Ppm	p.p.m	T.N.V %	Meq/10	در مت گرمشاف Soil نوع			SAR	32.0
عن (مانين على المراقب	0-15	0.14	68.4	216	49.65			14.17		5.04	
المنافر المنا	15-35	0.014	11.8	200	52.21			14.96		0.71	
Depth (em) De	35-70			·	49.65			15.22		0.62	
Depth (em) De											
Depth (em) De											
Depth (cm) Ca Mg+- Mg+- K+ Sum CO3 HCO3- Cl- SO4 Sum	عن (سائنيمتر)		الان در ليتر)	معاول (میٹی کی و	كاتوتهاي		کیونهای مسلول (میلی کی والان در لیتر)				
Ca- Mg+ Ns+ K+ Sum CO3- HCO3- CI- 504- Sum 0-15 6.8 5.6 12.5 0.29 25.19 0 5 16 4.1 25.1 15-35 3.4 0.5 1 0.13 5.03 0 3 1.5 0.48 4.98 35-70 1.5 1.5 0.76 0.12 3.88 0 2.5 1 0.34 3.84 0 Water Content of a part of the pa	Denth (cm)				(l)			Soluble Anions (meq/I)			
15-35 3.4 0.5 1 0.13 5.03 0 3 1.5 0.48 4.98 35-70 1.5 1.5 0.76 0.12 3.88 0 2.5 1 0.34 3.84	Departerary	Ca	Mg++	Na+	K+	Sum	CO3	HCO3 -	cı-	504	Sum
على المعارض ا	0-15	6.8	5.6	12.5	0.29	25.19	0	5	16	4.1	25.1
الله المعامل	15-35	3.4	0.5	- 1	0.13	5.03	0	3	1.5	0.48	4.98
Depth (cm) Field mossage 33,3 Kpa 1500 Kpa طابري طابري طابري طابري طابري Adjustment Class cmh Class 1	35-70	1.5	1.5	0.76	0.12	3.88	0	2.5	1	0.34	3.84
Depth (cm) Field mossage 33,3 Kpa 1500 Kpa طابري طابري طابري طابري طابري Adjustment Class cmh Class 1				·							
Depth (cm) Field mossage 33,3 Kpa 1500 Kpa طابري طابري طابري طابري طابري Adjustment Class cmh Class 1											
Depth (cm) איני בילי ביל ביל ביל (ביל ביל ביל ביל ביל ביל ביל ביל ביל ביל	عق (سانتیسر)	Water Content o			رژڻ خصرمن	وزن متسوهن	درست	Permeability كالملت تفوذ		المرد بنوري Inditration Rate	
BD (græm3) PD (græm3) Total Poresity ° amh Class cm h	Depth (co.)	Field moisoure	33,3 Kpa	1500 Kpa	ماعري	حقيتي	خدوارج	مانئينتر پر ساعت	كلاس	ستنبئز بزصاعت	عض
	Departon)	ر شرت مسعر يي	المترفيت وراعم	عة لإمرنگي	BD (gr/cm3)	PD (gr/cm3)	Total Perenty %	cπvh	Class	շուհ	C!ass
								· · · · · · · · · · · · · · · · · · ·	: .	- 7	

Table D-3-3-5-4 Laboratory Test of Soil Profile No. 2 (Soil Series 2) in Zeras

Lab. No.	:								ىد :	شماره أزمايثيا
من (مغنبتر)	سق	Particle size	classes (mm) (ك (قطر ته ميئيمتر)	برمدنركخا	بانث	درمد انباع	مدابت فكتريكي	راکش گی اثباع	
Depth (cm)	Horizon	Sand 2 - 0.05	Silt 0.05 - 0.002	Clay < 0.002	Gravel	Texture	SP	(بىنى ۋېتىر بىر مار) Ecc+10^3(dt/m)	₽Н⊴	oc%
0-20	Ap	6	58	36	3-15	SICL	44.44	0.58	7.91	1.24
20-45	Bwl	7	. 51	42		SIC	44.82	0.48	8.07	0.75
45-80	Bw2	3	53	44		SIC	43,91	0.47	8.25	0.38
80-150	Bw3	2	55	40		SIC	43.15	0.53	8.3	0.17
عمل (سقانیمتر)	ژ ت کل	غار قال جاب	يتنيد فابل جلب	عرمت مزاد	25	سديد فابل تبادل	غروت تبافل كالنوني	درهند متيد تنكأب	قمتت جذب مديم	درمت للباع بالزي
Cepth (cm)	Total N	Ava. P	Ava.K	خنش شرفده	Gypsum	Ex. Na	C.E.C	ESP	CID	85 %
	10111	bbw	p.p.m	TNV %	Meq/10	درست گرم خان (Og Sou	حيلن يختر والان	zar 	SAR	85%
0-20	0.16	43.4	230	48.26			18.43		0.48	
20-45	0.014	11.6	312	45			17,74		0.79	
45-80				47.79			17.39		0.93	
80-150				48.49			14.96		1.03	
مق (ستنبشر)	l 	الان در (وتر)	معاول (ميلي لکي و	كقيولهاي		فیوفهای مسلول زمیش هی والان در نیش)				
Depth (cm)	Soluble Cations (meq/l)					Soluble Anions (mcq/1)				
	Carr	Mg↔	Na+	- K+	Sum	CO3	HCO3 -	CI-	SO4	Sum
0-20	3.7	1.3	0.76	0.16	5.92	0	4	1.5	0.4	5.9
20-45	2	1.6	1.07	0.2	4.87	. 0	3	1	0.9	4.9
45-80	1.9	1.5	1.21	0,31	4.74	0	3	1.5	0.23	4.73
80-150	2.8	1	1.42	0.09	5.31	0	2.5	1.5	1.27	5.27
عق(سقتِمتَر)	(زرمتمرض وزن مصوص عرصه لبعرجود و Water Content				رژنمتموهن	درست	ې Permeability نارځ Infiltration Rate چ		نفرد يثير ي tate	
Depth (cm)	Field moisture	33.3 Кра	1500 Кра	ختعري	حتثلي	خال: و الرج	استنيمتر يو ساعت	كاثبر	ستتبعثر يز ساعت	كلاس
Separ(cia)	وطريت مسترايي	الرفيت زراعي	حد الأمر دگي	BD (gr cm³)	PD (gr:cm3)	Total Porosity %	απνħ	Class	cm h	Class
0-20	18.2	32	-16	1.33	2.59	51.35				
20-45	17.03	30	14	1.36	2.59	52.51		1		
45-80	16.5	30	14	1.35	2.59	52.6				
80-150	14.31	32	17.	1.37	2.59	52.9				

Table D-3-3-5-4 Laboratory Test of Soil Profile No. 7 (Soil Series 3) in Zeras

Area: Soil Serie Soil Profi Soil & W Lab. No.	le No. : ater La. ;		ZERAS 3 7 SCWRC	· · · · · · · · · · · · · · · · · · ·					و آب :	منطقه : سري خاك : شماره نيمرخ ! آزمايشگاه خاك شماره آزمايشا	
عن (سانشتر)	<u>ئ</u> ق	Particle size	clases (mm) (ه وحدر به موادمتر	برمدنراتخا	بنت	در صد اساع	ىد ۇ ت ئكترىكى	وتكش كل النباع	درمت کریں آئی	
Depth (cm)	Horizon	Sand 2 - 0.05	Silt 0.05 - 0.002	Clay < 0.002	Grave)	Texture	SP	(سي زيبنس بر سر) Ece*10^3(ds/m)	PHs	oc••	
0-20	Ap	6	58	36	15-35	SICL	46.53	0.46	7.87	0.77	
20-60	Bkl	5	45	50		SIC	47.25	0.46	8.16	0.45	
60-100	Bk2	3	51	46		SIC	72,11	0.3	8.28	0.25	
100-150	Bw	- 7	51	42		SIC	76,78	0.36	8.35	0.13	
عن زمانتینز)	رث کان	معر قدر حت.	بتاميد قابل جنب	درمت مو د	25	مسيد التجار فتنكال	طرعيت تبكل كتبرنى	در مدد مدیم تیادلی	فسنت جنب سنوم	درمت شناع باؤري	
		Ava 2	Ava K	خفشي شوقده	Сурѕит	Ex. Na	C.E.C				
Depth (cm)	Totai N	2 7 m	p.p.m	T.N,V %	Meq/10	درسد گره خان Nog Soil	ميلي هي والان	ESP	SAR	£\$ ° ₀	
0-20	0.014	33.6	312	49,65			18.43		0.58		
20-60	0.014	6.4	216	50.35			16.35		0.92		
60-100				51.28			16		0.45		
100-150	.			53.84			16.35		0.83		
		.:									
عن (سائنينزر)		الآن در أبتر)	معتُول (مِلِنِّي لَكِي و	كاليرنهاي		کنیرنهای مطرل (میلی کش رالان در لینز)					
Depth (cm)		Solub	le Cations (mee	/l)	So			luble Anions (meq/l)			
Espa, (any	C3	7,18	Na+	K+	Sum	CO3	HCO3 -	CI -	\$04	Sum	
0-20	2.8	0.8	0.78	0.13	4.51	0	3.5	1	0.02	4.52	
20-60	2.4	0.9	1.18	0.11	4.59	0	3	1.5	0.1	4.6	
60-100	0.8	1.8	0,52	0.04	3.16	0	1.5	1.5	0.15	3.15	
100-150	2.1	0.5	0.95	0.08	3,63	0	2	1.5	0.12	3.62	
من (ساشش)	Water Content of the open of the state of the water			رزنمنسرس	رژن منسـرمن	ر 	اللبت نفرة Permeability		لىر- بنير ئي Infiltration Rate		
Depth (cm)	Field moisture	33 3 Kpa	1500 Кра	ظاهري	ستينى	خت و ورج	مقتبستر يرماعت	كلاس	متتبيتر يرساعت	كثنز	
	وطرت منجزايي	غزفيت رزعي	د: ت <u>أ</u> مرنگو	BD (gr/cm3)	PD (gr/cm3)	Total Porestry 26	czny'h	Class	cm h	Class	
									* .		
							`				

D3.4 Basic Infiltration Rate

D3.4.1 Method applied for Survey and Analysis

Infiltration rate is the rate with which water penetrates into the soil from the soil surface. It is one of significant parameter of soil in relation to irrigation practices.

Double cylinder method was used to measure the intake rate. In this standard method, water is allowed to penetrate into the soil through cylinder of about 15-25cm diameter, and the rate of penetration (as high of water normally in mm) is measured by the time. (Normally in minute)

The readings of cumulative penetration are then plotted against elapsed time in normal or logarithmic paper, on which the best curve is fitted. Formula used for calculation is:

 $D = CT^m$

 $I_{av} = 60 \text{ CT}^n$

n = m - 1

 $I_b = a T_b^n$

 $T_{\rm b} = 600 n$

a, b = parameters from plotted curve

D = cumulative infiltration (cm)

T = Time (min)

I_{av} = Average infiltration rate (cm/hr)

 $I_b = Basic infiltration rate (cm/hr)$

T = a/(60(n+1))

I = instantaneous infiltration rate (cm)

 $I = aT^n + b$

D3.4.2 Classification of Permeability

Standards of classification of permeability are as follows:

Table D-3-4-1 Classification of Permeability

USDA				
Grade	Classification	Basic Intake Rate (cm/hr)		
1	Rapid	>25.00		
2	Rapid - Medium	25.00 - 6.25		
3	Medium	6.25 - 2.00		
4	Medium - Slow	2.00 - 0.50		
5	Slow	0.50 - 0.125		
6	Very Slow	< 0.125		

	5011 LBS	tiute of fran
Grade	Classification	Basic Intake Rate (cm/hr)
1	Very Rapid	>25.00
2	Papid	25.00 - 6.00
3	Moderate	6.00 - 2.00
4	Slow	2.00 - 0.10
5	Very Slow	<0.1

D3.4.3 Result of the Infiltration Survey

Infiltration survey has been carried out totally at 25 sites in the study areas. The results are summarized in Table D-3-4-2 and details are shown in Table D-3-4-3.

Table D-3-4-2 Comparison of Infiltration Rate by Areas

Study Area	Basic Infiltration Rate (Ib cm/hr)						
	Max	Mean	Min				
Vastegan	9.035	5.002	2.012				
Chaman Goli-Bazoft	7.652	3.045	0.753				
Sarbaz	10.731	4.729	1.797				
Tang Sorkh	7.944	3.470	0.855				
Zeras	3.282	1.547	0.720				
Max, Mean, Min	10.731	3.559	0.720				

Maximum infiltration rate is observed at 10.731 cm/hr in Soil Unit 8.1 in Sarbaz, and followed by 9.035 cm/hr in Soil Unit 3.1 in Vastegan. Those infiltration rates are evaluated as "Rapid-Medium" by USDA and "Rapid" by Soil Institute of Iran. On the other hand, permeability of Zeras is generally slow comparing to other four areas. Average permeability of Zeras is 1.547 cm/hr that is "Medium-Slow" by USDA and "Slow" by Soil Institute of Iran.

Table D-3-4-3 Basic Infiltration Rate in the Study Area

Vaste			<u> </u>					
No.	Profile.	Soil	Basic Inf	iltration F	tate (lb)	Average		Grading
	No.	Series	No.I	No.2	No.3	(cm/hr)	USDA	Iranian Soil Institute
1	222	1.3	12.285	8,256	5.644	8,728	Rapid-Medium	Rapid
2	145	4.1	3.281	2,179	4.161	3,207	Medium	Moderate
3	143	3.1	8.832	8.698	9.576	9,035	Rapid-Medium	Rapid
4	174	6.2	2.561	2,660	3.145	2,789	Medium	Moderate
5	161	1.1	2.553	2,770	7.404	4,242	Medium	Moderate
6	146	5.1	2.008	2.204	1.825	2,012	Medium	Moderate
Avera	ge					5.002		
	. 2	1,000						
	an Gori-B					14, 14		
No.	Profile.	Soil		iltration F		Average		Grading
	No.	Series	No.1	No.2	No.3	(cm/hr)	USDA	Iranian Soil Institute
1	120	1.1+1.2	4.057	12.141	6.757	7.652	Rapid-Medium	Rapid
2	109	3.1	4.232	1.373	3.324	2.976	Medium	Moderate
3	126	3.2	1.173	1.173	1.273	1.206	Medium-Slow	Slow
4	112	2.2	0.346	0.946	0.966	0.753	Medium-Slow	Slow
5	<u> 117 -</u>	3.1	2.069	3.937	1.912	2.639	Medium	Moderate
Avera	ge				<u> </u>	3.045		<u></u>
Sarba	z							
No.	Profile.	Soil	Basic Inf	iltration F	late (Ib)	Average	C	Grading
	No.	Series	No.1	No.2	No.3	(cm/hr)	USDA	Iranian Soil Institute
. 1	55	6.1	4.126	2.514	3.868	3,503	Medium	Moderate
2	67	3.1	6.689	1.239	2.671	3,533	Medium	Moderate
3	60	8.1	11.617	8.090	12.487	10.731	Rapid-Medium	Rapid
4	81	5.1	1.221	0.866	3.304	1.797	Medium-Slow	Slow
5	64	3.1	4.887	3.824	3.536	4.082	Medium	Moderate
Avera	ge					4,729		
Tang	Sorkh			<u>i</u>				
No.	Profile.	Soil	Basic Inf	iltration F	Rate (Ib)	Average	(Grading
100	No.	Series	No.1	No.2	No.3	(cm/hr)	USDA	Iranian Soil Institute
1	25	1.1	1.171	0.951	1.501	1.208	Medium-Slow	Slow
2	43	5.1	1.389	0.673	0.844	0.969	Medium-Slow	Slow
3	27	2.2	3.755	10.167	9.910	7.944	Rapid-Medium	Rapid
4	30	3.1	6.413	5.089	7.622	6.375	Rapid-Medium	Rapid
- 5	29	2.1	1.040	0.816	0.708	0.855	Medium-Slow	Slow
Avera	ge					3.470		
Zeras								
No.	Profile.	Soil	Rocic Inf	iltration F	rate (lb)	Average		Grading
110.	No.	Series	No.1	No.2	No.3	(cm/hr)	USDA	Iranian Soil Institute
1	12	2.3	2.536	4.479	2.831	3,282	Medium	Moderate
			0.510	2.217	0.288	1.005	Medium-Slow	
2 .	2	2.1 3.5	1.675	1.286	0.575	1.005	Medium-Slow	Slow Slow
4	1		1.048	0.640	0.575	0.720		Slow
-4		1.1	1.048	0.040	U.4/1	0.720	medium-910M	Siuw

D.4 Land Classification (Phase-2)

Table D-4-1 Evaluation Criteria for Land Classification for Irrigation

(Soil Institute of Iran, MOA)

```
g 2- Z 11 S2 A1
E1(E1)- d1(d1)- W1-O1-P1- F
Subsoil Permeability (between 0.20 and 1.20m depth)
                                                                                                 Tentative Subsoil Permeability Rating by Subsoil Heaviest Horizon
1: "Very rapid" (>25 cm/hr, Maximum Land Class III)
2: "Rapid" (from 6 to 25 cm/h, Maximum Land Class II)
3: "Moderate" (from 2 to 6 cm/h, Maximum Land Class I)
4: "Slow" (from 0.1 to 2 cm/h, Maximum Land Class II)
                                                                                                      V (non massive structure)
5: "Very slow" (<0.1 cm/h, Maximum Land Class III)
                                                                                                      V (massive structure)
     Subsoil stoniness (percentage of coarse fragment by volume between 0.20 and 0.80m)
     no symbol: Sise of coarse fragment are not distinguished (Maximum land Class I)
      g: Between 15 and 35% of coarse fragments (Maximum Land Class II)
     G: Between 35 and 75% of coarse fragments (Maximum Land Class III) Z:>75% (Maximum Land Class IV?)
           Topsoil texture (top 20cm)
Z: "Very coarse" sand - coarse sand (Maximum Land Class (V)
                                                                                                                             U.S. System

    "Very coarse" sand - coarse sand (Maximum Land Class IV)
    C: "Coarse" Loamy coarse sand, fine sand (Maximum Land Class III)
    L: "Light" Coarse sandy loam, loamy fine sand (Maximum Land Class II)
    M: "Medium" Loam, fine sandy loam, silt loam, silt (Maximum Land Class I)
    H: "Heavy" Clay loam, silty clay loam, sandy clay loam (Maximum Land Class I)
                                                                                                                             2-0.2mm; coarse sand
                                                                                                                             0.2-0,05mm; fine sand
                                                                                                                             0.05-0.002mm; silt
                                                                                                                             <0.002mm; clay
           V: "Very heavy" Sandy clay, silty clay, clay (Maximum Land Class II)

Topsoil stoniness (Volume by % and Maximum Land Class)

Volume % Fine Coarse Stones Boulders Coarse
                                                                                          Coarse fragments
                                  gravels Gravels
                                                                                          Fine gravels: size between 2mm and 2.5cm
                                                                    (b)-II
                                                         (S)-II
                                            (g)-11
g-111
                                                                                          Coarse gravels: size between 2.5 and 7.5cm
                                                                                          Stones: size between 7.5 and 25cm
                  35-75%
                                  F-III
                                             G-IV
                                                                                          Boulders: size above 25cm
                       Soil Depth
                       no symbol : "Very deep" > 120cm
                                                                                     Maximum Land Class
                       1: "Deep" 80 - 120cm
                                                                                                          Fine sandy loam or finer
no 1 2 3 4
I I II III IV
                                                                                          Limiting
                                                                                                                                            Coarser than fine sandy loans
                       2: "Moderately deep" 50 - 80cm
3: "Shallow" 25 - 50cm
                                                                                                                                             no 1 2 3 4
II II III IV IV
                                                                                                                                             II II III IV IV
                                                                                          Z or P
                       4: "Very shallow" 10 - 25cm
R or RW: depth < 10cm
Type-limiting Layer (for soil depth)
                             2: "Gravel limiting layer" of unconsolidated gravel stone and coarse sand with at least 75% of the volume and thickness at least 30cm.

P: "Paralithic (lithic like) limiting layer" of continuous coherent material having hardness of mohs scale<3.

L: "Lithic limiting layer" of coherent unweathered rock having mohs scale >3.
                                  no symbol: Rate > 2cm/h No limitation (Maximum Land Class I) (Note) Splinkler for > 7cm/ha
                                  I1: Rate 1-2cm/h (Maximum Land Class II)
                                  12: Rate 0.5 - 1cm/ha (Maximum Land Class III)
                                  l3: Rate 0.2 - 0.5cm/ha (Maximum Land Class IV)
                                  I4: Rate < 0.2cm/ba (Maximum Land Class V)
                                        Soil Salinity
                                        no symbol: Ece < 4 mmhos/cm, no or very slight limitation (Maximum Land Class I)
                                        S1: ECe = 4 - 8 mmhos/cm, slight salinity limitation (Maximum Land Class II)
                                        S2: ECe = 8 - 16 mmhos/cm, moderate salinity limitation (Maximum Land Class III)
                                        S<sub>3</sub>: ECe = 16 - 32 mmhos/cm, severe salinity limitation (Maximum Land Class V)
                                        S4: ECc > 32 mmhos/cm, very severe salinity limitation (Maximum Land Class V or VI)
                                             Soil Alkalinity (for the first 75cm of soil)
                                             no symbol: "no alkalinity problem" ESP<10%, pH<8.5, SAR<8 (Maximum Land Class I)
                                             A1: "slight alkalinity problem" ESP=10-15%, pH>8.5, SAR=8-13 (Maximum Land Class II)
                                             A2: "smoderate alkalinity problem" ESP=15-30%, pH=8.5-9, SAR=13-30 (Maximum Land Class III)
                                             A<sub>3</sub>: "severe alkalinity problem" ESP=30-50%, pH=9-9.5, SAR=30-70 (Maximum Land Class V)
                                             A4: "very severe alkalinity problem" ESP>50%, pH>9.5, SAR>70 (Maximum Land Class VI)
Overall Slope (longest slope of mapping unit)
                                                                                          When the slopes are terraced
A: "Level to very gently sloping" 0-2% (Maximum Land Class I)
B: "Gently sloping" 2-5% (Maximum Land Class II)
```

Dr. Cours propriet Days (1410)	,	11 20	a	1033	,				ույ
C: "Sloping" 5-8% (Maximum	Land	Ct, II							
: "Strongly sloping" 8-12% (Maximum Land Class IV)									Dt. III
E: "Moderately steep" 12-25%	(Max	imu	m La	ind C	lass	IV/V	1)		Et, IV
F: "Steep" 25-40% (Maximum							-,		FLIV
G: "Very steep" 40-70% (Maxi					n				Gt. IV
H: "Extremely steep" >70% (M						١			HL IV
Transversal Slope							ated	to t	he Overall Slope
no symbol : slope < 1%	Α	В	C	D	E		G	Н	
a: stope = 1-2%	ī	Ħ	III	IV	IV*	VI	VI	VI	
b : slope = 2-5%	11	Ш	ш	iv	VI	VI	V)	VI	
c : slope = 5-8%	111	H	IV	IV	VI	VI	VΙ	VI	
d: slope = 8-12%	IV	17	IV	IV	VI	VI	VΙ	VI	•
e : slope = 12-25%	IV	IV	IV*	IV*	VI	VI	VI	VI	
f:slope = 25-40%	VΙ	VI	٧ſ	VI	iV	VI	VI	VΙ	
g:slope = 40-70%	VI	VΙ	VI	Vì	VI	VI	VΙ	VI	
h : slope > 70%	VI	VĮ	Vi	VI	VI	VI	Vi		(Note) IV*: IV or VI by local specifications

Table D-4-1 Evaluation Criteria for Land Classification for Irrigation (2/2)

(Soil	Institute	of Iran,	MOA)
-------	-----------	----------	------

P₁ P₂

 P_2

PI

 P_2

 $\mathbf{P}_{\mathbf{l}}$

 P_3

< 2weeks

2-6weeks 6-10weeks P3

			********			titute of Iran,	MOA)
Micro-relief (unduration within 100m distance)	Ave. micr	o_relief	Ave. cut &	60	Earth moving		
none: "None or very slight" (Maximum land Class I)	0-15cm	<u>O-ICHCI</u>	<7.5	× 1111	<375	, 1,111 / 1111/2	
1: "Slight" (Maximum land Class II)	15-30cm		7.5-15cm		375-750		
2 : "Moderate" (Maximum land Class III)	30-60cm		15-30cm		750-1500		
3: "Strong" (Maximum land Class IV)	>60cm		>30cm		>1500		
Present Erosion Status							
<water erosion=""></water>	,	Water Ero	sion Rating	<u>Spa</u>	cing of Rills a	nd Gullies	
noe: "No apperent erosion" (Maximum Land Class 1)		Erosion De	<u>eth 1</u>	50-500	m 50-150n	n 50-20m	<u> <20m</u>
E1: "Slight erosion" (Maximum Land Class II)	3	Rill (5-30c	m)	-	-	E_1	E ₂
E2: "Moderate erosion" (Maximum Land Class III)	(Gully (30-1	00cm)	-	E_1	\dot{E}_2	E3
E3: "Severe erosion" (Maximum Land Class IV)	(Gully (1-3)	n)	$\mathbf{E_l}$	E ₂	E ₃	"E"
"E": "Destroyed by gully erosion" (Maximum Land C	lass VI)						
<wind erosion=""></wind>	,	Wind Eros	ion Rating				
(E1): "Slight erosion" (Maximum Land Class II)]	No deposit	and no rills by	y wind			
(E2): "Moderate erosion" (Maximum Land Class III)	:	Shallow ril	ls (5-15cm) b	y wind			
(E ₃): "Severe erosion" (Maximum Land Class IV)	3	Extreme er	osin by wind				
Present Sediment Status			-				
< Water Erosion Products>		R	ating of depe	osition :	by area affec	ted	
none: "No or slight deposition" (Maximum L	and Class I) A	rea < 10%				
d ₁ : "Slight deposition" (Maximum Land Class	ss II)	Α	rca = 10 - 40'	%			
d ₂ : "Moderate deposition" (Maximum Land	Class III)	Α	rea = 40 -75%	%			
d ₃ : "Severe deposition" (Maximum Land Cla	iss (V)	A	rca > 75%				
<wind erosion="" products=""></wind>			ating of depe				
none: "No or slight deposition" (Maximum L	and Class I	, S ₁	oarse unstabil	ized hu	mmocks of loc	ose sands mor	e than 10m apart,
none. To or sight occording (Maximum L	and Class I	, <u>w</u>	ith a height <	20cm			
		S	oarse unstabil	lized hu	mmocks of loc	se sands mor	e than 10m apart
(d ₁): "Slight deposition" (Maximum Land Cl	ass II)	137	ith a height o	£20-100	Ocm, or many	hummocks le	ss than 10m with a
		h	ight <20cm.				
(d.) . Whatever described Officianos Lon	d Class III)	N	lany unstabili	zed hun	unocks of loo	se sands less t	than 10m apart,
(d ₂): "Moderate deposition" (Maximum Land	u Class III)	W	ithout sand sl	neets wi	th a height of ?	20-100cm.	
(d.): "Source denogition" (Maximum Land C	lose IVO	S	cattered dune:	s> [m]	neight or Cont	inuous sand s	heets and/or micro-
(d ₃): "Severe deposition" (Maximum Land C	.105514)	d	mes < im thic	k.			
D: "Sand dunes" (Maximum Land Class VI)		D	unes and/or s	and she	ets > 1 m thick	:	
Groundwater Depth							
Saline Groundwater> EC>1.5mm	mhos/cm						
W ₃ : < 1.20m deep							
W ₂ : 1.20 - 2m deep							
W ₁ : 2 - 3m deep							
W ₀ : 3 - 5m deep							
Sweet Groundwater> EC<1.5mm	nhos/cm						
W_3 : < 75cm deep							
W ₂ :: 0.75 - 1.20m deep							
W ₁ : 1.20 - 2m deep							
W ₀ : 2 - 5m deep							
Other Drainage Limitations							
O ₁ : between 1.20-2m, presence	e of clay par	n or a horiz	on of permea	bility <).imm/hr (C)	ass I without	W₀, II with W₀)
O ₂ : same between 0.75 - 1.20r	n (Class II v	without W1	, III with W ₁))			
O ₃ ; same between 0.20 -0.75π	ı (Class III v	without W2	, V with W2)				
Ponding Hazard				Rat	ing of Pondir	超	
P ₁ : "Slight limitation" by	ponding (M	laximum L	and Class II)		<u>Rec</u>	urrent freque	ncy
P ₂ : "Moderate limitation"	(Maximum	Land Clas	s III)	Dur	ation 1-2	yr <u>3-5vr</u>	6-10yr
D . "Course limitation" (A.	faviraum la	nd Class V	1	12	make D	D.	

 P_3 : "Severe limitation" (Maximum land Class V)

Flooding Hazard
F1: "Slight" Class II (frequency 6-10yr)

F2: "Moderate" Class III (frequency 3-5yr) F3: "Severe" Class V (frequency 1-2yr)

Table D-4-2 Land Classification and Its Major Restrictions

Land Classification of Vastegan

Class	Area (ha)	Ratio (%)
i	496.84	13.6%
II S	232.94	6.4%
II ST	92.60	2.5%
n sw	546.16	15.0%
III S	366.80	10.1%
III T	33.26	0.9%
III W	1,587.98	43.5%
III TW	169.41	4.6%
IV S	76.91	2.1%
IV T	3.65	0.1%
VI RW	41.38	1.1%
I	496.84	13.6%
II ·	871.70	23.9%
Ш	2,157.45	59.1%
IV_	80.56	2.2%
VI RW	41.38	1.1%
Total	3,647.93	100.0%

Class	Area (ha)	Ratio (%)		
II ST	252.89	10.3%		
III ST	0.00	0.0%		
III ST + IV ST	1,014.94	41.4%		
IV S	630.67	25.7%		
IV ST	555.85	22.6%		
11	252.89	10.3%		
III	0.00	0.0%		
III+IV	1,014.94	41.4%		
ΓV	1,186.52	48.3%		
Total	2,454.35	100.0%		

Land Classification of Sarbaz

Class	Area (ha)	Ratio (%)
II ST	1,129.99	21.0%
THS	98.11	1.8%
III ST	2,156.54	40.0%
IVT	371.20	6.9%
IV ST	1,487.66	27.6%
IV ST - VI ST + III ST	0.00	0.0%
VI RW	12.22	0.2%
VIR ·	133.79	2.5%
H	1,129.99	21.0%
Ш	2,254.65	41.8%
IV ·	1,858.86	34.5%
IV-VI+III	0.00	0.0%
VI RW	12.22	0.2%
VI R	133.79	2.5%
Total	5,389.51	100.0%

Land Classification of Tangsorkh

Class	Area (ha)	Ratio (%)
II TW	29.12	2.4%
III T	120.32	9.8%
III ST	544.94	44.4%
III TW	167.74	13.7%
IV T	258.71	21.1%
VI RW	107.69	8.8%
II	29.12	2.4%
Ш	833.00	67.8%
IV .	258.71	21.1%
VI	107.69	8.8%
Total	1,228.52	100.0%

(Note) IV ST - VI ST + III ST (1,084.46ha) omitted due to outside of the area.

Class	Area (ha)	Ratio (%)		
II ST	68.59	12.8%		
III S	83.82	15.7%		
ШT	24.96	4.7%		
III ST	180.46	33.8%		
IV T	176.36	33.0%		
VIT		0.0%		
II	68.59	12.8%		
III	289.24	54.1%		
ĮV	176.36	33.0%		
VI		0.0%		
Total	534.19	100.0%		

(Note) 1) VI T is neglected in this table, but it covers the area extensivey.

2) Detail descriptions are in Table D-4-3 (1) to (5)

3) Location of above classified lands is presented in Figure 3-6 to 3-10 in BATABASE MAPS.

Table D-4-3(1) Land Classification Mapping for Irrigation in Vastegan (1/2)

Row	Land classification	class	soil	soil	Area	%	Description
	symbols	. &	series	napping	(ha)		
		subclass	No.	 unit			
1	3H A-Eo	Į.	4	4.1	2 48. 7 2	6.82	moderate permeability, heavy surface soil texture, 0-2% slope.
2	3H A-Eo	I	5	5.1	248.12	6.80	Moderate permeability heavy surface soil texture 0-2% slope.
3	4V1-p A-Eo	IIS	1	1.1	56.97	1,56	Slow permeability, very heavy surface soil texture, weathered calcareous marls (paralithic) within depth of 80-120cm., 0-2% slopes
4	3H2 - Z A - E0	IIS	5	5.2	175.97	4.82	Moderate permeability, heavy surface soil texture, more than 75% fine and coarse gravels within depth of 50-80 cm., 0-2% slope.
5	4V A - E0 - O1 - W0	– IISW	6	6.1	546.16	14.97	Slow permeability very heavy surface soil texture. 0-2% slope, slight hydromorphy limitaion, ground water table 2-3m.
6	4V (g) 1 - P Bal - E1	IIST	1	1.2	92.60	2.54	Slow permeability very heavy surface soil texture, 3-15% coarse gravels in topsoil, weathered
							calcarous marls (paralithic) within depth of 80-120cm., 2-5% overall and 1-2% transversal slope, slight microrelief and water erosion.
7	2GMg Aa - E0	IIIS	3	3.1	366.80	10.05	Rapid permeability, 35-75% fine and coarse gravel in subsoil, medium surface soil texture, 15-35% coarse gravels in topsoil, 0-2% overall and 1-2%
						 	transversal slopes.
8	4V (g) Bb1 - Ē1	ніт	1	1.3	33.26	0.92	Slow permeability, very havery surface soil texture, 3-15% coarse gravels in topsoil, 2-5% overall and transversal slope, slight
				1			micorelief and water erosion.

Table D-4-3(1) Land Classification Mapping for Irrigation in Vastegan (2/2)

Row	Land classification	class	soil	soil	Area	%	Description
	symbols	&	series	napping	(ha)		
	!	subdass	No.	unit			
9	4V A - E0 - O2 - W1	IIIW	6	6.2	1299.9	35.63	Slow permeability, very heavy surface soil texture, 0-2% slope, moderate hydromorphy limitation, slightly high groundwater table (1.2-2m).
10	4V A - E0 - O3 - W1	IIIW	6	6.4	232.44	6.37	Slow permeability very heavy surface soil texture, 0-2% slope, severe hydromorphy limitalion, slightly high groundwater table (1-20-2m).
11	4V A - E0 - O2 - W2	IIIW	6	6.3	55.64	1.53	Slow permeability very heavy surface soil texture, 0-2% slope, moderate hydromorphy limitaion, moderately high groundwater table (0.8-1.20cm).
12	3H (g) A1 - E2 - W0 - F2	IIITW	4	4.2	169.41	1.64	Moderate permeability, heavy surface siol texture, 3-15% coarse gravels in topsoil, 0-2% slope, moderate water erosion, groundwater table (2-3m), moderate flooding hazards.
13	1GLG Bal - El	IVS	2	2.1	76.91	2.12	Very Rapid permeability, 35-75% fine and coarse gravels in subsoi, light surface soil texture, 2-5% overall and 1-2% transversal slopes, slight microrelief and water erosion.
14	IV T	ΙV	т		3.65	0.10	Hills
15	VI RW	VI	RW		41.38 3647.93	<u> </u>	Gravelly and stony River wash Total

Table D-4-3(2) Land Classification Mapping for Irrigation in Chaman Goli-Bazoft (1/2)

Row	Land classification	class	soil	soil	Area	%	
	symbols	&	series	mapping	(ha)		Description
		subclass	No.	unit			
							Slow permeability, very heavy
1	4V (g) Ba1 - E1	IIST	3	3.1	43.43	1.77	surface soil texture, 3-15% coarse
	Bai-Bi				:		gravels in topsoil, 2-5% overall
							and 1-2% transversal slopes, slight microrelief and water erosion.
:	437/431 7		,				Slow permeability very heavy surface soil texture, 3-15% coarse
2	$\frac{4V(g)1 - Z}{Ba1 - E1}$	IIST	3	3.2	209.46	8.53	gravels in topsoil, more than 75%
			• •				fine and coarse gravels within
							depth of 80-120 cm., 2-5% overall
						1.	and 1-2% transversal slopes, slight
							microrelief and water erosion.
							Slow permeability, 15-35% fine
3	4gVS Bc2 - E2	IIIST	1	1.1	•	-	and eoares gravels in subsoil, very
	DCZ - CSZ			:			heavy surface soil texture, 15-35% stones in topsoil, 2-5% overall and
. •							5-8% transversal slopes, moderate
							microrelief and water erosion.
							Slow permeability, 35-75% coarse
i	4GVB1 - P Bb2- E2	īvs	2	2.1	630.67	25.70	gravels and stones in subsoil, very
7	Bb2- E2	113	2	20.1	W0.07	23.70	heavy surface soil texture, 35-75%
							boulders in topsoil, weathered
							calcareous marks within depth of
		 					80-120 cm, 2-5% overall and transversal slopes, moderate
							microrelief and water erosion.
		<u> </u>	·				Slow permeability, 15-35% fine
5	4gVB	IVST	1	1.2		:	and coarse gravels in subsoil, very
5	Ec2- E3	1421		1.2	•		heavy surface siol texture, 35-75%
1		 		}			boulders in topsoil, 12-25% overall
				•			and 5-8% transversal slopes,
							moderate microrelief, severe water
							erosion.

Table D-4-3(2) Land Classification Mapping for Irrigation in Chaman Goli-Bazoft (2/2)

Row	Land classification	class	soil	soil	Area	%	
	symbols	&	series	mapping	(ha)		Description
		subclass	No.	unit			
							Slow permeability, 35-75% fine
6	4GVB1 - P	IVST	2	2.2	555.85	22.65	and coares gravels in subsoil, very
-	Cc3 - E2						heavy surface soil texture, 35-75%
			-				boulders in topsoil, weathered
						200	calcareous marls within depth of 80-120cm, 5-8% overall and
							transversal slopes, strong
						1 11	microrelief, moderaste water
			- N				erosion.
	4.376	ШѕТ	1	1.1			
7	4gVS Bc2 - E2	+	+	+	1014.94	41.35	Association of 1.1.+1.2
	+ 4gVB	IVST	1	1.2			
	FØ - E3				2454.35	100.00	Total

Table D-4-3(3) Land Classification Mapping for Irrigation in Sarbaz (1/3)

	· .			V-1			
Row	Land classification	class	soil	soil	Area	%	Description
	symbols	& .	series	napping	(ha)	1.	
		subclass		unit			
·		buociass	140.	AKUE		~ 	1 1/1/200 \$ 200
	4 H Ba1-E1		- ,				slow permeability, heavy or very
1		IIST	8	8.1	713.71	11.0	heavy surface soil texture, 2-5%
	4V Ba1 - E1	IIST	7	7.1	416.28	6.43	overall and 1-2% transversal
	Da1 • L1	1101	'	/.1	410.20	0.43	slopes, slight microrelif and water
							erosion.
						-	Rapid permeability, 35-75%
							coarse gravels and stones in
2	2GHg3 - 2	шс	0		00.11	1.51	subsoil, heavy surface soil texture.
2	2GHg3 - 2 Ba1 - E1	III S	9	9.1	98.11	1.51	15-35% coarse gravels in topsoil,
							more than 75% stones and
							boulders within depth of 25-50
* *							cm., 2-5% overall and 1-2%
						*	transversal slopes, slight microre
							lief and water erosion.
							Slow permeability, 15-35% coarse
							gravels and stones in subsoil,
	4 gHg	UTOTT!	2				heavy surface soil texture, 15-35%
3	4 gHg Bc2 - E2	HIST	_ Z	2.1	•	-	coarse gravels in topsoil, 2-5%
							overall and 5-8% transversal
							slopes, moderate microrelief and
			-		:		water erosion.
							Slow permeability, heavy surface
							soil texture, 15-35% coarse gravels
	4 Hg3 - p	III CYT		4.			in topsoil, weathered calcareous
+	4 Hg3 - p Bb1 - E1	ш ѕт	4	4.1	*	•	marls (paralithic) within depth of
					. }		25-50cm., 2-5% overall and
							transversal slopes, slight
1.5							microrelief and water erosion.
•							Slow permeability, heavy surface
]			soil texture, 15-35% stones in
-	4 HS3 - P	HICT	4	4.3	170 12	2 27	topsoil, weathered calcareous
5	Cc2 - E2	HIST	4	4.2	179.13	2.77	marks (paralithic) within depth of
					.	•	25-50 cm., 5-8% overall and
							transversal slopes, moderate
							microrelief and water erosion.

Table D-4-3(3) Land Classification Mapping for Irrigation in Sarbaz (2/3)

Row	Land classification	class	soil	soil	Area	%	Description
	symbols	&	series	mapping	(ha)		
		subclass	No۰	unit			
4							Slow permeability, 15-35%
							coarse gravels in subsoil, very
	4 ovo 2 - P						heavy surface soil texture, 15-35%
6	4 gvg 2 - P Bb - Cb1 - E1	ПІЅТ	5	5.1	104.34	1.61	coarse gravels in topsoil,
				.			weathered calcareous marks
						· .	(paralithic) within depth of 50-80
							cm., 2-5% to 5-8% overall and
							2-5% transversal slopes, slight
•							microrelief and water erosion.
				_			Slow permeability, 35-75%
							coarse gravels and stones and
7	4GVg3 - Z Bb2 - E2	ШЅТ	6	6.1	342.92	5.3	boulders in subsoil, very heavy
,	Bb2 - E2	шы	υ,	0.1	342.92	J.J	surface soil texture, 15-35% coarse
							gravels in topsoil, more than 75%
					: '		stones and boulders within depth of 25-50 cm., 2-5% overall and
							transversal slopes, moderate
							microrelief and water erosion.
							Slow permeability, 15-35% coarse
							gravels in subsoil, very heavy
							surface soil texuture weathered
8	4gV1 - P Bc - Dc2 - E2	IV T	5	5.2	371.2	5.74	calcareous marls (paralithic)
	Bc - Dc2 - E2						within depth of 80-120cm. 2-5 to
		}					8-12% overall and 5-8%
							transversal slopes, moderate
	,					•	microrelief and water erosion.
							Slow permeability, heavy surface
							soil texture, 15-35% coarse
	4Uo4 D						gravels in topsoil, weathered
9	4Hg4 - P Cc - Dc3 - E2	IV ST	3	3.1	1235.33	19.08	,
						19.2	within depth of 10-25 cm., 5-8 to
							8-12% overall and 5-8%
	÷ .						transversal slopes, strong
							microrelif, moderate water
			1				erosion.

Table D-4-3(3) Land Classification Mapping for Irrigation in Sarbaz (3/3)

Row	Land classification	class	soil	soil	Area	%	Description
	symbols	&	series	napping	(ha)		
		subclass	No.	unit			
					:		Slow permeability, 15-35% coarse
	all that				· :		gravels in subsoil, very heavy
10	4gVG1 - P Db - Dc2 - E3	IVST	5	5.3	252.33	3.89	surface soil texture, 35-75% coarse gravels in topsoil, weathered
	D0 - DC2 - E3						calcareous marks (paralithic)
						-	within depth of 80-120cm., 8-12%
							overall and 2-5% to 5-8%
			-				transversal slopes, moderate microrelief, severe water erosion.
					· · · · · ·		Slow permeability, 35-75% stones
		IV -					and boulders in subsoil, very
11	4GVB1 - Z Ec3 - E2	VIST	1	1.1	_	_	heavy surface soil texture, 35-75% Boulders in topsoil, more than
	Ec3 - E2					,	75% stones and boulders within
							depth of 80-120 cm., 12-25%
							overall and 5-8% transversal
							slopes, strong microrelief,moderate water
				1 .			erosion.
		Ŀ	.7		€	75	-
12	4 GVB1 - Z Ec3 - E2	S III	1+2	1.1+2.1	1084.60	16.75	
	+	IV - VIST + III ST		_	_		Association of 1.1 + 2.1
	4gHg Bc2 - Ec	VIS					
	BCZ - EC	≥				·.	
		<u></u>	\		5	.	
13	4Hg3 - P	III ST	+ 5	+ 5.1	530).15	23.64	
	+ +	+	•4	4.	-	·	Association of 4.1 + 5.1
	4gVg2 - P Bb1 - Cb1 - E1	IIIST					
	Bb1 - Cb1 - E1					٠	
14	VI	VI	RW	 	12.22	0.18	Gravelly and stony River wash
15	\overline{RW}	VI	R		133.79	2.08	Rocky mountaions
1.7	VI R					100	
					6474.1	100	TOTAL

Table D-4-3(4) Land Classification Mapping for Irrigation in Tang Sorkh (1/2)

Row	Land classification	class	soll	soil	Area	%	
	symbols	&	series	mapping	(ha)		Description
		subclass	No.	unit			
1	3M A1- E1 - W1 - O1 - F1	IITW	5	5.1	29.12	2.37	Moderate permeability, medium surface soil texture, 0-2% slope, slight microrelief and water erosion, slightly high ground water
		:.					table (120-2m), slight hydromorphy and flooding limitations.
							Moderate permeability, heavy
2	3H (g) Bb2 - E2	mr	3	3.1	120.32	9.75	surface soil texture, 3-15% coarse gravels in topsoil, 2-5% overall
	502 55			-			and trasversal slopes, moderate microrelief and water erosion.
3	3 g H g Bc2 - E2	III ST	1	1.1	86.51	7.04	Moderate permeability, heavy surface soil texture, 15-35% coarse gravels in subsoil and topsoil, 2-5% overall and 5-8% transversal slopes, moderate microrelief and
							water erosion.
4	3GHg Ba1 - E2	IIIST	2	2.1	40.49	3.3	Moderate permeability, 35-75% coarse gravels in subsoil, heavy surface soil texture, 15-35% coarse gravels in topsoil, 2-5% overall and 1-2% transversal slopes, slight
							microrelief, moderate water erosion.
5	3GHg Bb1 - E2	IIIST	2	22	154.35	12.56	Moerate permeability, 35-75% coarse gravels in subsoil, heavy surface soil texture, 15-35% coarse gravels in topsoil, 2-5% overall
							and transversal slopes, slight microrelief, moderate water erosion.
6	3GHg1 - Z Bbt2 - E2	IIIST	2	2.3	73.43	5.98	Moderate permeability, 35-75% coarse gravels in subsoil, heavy surface soil texture, 15-35% coarse gravels in topsoi, more than 75%
							coarse gravels within depth of 80-120 cm., 2-5% overall and transversal terraced slopes,
							moderate microrelief and water erosion.
				D-	96		

Table D-4-3(4) Land Classification Mapping for Irrigation in Tang Sorkh (2/2)

Row	Land classification	class	soil	soil	Area	%	I
						, ,,	The construction
	symbols	&	series	mapping	(ha)		Description
		subclass	No.	unit			
7	4GVg2 - Z Bb2 - E2	mst	4	4.1	190.16	15.48	Slow permeability 35-75% coarse gravels and stones in subsoil, very heavy surface soil textuure, 15-35% coarse gravels in topsoil,
							more than 75% coarse gravels within depth of 50-80 cm., 2-5% overall and transversal slopes, moderate microrelief and water erosion.
8	3M A2-E2-W0-F2	штw	5	5.2	167.74	13.7	Moderate permeability, medium surface soil textue, 0-2% slopes, moderate microrelief and water
							erosion, groand water table 2-3m., moderate flooding hazards.
9	3GVS4 - P Cd3 - E2	IVT	6	6.1	258.71	21.05	Moderate permeability, 35-75% coarse gravels in subsoil, very heavy surface soil texture, 15-35%
							stones in topsoil, weathered shale within depth of 10-25cm., 5-8%
							overall and 8-12% transversal
			-				slope, strong microrelief, moderate water erosion.
10	VI RW	VI	RW		107.96	8.77	Cravelly & stony river washes
			·—		1228.52	100	Total

Table D-4-3(5) Land Classification Mapping for Irrigation in Zeras (1/2)

	<u> </u>	-			. .		<u>. </u>
Row	Land classification	class	soil	soil	Area	%	Description
	symbols	&	series	mapping	(ha)		
		subclass	No.	ùnit			
1	4H(S) Bal-E1	IIST	2	2.1	68.59	12.84	Slow permeability, heavy surface soil texture,3-15% stones in topsoil, 2-5% overall&1-2% transversal slopes, slight microrelief and water erosion.
2	4Hg Bal-E1	IIIS	3	3.1	27.21	5.09	slow permeability, heavy surface soil texture, 15-35% coarse gravels in topsoil, 2-5% overall & 1-2% transversal slopes, slight microrelief and water erosion.
3	4GHS3 - Z Ba1 - E1	IIIS	1	1.1	56.61	10.6	Slow permeability, 35-75% stones and boulders in subsoil, heavy surface soiltexture, 15-35% stones in topsoil, more than 75% stones
							and boulders within depth of 25-50 cm, 2-5% overall and 1-2% transversal slopes, slight microrelief and water erosion
4	4H(S) Bb1-E2	IIIT	3	3.2	24.96	4.67	slow permeability, heavy surface soil texture, 3-15% stones in topsoil, 2-5% overall and transversal slopes, slight
							microrelief, moderate water erosion.
5	4HS Cb2-E2	IIIST	2	2.2	47.3	8.85	Slow permeability, heavy surface soil texture, 15-35% stones in topsoil, 5-8% overall and 2-5% transversal slopes, moderate
			 		·		microrelief and water erosion. slow permeability, heavy surface
6	4HS1 - Z Bc2 - E2	IIIST	3	3.3	31.29	5.86	soil texture, 15-35% stones in topsoil, more than 75% coarse gravels and slones, within depth of 80-120 cm., 2-5% overall and
		140 and 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					5-8% transversal slopes, moderate microrelief and water erosion

Table D-4-3(5) Land Classification Mapping for Irrigation in Zeras (2/2)

Row	Land classification	class	soil	soil	Area	%	Description
	symbols	&	series	mapping	(ha)		
		subclass		unit			
							Slow permeability, , 35-75%
7	4GHS3 - Z	IIIST	1	1.2	101.87	19.07	stones & boulders in subsoil,
ĺ	Bb1-E2		•	1.2	101.0.	17.0.	heavy surface soil texture 15-35%
							stones in topsoil, more than 75%
							stones & boulders within depth
] ,			of 25-50cm, 2-5% overall and
							transversal slopes, slight
,							microrelief, moderate water
							erosion
							Slow permeability, heavy surface
8	4Hg Bd3-E3	IVT	- 3	3.5	76.16	14.26	soil texture,15-35% coarse gravels
	Bd3-E3	* * *		""		1	in topsoil, 2-5% overall and
							8-12% transversal slopes, Strong
		.					microrelief and water erosion.
							slow permeability, heavy surface
9	4Hg1- Z	IVT	3	3.4	100.2	18.76	soil texture, 15-35% coarse
	Cd2 - E2					2011	gravels in topsoil, move than
			•				75% coarse gravels and stones
							within depth of 80-120cm., 5-8%
							overall and 8-12% transversal
							slopes, moderate microrelief and
			_				water erosion.
							Slow permeability, heavy surface
10	4H(g) G3 - F3	VIT	2	2.3			soil texture, 3-15% coarse gravels
10	G3 - E3	`	~		į .		in topsoil, 40-70% slope, strong
							microrelief and water erosion.
					534.19	100.00	Total

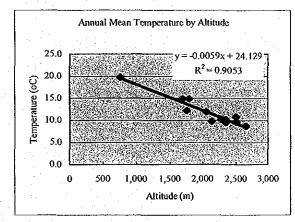
D.5 Soil Erosion (Phase-2)

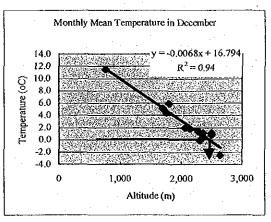
	Meh	Aba	Aza	Dey	Bah	Esf	Far	Ord	Kho	Tir	Mor	Sha	Total
	(Oct)	(Nov)	(Dec)	(Jan)	(Feb)	(Mar)	(Apr)	(May)	(Jun)	(Jul)	(Aug)	(Sep)	
/astegan													
Precipitation		#0.5										- 4	
Rain fall (mm)	17.8	72.7	137.3	117.8	131.8	159.6	85.5	43.7	3.8	3.5	1.6	0.0	775.
Rainy day (days) Temperature	1	3	4	4	4	5	. 5	4	1	0	1	0	3
Tmax (°C)	18.1	10.6	3.5	0.5	2.6	7.4	13.0	18.9	25.4	28.7	28.3	24.5	15.
Mean (°C)	8.5	2.6	-3.3	-6.4	-4.2	0.9	6.2		4				
· · · · · · · · · · · · · · · · · · ·		ι		-13.2				11.0	15.9	.19.3	18.6	14.2	6.
Min (°C)	-1.2	-5.4	-10.1		-11.0	-5.6	-0.6	3.0	6.4	9.9	8,9	3.8	-1.
Ref. ET ₀ (mm)	91.1	54.6	33.8	27.6	34.7	58.6	78.9	127.1	154.5	163.7	153,5	127.2	1105.
Frost days (days)		·····				·	·					- 1	13
Chaman Goli-Bazoft Precipitation										100			
Rain fall (mm)	23.0	121.1	278.9	253,4	206.0	300.3	173.8	116.0	0.7	0.0	0.3	1.0	1474
Rainy day (days)	2	5	9	10	13	12	175.0	7	.0	0.0	0.5	. 0	14/4
Temperature			•					All Section					
Tmax (°C)	21.3	14.2	5.4	2.3	4.7	8.9	14.2	22.0	28.9	32.7	32.0	28.2	. 17
Mean (°C)	13.5	7.5	-0.5	-4.6	-1.7	3.5	9.0	15.1	20.0	23.8	23.4	19.3	-10
Min (°C)	5.7	0.7	-6.3	-11.5	-8.0	-2.0	3.8	8.1	11.0	14.9	14.7	10.3	3
Ref. ET _o (mm)	74.7	40.5	26.4	21.7	30.0	53.6	90.0	136.1	154.5	166.8	150.0	_	1058
Frost days (days)		. 40.5	20.4	21.7	30.0	. 55.0	70.0	130.1	1.34.2	100.6	130.0	114.3	
Sarbaz	•				<u></u>	 -							13
Precipitation Precipitation					· .			•	*.	1. 1:			
Rain fall (mm)	5.3	46.3	107.1	108.8	114.9	128,4	117.5	38.5	15.3	8.7	1.6	0.0	692
Rainy day (days)	0	- 2	4	4	4	5	4	2	0	0	0	0.0	2
Temperature			٠.		3.57			-	15.		44.		
Tmax (°C)	17.6	11.9	5.9	2.4	5.4	9.4	14.6	20.1	25.8	28.8	27.6	22.1	16
Mean (°C)	8.3	3.3	-1.6	-5.2	-2.1	2.7	7.2	11.8	16.2	19.0	17.8	12.9	7
Min (°C)	-1.1	-5.4	-9.0	-12.8	-9.6	-4.1	-0.3	3.5	6.6	9.1	8.0	3.6	-1.
Ref. ET ₀ (mm)	111.0	66.9	43.5	38.1	43,1	54.9	93.0	127.1	158.1	179.8	179.8	151.8	1247
Frost days (days)							23.0	.~			177.0	1.01.0	1247
langsorkh													
Precipitation						100					:		
Rain fall (mm)	11.2	93.1	196.0	211.3	208.8	216.1	150.9	57.9	2.5	0.5	2.0	0.3	1150.
Rainy day (days)	2	5	7	9	10	10	9	. 5	1	. 0	0	0	5
Temperature				•			4.					11.	
Tmax (°C)	20.2	13.1	7.8	4.2	5.7	9.2	16.1	22.2	28.4	31.1	30.3	26.6	17.
Mean (°C)	12.4	6.5	2.2	-0.9	0.6	4.3	9.8	14.9	19.7	23.0	22.2	18.2	11
Min (°C)	4.6	-0.2	-3.5	-5.9	-4.6	-0.7	3.5	7.5	- 11.0	14.9	14.0	9.8	4
Ref. ET ₀ (mm)	74.7	40.5	26.4	21.7	30.0	53.6	90.0	136.1	154.5	166.8	150.0	114.3	1058.
Frost days (days)											:		5
Zeras .													
Precipitation												- N	* . *.
Rain fall (mm)	7.0	55.6	151.2	142.7	124.3	146.0	99.5	43.3	2.2	0.0	0.8	0.0	772
Rainy day (days)	l	4	6	7	7	9	7	4	0	. 0	0	0	4
Temperature										1.5			
Tmax (°C)	23.9	18.4	14.5	12.7	10.9	15.1	24.0	26.2	35.8	37.6	38.4	35.2	24
Mean (°C)	17.5	12.5	9.1	6.5	7.2	10.0	16.8	20.4	26.1	28.5	29.0	25.5	17
Min (°C)	11.0	6.6	3.7	0.2	3.5	4.8	9.6	14.5	16.4	19.4	19.5	15.7	10
Ref. ET ₀ (mm)	108.2	8.16	38.4	37.8	49	1.88	117.9	165,9	195.3	219.2	197.8	151.2	1425
V 1				-	-	-							

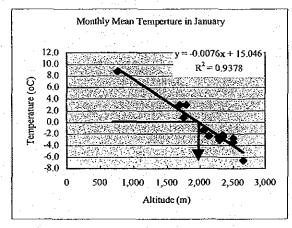
Frost period

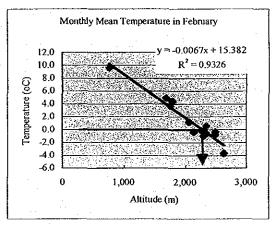
Table D-5-1-2 Relation between Altitude and Temperature

Station	Elevation					4	Mean Te	mperatu	ire (°C)					·
	(m)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Karkhane-Ghand-Yasuj	1,760	0.8	3,7	7.5	11.4	16.5	21.0	23.2	22.0	18.5	9.6	7.9	4.4	12.2
Yasuj	1,800	3,0	4.4	8.0	13.6	18.6	23.5	26.8	26.0	22.0	16.2	10.3	5.9	14.9
Hanna	2,350	-2.5	0.6	5.3	9.9	14.5	18.9	21.7	20.5	15.5	10.9	6.0	1.1	10.2
Lordjan	1,700	3.0	4.9	9.0	13.6	18.7	23.9	25,7	25.8	21.7	16.2	10.5	5.1	14.9
Mehrgerd	2,350	-2.2	-0.6	4.7	7.9	13,2	17.8	21.1	19,5	15.8	11.4	5.8	0.6	9,6
Adl	2,280	-2.6	-0.3	4.8	10.2	14.2	18.7	21.8	21.0	16.5	11.1	6.3	1.3	10.2
Emam-gheis	2,300	-3.1	-1.0	4.1	9.4	14.2	19.1	22.5	21.8	17.4	11.6	5.8	-0.1	10.1
Edalat-organ	2,500	-3.4	-0.8	3.2	8.7	13.5	18.6	21.9	20.4	17.1	11.1	5.4	8.0	9,7
Boroojen	2,140	-2.4	-0.4	4.3	9.7	14.1	18.7	22.1	20.9	16.4	11.1	6.3	1.8	9,8
Shahrekord	2,060	-1.5	1.2	6.1	10,6	15.9	20.8	24.1	23,2	18.8	13.2	7.6	2.0	11.9
Kohrang	2,650	-6.6	-3.7	1.5	7.0	13.1	18.0	21.8	21.4	17.2	11.5	5.4	-2.5	8.7
Semirom-olia	2,500	-2.8	-0.4	5,2	10.4	14.4	20,2	22.8	21.4	18.0	12.6	6.4	1.1	10.8
Izeh	764	8.8	9.6	12,3	19.2	22.8	28.5	30.9	31.4	27,8	19.8	14.9	11.5	19.8









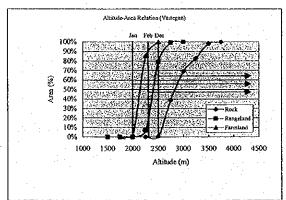
Altitude at 0°C of mean temperature

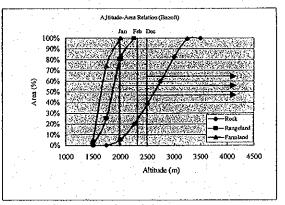
December 2,470 m January 1,980 m February 2,296 m (Note)

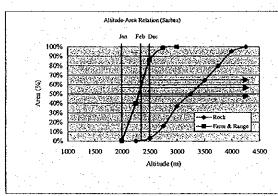
1) referring to Table C-2-5, Annex C.

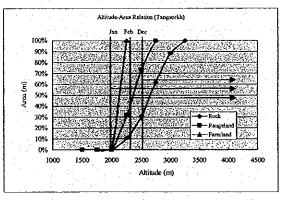
2) Data of Khafr, Naghsh-bahram and Chalshotor have been omited because far from trend.

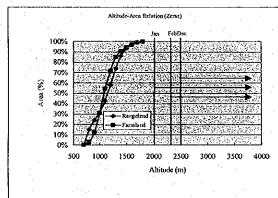
Table D-5-1-3 Estimation of Frost Period of Farmland and Rangeland by Alutitude

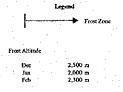












Surbaz Frost Ares

Tangsorkh Front Area

Table D-5-1-4 Rainfall Duration Analysis in the Study Area

Duration and rainfall intensity equation has been analyzed utilizing the relation of short duration and rainfall intensity in Yasuj. Its relation is as follows:

Relation of Duration and Rainfall Intensity in Yasuj

		· · · · · · · · · · · · · · · · · · ·								· · · · · · · · · · · · · · · · · · ·	
Return Period			11.41		Rainfall	Intensity ((mm/hr)				
(yr)	15 min	30 min	45 min	60 min	90 min	120 min	180 min	240 min	300 min	360 min	Daily
2	21.8	14.5	11.8	9.9	8.6	7.9	6.7	6.0	5,4	5,1	3.0
5	31.1	19.7	16.0	14.0	11.8	10.8	9.0	7.9	7.2	6.7	4.0
10	37.3	23.2	18.7	16,6	14.0	12.8	10.5	9.2	8.3	7.8	4.6
25	45.1	27.6	22.2	20.0	16.8	15.2	12.4	10.8	9.8	9.2	5.4
Return Period				W.,	Rainfa	ii Amount	(mm)				
(ут)	15 min	30 min	45 min	60 min	90 min	120 min	180 min	240 min	300 min	360 min	Daily
2	5.5	7.3	8.9	9.9	12,9	15.8	20.1	24.0	27.0	30.6	72
5	7.8	9.9	12.0	14.0	17.7	21.6	27.0	31.6	36.0	40.2	95
10	9.3	11.6	14.0	16.6	21.0	25,6	31.5	36.8	41.5	46.8	110
25	11.3	13.8	16.7	20.0	25.2	30.4	37.2	43.2	49.0	55.2	130

For estimating short duration rainfall Rt from RT, Sherman type equation is applied as below.

$$Rt = RT \left(\frac{t}{T}\right)^k$$

Where, RT: Thour rainfall (mm)

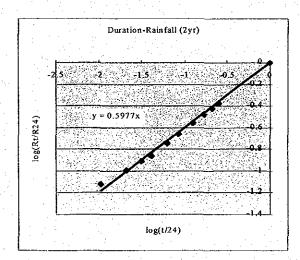
Rt: t hour rainfall (mm)

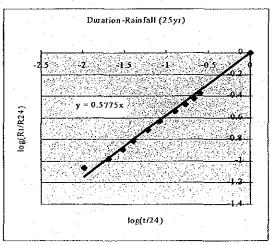
k: constant

Constant k is generally between 1/2 to 1/3, and 1/2 (0.5) is generally applied in Japan. Above equation can be converted to following equation:

$$Log\left(\frac{Rt}{RT}\right) = kLog\left(\frac{t}{T}\right)$$

When analyzing return period for two cases of 2 years and 25 years, constant k can be defined at 0.6 in Yasuj as below.





Relation of Duration and Rainfall Intensity in Yasuj

Table D-5-1-5 Computation of Hourly Rainfall and Its Energy and Erodibility Index

		Daily R	ainfall					100					`. · .	Compu	utation	of Rt (cm/hr)						2					
				· 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
da	у_	R(mm)	R(cm)	0.15												0.03					0.03	0.03	0,03	0.03	0.03	0,03	0,03	
	1	71.3		1.06				0.35								0,23			0.21	0.21	0.2	0.2	0.19	0.19	0,19	0.18	0.18	٠
	2	35.7	3.57	0.53	0.27	0.22	0.19	0.17	0.16	0.15	0,14	0.14	0.13	0.12	0.12	0.12	0,11	0.11	11.0	0.1	0.1	0.1	0.1	0.1	0.09	0.09	0.09	
	3) 0	. 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	. 0	. 0	0	. 0	
	4	(0	0	0	. 0	0	0	0	0	0	0	0	. 0	0	. 0	0	0	: 0	0	0	0	0	0	0	0	
	5	(. 0	0	0	; 0	Ú	0	0	0	0	0	0	0	0	. 0	0	. 0	. 0	0	0	0	0	. 0	0	0	
	6	. (. 0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	Û	O,	0	0	. 0	0	0	0	Û	0	
	7	C		. 0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	Ð	0	. 0	0	0	. 0	0	0	
	8	44.6			0.34	0.28	0.24	0.22	0.2	0.19						0,14		0.14				0.12	0.12		0.12	0.11	0.11	
	9	121.9				0.76	0.66		0.55					0.42		0.4	0.38	0.37	0,36	0.35	0.35	0.34	0.33	0,32	0.32		0.31	
	10	50.3																			0.14		0,14	0.13	0.13	0.13	0.13	
	11	74.6		1.11				0.36		0,31											0.21	0.21	0.2	0.2	0.19	0.19	0.19	
	12	2.1						0,01	0,01			0.01	0.01	0.01		0.01	0.01	0.01	0,01	0.01	0,01	0,01	10.0	0.01	0.01	10,0	0.01	
	13	C		. 0	0	0	. 0	0	. 0	0	0	. 0	0	0	. 0	0	O	0	0	0	0	. 0	0	. 0	0	0	. 0	
	14	1	0.1		0.01	0,01	0,01	. 0	0	. 0	0	0	.0	0	. 0	. 0	. 0	0	. 0	. 0	0	. 0	0	0	. 0	. 0	0	
	15	2.6	0.26		0,02	****	0.01	0.01	0.01	0,01	0.01		0.01		0.01			0.01	0.01	0.01	0.01	0.01	0,01	0.01	0.01	0,01	0.01	
	16	4		0.06	0.03	***	0.02	0.02	0.02	0.02		0.02	0,01	0.01	0.01	0.01	0,01	0.01	0.01	0.01	0.01	10,0	0.01	0.01	0.01	0.01	0.01	
	17	0	•	. 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	. 0	0	. 0	0	. 0	
	18			0	0	0	0	0	- 0	0	0	, 0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	
	19	0		0	0	. 0	0	0	0	0	0	. 0	0	0	0	. 0	0	0	0	. 0	0	0	0	0	. 0	0	0	
	0.0	. 0.8		0.01	0.01	0	0	0	0	0	0	0	0	0	Û	0	0	0	0	0	. 0	. 0	Û	- 0	. 0	0	. 0	
	21	0	-	: 0	0	0	Û	0	. 0	0	0	0	0	0	0	0	0	. 0	. 0	0	0	. 0	0	. 0	0	0	. 0	
	22	0	-	0	0	0	. 0	. 0	0	0	0	0	0	0	0	. 0	0	0	0	. 0	0	0	0	0	0	0	0	
	23	2.3		0.03	0.02	0.01	0.01	0.01	0.01	0,01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	10,0	10,0	0.01	0.01	0.01	10,0	0.01	10,0	0,01	0.01	
	24	0		. 0	0	. 0	. 0	0	0	0	. 0	O	0	0	0	0	0	0	- 0	0	0	. 0	0	. 0	0	0	. 0	
	25	C	, -	0	0	0	0	0	0	0	0	0	0	0	0	0	Ó	0	0	0	0	0	0	0	0	0	. 0	
	26	C	0	0	0	0	0	0	0	0	. 0	. 0	0	0	0	0	. 0	. 0	0	0	0	. 0	0	. 0	0	0	0	
	27	. 0		. 0	0	. 0	0	0	. 0	0	0	0	0	0	0	0	0	0	. 0	0	0	. 0	0	o.	0	0	. 0	
	28	4,6			0.04	0.03	0.02		0.02			0.02		0.02	0.02	0.01	0.01	0.01	0.01	10.0	0.01	0.01	0,01	0.01	0.01	0.01	0,01	
	29	0		0	0	0	0	0	0	0	. 0	0	0	0	0	, 0	. 0	0	. 0	0	0	0	0	. 0	0	0	0	
	30	2.8		0.04	0.02	0.02		0.01			10.0						0.01	10,0	0.01	0.01	0.01	0.01	0,01	0.01	0,01	0.01	10.0	
	31			0	0	0	0	0	0	. 0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	0	0	0	
		418.6	mm													100												
	٠,	R(mi6il e	attente.							100	n			e de la companya de La companya de la co	n :a:	T -€21								100				•

	R(raifall ere	odibility								Rainf	all Ene	rev of	a Unit	Raifll	E=f21	0+89le	e(It))	Rt (m	t/ha)				100	1			
day	E 160/100	E	ì	2	3	4	5	- 6	7	8	. 9	10	. 11	12	13	14	15	16	17	18	19	20	21	22	23	24	
i	12.7	1199	225	102	78.9	66.8	59	53.4	49.2	45.8	43.1	40.7	38.7	37	35,5	34.2	33	31.9	30.9	30	29.2	28.4	27.7	27	26.4	25.8	
2	2.68	505	98.4	43.7	33.6	28.3	24.9	22.4	20,6	19.1	17,9	16,9	16,1	15.3	14,7	14.1	13.6	13.1	12.7	12.3	11.9		11.3	11	10.8	10.5	
3	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	0.	. 0	0	0	0	0	0	0	0	0	
. 4	. 0	. 0	0	0	0	0	0	0	0	- 0	0	0	0	. 0	0	0	. 0	. 0	ō	0	0	ō		ō	ō	- 0	
5	. 0	0	0	. 0	0	0	0	0	0	0	· 0	0	0	0	0	- 0	Ó	. 0	0	Ó	0	· ò	. 0	ō	0	ó	
6	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	. 0	0	0	0	. 0	0	. 0	0	0	0	0	
7	. 0	. 0	0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	. 0	. 0	Ó	0	0	0	. 0	
8	4.43	669.3	129	57.6	44.3	37,4	33	29.8	27.4	25.4	23.9	22.5	21,4	20,4	19.6	18.8	18.1	17.5	17	16.5	16	15.6	15.2	14.8	14.4	14.1	
. 5	41.7	2303	422	194	151	128	113	103	94.8	88.4	83.2	78.8	75	71.8	68.9	66.4	64.1	62	60.1	58.4	56,9	55.4	54	52.8	51.6	50.5	
10	5.81	778.2	148	66.7	51.5	43.5	38.3	34.6	31.8	29.6	27,8	26.3	25	23.8	22.8	22	21.2	20.5	19.8	19.2	18.7	18.2	17.7	17.3	16.9	16.5	
. 11	14.05	1268	237	108	83.4	70.6	62.4	56.5	52	48.5	45.5	43.1	41	39.2	37.6	36.2	34,9	33,7	32,7	31.7	30.9.	30.1	29.3	28.6	28	27,4	
- 12		6.71	2.37	18.0	0.55	0.42	0.34	0.28	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.11	0.1	0.09	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.04	
13	. 0	0	0	. 0	0	0	0	0	0	0	0	0	. 0	0	0	. 0	0	0	0	0	0	0	- 0	. 0	0	0	
14	. 0	0.327	0.7	0,17	80,0	0.04	0,02	0.01	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0.1	-0.1	-0,1	-0.1	
15	. 0				0.81	0.64	0.52	0.45	0.39	0.35	0.31	0.28	0.25	0.23	0.21	0.2	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.1	
16		22.74	5.99	2.31	1.66	1.34	1,13	0.99	0.88	0.8	0.73	0.67	0.62	0.58	0.55	0.51	0.49	0.46	0.44	0.42	0.4	0.38	0.37	0.35	0.34	0.33	
17		0	0	0	0	0	0	0	0	0	0	-0	0	0	0	. 0	0	0	0	0	0	0	. 0	0	0	. 0	
18		0	0	0	0	0	0	0	0	. 0	0	0	0	0.	. 0	. 0	0	. 0	0	. 0	0	0	0	0	0	O	
19		0	0	0	0	0	0	0	. 0	0	0	Ġ	0	0	0	· 0	0	0	0	0	0	0	. 0	0	0	. 0	
· 20		-0.428		0.08	0.02	-0	-0	-0	-0	-0	-0	-0	-0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.1	-0.1	-0,1	-0.1	-0.1	-0.1	-0.1	
21		0	0	. 0	0	0	0	0	0	0	0	0	0	0	. 0	0	. 0	0	0	0	0	. 0	0	0	. 0	0	
22		0	0	0	0	0	0	0	0	0	ø	0	0	Û	. 0	. 0	0	0	0	. 0	0	. 0	0	0	0	0	
23		8.158	2.72	0.95	0.65			0.35	0.3	0.26	0,23	0.21	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.1	0.09	0.09	0.08	0.07	0.07	0.06	
24		0	0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	. 0	0	0	. 0	0	0	0	0	
25		0	0	0	0	0	0	0	0	0	0	Q	0	0	- 0	. 0	0	0	0	0	0	0	. 0	0	. 0	- 0	
26		0	0	0	0	0	0	0	0	0	0	0	. 0	0	, 0	0	0	0	0	0	0	0	0	0	. 0	0	
27		. 0	. 0	.0	0	0	0	0	0	0	0	0	0	0	. 0	0	0	0	0	0	0	÷ 0.	0	0	. 0	0	
28		28.64	7.26	2.84	2.07	1.67	1.42	1.25	1.12	1.01	0.93		0.8	0.75	0.71	0.67		0.61	0.58	0.55	0.53	0.51	0.49	0.47	0.45	0.44	
29		0	0	0	0	0	0	0	0	. 0	0	0	0	0	0	0	0	0	0	0	0	0.	- 0	. 0	. 0	0	
30		12.06				0,73	0.6	0.52	0.45	0.4	0.36			0.28	0.26	0.24	0.22	0.21	0.2	81.0	0.17	0.16	0.15	0.15	0.14	0.13	
31	_	0	0	0	0	0	0	0	0	. 0	0	0	0	0	0	0	0	0	0	0	0	0	. 0	0	: 0	0	
R=	81.41																	:									•

(Note) Computation for December in Tangsorkh.

Tabke D-5-1-6 Computation of Annual Crop Management Factors of Wheat and Dry Type Alfalfa

Arca			M	onthly a	nd Anni	ıal Rainf	ill Erosiv	ity Index	R (tf•n	ւ2/ha∙հւ	r)			
	Meh	Aba	Aza	Dey	Bah	Esf	Far	Ord	Kho	Tir	Mor	Sha	Total	
	(Oct)	(Nov)	(Dec)	(Jan)	(Feb)	(Mar)	(Apr)	(May)	(Jun)	(Jul)	(Aug)	(Sep)	(Ra)	
Vastegan	0.19	0.00	13.13	0,00	5.18	21.63	11.68	15.59	0.00	0.00	0.00	0.00	67.40	
Bazoft	0.58	44,57	51.44	16.86	5.08	10.59	8.39	2.49	0.00	0.00	0.01	0.05	140.06	
Sarbaz	0.00	0.00	32,23	0.00	1.71	34.34	4.87	5.25	0.00	0.00	0.00	0.00	78.40	
Tangsorkh	0.00	5.53	81.41	0.00	20.13	30,20	7.22	0.00	0.02	0.00	0.00	0.00	144.51	
Zeras	0.20	7.91	3.69	13.78	2.24	4.98	3.38	1.07	0.00	0.00	0.00	0.00	37.25	
•														

Computation of Annual Crop Management Factors

Area/	Meh	Aba	Aza	Dey	Bah	Esf	Far	Ord	Kho	Tir	Мог	Sha	Total	Annual
Crops	(Oct)	(Nov)	(Dec)	(Jan)	(Feb)	(Mar)	(Apr)	(May)	(Jun)	(Jul)	(Aug)	(Sep)	(Ri*Ci)	(Ca)
Wheat														
Vastegan	0.11	0.00	2,63	0.00	1.04	4.33	2.34	3.12	0.00	0.00	0.00	0.00	13.56	0.20
Bazoft	0.35	17.83	10.29	3.37	1.02	2.12	1.68	0.50	0.00	0.00	0.01	0.03	37.18	0.27
Sarbaz	0.00	0.00	6.45	0.00	0.34	6.87	0.97	1.05	0.00	0,00	0.00	0.00	15.68	0.20
Tangsorkh	0.00	2.21	16.28	0.00	4.03	6.04	1.44	0.00	0.01	0.00	0.00	0.00	30.01	0.21
Zeras	0.12	3.16	0.74	2.76	0.45	1.00	0.68	0.21	0.00	0.00	0.00	0.00	9.11	0.24
Dry Type Alf	alfa									. 1				
Vastegan	0.02	0.00	0.26	0.00	0.10	0.43	0.23	0.31	0.00	0.00	0.00	0.00	1.36	0.02
Bazoft	0.06	2.67	1.03	0,34	0.10	0.21	0.17	0.05	0.00	0.00	0.00	0.01	4.64	0.03
Sarbaz	0.00	0.00	0.64	0.00	0.03	0.69	0.10	0.11	0.00	0.00	0.00	0.00	1.57	0.02
Tangsorkh	0.00	0.33	1.63	0.00	0.40	0.60	0.14	0.00	0.00	0.00	0.00	0.00	3.11	0.02
Zeras	0.02	.0.47	0.07	0.28	0.04	0.10	0.07	0.02	0.00	0.00	0.00	0.00	1.08	0.03

Table D-5-1-7 Land Cover and Cron Management Factor in Rangeland for Present, Protection and Seeding

Surbax 50					1401	e D-s)-I-/	Lan	I COA	er an	u Cro	h ivra	mage	neni	racto	1 111 1	range	land	ULF	CSCHI	, 1100	ectivi	1 anu	Seeu.	mg				
Try by Tree Bull Graffed Standar Graffed Graffed	Area		Pre	sent Vege	tation and	Land Co	ver				Pre:	sent					after Pr	otection					after S	eeding			Ca	≕Cm*Rm/	Kr.
Vesteral B. 196 196	Veg.			Presen	t land cov	rer (%)			Veg. (Cover		Non. Veg		Bare	Veg (Cover		Non. Veg		Bare	Veg.	Caver		Non. Veg		Bare		5	20
AL 096 2290 696 796	Туре	Tree		Grass/	Rock	Stons	Litter			,	Rock	Stone	Litter	Soil		i :	Rock	Stone	Litter	Soil			Rock	Stone	Litter	Soil	Piesen	after Protecti	after Seeding
Ave. 96, 98, 93, 330, 11% 186, 95, 247, 976, 330, 11% 187, 187, 976, 247, 978, 978, 978, 978, 978, 978, 978, 97	AL	0%		16%	19%	9%			24%				7%		24%		19%		7%		24%			9%	0%		0.17	0.08	0.03
Ave. 96, 98, 93, 330, 11% 186, 95, 247, 976, 330, 11% 187, 187, 976, 247, 978, 978, 978, 978, 978, 978, 978, 97			************		8%				0%	52%	8%		7%		0%		3%	6%	7%	12%	0%	86%	3%		0%	0%			0.03
Chambar Gol-Bascell CC-1 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5%																													0.03
CC-2 756 1796 2796 1796 2796 1796 3796 4709 375 2796 1796 5796 7796 4709 3796 3796 3796 3796 3796 3796 3796 379			9%	33%	11%	14%	6%	24%	9%	35%	31%	14%	0%	24%	9%	31%	11%	14%	6%	9%	9%	00%	11%	14%	0%	0%	0.17	0,08	0.03
Art 9% 25% 20% (8%) 12% 5% 5% 20% 20% (8%) 12% 5% 5% 20% 25% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20	QC-1	-Bazoit 5%	0%	47%	25%	5%	15%	3%	5%		25%	5%	15%	3%	5%	62%	25%	5%		0%	5%	65%	25%	5%	0%	0%			0.08
Art 9% 25% 20% (8%) 12% 5% 5% 20% 20% (8%) 12% 5% 5% 20% 25% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20	QC-2			24%		5%	7%				11%	5%	7%					5%	7%	25%	13%			5%	0%		0,28		0.08
Art 9% 25% 20% (8%) 12% 5% 5% 20% 20% (8%) 12% 5% 5% 20% 25% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20	QB	4%		31%	35%	8%	6%	16%			35%	8%	6%	16%	4%	46%		8%	6%	1%	4%	53%	35%	8%	0%		0,14		0.06
Art 9% 25% 20% (8%) 12% 5% 5% 20% 20% (8%) 12% 5% 5% 20% 25% 20% 20% 20% 20% 20% 20% 20% 20% 20% 20	OP Forest					18%	17%		6%		10%	18%			7% 6%		12%	4% 18%	11%				12%				0.13		0.09
AA		4%	3%		19%			18%	7%		19%	8%	11%	15%	7%	52%	19%	8%	11%	3%	7%	66%	19%	8%	0%	0%			0.08
AG 976 1896 2195 1996 976 336 1896 1996 2196 1996 1996 2196 1996 979 1996 1996 1996 1996 1996 5896 1996 5896 1996 5896 1996 5896 1996 5896 1996 5896 5896 19	Sarbaz																									ľ			
All 0% 10% 13% 9% 13% 1% 9% 13% 1% 5% 33% 18% 5% 5% 7% 8% 13% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10	AA	0%	25%	20%	18%	/2%	5% 3%	3.4%		20%		12%	3%			35%		12%	5% 3%	5%	25%		18%	12%	0%		0,14	0.06	0,03
Ave. 7% 16% 34% 19% 12% 5% 24% 16% 34% 19% 12% 5% 24% 16% 48% 10% 12% 5% 5% 5% 16% 62% 19% 19% 19% 0% 0% 0% 0% 0% 0% 0%	ÄH	0%		31%	6%	13%	3%	27%	20%	31%	6%	13%	3%		20%	46%	6%	13%	3%	12%	20%	61%	6%	13%	0%	0%			0.04
Ave. 7% 16% 34% 19% 12% 5% 24% 16% 34% 19% 12% 5% 24% 16% 48% 10% 12% 5% 5% 5% 16% 62% 19% 19% 19% 0% 0% 0% 0% 0% 0% 0%	ÄL		18%	26%		8%	3%	38%		26%			3%				7%		3%				7%	8%	0%	0%	0.25	0.17	0,04
Ave. 7% 16% 34% 19% 12% 5% 24% 16% 34% 19% 12% 5% 24% 16% 48% 10% 12% 5% 5% 5% 16% 62% 19% 19% 19% 0% 0% 0% 0% 0% 0% 0%		0%	33%			15%	4%		33%	14%	7%	15%	4%	27%	33%	29%	7%	15%	4%	12%	33%		7%		0%	0%	0.18		0.03
Ave. 7% 16% 34% 19% 12% 5% 24% 16% 34% 19% 12% 5% 24% 16% 48% 10% 12% 5% 5% 5% 16% 62% 19% 19% 19% 0% 0% 0% 0% 0% 0% 0%	EG					11%	4%				7%	11%	4%					11%	4%				7%						0.04
Ave. 7% 16% 34% 19% 12% 5% 24% 16% 34% 19% 12% 5% 24% 16% 48% 10% 12% 5% 5% 5% 16% 62% 19% 19% 19% 0% 0% 0% 0% 0% 0% 0%	GL GE					18%	7%																		0%		0.11		0.04
AB									16%																				0.04
WL C% 18% 37% 44% 20% 65% 15% 18% 37% 44% 20% 65% 15% 18% 52% 44% 20% 65% 0.00 18% 58% 44% 20% 0.00	Tangsorkh																												
WL C% 18% 37% 44% 20% 65% 15% 18% 37% 44% 20% 65% 15% 18% 52% 44% 20% 65% 0.00 18% 58% 44% 20% 0.00	AB		23%		22%	19%	7%	8%)		21%	22%	19%	7%	8%		36%	22%	19%	0%		23%	36%	22%			0%	0.08	0.03	0.03
WL C% 18% 37% 44% 20% 65% 15% 18% 37% 44% 20% 65% 15% 18% 52% 44% 20% 65% 0.00 18% 58% 44% 20% 0.00		0%		18%			7%	43%		18%	9%						9%		7%		11%		9%	12%	0%		0.28		0.05
WL C% 18% 37% 44% 20% 65% 15% 18% 37% 44% 20% 65% 15% 18% 52% 44% 20% 65% 0.00 18% 58% 44% 20% 0.00	GB		4%	17%	22%	14%	2%	41%	4%	17%	22%[[4%]		41%		32%	22%	14%	2%	26%	4%	60%	22%		0%	0%	0,27		0.05
Ave. 1% 12% 30% 14% 14% 5% 3% 23% 13% 30% 14% 14% 5% 23% 13% 30% 14% 14% 5% 5% 23% 13% 46% 14% 5% 5% 14% 14% 5% 5% 14% 14% 0% 0% 0% 0.17 0.09 0.02 Zetas AB 0% 26% 23% 0% 4% 14% 33% 26% 23% 0% 4% 14% 33% 26% 23% 0% 4% 14% 33% 26% 38% 0% 44% 14% 18% 18% 26% 0% 0% 0% 0.22 0.16 0.00 AE 0% 18% 20% 0% 12% 13% 37% 18% 20% 0% 12% 13% 37% 18% 33% 26% 0% 0% 0.22 0.18 0.00 AP 0% 17% 20% 5% 5% 0% 12% 13% 37% 18% 20% 0% 12% 13% 37% 18% 37% 18% 37% 18% 37% 0.00 0.02 0.02 0.03 AP 0% 10% 5% 0% 5% 5% 0% 10% 5% 0% 10% 5% 0% 0% 0.22 0.18 0.00 SI 1 5% 0% 5% 0% 0% 0% 0% 0.02 0.03 0.03 0.00 0 EA 1% 0% 0% 5% 0% 0% 0% 0% 0.02 0.03 0.03 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0.02 0.19 0.00 0 EA 1% 0% 0% 0% 0% 0% 0% 0% 0.02 0.11 0.00 0 EA 1% 0% 0% 0% 0% 0% 0.02 0.02 0.11 0.00 0 EA 1% 0% 0% 0% 0% 0.02 0.02 0.11 0.00 0 EA 1% 0% 0% 0% 0% 0.02 0.02 0.01 0.00 0 EA 1% 0% 0% 0% 0% 0.02 0.02 0.01 0.00 0 EA 1% 0% 0% 0% 0% 0.02 0.02 0.01 0.00 0 EA 1% 0% 0% 0% 0% 0.02 0.02 0.01 0.00 0 EA 1% 0% 0% 0% 0% 0.02 0.02 0.01 0.00 0 EA 1% 0% 0% 0% 0% 0.02 0.02 0.01 0.00 0 EA 1% 0% 0% 0% 0.02 0.02 0.02 0.02 0.02 0.02			276		1374		470											200%					13%						0.05
Zeras AB 0% 26% 23% 0% 4% 4% 4% 33% 26% 23% 0% 4% 14% 33% 266 23% 0% 4% 14% 33% 26% 38% 0% 4% 14% 18% 26% 70% 0% 0% 022 0.16 0.00 AE 0% 18% 0% 0% 12% 13% 37% 18% 26% 0% 12% 13% 37% 18% 26% 0% 11% 22% 13% 22% 18% 0% 0% 12% 13% 22% 0% 0% 0.22 0.18 0.00 AP 0% 17% 29% 8% 6% 11% 29% 17% 29% 8% 6% 11% 29% 17% 29% 8% 6% 11% 29% 17% 20% 8% 0% 0% 0.22 0.18 0.00 SI 1 1% 0% 15% 52% 0% 10% 8% 29% 1% 55% 0% 10% 8% 29% 1% 55% 0% 0% 0% 0% 0.22 0.18 0.00 EA 1% 0% 46% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0.22 0.15 0.00 CC 1% 0% 38% 0% 13% 9% 39% 11% 36% 0% 13% 9% 39% 11% 53% 0% 13% 0% 13% 0% 13% 0% 0% 0% 0% 0.22 0.15 0.00 CC 4% 0% 25% 0% 0% 13% 9% 39% 11% 36% 0% 13% 9% 39% 11% 53% 0% 13% 9% 24% 11% 88% 0% 13% 0% 0% 0% 0.22 0.15 0.00 CC 4% 0% 0% 27% 27% 28% 0% 5% 59% 4% 22% 4% 59% 0% 13% 0% 13% 0% 13% 0% 13% 0% 0% 0% 0.22 0.15 0.00 CC 4% 0% 27% 27% 4% 5% 5% 59% 4% 22% 4% 59% 0% 59% 4% 27% 4% 5% 6% 4% 5% 6% 4% 5% 6% 4% 5% 6% 4% 5% 6% 4% 5% 0% 0% 0% 0.23 0.15 0.00 CC 4% 0% 0% 27% 27% 28% 5% 5% 5% 5% 4% 22% 4% 59% 0% 59% 4% 59% 5% 6% 4% 5% 6% 4% 5% 6% 4% 5% 6% 6% 0% 0% 0% 0.23 0.15 0.00 CC 4% 0% 0% 27% 27% 27% 39% 39% 0% 39% 13% 5% 5% 4% 5% 6% 4% 5% 6% 4% 5% 6% 4% 5% 6% 6% 5% 0% 0% 0% 0.23 0.15 0.00 CC 4% 0% 0% 27% 27% 4% 5% 5% 5% 4% 22% 4% 59% 0% 59% 4% 59% 5% 6% 5% 5% 4% 5% 6% 5% 6% 5% 6% 5% 6% 5% 6% 5% 0% 0% 0% 0.23 0.15 0.00 CC 4% 0% 0% 27% 27% 39% 32% 5% 5% 5% 5% 5% 5% 4% 5% 5% 6% 5% 5% 4% 5% 5% 6% 5% 5% 6% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5%																		14%											
AB 0% 25% 23% 0% 4% 4% 14% 33% 25% 25% 0% 18% 33% 25% 25% 0% 0% 12% 33% 25% 18% 0% 4% 14% 18% 25% 0% 0% 0% 0% 0% 0% 0% 0.22 0.15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				3070		. 470		20.0							1374	7474		1477		- 3/		25.0		1470		****		0.03	0.05
AE			26%	23%	0%	4%			26%		0%	4%	14%		26%	38%		4%	14%			70%	0%		0%		0.23	0.16	0.06
AP 0% 17% 29% 8% 9% 11% 29% 8% 6% 11% 29% 8% 6% 11% 29% 8% 6% 11% 11% 29% 8% 6% 11%					0%	12%														22%			0%		0%		0.26	0.18	0.06
S1 1% 0% 57% 0% 19% 8% 27% 1% 52% 0% 1% 35% 0% 1% 57% 0% 10% 8% 14% 1% 1% 89% 0% 10% 0% 0% 0% 0% 0%			17%		8%	6%		29%																6%	0%				0.06
LA 17% 407% 407% 57% 57% 57% 57% 407% 17% 407% 17% 407% 17% 407% 17% 407% 17% 57% 57% 57% 57% 57% 57% 57% 57% 57% 5	Sil		0%	52%		10%	8%				0%	10%	8%					10%	8%		1%		0%		0%	0%	0.22		0.07
UE 179 UV6 3078 UV6 179 179 179 179 179 179 179 179 179 179	EA	1%	0%	46%		6%	7%	40%		45%	0%	6%		40%				6%	7%				0%			0%[0.28	0.21	0.08
CH 676 CH 676 CH 676 CH 676 CH CH CH CH CH CH CH C	<u>Qu</u>																		5% 60%		170		402	13%			0.27	0.20	0,07
OB 5% 0% 32% 0% 5% 7% 51% 5% 32% 0% 5% 7% 51% 5% 32% 0% 5% 7% 5% 5% 47% 0% 5% 7% 38% 5% 90% 0% 5% 0% 0% 0% 0% 034 0.26 0.07 Ave 2% 7% 32% 2% 7% 12% 39% 9% 32% 2% 7% 12% 39% 9% 46% 2% 7% 12% 2% 7% 12% 2% 7% 06% 0% 0% 0.28 0.20 0.07		602	00/1		20%	397				2702	792	39%	3702		602	42%	70/		37%		K02		70%	302	70/				0,07
Ave 2% 7% 32% 2% 7% 12% 39% 9% 32% 2% 7% 12% 39% 9% 32% 20 0.0	X																										0.24		0.07
																													0.07

Vegetation Condition	Meh	Aba	Λza	Dey	Bah	Esf	Far	Ord	Kho	Ίīτ	Мог	Sha
-	(Oct)	(Nov)	(Dec)	(Jan)	(Feb)	(Mar)	(Apr)	(May)	(Jun)	(Jul)	(Aug)	(Sep)
Perennial vegetation	0.02	0.02	0.02	0.02	0,02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Seasonal vegetation												
Other than Zeras	0.5	0.2	0.1	0.05	0.02	0,02	0.02	0.02	0.02	0.02	0.5	0.5
Zeras	0.5	0.2	0.1	0.05	0.02	0,02	0.02	0.02	0.02	0.5	0.5	0.5
Rock	0.001	0.001	0.001	100.0	0.001	0,001	0.001	0.001	0.001	0.001	100.0	0.001
Stone	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0,02	0.02	0,62	0.02	0.02
Litter	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Bare soit	0.6	0.6	0.6	0.6	0.6	0.6	0,6	0.6	0.6	0.6	0.6	0.6

- | Adviv | 2/24 | 7/6 | 12/5 | 24/6 | 5/24 | 5/2 | 2/6 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 5/2 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 | 7/6 in bare land by protection.

 - 7) All bare land is covered by seasonal vegetation by seeding.
 8) Seasonal crop management factors (Ci) are assumed as in left hand Table.

Table D-5-1-8 Existing Waterway Condition in the Farmland Area

\rea		Table D-5-1-8			W	aterway De	nsity and Cor	dition		
	Farmland				F	armland Slo	pe		T	Total
			- 5%	5% - 13%		20% - 30%		40% - 50%	50% -	
	IFL	Area (ha)	3,450	11			<u> </u>			3,4
		Waterway Length (Km)	121	0						1
		Waterway Density (m/ha)	35	0						3
_	DFL	Area (ha)		63						
83		Waterway Length (Km)		1,60			 	·		1
£		Waterway Density (m/ha)		25,4			·			2
Š	Orchard	Area (ha)	5	2.7.4	41					
K4-1-9 Vastegan	Otellard	Waterway Length (Km)	-		0				[-	
1		Waterway Density (m/ha)	- 0		0				·	
×	Total	Area (ha)	3,455	74	41	0	0	0	ol	3,5
	Total	Waterway Length (Km)	120.75	1.6	0	o	0	0	ŏ	122
		Waterway Density (m/ha)	34.9					<u>-</u>	<u></u> -	3
		Waterway condition		<u> </u>			C	L		
	IFL	Area (ha)	No serious v			n upper marl		asin.		
	ILP	Waterway Length (Km)		182	280	69	62	<u> </u>		
				7.9	13.7	4.45	1.2			27
	NEI.	Waterway Density (m/ha)		43.4	48.9	64.5	19.4			4
G	DFL	Area (ha)	1	277	163	79	5			5
3az		Waterway Length (Km)		9.2	10.4	6.8	0.4].	2
莹		Waterway Density (m/ha)	_	33.2	63.8	86.1	80.0	ļl		5
K5-19a Chaman Goli-Bazoft	FDF	Area (ha)		73	306	186	59			(
띪		Waterway Length (Km)		1.5	12.7	13.5	4.5			3
æ		Waterway Density (m/ha)		20.5	41.5	72.6	76,3			5
ភូ	Orchard	Area (ha)				23			L	
8		Waterway Length (Km)				0.8				
급		Waterway Density (m/ha)				34.8				3
¥	Total	Алеа (ha)	0	532	749	357	126	0	0	1,7
		Waterway Length (Km)	0	19	37	26	6	0	0	87
		Waterway Density (m/ha)		35.0	49.1	71.6	48.4			4
		Waterway condition	Some water	ways of the l	eft bank area		r and nearby	Ghale Tabar	ak village are	
	DFL	Area (ha)	26	20	122	40			1	2
		Waterway Length (Km)	0.5	2	3.7	2.5				
Sarbaz		Waterway Density (m/ha)	19.2	100.0	30.3	62,5				4
ar C	Orchard	Area (ha)	373	678	990					2,0
		Waterway Length (Km)	8.8	18	55,5			· · · - · · · · · · · · · · · · · · · ·	- 1	8:
K7-0-19-1		Waterway Density (m/ha)	23,6	26.5	56.1					41
3	Total	Area (ha)	399	698	1,112	40	0	0	0	2,2
ř.	Total	Waterway Length (Km)	9	20	59	3	0	0	0	
×		Waterway Density (m/ha)	23.3		53,2	62,5		<u>-</u>		4
		Waterway condition								4
	IFL		iviosi water				ties are serio	us in and nea	by rangeland.	
	IF L	Area (ha)		145	81	24				2
		Waterway Length (Km)		4.2	3.8	1.6		ļ		
	F-97	Waterway Density (m/ha) .		29.0	46.9	66.7				3
ź	DFL	Area (ha)		80	84	44				
Soi		Waterway Length (Km)		4.3	8.4	3				!
ĕ		Waterway Density (m/ha)		53.8		68.2				7
ä	Orchard	Area (ha)			266			j		
∞ .		Waterway Length (Km)		<u> </u>	12.5		<u></u>		1	1
K7-48 Tang Sorkh		Waterway Density (m/ha)		L	47.0					4
52	Total	Arca (ha)	0	225	431	68	0	0	0	7
		Waterway Length (Km)	0	9	25	5	0	0	0	3
		Waterway Density (m/ha)		37.8		67.6			T T	5
		Waterway condition	Waterways	in dry famila	ınd are suffer		ion due to m	arl weathered	soil.	
	DFL	Area (ha)		123	170	464	789	471	124	2,0
S		Waterway Length (Km)		2.80	7.85	18.55	38,60	6,60	6.20	80
e Ia		Waterway Density (m/ha)	1	22,8	46,2	40.0	48.9	14.0	50.0	4
K8-28 Zeras	Total	Area (ha)	1 0		170	464	789	471	124	2,1
2		Waterway Length (Km)	0.00		7.85	18.55	38.60	6.60	6.20	80.
×		Waterway Density (m/ha)		22.8	46.2	40.0	48.9	14.0	50	3
		Waterway condition	Most water					tone deposite		
Fran	Area (ha)	Tacovay condition	3,854		2,503	929	915	471		20.) 10,4
Jian I		Length (Km)	130		129				124	418.
						51	45	7	6	
-1-5	Water	Density (m/ha)	33.7	31.2	51.4	55.1	48.9	14.0	50.0	4

¹⁾ Excluding large channels or tributaries having a large catchment area from upstream.
2) Waterway length is measured on 1:10,000 map.
3) Average density of waterway is weighted by area.
4) IFL: Irrigated Farmland, DFL: Dry Farmland, FD: Forest with dry farming