

Table G.2.1.2.3 (12) Unit Crop Water Requirement (Climate Conditions : Droughty 1999-2000)

Crop :Sunflower																	
Item	Description	1999			2000												Total (Apr-Sep)
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
(1)Monthly Water Balance																	
Monthly ETo (mm)	(1)	45.5	14.2	8.2	10.1	18.2	37.6	93.2	129.3	152.3	116.8	116.0	74.0	41.3	16.7	7.0	681.6
Monthly precipitation (mm)	(2)	18.6	67.6	34.9	38.6	40.0	72.6	8.6	43.8	19.2	84.3	66.2	46.6	42.9	67.5	43.7	268.7
Effective rainfall (Pe)(mm)	(3)calculated by FAO-24 table	13.2	34.2	22.7	24.7	25.7	45.7	8.6	35.4	17.5	62.5	50.3	33.1	29.3	35.9	25.2	207.3
Upward water supply (Ge)(mm)	(4)estimation	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	0.0	0.0
Kc for single crop coefficient	(5)from FAO-56 table							0.35	0.45	1.15	1.15	1.17	0.48				
Crop water requirement ETc(mm)	(6)=(1)*(5)							32.6	58.2	175.1	134.3	135.8	35.5				571.5
Daily ETc (M.ET c/30)(mm)	(7)=(6)/30							1.09	1.94	5.84	4.48	4.53	1.18				
Soil water depletion fraction[p]	(8)calculated by FAO-33 table							0.826	0.802	0.843	0.552	0.547	0.824				
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)							140	140	140	140	140	140				
Root Depth [D](m)	(10) from JICA study team							1.0	1.0	-1.0	1.0	1.0	1.0				
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)							140	140	140	140	140	140				
Remaining available soil water [(1-p)Sa*D](mm)	(12)=((1-8)*(11))							24.3	27.8	21.9	62.7	63.4	24.7				
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)							115.7	112.2	118.1	77.3	76.6	115.3				
We of beginning of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))							91.0	115.6	74.9	62.5	50.3	33.1				
Rate of Cultivated period of month	(15)							0.3	1.0	1.0	1.0	1.0	0.5				
We of end of month [Wb+Pe+Ge-ETc]	(16)=(14)-(6)*(15)							80.2	57.4	-100.2	-71.9	-85.5	15.3				
We carried over: (Wb)(mm)	(17)=(16)<=(13)							82.4	80.2	57.4	0.0	0.0	15.3				
Runoff of effective rainfall (mm)	(18)							0.0	0.0	0.0	0.0	0.0	0.0				0.0
(2) Irrigation water requirement																	
Necessary irrigation water requirement (mm)	(19)							0.0	0.0	100.2	71.9	85.5	0.0				257.5
Net irrigation water requirement (m ³ /ha)	(20)							0	0	1,002	719	855	0				2,575
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)							0	0	1,542	1,106	1,315	0				3,962
Crop :Grain Maize																	
Item	Description	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
(1)Monthly Water Balance																	
Kc for single crop coefficient	(5)from FAO-56 table							0.70	0.88	1.10	1.19	1.13	0.72	0.4			
Crop water requirement ETc(mm)	(6)=(1)*(5)							65.2	113.8	167.5	139.0	131.1	53.3	16.5			686.4
Daily ETc (M.ET c/30)(mm)	(7)=(6)/30							2.17	3.79	5.58	4.63	4.37	1.78	0.55			
Soil water depletion fraction [p]	(8)calculated by FAO-33 table							0.862	0.721	0.571	0.637	0.663	0.884	0.930			
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)							140	140	140	140	140	140	140			
Root Depth [D](m)	(10) from JICA study team							1.2	1.2	1.2	1.2	1.2	1.2	1.2			
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)							168	168	168	168	168	168	168			
Remaining available soil water [(1-p)Sa*D](mm)	(12)=((1-8)*(11))							23.2	46.9	72.1	61.0	56.6	19.6	11.7			
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)							144.8	121.1	95.9	107.0	111.4	148.4	156.3			
We of beginning of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))							114.1	84.2	17.5	62.5	50.3	33.1	29.3			
Rate of Cultivated period of month	(15)							1.0	1.0	1.0	1.0	1.0	1.0	1.0			
We of end of month [Wb+Pe+Ge-ETc]	(16)=(14)-(6)*(15)							48.9	-29.5	-150.0	-76.5	-80.8	-20.2	12.8			
We carried over: (Wb)(mm)	(17)=(16)<=(13)							105.5	48.9	0.0	0.0	0.0	0.0	12.8			
Runoff of effective rainfall (mm)	(18)							0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
(2) Irrigation water requirement																	
Necessary irrigation water requirement (mm)	(19)							0.0	29.5	150.0	76.5	80.8	20.2	0.0			357
Net irrigation water requirement (m ³ /ha)	(20)							0	295	1,500	765	808	202	0			3,571
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)							0	454	2,308	1,178	1,243	311	0			5,494

Table G.2.1.2.3 (13) Unit Crop Water Requirement (Climate Conditions : Droughty 1999-2000)

Crop : Carrot		1999												2000				Total (Mar-Aug)
Item	Description	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
(1) Monthly Water Balance																		
Monthly ETc (mm)	(1)	45.5	14.2	8.2	10.1	18.2	37.6	93.2	129.3	152.3	116.8	116.0	74.0	41.3	16.7	7.0	645.2	
Monthly precipitation (mm)	(2)	18.6	67.6	34.9	38.6	40.0	72.6	8.6	43.8	19.2	84.3	66.2	46.6	42.9	67.5	43.7	294.7	
Effective rainfall (mm) (Pe)	(3) calculated by FAO-24 table	13.2	34.2	22.7	24.7	25.7	45.7	8.6	35.4	17.5	62.5	50.3	33.1	29.3	35.9	25.2	219.9	
Upward water supply	(4) estimation	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	0.0	0.0	
Kc for single crop coefficient	(5) from FAO-56 table						0.70	0.72	0.91	1.05	1.05	1.00						
Crop water requirement ETc (mm)	(6)=(1)*(5)						26.3	67.1	117.7	159.9	122.7	116.0						
Daily ETc (M.E.T c/30)(mm)	(7)=(6)/30						0.88	2.24	3.92	5.33	4.09	3.87						
Soil water depletion fraction [p]	(8) calculated by FAO-33 table						0.700	0.651	0.483	0.384	0.468	0.488						
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)						140	140	140	140	140	140						
Root Depth [D](m)	(10) from FAO-56 table						0.5	0.5	0.5	0.5	0.5	0.5						
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)						70	70	70	70	70	70						
Remaining available soil water [(1-p)Sa*D](mm)	(12)=[(1-(8)*(11))						21.0	24.4	36.2	43.2	37.2	35.8						
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)						49.0	45.6	33.8	26.8	32.8	34.2						
We of beginning of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))						94.6	57.6	35.4	17.5	62.5	50.3						
Rate of Cultivated period of month	(15)						0.33	1.00	1.00	1.00	1.00	0.67						
We of end of month [Wb+Pe+Ge-ETc]	(16)=(14)-(6)*(15)						86.0	-9.5	-82.3	-142.4	-60.2	-27.5						
We carried over: (Wb)(mm)	(17)=(16)<-(13)						49.0	49.0	0.0	0.0	0.0	0.0						
Runoff of effective rainfall (mm)	(18)							37.0	0.0	0.0	0.0	0.0						
(2) Irrigation water requirement																	37.0	
Necessary irrigation water requirement (mm)	(19)							0.0	9.5	82.3	142.4	60.2	27.5					
Net irrigation water requirement (m ³ /ha)	(20)							0	95	823	1,424	602	275					
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)							0	146	1,266	2,191	926	422					
Crop : Potato																	4,932	
Item	Description	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total	
(1) Monthly Water Balance																		
Kc for single crop coefficient	(5) from FAO-56 table							0.50	0.59	1.03	1.15	0.95						
Crop water requirement ETc (mm)	(6)=(1)*(5)							46.6	76.3	156.9	134.3	110.2						
Daily ETc (M.E.T c/30)(mm)	(7)=(6)/30							1.55	2.54	5.23	4.48	3.67						
Soil water depletion fraction [p]	(8) calculated by FAO-33 table							0.506	0.459	0.289	0.326	0.374						
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)							140	140	140	140	140						
Root Depth [D](m)	(10) from FAO-56 table							0.5	0.5	0.5	0.5	0.5						
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)							70	70	70	70	70						
Remaining available soil water [(1-p)Sa*D](mm)	(12)=[(1-(8)*(11))							34.6	37.8	49.8	47.2	43.8						
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)							35.4	32.2	20.2	22.8	26.2						
We of end of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))							44.0	56.1	17.5	62.5	50.3						
Rate of Cultivated period of month	(15)							0.50	1.00	1.00	1.00	0.67						
We of end of month [Wb+Pe+Ge-ETc]	(16)=(14)-(6)*(15)							20.7	-20.2	-139.4	-71.9	-23.6						
We carried over: (Wb)(mm)	(17)=(16)<-(13)							35.4	20.7	0.0	0.0	0.0						
Runoff of effective rainfall (mm)	(18)								0.0	0.0	0.0	0.0						
(2) Irrigation water requirement																	0.0	
Necessary irrigation water requirement (mm)	(19)							0.0	20.2	139.4	71.9	23.6						
Net irrigation water requirement (m ³ /ha)	(20)							0	202	1,394	719	236						
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)							0	310	2,144	1,106	363						

Table G.2.1.2.3 (14) Unit Crop Water Requirement (Climate Conditions : Droughty 1999-2000)

Crop :Asparagus		1999			2000												Total
Item	Description	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	(Mar-oct)
(1)Monthly Water Balance																	
Monthly ET _o (mm)	(1)	45.5	14.2	8.2	10.1	18.2	37.6	93.2	129.3	152.3	116.8	116.0	74.0	41.3	16.7	7.0	760.4
Monthly precipitation (mm)	(2)	18.6	67.6	34.9	38.6	40.0	72.6	8.6	43.8	19.2	84.3	66.2	46.6	42.9	67.5	43.7	384.2
Effective rainfall (mm) (Pe)	(3)calculated by FAO-24 table	13.2	34.2	22.7	24.7	25.7	45.7	8.6	35.4	17.5	62.5	50.3	33.1	29.3	35.9	25.2	282.3
Upward water supply	(4)estimation	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	0.0	0.0
Kc for single crop coefficient	(5)from FAO-56 table						0.50	0.61	0.92	0.95	0.95	0.92	0.66	0.37			
Crop water requirement ET _c (mm)	(6)=(1)*(5)						18.8	56.8	118.9	144.7	111.0	106.8	48.8	15.3			621.1
Daily ET _c (M.ET c/30)(mm)	(7)=(6)/30						0.63	1.89	3.96	4.82	3.70	3.56	1.63	0.51			
Soil water depletion fraction [p]	(8)calculated by FAO-33 table						0.705	0.677	0.479	0.413	0.505	0.519	0.683	0.708			
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)						140	140	140	140	140	140	140	140			
Root Depth [D](m)	(10) from FAO-56 table						1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)						140	140	140	140	140	140	140	140			
Remaining available soil water [(1-p)Sa*D](mm)	(12)=((1-8)*(11))						41.3	45.2	73.0	82.1	69.3	67.3	44.4	40.9			
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)						98.7	94.8	67.0	57.9	70.7	72.7	95.6	99.1			
We of beginning of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))						113.4	103.2	81.7	17.5	62.5	50.3	33.1	29.3			
Rate of Cultivated period of month	(15)						1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
We of end of month [Wb+Pe+Ge-ET _c]	(16)=(14)-(6)*(15)						94.6	46.4	-37.2	-127.2	-48.5	-56.5	-15.8	14.1			
We carried over: (Wb)(mm)	(17)=(16)<=(13)						67.7	94.6	46.4	0.0	0.0	0.0	0.0	14.1			
Runoff of effective rainfall (mm)	(18)						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
(2) Irrigation water requirement																	
Necessary irrigation water requirement (mm)	(19)						0.0	0.0	37.2	127.2	48.5	56.5	15.8	0.0			285.1
Net irrigation water requirement (m ³ /ha)	(20)						0	0	372	1,272	485	565	158	0			2,851
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)						0	0	572	1,957	746	869	242	0			4,386
Crop :Rapeseed																	
Item	Description	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
(1)Monthly Water Balance																	
Kc for single crop coefficient	(5)from FAO-56 table	0.35	0.35	0.35	0.35	0.35	0.35	0.60	1.11	0.60							
Crop water requirement ET _c (mm)	(6)=(1)*(5)	15.9	5.0	2.9	3.5	6.4	13.2	55.9	143.5	91.4							337.6
Daily ET _c (M.ET c/30)(mm)	(7)=(6)/30	0.53	0.17	0.10	0.12	0.21	0.44	1.86	4.78	3.05							
Soil water depletion fraction [p]	(8)calculated by FAO-33 table	0.843	0.853	0.855	0.855	0.852	0.845	0.804	0.522	0.695							
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)	140	140	140	140	140	140	140	140	140							
Root Depth [D](m)	(10) from FAO-56 table	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0							
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)	140	140	140	140	140	140	140	140	140							
Remaining available soil water [(1-p)Sa*D](mm)	(12)=((1-8)*(11))	22.0	20.6	20.3	20.4	20.7	21.7	27.4	67.0	42.6							
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)	118.0	119.4	119.7	119.6	119.3	118.3	112.6	73.0	97.4							
We of end of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))	105.6	123.9	141.5	144.4	145.4	164.9	126.9	106.4	17.5							
Rate of Cultivated period of month	(15)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00							
We of end of month [Wb+Pe+Ge-ET _c]	(16)=(14)-(6)*(15)	89.7	118.9	138.7	140.9	139.0	151.8	71.0	-37.1	-73.9							
We carried over: (Wb)(mm)	(17)=(16)<=(13)	92.4	89.7	118.9	119.7	119.3	118.3	71.0	0.0	0.0							
Runoff of effective rainfall (mm)	(18)	0.0	0.0	18.9	21.2	19.8	33.4	0.0	0.0	0.0							93.4
(2) Irrigation water requirement																	
Necessary irrigation water requirement (mm)	(19)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.1	73.9							111.0
Net irrigation water requirement (m ³ /ha)	(20)	0	0	0	0	0	0	0	371	739							1,110.0
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)	0	0	0	0	0	0	0	571	1,137							1,708

Table G.2.1.2.3 (15) Unit Crop Water Requirement (Climate Conditions : Droughty 1999-2000)

Crop : Alfalfa																	
Item	Description	1999			2000												Total (Apr-Oct)
		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
(1) Monthly Water Balance																	
Monthly ETo (mm)	(1)	45.5	14.2	8.2	10.1	18.2	37.6	93.2	129.3	152.3	116.8	116.0	74.0	41.3	16.7	7.0	722.9
Monthly precipitation (mm)	(2)	18.6	67.6	34.9	38.6	40.0	72.6	8.6	43.8	19.2	84.3	66.2	46.6	42.9	67.5	43.7	311.6
Effective rainfall (mm) (Pe)	(3) calculated by FAO-24 table	13.2	34.2	22.7	24.7	25.7	45.7	8.6	35.4	17.5	62.5	50.3	33.1	29.3	35.9	25.2	236.6
Upward water supply	(4) estimation	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	0.0	0.0
Kc for single crop coefficient	(5) from FAO-56 table							0.70	1.11	0.50	1.18	0.62	0.96	1.04			
Crop water requirement ETc(mm)	(6)=(1)*(5)							65.2	143.5	76.1	137.8	71.4	71.0	42.9			608.0
Daily ETc (M.ET c/30)(mm)	(7)=(6)/30							2.17	4.78	2.54	4.59	2.38	2.37	1.43			
Soil water depletion fraction [p]	(8) calculated by FAO-33 table							0.783	0.522	0.746	0.541	0.746	0.763	0.817			
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)							140	140	140	140	140	140	140			
Root Depth [D](m)	(10) from FAO-56 table							1.0	1.0	1.0	1.0	1.0	1.0	1.0			
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)							140	140	140	140	140	140	140			
Remaining available soil water [(1-p)Sa*D](mm)	(12)=[(1-(8))*(11)]							30.4	67.0	35.5	64.3	35.6	33.1	25.7			
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)							109.6	73.0	104.5	75.7	104.4	106.9	114.3			
We of beginning of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))							86.5	56.6	17.5	62.5	50.3	33.1	29.3			
Rate of Cultivated period of month	(15)							1.00	1.00	1.00	1.00	1.00	1.00	0.67			
We of end of month [Wb+Pe+Ge-ETc]	(16)=(14)-(6)*(15)							21.3	-86.9	-58.7	-75.4	-21.1	-37.9	0.6			
We carried over: (Wb)(mm)	(17)=(16)<=(13)							77.9	21.3	0.0	0.0	0.0	0.0	0.6			
Runoff of effective rainfall (mm)	(18)							0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
(2) Irrigation water requirement																	
Necessary irrigation water requirement (mm)	(19)							0.0	86.9	58.7	75.4	21.1	37.9	0.0			279.9
Net irrigation water requirement (m ³ /ha)	(20)							0	869	587	754	211	379	0			2,799
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)							0	1,336	902	1,160	324	584	0			4,306
Crop : Soybeans																	
Item	Description	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
(1) Monthly Water Balance																	
Kc for single crop coefficient	(5) from FAO-56 table							0.40	0.65	1.15	1.08	0.54					
Crop water requirement ETc(mm)	(6)=(1)*(5)							37.3	84.0	175.1	126.2	62.7					485.3
Daily ETc (M.ET c/30)(mm)	(7)=(6)/30							1.24	2.80	5.84	4.21	2.09					
Soil water depletion fraction [p]	(8) calculated by FAO-33 table							0.904	0.815	0.558	0.679	0.868					
Available soil water [Sa](mm/m)	(9) from JICA study team (14%)							140	140	140	140	140					
Root Depth [D](m)	(10) from FAO-56 table							0.6	0.6	0.6	0.6	0.6					
Available soil water in root zone [D*Sa](mm)	(11)=(9)*(10)							84	84	84	84	84					
Remaining available soil water [(1-p)Sa*D](mm)	(12)=[(1-(8))*(11)]							8.1	15.5	37.1	26.9	11.1					
Available soil water to crop [p*Sa*D](mm)	(13)=(9)*(11)							75.9	68.5	46.9	57.1	72.9					
We of end of month [Wb+Pe+Ge]	(14)=(be.mon.(17)+(2)+(3))							84.5	101.3	34.7	62.5	50.3					
Rate of Cultivated period of month	(15)							0.50	1.00	1.00	1.00	0.67					
We of end of month [Wb+Pe+Ge-ETc]	(16)=(14)-(6)*(15)							65.9	17.2	-140.4	-63.7	8.3					
We carried over: (Wb)(mm)	(17)=(16)<=(13)							75.9	65.9	17.2	0.0	0.0	8.3				
Runoff of effective rainfall (mm)	(18)							0.0	0.0	0.0	0.0	0.0					0.0
(2) Irrigation water requirement																	
Necessary irrigation water requirement (mm)	(19)							0.0	0.0	140.4	63.7	0.0					204.1
Net irrigation water requirement (m ³ /ha)	(20)							0	0	1,404	637	0					2,041
Gross irrigation water requirement (m ³ /ha)	(21)=(20)*(1/0.65)							0	0	2,160	980	0					3,140

Table G.2.1.2.4 Summary of Crop Irrigation Requirement
Crop Irrigation Requirement (climate condition 1993)

Item	Irrigation Water Requirement (mm)							Total	
	1993							(mm)	(m ³ /ha)
	Crop	APR	MAY	JUN	JUL	AUG	SEP		
Winter Wheat	0.0	58.8	64.2	0.0				123.0	1,230
Spring Barley	0.0	56.6	83.6	0.0				140.2	1,402
Grain maize	0.0	39.6	78.8	66.5	52.7	27.4	0.0	265.0	2,650
Carrot	0.0	70.2	72.7	49.2	2.3			194.4	1,944
Potato	0.0	9.1	70.3	61.6	0.0			140.9	1,409
Asparagus	0.0	48.2	60.6	36.9	29.7	23.2		198.7	1,987
Sunflower	0.0	0.0	29.1	61.6	54.9	0.0		145.6	1,456
Soybeans	0.0	0.0	56.4	52.9	0.0			109.3	1,093
Rapeseed	0.0	16.0	18.2					34.2	342
Alfalfa	0.0	95.1	6.1	65.3	0.0	41.1	0	207.6	2,076

Crop Irrigation Requirement (climate condition 1998)

Item	Net Irrigation Water Requirement (mm)							Total	
	1998							(mm)	(m ³ /ha)
	Crop	APR	MAY	JUN	JUL	AUG	SEP		
Winter Wheat	0.0	60.4	39.7	0.0				100.1	1,001
Spring Barley	0.0	75.7	57.7	8.5				141.9	1,419
Grain maize	0.0	36.3	53.2	86.1	91.8	0.0	0.0	267.4	2,674
Carrot	0.0	44.9	47.6	69.4	43.5			205.4	2,054
Potato	0.0	4.2	45.3	81.4	39.9			170.8	1,708
Asparagus	0.0	49.6	36.3	57.5	69.8	0.0		213.2	2,132
Sunflower	0.0	0.0	28.5	81.4	96.1	0.0		206.0	2,060
Soybeans	0.0	0.0	28.4	73.0	0.0			101.4	1,014
Rapeseed	0.0	0.0	0.0					0.0	0
Alfalfa	0.0	87.7	0.0	70.4	38.2	0.0	0	196.3	1,963

Average year Irrigation Requirement (Climate condition 1993,1998)

Item	Irrigation Water Requirement (mm)							Total	
	Average year (1993,1998)							(mm)	(m ³ /ha)
	Crop	APR	MAY	JUN	JUL	AUG	SEP		
Winter Wheat	0.0	59.6	52.0	0.0	0.0	0.0	0.0	111.6	1,116
Spring Barley	0.0	66.1	70.6	4.3	0.0	0.0	0.0	141.0	1,410
Grain maize	0.0	38.0	66.0	76.3	72.3	13.7	0.0	266.2	2,662
Carrot	0.0	57.6	60.1	59.3	22.9	0.0	0.0	199.9	1,999
Potato	0.0	6.6	57.8	71.5	20.0	0.0	0.0	155.9	1,559
Asparagus	0.0	48.9	48.4	47.2	49.7	11.6	0.0	205.9	2,059
Sunflower	0.0	0.0	28.8	71.5	75.5	0.0	0.0	175.8	1,758
Soybeans	0.0	0.0	42.4	63.0	0.0	0.0	0.0	105.4	1,054
Rapeseed	0.0	8.0	9.1	0.0	0.0	0.0	0.0	17.1	171
Alfalfa	0.0	91.4	3.0	67.8	19.1	20.6	0.0	201.9	2,019

Droughty year Irrigation Requirement (Climate condition 2000)

Item	Net Irrigation Water Requirement (mm)							Total	
	2000							(mm)	(m ³ /ha)
	Crop	APR	MAY	JUN	JUL	AUG	SEP		
Winter Wheat	0.0	85.6	131.8	0.0				217.4	2,174
Spring Barley	0.0	72.5	156.1	0.6				229.2	2,292
Grain maize	0.0	29.5	150.0	76.5	80.8	20.2	0.0	357.0	3,570
Carrot	9.5	82.3	142.4	60.2	27.5			321.9	3,219
Potato	0.0	20.2	139.4	71.9	23.6			255.1	2,551
Asparagus	0.0	37.2	127.2	48.5	56.5	15.8		285.2	2,852
Sunflower	0.0	0.0	100.2	71.9	85.5	0.0		257.6	2,576
Soybeans	0.0	0.0	28.4	73.0	0.0			101.4	1,014
Rapeseed	0.0	37.1	73.9					111.0	1,110
Alfalfa	0.0	86.9	58.7	75.4	21.1	37.9	0	280.0	2,800

Table G.2.1.2.5 Pump Capacity and Supply Water Volume

1) Male Lezare-2 (CS Kostoliste)

Pump Type	Whole area of Kostoliste						Case study area		
	Pump capacity			Number of pump (unit)	Total discharge (l/hr)	G11/(De.+Ko.) 0.89	Benefited area (ha)	Case study area (ha)	Available water of case study area (l/hr)
	(l/sec)	(l/min)	(l/hr)						
Type 1	65	3,900	234,000	3	702,000	624,780	4,407	372	52,738
Type 2	115	6,900	414,000	4	1,656,000	1,473,840			124,409
Type 3	440	26,400	1,584,000	3	4,752,000	4,229,280			356,998
Total	620	37,200	2,232,000	10	7,110,000	6,327,900			534,145

2) Gajary (CS Dolecky)

Pump Type	Whole area of Dolecky						Case study area		
	Pump capacity			Number of pump (unit)	Total discharge (l/hr)	G11/(De.+Ko.) 0.89	Benefited area (ha)	Case study area (ha)	Available water of case study area (l/hr)
	(l/sec)	(l/min)	(l/hr)						
Type 1	30	1,800	108,000	4	432,000	384,480	2,066	465	86,536
Type 2	100	6,000	360,000	6	2,160,000	1,922,400			432,680
Total		7,800	468,000	10	2,592,000	2,306,880			519,215

Table G.2.1.2.6 Hydrant Discharge and Unit Irrigation Area

Hydrant discharge				unit Irrigation area		
				(mm)	(mm)	(mm)
(l/sec)	(l/min)	(l/hr)	(m ³ /hr)	10	20	30
				(ha/hr)	(ha/hr)	(ha/hr)
10.0	600	36,000	36	0.32	0.16	0.11
12.5	750	45,000	45	0.41	0.20	0.14
15.0	900	54,000	54	0.49	0.24	0.16
20.0	1,200	72,000	72	0.65	0.32	0.22

Application Efficiency : 0.9

Table G.2.1.2.7 Pump Driving Hours and Supply Water Volume

(1) Male Levare

1) Male Levare-1 (Male Levare CV5)

Pump capacity	Unit discharge	Unit discharge	No. of pump	Total discharge	Irrigation hour	Irrigation days	Water Volume
(l/min)	(l/sec)	(l/hr)	(set)	(l/hr)	(hr)	(day)	(m ³ /mon.)
Average year (Irrigation time:16hours)							
117	7,000	420000	1	420,000	16	28	188,160
117	7,000	420000	2	840,000	16	28	376,320
117	7,000	420000	3	1,260,000	16	28	564,480
Droughty year (Irrigation time:24hours)							
117	7,000	420000	1	420,000	24	28	282,240
117	7,000	420000	2	840,000	24	28	564,480
117	7,000	420000	3	1,260,000	24	28	846,720

2) Male Levare-2 (CS Kostoliste)

Pump capacity for case study	Pump capacity for case study	Pump capacity for case study	Pump capacity for case study	Total discharge	Irrigation hour	Irrigation days	Water Volume
(l/sec)	(l/min)	(l/hr)	(set)	(l/hr)	(hr)	(day)	(m ³ /mon.)
Average year (Irrigation time:16hours) (2/3)							
148	8,902	534,145	-	356,097	16	28	159,531
Droughty year (Irrigation time:24hours) (3/3)							
148	8,902	534,145	-	534,145	24	28	358,946

(2) Gajary (CS Delecky)

Pump capacity for case study	Pump capacity for case study	Pump capacity for case study	Pump capacity for case study	Total discharge	Irrigation hour	Irrigation days	Water Volume
(l/sec)	(l/min)	(l/hr)	(set)	(l/hr)	(hr)	(day)	(m ³ /mon.)
Average year (Irrigation time:16hours) (2/3)							
144	8,654	519,215	-	346,144	16	28	155,072
Droughty year (Irrigation time:24hours) (3/3)							
144	8,654	519,215	-	519,215	24	28	348,913

Table G.2.1.2.8 Water Requirement and Irrigation Area-Scenario A (Average Year)

Case Study Area Crop	April			May			June			July			August			Sept.			Total (m ³ /year)
	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	
1) Male Levare																			
Male Levare-1 (CVS Male Levare)																			
Wheat	0.0	9	0.0	70.1	9	6,311	61.1	9	5,502	0.0									11,813
Spring Barley	0.0	77	0.0	77.8	77	59,906	83.1	77	64,000	5.0	77	3,850							127,756
Grain maize	0.0	150	0.0	44.6	150	66,971	77.6	150	116,429	89.8	150	134,643	85.0	150	127,514	16.1	150	24,209	469,766
Carrot	0.0	80	0.0	67.7	80	54,173	70.8	80	56,610	69.8	80	55,832	26.9	80	21,548	0.0	80		188,164
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0		0
Asparagus	0.0	0	0.0	57.6	1	576	57.0	1	570	55.5	1	555	58.5	1	585	13.7	1	137	2,423
Sunflower	0.0	0	0.0	0.0	17	0	33.9	17	5,760	84.1	17	14,297	88.8	17	15,101	0.0	17		35,157
Soybeans	0.0	0	0.0	0.0	0	0	49.9	0	0	74.1	0	0	0.0	0	0	0.0	0		0
Alfalfa	0.0	97	0.0	107.6	97	104,331	3.6	97	3,467	79.8	97	77,408	22.5	97	21,796	24.2	97	23,453	230,455
i) total		413	0.0		431	292,268		431	252,337		422	286,585		345	186,545		345	47,799	1,065,535
Pump supply volume			376,320			376,320			376,320			376,320			376,320			376,320	2,257,920
Male Levare-2 (CS kostoliste)																			
Wheat	0.0	36	0.0	70.1	36	25,246	61.1	36	22,006	0.0									47,252
Spring Barley	0.0	18	0.0	77.8	18	14,004	83.1	18	14,961	5.0	18	900	0.0			0.0			29,865
Grain maize	0.0	7	0.0	44.6	7	3,125	77.6	7	5,433	89.8	7	6,283	85.0	7	5,951	16.1	7	1,130	21,922
Carrot	0.0	84	0.0	67.7	84	56,882	70.8	84	59,441	69.8	84	58,624	26.9	84	22,626	0.0	84	0	197,572
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0		0
Asparagus	0.0	48	0.0	57.6	48	27,628	57.0	48	27,355	55.5	48	26,660	58.5	48	28,093	13.7	48	6,557	116,293
Sunflower	0.0	33	0.0	0.0	33	0	33.9	33	11,181	84.1	33	27,752	88.8	33	29,313	0.0	33	0	68,247
Soybeans	0.0	8	0.0	0.0	8	0	49.9	8	3,991	74.1	8	5,927	0.0	8	0	0.0	8	0	9,918
Alfalfa	0.0	1	0.0	107.6	1	1,076	3.6	1	36	79.8	1	798	22.5	1	225	24.2	1	242	2,376
ii) total		235	0.0		235	127,960		235	144,404		199	126,944		181	86,208		181	7,929	493,445
Pump supply volume			159,531			159,531			159,531			159,531			159,531			159,531	957,189
2) Gajary (CS Delecky)																			
Wheat	0.0	2	0.0	70.1	2	1,403	61.1	2	1,223	0.0									2,625
Spring Barley	0.0	44	0.0	77.8	44	34,232	83.1	44	36,571	5.0	44	2,200	0.0			0.0			73,003
Grain maize	0.0	62	0.0	44.6	62	27,681	77.6	62	48,124	89.8	62	55,652	85.0	62	52,706	16.1	62	10,007	194,170
Carrot	0.0	40	0.0	67.7	40	27,087	70.8	40	28,305	69.8	40	27,916	26.9	40	10,774	0.0	40	0	94,082
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0		0
Sunflower	0.0	24	0.0	0.0	24	0	33.9	24	8,132	84.1	24	20,183	88.8	24	21,319	0.0	24	0	49,634
Soybeans	0.0	10	0.0	0.0	10	0	49.9	10	4,989	74.1	10	7,408	0.0	10	0	0.0	10	0	12,397
Alfalfa	0.0	35	0.0	107.6	35	37,645	3.6	35	1,251	79.8	35	27,931	22.5	35	7,865	24.2	35	8,462	83,154
iii) total		217	0		217	128,048		217	128,594		215	141,291		171	92,664		171	18,469	509,065
Pump supply volume			155,072			155,072			155,072			155,072			155,072			155,072	930,434
Total i)+ii)+iii)		865	0		883	548,276		883	525,336		836	554,820		697	365,417		697	74,196	2,068,045

Table G.2.1.2.9 Water Requirement and Irrigation Area-Scenario B (Average Year)

Case Study Area	April			May			June			July			August			Sept.			Total (m ³ /year)
	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	
1) Male Levare																			
Male Levare-1 (CVS Male Levare)																			
Wheat	0.0	0		70.1	0	0	61.1	0	0	0.0									0
Spring Barley	0.0	43	0.0	77.8	43	33,454	83.1	43	35,740	5.0	43	2,150							71,344
Grain maize	0.0	0	0.0	44.6	0	0	77.6	0	0	89.8	0	0	85.0	0	0	16.1	0	0	0
Carrot	0.0	51	0.0	67.7	51	34,535	70.8	51	36,089	69.8	51	35,593	26.9	51	13,737	0.0	51	0	119,955
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	57.6	0	0	57.0	0	0	55.5	0	0	58.5	0	0	13.7	0	0	0
Sunflower	0.0	27	0.0	0.0	27	0	33.9	27	9,148	84.1	27	22,706	88.8	27	23,984	0.0	27	0	55,838
Soybeans	0.0	0	0.0	0.0	0	0	49.9	0	0	74.1	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	107.6	0	0	3.6	0	0	79.8	0	0	22.5	0	0	24.2	0	0	0
i) total		121	0.0		121	67,990		121	80,977		121	60,449		78	37,721		78	0	247,137
Pump supply volume			376,320			376,320			376,320			376,320			376,320			376,320	2,257,920
Male Levare-2 (CS kostoliste)																			
Wheat	0.0	0		70.1	0	0	61.1	0	0	0.0									0
Spring Barley	0.0	19	0.0	77.8	19	14,782	83.1	19	15,792	5.0	19	950		19	0.0	19			31,524
Grain maize	0.0	0	0.0	44.6	0	0	77.6	0	0	89.8	0	0	85.0	0	0	16.1	0	0	0
Carrot	0.0	64	0.0	67.7	64	43,339	70.8	64	45,288	69.8	64	44,666	26.9	64	17,239	0.0	64	0	150,531
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0	0	0
Asparagus	0.0	48	0.0	57.6	48	27,628	57.0	48	27,355	55.5	48	26,660	58.5	48	28,093	13.7	48	6,557	116,293
Sunflower	0.0	42	0.0	0.0	42	0	33.9	42	14,231	84.1	42	35,321	88.8	42	37,308	0.0	42	0	86,860
Soybeans	0.0	0	0.0	0.0	0	0	49.9	0	0	74.1	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	107.6	0	0	3.6	0	0	79.8	0	0	22.5	0	0	24.2	0	0	0
ii) total		173	0		173	85,748		173	102,666		173	107,597		173	82,640		173	6,557	385,208
Pump supply volume			159,531			159,531			159,531			159,531			159,531			159,531	957,189
2) Gajary (CS Delecky)																			
Wheat	0.0	0	0.0	70.1	0	0	61.1	0	0	0.0									0
Spring Barley	0.0	25	0.0	77.8	25	19,450	83.1	25	20,779	5.0	25	1,250	0.0		0.0				41,479
Grain maize	0.0	0	0.0	44.6	0	0	77.6	0	0	89.8	0	0	85.0	0	0	16.1	0	0	0
Carrot	0.0	30	0.0	67.7	30	20,315	70.8	30	21,229	69.8	30	20,937	26.9	30	8,081	0.0	30	0	70,562
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	57.6	0	0	57.0	0	0	55.5	0	0	58.5	0	0	13.7	0	0	0
Sunflower	0.0	18	0.0	0.0	18	0	33.9	18	6,099	84.1	18	15,138	88.8	18	15,989	0.0	18	0	37,226
Soybeans	0.0	0	0.0	0.0	0	0	49.9	0	0	74.1	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	35	0.0	107.6	35	37,645	3.6	35	1,251	79.8	35	27,931	22.5	35	7,865	24.2	35	8,462	83,154
iii) total		108	0.0		108	77,410		108	49,358		108	65,255		83	31,935		83	8,462	232,420
Pump supply volume			155,072			155,072			155,072			155,072			155,072			155,072	930,434
Total i)+ii)+iii)		402	0		402	231,148		402	233,001		402	233,301		334	152,295		334	15,020	864,765

Table G.2.1.2.10 Water Requirement and Irrigation Area-Scenario C (Average Year)

Case Study Area Crop	April			May			June			July			August			Sept.			Total (m ³ /year)
	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	
1) Male Levare																			
Male Levare-1 (CVS Male Levare)																			
Wheat	0.0	0	0.0	70.1	0	0	61.1	0	0	0.0									0
Spring Barley	0.0	0	0.0	77.8	0	0	83.1	0	0	5.0	0	0							0
Grain maize	0.0	0	0.0	44.6	0	0	77.6	0	0	89.8	0	0	85.0	0	0	16.1	0	0	0
Carrot	0.0	51	0.0	67.7	51	34,535	70.8	51	36,089	69.8	51	35,593	26.9	51	13,737	0.0	51	0	119,955
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	57.6	0	0	57.0	0	0	55.5	0	0	58.5	0	0	13.7	0	0	0
Sunflower	0.0	0	0.0	0.0	0	0	33.9	0	0	84.1	0	0	88.8	0	0	0.0	0	0	0
Soybeans	0.0	0	0.0	0.0	0	0	49.9	0	0	74.1	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	107.6	0	0	3.6	0	0	79.8	0	0	22.5	0	0	24.2	0	0	0
i) total		51	0.0		51	34,535		51	36,089		51	35,593		51	13,737		51	0	119,955
Pump supply volume			376,320			376,320			376,320			376,320			376,320			376,320	2,257,920
Male Levare-2(CS kostoliste)																			
Wheat	0.0	0	0.0	70.1	0	0	61.1	0	0	0.0									0
Spring Barley	0.0	0	0.0	77.8	0	0	83.1	0	0	5.0	0	0				0.0			0
Grain maize	0.0	0	0.0	44.6	0	0	77.6	0	0	89.8	0	0	85.0	0	0	16.1	0	0	0
Carrot	0.0	20	0.0	67.7	20	13,543	70.8	20	14,153	69.8	20	13,958	26.9	20	5,387	0.0	20	0	47,041
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0	0	0
Asparagus	0.0	48	0.0	57.6	48	27,628	57.0	48	27,355	55.5	48	26,660	58.5	48	28,093	13.7	48	6,557	116,293
Sunflower	0.0	0	0.0	0.0	0	0	33.9	0	0	84.1	0	0	88.8	0	0	0.0	0	0	0
Soybeans	0.0	0	0.0	0.0	0	0	49.9	0	0	74.1	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	107.6	0	0	3.6	0	0	79.8	0	0	22.5	0	0	24.2	0	0	0
ii) total		68	0		68	41,171		68	41,508		68	40,618		68	33,480		68	6,557	163,334
Pump supply volume			159,531			159,531			159,531			159,531			159,531			159,531	957,189
2) Gajary (CS Delecky)																			
Wheat	0.0	0	0.0	70.1	0	0	61.1	0	0	0.0									0
Spring Barley	0.0	0	0.0	77.8	0	0	83.1	0	0	5.0	0	0	0.0			0.0			0
Grain maize	0.0	0	0.0	44.6	0	0	77.6	0	0	89.8	0	0	85.0	0	0	16.1	0	0	0
Carrot	0.0	30	0.0	67.7	30	20,315	70.8	30	21,229	69.8	30	20,937	26.9	30	8,081	0.0	30	0	70,562
Potato	0.0	0	0.0	7.8	0	0	68.0	0	0	84.1	0	0	23.5	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	57.6	0	0	57.0	0	0	55.5	0	0	58.5	0	0	13.7	0	0	0
Sunflower	0.0	0	0.0	0.0	0	0	33.9	0	0	84.1	0	0	88.8	0	0	0.0	0	0	0
Soybeans	0.0	0	0.0	0.0	0	0	49.9	0	0	74.1	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	35	0.0	107.6	35	37,645	3.6	35		79.8	35	27,931	22.5	35	7,865	24.2	35	8,462	81,903
iii) total		65	0		65	57,960		65	21,229		65	48,868		65	15,945		65	8,462	152,464
Pump supply volume			155,072			155,072			155,072			155,072			155,072			155,072	930,434
Total i)+ii)+iii)		184	0		184	133,667		184	98,826		184	125,079		184	63,163		184	15,020	435,753

Table G.2.1.2.11 Water Requirement and Irrigation Area-Scenario A (Droughty Year)

Case Study Area Crop	April			May			June			July			August			Sept.			Total (m ³ /year)
	(mm/month)	(ha)	(m ³ /mon.)	(mm/month)	(ha)	(m ³ /mon.)	(mm/month)	(ha)	(m ³ /mon.)	(mm/month)	(ha)	(m ³ /mon.)	(mm/month)	(ha)	(m ³ /mon.)	(mm/month)	(ha)	(m ³ /mon.)	
1) Male Levare																			
Male Levare-1 (CV5 Male Levare)																			
Wheat	0.0	9	0.0	100.7	9	9,064	155.1	9	13,955	0.0									23,019
Spring Barley	0.0	77	0.0	85.3	77	65,676	183.6	77	141,408	0.7	77	544	0.0						207,628
Grain maize	0.0	150	0.0	34.7	150	52,059	176.5	150	264,706	90.0	150	135,000	95.1	150	142,588	23.8	150	35,647	630,000
Carrot	11.2	80	894	96.8	80	77,459	167.5	80	134,024	70.8	80	56,659	32.4	80	25,882	0.0	80	0	294,918
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	43.8	1	438	149.6	1	1,496	57.1	1	571	66.5	1	665	18.6	1	186	3,355
Sunflower	0.0	0	0.0	0.0	17	0	117.9	17	20,040	84.6	17	14,380	100.6	17	17,100	0.0	17	0	51,520
Soybeans	0.0	0	0.0	0.0	0	0	33.4	0	0	85.9	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	97	0.0	102.2	97	99,168	69.1	97	66,987	88.7	97	86,045	24.8	97	24,079	44.6	97	43,251	319,529
i) total		413	894		431	303,864		431	642,616		422	293,198		345	210,314		345	79,084	1,529,969
Pump supply volume			846,720			846,720			846,720			846,720			846,720			846,720	5,080,320
Male Levare-2 (CS kostoliste)																			
Wheat	0.0	36	0.0	100.7	36	36,254	155.1	36	55,821	0.0									92,075
Spring Barley	0.0	18	0.0	85.3	18	15,353	183.6	18	33,056	0.7	18	127	0.0						48,536
Grain maize	0.0	7	0.0	34.7	7	2,429	176.5	7	12,353	90.0	7	6,300	95.1	7	6,654	23.8	7	1,664	29,400
Carrot	11.2	84	939	96.8	84	81,332	167.5	84	140,725	70.8	84	59,492	32.4	84	27,176	0.0	84	0	309,664
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	48	0.0	43.8	48	21,007	149.6	48	71,831	57.1	48	27,388	66.5	48	31,906	18.6	48	8,922	161,054
Sunflower	0.0	33	0.0	0.0	33	0	117.9	33	38,901	84.6	33	27,914	100.6	33	33,194	0.0	33	0	100,009
Soybeans	0.0	8	0.0	0.0	8	0	33.4	8	2,673	85.9	8	6,871	0.0	8	0	0.0	8	0	9,544
Alfalfa	0.0	1	0.0	102.2	1	1,022	69.1	1	691	88.7	1	887	24.8	1	248	44.6	1	446	3,294
ii) total		235	939		235	157,398		235	356,051		199	128,979		181	99,179		181	11,032	753,576
Pump supply volume			358,946			358,946			358,946			358,946			358,946			358,946	2,153,674
2) Gajary (CS Delecky)																			
Wheat	0.0	2	0.0	100.7	2	2,014	155.1	2	3,101	0.0									5,115
Spring Barley	0.0	44	0.0	85.3	44	37,529	183.6	44	80,805	0.7	44	311	0.0						118,645
Grain maize	0.0	62	0.0	34.7	62	21,518	176.5	62	109,412	90.0	62	55,800	95.1	62	58,936	23.8	62	14,734	260,400
Carrot	11.2	40	447	96.8	40	38,729	167.5	40	67,012	70.8	40	28,329	32.4	40	12,941	0.0	40	0	147,459
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	43.8	0	0	149.6	0	0	57.1	0	0	66.5	0	0	18.6	0	0	0
Sunflower	0.0	24	0.0	0.0	24	0	117.9	24	28,292	84.6	24	20,301	100.6	24	24,141	0.0	24	0	72,734
Soybeans	0.0	10	0.0	0.0	10	0	33.4	10	3,341	85.9	10	8,588	0.0	10	0	0.0	10	0	11,929
Alfalfa	0.0	35	0.0	102.2	35	35,782	69.1	35	24,171	88.7	35	31,047	24.8	35	8,688	44.6	35	15,606	115,294
iii) total		217	447		217	135,573		217	316,133		215	144,376		171	104,707		171	30,340	731,576
Pump supply volume			348,913			348,913			348,913			348,913			348,913			348,913	2,093,477
Total i)+ii)+iii)		865	2,280		883	596,834		883	1,314,800		836	566,553		697	414,200		697	120,455	3,015,122

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Table G.2.1.2.12 Water Requirement and Irrigation Area-Scenario B (Droughty Year)

Case Study Area Crop	April			May			June			July			August			Sept.			Total (m ³ /year)
	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	(mm/mon)	(ha)	(m ³ /mon.)	
1) Male Levare																			
Male Levare-1 (CV5 Male Levare)																			
Wheat	0.0	0	0.0	100.7	0	0	155.1	0	0										0
Spring Barley	0.0	43	0.0	85.3	43	36,676	183.6	43	78,968	0.7	43	304	0.0						115,948
Grain maize	0.0	0	0.0	34.7	0	0	176.5	0	0	90.0	0	0	95.1	0	0	23.8	0	0	0
Carrot	11.2	51	570	96.8	51	49,380	167.5	51	85,440	70.8	51	36,120	32.4	51	16,500	0.0	51	0	188,010
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	43.8	0	0	149.6	0	0	57.1	0	0	66.5	0	0	18.6	0	0	0
Sunflower	0.0	27	0.0	0.0	27	0	117.9	27	31,828	84.6	27	22,839	100.6	27	27,159	0.0	27	0	81,826
Soybeans	0.0	0	0.0	0.0	0	0	33.4	0	0	85.9	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	102.2	0	0	69.1	0	0	88.7	0	0	24.8	0	0	44.6	0	0	0
i) total		121	570		121	86,056		121	196,236		121	59,262		78	43,659	87	78	0	385,784
Pump supply volume			846,720			846,720			846,720			846,720			846,720			846,720	5,080,320
Male Levare-2 (CS kostoliste)																			
Wheat	0.0	0	0.0	100.7	0	0	155.1	0	0										0
Spring Barley	0.0	19	0.0	85.3	19	16,206	183.6	19	34,893	0.7	19	134	0.0						51,233
Grain maize	0.0	0	0.0	34.7	0	0	176.5	0	0	90.0	0	0	95.1	0	0	23.8	0	0	0
Carrot	11.2	64	715.3	96.8	64	61,967	167.5	64	107,219	70.8	64	45,327	32.4	64	20,706	0.0	64	0	235,934
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	48	0.0	43.8	48	21,007	149.6	48	71,831	57.1	48	27,388	66.5	48	31,906	18.6	48	8,922	161,054
Sunflower	0.0	42	0.0	0.0	42	0	117.9	42	49,511	84.6	42	35,527	100.6	42	42,247	0.0	42	0	127,285
Soybeans	0.0	0	0.0	0.0	0	0	33.4	0	0	85.9	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	102.2	0	0	69.1	0	0	88.7	0	0	24.8	0	0	44.6	0	0	0
ii) total		173	715		173	99,180		173	263,453		173	108,376		154	94,859	154	8,922	0	575,506
Pump supply volume			358,946			358,946			358,946			358,946			358,946			358,946	2,153,674
2) Gajary (CS Delecky)																			
Wheat	0.0	0	0.0	100.7	0	0	155.1	0	0										0
Spring Barley	0.0	25	0.0	85.3	25	21,324	183.6	25	45,912	0.7	25	176	0.0						67,412
Grain maize	0.0	0	0.0	34.7	0	0	176.5	0	0	90.0	0	0	95.1	0	0	23.8	0	0	0
Carrot	11.2	30	335	96.8	30	29,047	167.5	30	50,259	70.8	30	21,247	32.4	30	9,706	0.0	30	0	110,594
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	43.8	0	0	149.6	0	0	57.1	0	0	66.5	0	0	18.6	0	0	0
Sunflower	0.0	18	0.0	0.0	18	0	117.9	18	21,219	84.6	18	15,226	100.6	18	18,106	0.0	18	0	54,551
Soybeans	0.0	0	0.0	0.0	0	0	33.4	0	0	85.9	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	35	0.0	102.2	35	35,782	69.1	35		88.7	35	31,047	24.8	35	8,688	44.6	35	15,606	91,124
iii) total		108	335		108	86,153		108	117,389		108	67,696		83	36,500	83	15,606	0	323,680
Pump supply volume			348,913			348,913			348,913			348,913			348,913			348,913	2,093,477
Total i)+ii)+iii)		402	1,621		402	271,389		402	577,079		402	235,335		315	175,018	315	24,528	0	1,284,970

Table G.2.1.2.13 Water Requirement and Irrigation Area-Scenario C (Droughty Year)

Case Study Area Crop	April			May			June			July			August			Sept.			Total (m ³ /year)
	(mm/month)	(ha)	(m ³ /month)	(mm/month)	(ha)	(m ³ /month)	(mm/month)	(ha)	(m ³ /month)	(mm/month)	(ha)	(m ³ /month)	(mm/month)	(ha)	(m ³ /month)	(mm/month)	(ha)	(m ³ /month)	
1) Male Levare																			
Male Levare-1 (CVS Male Levare)																			
Wheat	0.0	0	0.0	100.7	0	0	155.1	0											
Spring Barley	0.0	0	0.0	85.3	0	0	183.6	0	0	0.7	0	0	0.0					0.0	0
Grain maize	0.0	0	0.0	34.7	0	0	176.5	0	0	90.0	0	0	95.1	0	0	23.8	0	0	0
Carrot	11.2	51	570	96.8	51	49,380	167.5	51	85,440	70.8	51	36,120	32.4	51	16,500	0.0	51	0	188,010
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	43.8	0	0	149.6	0	0	57.1	0	0	66.5	0	0	18.6	0	0	0
Sunflower	0.0	0	0.0	0.0	0	0	117.9	0	0	84.6	0	0	100.6	0	0	0.0	0	0	0
Soybeans	0.0	0	0.0	0.0	0	0	33.4	0	0	85.9	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	102.2	0	0	69.1	0	0	88.7	0	0	24.8	0	0	44.6	0	0	0
i) total		51	570		51	49,380		51	85,440		51	36,120		51	16,500		51	0	188,010
Pump supply volume			846,720			846,720			846,720			846,720			846,720			846,720	5,080,320
Male Levare-2 (CS kostoliste)																			
Wheat	0.0	0	0.0	100.7	0	0	155.1	0											
Spring Barley	0.0	0	0.0	85.3	0	0	183.6	0	0	0.7	0	0	0.0					0.0	0
Grain maize	0.0	0	0.0	34.7	0	0	176.5	0	0	90.0	0	0	95.1	0	0	23.8	0	0	0
Carrot	11.2	20	223.5	96.8	20	19,365	167.5	20	33,506	70.8	20	14,165	32.4	20	6,471	0.0	20	0	73,729
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	48	0.0	43.8	48	21,007	149.6	48	71,831	57.1	48	27,388	66.5	48	31,906	18.6	48	8,922	161,054
Sunflower	0.0	0	0.0	0.0	0	0	117.9	0	0	84.6	0	0	100.6	0	0	0.0	0	0	0
Soybeans	0.0	0	0.0	0.0	0	0	33.4	0	0	85.9	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	0	0.0	102.2	0	0	69.1	0	0	88.7	0	0	24.8	0	0	44.6	0	0	0
ii) total		68	224		68	40,372		68	105,336		68	41,553		68	38,376		68	8,922	234,784
Pump supply volume			358,946			358,946			358,946			358,946			358,946			358,946	2,153,674
2) Gajary (CS Delecky)																			
Wheat	0.0	0	0.0	100.7	0	0	155.1	0											
Spring Barley	0.0	0	0.0	85.3	0	0	183.6	0	0	0.7	0	0	0.0					0.0	0
Grain maize	0.0	0	0.0	34.7	0	0	176.5	0	0	90.0	0	0	95.1	0	0	23.8	0	0	0
Carrot	11.2	30	335	96.8	30	29,047	167.5	30	50,259	70.8	30	21,247	32.4	30	9,706	0.0	30	0	110,594
Potato	0.0	0	0.0	23.8	0	0	164.0	0	0	84.6	0	0	27.8	0	0	0.0	0	0	0
Asparagus	0.0	0	0.0	43.8	0	0	149.6	0	0	57.1	0	0	66.5	0	0	18.6	0	0	0
Sunflower	0.0	0	0.0	0.0	0	0	117.9	0	0	84.6	0	0	100.6	0	0	0.0	0	0	0
Soybeans	0.0	0	0.0	0.0	0	0	33.4	0	0	85.9	0	0	0.0	0	0	0.0	0	0	0
Alfalfa	0.0	35	0.0	102.2	35	35,782	69.1	35		88.7	35	31,047	24.8	35	8,688	44.6	35	15,606	91,124
iii) total		65	335		65	64,829		65	50,259		65	52,294		65	18,394		65	15,606	201,718
Pump supply volume			348,913			348,913			348,913			348,913			348,913			348,913	2,093,477
Total i)+ii)+iii)		184	1,129		184	154,581		184	241,035		184	129,967		184	73,271		184	24,528	624,511

Table G .2.1.2.14 Irrigation Area of Scenario A. B. C

Crop	Scenario A			Scenario B			Scenario C		
	Irrigation area	No irrigation area	total	Irrigation area	No irrigation area	total	Irrigation area	No irrigation area	Total
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)
Mala Levare (1)									
Wheat	9	29	38	0	68	68	0	62	62
Spring barley	77	0	77	43	0	43	0	17	17
Grain maize	150	0	150	0	108	108	0	50	50
Vegetable	80	0	80	51	0	51	51	0	51
Asparagus	1	0	1	0	0	0	0	0	0
Sunflower	17	0	17	27	0	27	0	0	0
Soybeans	0	0	0	0	6	6	0	0	0
Alfalfa	97	0	97	0	97	97	0	133	133
Rapeseed	0	0	0	0	11	11	0	17	17
Rye	0	9	9	0	22	22	0	103	103
Apple	0	34	34	0	34	34	0	34	34
Meadow	0	87	87	0	123	123	0	123	123
Sub- total	431	159	590	121	469	590	51	539	590
Wheat									
Wheat	36	7	43	0	53	53	0	40	40
Spring barley	18	0	18	19	0	19	0	0	0
Grain maize	7	4	11	0	5	5	0	79	79
Vegetable	84	0	84	64	0	64	20	0	20
Asparagus	48	0	48	48	0	48	48	0	48
Sunflower	33	0	33	42	0	42	0	0	0
Soybeans	8	0	8	0	14	14	0	0	0
Alfalfa	1	5	6	0	3	3	0	51	51
Rapeseed	0	12	12	0	15	15	0	23	23
Rye	0	0	0	0	0	0	0	2	2
Meadow	0	31	31	0	31	31	0	31	31
Sub- total	235	59	294	173	121	294	68	226	294
Gajary									
Wheat	2	44	46	0	57	57	0	41	41
Spring barley	44	10	54	25	0	25	0	0	0
Grain maize	62	49	111	0	55	55	0	60	60
Vegetable	40	0	40	30	0	30	30	0	30
Sunflower	24	0	24	18	0	18	0	0	0
Soybeans	10	0	10	0	10	10	0	0	0
Alfalfa	0	78	78	0	69	69	0	91	91
Rapeseed	0	6	6	0	15	15	0	11	11
Rye	0	0	0	0	15	15	0	61	61
Meadow	35	0	35	35	75	110	35	75	110
Sub- total	217	187	404	108	296	404	65	339	404
Total	883	405	1,288	402	886	1,288	184	1,104	1,288

Table G.2.1.2.15 Summary of Irrigation Area of Scenario A,B,C

Item	Scenario A			Scenario B			Scenario C		
	Irrigation area	No irrigation area	total	Irrigation area	No irrigation area	total	Irrigation area	No irrigation area	Total
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)
Mala Levare (1)	431	159	590	121	469	590	51	539	590
Mala Levare (2)	235	59	294	173	121	294	68	226	294
Gajary	217	187	404	108	296	404	65	339	404
Total	883	405	1,288	402	886	1,288	184	1,104	1,288

Table G.2.1.2.16 Crop and Irrigation Area of Scenario A. B. C

Crop	Scenario-A			Scenario-B			Scenario-C		
	Pump irrigation area		Total	Pump irrigation area		Total	Pump irrigation area		Total
	Irrigation area	No Irrigation area		Irrigation area	No Irrigation area		Irrigation area	No Irrigation area	
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	
Wheat	47	80	127	0	178	178	0	143	143
Spring barley	139	10	149	87	0	87	0	17	17
Grain maize	219	53	272	0	168	168	0	189	189
Vegetable	204	0	204	145	0	145	101	0	101
Asparagus	49	0	49	48	0	48	48	0	48
Sunflower	74	0	74	87	0	87	0	0	0
Soybeans	18	0	18	0	30	30	0	0	0
Alfalfa	98	83	181	0	169	169	0	275	275
Rapeseed	0	18	18	0	41	41	0	51	51
Rye	0	9	9	0	37	37	0	166	166
Apple	0	34	34	0	34	34	0	34	34
Meadow	35	118	153	35	229	264	35	229	264
Total	883	405	1,288	402	886	1,288	184	1,104	1,288

Table G.2.1.2.22 Number of Sprinkler and Velocity

Discharge of Sprinkler	10 l/sec								15 l/sec						
	0.125	0.150	0.200	0.250	0.300	0.400	0.500	0.125	0.150	0.200	0.250	0.300	0.400	0.500	
Pipe diameter (m)	0.012	0.018	0.031	0.049	0.071	0.126	0.196	0.012	0.018	0.031	0.049	0.071	0.126	0.196	
Area of pipe (m ²)	0.012	0.018	0.031	0.049	0.071	0.126	0.196	0.012	0.018	0.031	0.049	0.071	0.126	0.196	
Number of Sprinkler and Velocity in pipe (m/sec)	1	0.81	0.57	0.32	0.20	0.14	0.08	0.05	1.22	0.85	0.48	0.31	0.21	0.12	0.08
	2	1.63	1.13	0.64	0.41	0.28	0.16	0.10	2.44	1.70	0.95	0.61	0.42	0.24	0.15
	3	2.44	1.70	0.95	0.61	0.42	0.24	0.15	3.67	2.55	1.43	0.92	0.64	0.36	0.23
	5	4.07	2.83	1.59	1.02	0.71	0.40	0.25	6.11	4.24	2.39	1.53	1.06	0.60	0.38
	10	8.15	5.66	3.18	2.04	1.41	0.80	0.51	12.22	8.49	4.77	3.06	2.12	1.19	0.76
	15	12.22	8.49	4.77	3.06	2.12	1.19	0.76	18.33	12.73	7.16	4.58	3.18	1.79	1.15
	30	24.45	16.98	9.55	6.11	4.24	2.39	1.53	36.67	25.46	14.32	9.17	6.37	3.58	2.29

Table G.2.1.2.17 Irrigation Cost (Average Year)

No.	Description	Unit	Wheat	Spring Barley	Grain maize	Sunflower	Soybeans	Alfalfa	Asparagus	Vegetable
1)	Irrigation scale	ha	18.2	18.2	18.2	18.2	18.2	18.2	18.2	10.4
2)	Number of Sprinkler	unit	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3)	Man power (Transportation and irrigation)									
	Transportation and setting	Labor	day	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Irrigation	7day X 2 parson	day	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Clear away		day	0.5	0.5	0.5	0.5	0.5	0.5	1.0
	Total		day	15.5	15.5	15.5	15.5	15.5	15.5	16.0
	Man power Cost (18.2ha)	500.1	sk/day	7,751.8	7,751.8	7,751.8	7,751.8	7,751.8	7,751.8	8,001.8
	i)Man power Cost (ha)			481.5	481.5	481.5	481.5	481.5	481.5	869.8
4)	Drive administrative expenses									
	Transportation work	Track and trailer	day	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Transportation cost	1,250.0	sk/day	1,250.0	1,250.0	1,250.0	1,250.0	1,250.0	1,250.0	1,250.0
	Irrigation work	Tractor	day	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Irrigation cost (18.2ha)	400.0	sk/day	5,600.0	5,600.0	5,600.0	5,600.0	5,600.0	5,600.0	5,600.0
	ii)Irrigation cost (ha)			347.8	347.8	347.8	347.8	347.8	347.8	608.7
5)	Expenditure of Sprinkler									
	Sprinkler cost(Oneunit)	450,000.0	sk							568,122.0
	After subsidy price(30%)	135,000.0	sk	135,000.0	135,000.0	135,000.0	135,000.0	135,000.0	135,000.0	170,436.6
	Annual depreciation expense	Redemption for ten years(1/12)/18.2ha	sk/ha	698.8	698.8	698.8	698.8	698.8	698.8	1,543.8
	Maintenance expense	5% of repair cost(ha)	sk	34.9	34.9	34.9	34.9	34.9	34.9	77.2
	iii) Total of year expenditure(ha)	(ha)	sk	733.7	733.7	733.7	733.7	733.7	733.7	1,621.0
6)	Water cost									
	Amount Irrigation water	Unit/ha	m3/ha/year	1,313	1,659	3,132	2,068	1,240	2,376	2,423
	Amount Irrigation water	Total(16.1ha)	m3/ha/year	23,888	30,197	56,998	37,639	22,562	43,240	44,095
	Unit Water cost (18.2ha)(30%)	0.90	sk	21,499.6	27,177.2	51,298.5	33,875.2	20,306.2	38,916.0	39,685.1
	iv) Unit Water cost (ha)	(ha)	sk	1,181.3	1,493.3	2,818.6	1,861.3	1,115.7	2,138.2	2,180.5
	Ground Total (i+ii+iii+iv)	(ha)	sk	2,744.3	3,056.2	4,381.6	3,424.3	2,678.7	3,701.2	3,743.5

Table G.2.1.2.18 Irrigation Cost (Droughty Year)

No.	Description	Unit	Wheat	Spring Barley	Grain maize	Sunflower	Soybeans	Alfalfa	Asparagus	Vegetable
1)	Irrigation scale	ha	18.2	18.2	18.2	18.2	18.2	18.2	18.2	10.4
2)	Number of Sprinkler	unit	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3)	Man power (Transportation and irrigation)									
	Transportation and setting	Labor	day	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Irrigation	7day X 2 parson	day	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Clear away		day	0.5	0.5	0.5	0.5	0.5	0.5	1.0
	Total		day	15.5	15.5	15.5	15.5	15.5	15.5	16.0
	Man power Cost (18.2ha)	500.1	sk/day	7,751.8	7,751.8	7,751.8	7,751.8	7,751.8	7,751.8	8,001.8
	i)Man power Cost (ha)			481.5	481.5	481.5	481.5	481.5	481.5	869.8
4)	Drive administrative expenses									
	Transportation work	Track and trailer	day	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Transportation cost	1,250.0	sk/day	1,250.0	1,250.0	1,250.0	1,250.0	1,250.0	1,250.0	1,250.0
	Irrigation work	Tractor	day	14.0	14.0	14.0	14.0	14.0	14.0	14.0
	Irrigation cost (18.2ha)	400.0	sk/day	5,600.0	5,600.0	5,600.0	5,600.0	5,600.0	5,600.0	5,600.0
	ii)Irrigation cost (ha)			347.8	347.8	347.8	347.8	347.8	347.8	608.7
5)	Expenditure of Sprinkler									
	Sprinkler cost(Oneunit)	450,000.0	sk							568,122.0
	After subsidy price(30%)	135,000.0	sk	135,000.0	135,000.0	135,000.0	135,000.0	135,000.0	135,000.0	170,436.6
	Annual depreciation expense	Redemption for ten years(1/12)/2.6ha	sk	698.8	698.8	698.8	698.8	698.8	698.8	1,543.8
	Maintenance expense	5% of repair cost(ha)	sk	34.9	34.9	34.9	34.9	34.9	34.9	77.2
	iii) Total of year expenditure(ha)	(ha)	sk	733.7	733.7	733.7	733.7	733.7	733.7	1,621.0
6)	Water cost									
	Amount Irrigation water	Unit/ha	m3/ha/year	2,558	2,696	4,200	3,031	1,193	3,294	3,355
	Amount Irrigation water	Total(18.2ha)	m3/ha/year	46,549	49,076	76,440	55,157	21,712	59,953	61,066
	Unit Water cost (18.2ha)(30%)	0.90	sk	41,894.3	44,168.2	68,796.0	49,641.0	19,540.4	53,957.6	54,959.7
	iv) Unit Water cost (ha)	(ha)	sk	2,301.9	2,426.8	3,780.0	2,727.5	1,073.6	2,964.7	3,019.8
	Ground Total (i+ii+iii+iv)	(ha)	sk	3,864.9	3,989.8	5,343.0	4,290.5	2,636.6	4,527.7	4,582.8

TableG.2.1.2.19 (1) Rehabilitation Cost of The Irrigation System Velke Levare - Malacky (1)

No.	Item	Cost (SKK)
1) Delivering Pumping Station Gajary		
	- Repairing the sewage closing device (closure) DN 800 of the delivering object	70,000
	- Cleaning the suction shaft	80,000
	- Cleaning feed line to the suction shaft	80,000
	- Repairing pumping FLYGT (4 – 5 pieces)	8,000,000
	- Reconstructing suction shaft	460,000
	- Delivery and assembling of water-gauge water take off	220,000
	- Reconstructing pumping motor of compensation, including their automatic pirating	560,000
	Total for Delivering Pumping Station Gajary	9,470,000
2) Irrigation Pumping Station Dolečka		
	- Repairing flap traps (return valves) DN 300 and DN 200	190,000
	- Reconstruction and repairing of low and high voltage distributors	360,000
	- Changing the closing ventill (valve) DN 800 with servo drive	390,000
	- Delivery and assemblage of DN 400	220,000
	- Delivery and assemblage of motor pump compensation	440,000
	- Revision and repair pressure tanks /2 pieces/ container including renewing	
	- internal and external paint and changing damaged equipments	210,000
	- Renewing the paint of technological facilities and smith products – protecting from corrosion	280,000
	- Changing and repairing damaged windows, doors and renewing the paint of protecting grille	320,000
	- Renewing the internal well paints of the building part of the pumping station and operating room	120,000
	- Renewing, changing and repairing roof isolation a repairing rainy canal and leakage	200,000
	- Reconstruction of the pipe events to the level of pipe arrangement increase the effectively of manipulation with water according to pipe distribution and each user(expected 8 sections and 300 000 SKI)	2,400,000
	- Filling up missing concrete curb to protect small objects of pipe arrangement.	
	- Including signal bars by 120 pieces	160,000
	- Repairing and changing non-functional air chamber DEN 80 (15 pieces)	90,000
	- Repairing and changing non-functional hydration clothing DEN 100 and DEN 150 (total number 32 pieces)	240,000
	Total for Irrigation Pumping Station Dolečka	5,620,000

TableG.2.1.2.19 (2) Rehabilitation Cost of The Irrigation System Velke Levare - Malacky (2)

No.	Item	Cost (SKK)
3)	<u>Irrigation Pumping Station Kostoliste</u>	
	- Repairing damaged electro motors – 1 piece/100 W and 1 piece/200 W	360,000
	- Revision and repairing flap traps (return valves) DN 200 and DN 300	120,000
	- Delivery and assemblage of compensation of pumping motors	680,000
	- Repairing and changing of valves of regulating pressure impact of feed line – 4 pieces of DN 150 – 200	450,000
	- Revision and repair of pressure tanks 2 pieces and reconstruction of internal and external paints, and replacement of broken facilities	210,000
	- Replacement of scordated pipe – DN 250	120,000
	- Renewing the paint of technological facilities and smith products – protection from corrosion	360,000
	- Renewing internal well paints of building part of pumping station and operating room	160,000
	- Renewing, changing and repairing roof isolation a repairing rainy canal and leakage	280,000
	- Replacement and repairing broken windows, doors and renewing the paint of protecting grid	440,000
	- Repairing assembly bedding and clothing clapper on the tube net DN 300 – 4 pieces	160,000
	- Delivery and assemblage clothing DN 800 on the press pipe of Irrigation Pumping Station	320,000
	- Reconstruction of events on the tube net to increase the effectivly of manipulation with water according to tube distribution and each user (expected 14 sections and 300 000 SKK)	4,200,000
	- Repairing and changing non-functional air chamber DN 80 (14 pieces)	80,000
	- Repairing and replacement of non-functional hydration clothing DN 100 and DN 150 (total number 32 pieces)	240,000
	- Replacement o steel pipe of above melioration canales DN 200 and DN 300 with the size of 2 x 22 m	240,000
	- Repairing water-gauge shaft including the replacement of assembly bedding DN 300 – 2 pieces	260,000
	- Filling up missing concrete curb to protect small objects of pipe arrangement, including signal bars - 160 pieces	240,000
	- Repairing supplying pipe to rotating irrigation type FREGAT	70,000
	Total for Irrigation Pumping Station Kostoliste	8,990,000
	The irrigation system Velke Levare - Malacky :Total	24,080,000

TableG.2.1.2.20 Rehabilitation Cost Sekule -Male Levare Irrigation System

Item	Cost (SKK)
- Repair Screen and gate	300,000
- Reparation and Replacement of non-functional hydrant valves (DN 100 and DN 150 (40 pieces)	300,000
- Reparation and replacement of non-functional air valves DN80(20 pieces)	120,000
- Filling up missing Concrete Curbs to protect the hydrants on pipe network including signal bars(140 pieces)	186,000
- Reconstruction of events on pipe network to provide water supply to signal users (4 sections expected)	1,200,000
- Renewing, replacement and reparation of roof isolation and reparation of rain canals and leakage	180,000
- Renewing the internal walls paint of the building part of pumping station and operation room	90,000
- Replacement and reparation of damaged windows, doors and renewing the paint of protecting grille	200,000
- Renewing the paint of technological facilities and smith products - protecting from corrosion	80,000
- Revision and repair of pressure tank (1 piece), including the renewing of internal and external paint, replacement of damaged equipments	20,000
- Delivery and installation of water meter	300,000
- Reconstruction and reparation of low voltage distributors	300,000
- Reparation of back flaps	200,000
- Total	3,476,000

Table G.2.1.2.21 Rehabilitation Cost for Irrigation Facilities of Case Study Area

Irrigation system	unit	Male Levare (1)	Male Levare (2) (Kostoliste)	Gajary (Dolecky)	Gajary (P.St 11)	Total
Irrigation area	(ha)	590	294	404	-	1,288
Total repair cost	(Sk)	3,476,000	758,756	1,264,500	1,221,630	6,720,886
Unit repair cost	(Sk/ha)	5,892	2,581	3,130	1,460	-