

表 3.2.1 調査対象地域内河川の月別平均流量

(unit: m³/sec)

Name of River	Item	Description	Mean Monthly Discharge												Seasonal Average				
			Annual												I-XII	X-IX	IV-IX	X-III	
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.					Mean
Ialomita	No. of Station	546	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43
	Name of Station	Cosereni	29.3	36.1	47.7	59.6	63.3	56.4	43.8	29.4	22.9	25.8	26.3	30.1	39.2	39.2	39.1	45.9	32.9
	Catchment Area	6,265 km ²	120.0	109.0	145.0	156.0	179.0	125.0	192.0	71.9	97.3	298.0	80.1	79.3	82.4	82.4	84.5	88.6	102.4
	period	1950 - 1993	8.1	10.2	13.5	10.3	11.3	6.5	5.5	5.3	5.1	5.7	8.8	7.4	11.8	11.8	11.2	10.0	12.2
	No. of Station	547	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43
	Name of Station	Siobozia	33.1	38.9	55.6	67.2	68.0	63.0	49.4	33.9	26.1	27.5	28.6	32.7	43.7	43.7	43.6	51.3	36.5
	Catchment Area	9,154 km ²	145.0	110.0	147.0	242.0	164.0	128.0	214.0	83.7	97.6	282.0	81.6	88.3	86.8	86.8	94.1	101.6	111.3
	period	195 - 1993	10.6	11.0	14.7	11.1	12.2	8.3	9.0	4.0	3.7	5.0	9.4	8.5	12.8	12.8	13.0	10.8	13.0
	No. of Station	579	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	32
	Name of Station	Racalau	61.6	74.1	118.2	203.2	221.3	218.5	183.8	148.1	98.2	88.5	79.3	74.8	130.8	130.8	132.5	178.8	82.7
Siret	Catchment Area	19,492 km ²	145.0	145.0	252.0	433.0	924.0	672.0	844.0	247.0	372.0	174.0	179.0	246.8	246.8	251.0	370.3	195.5	
	period	1950 - 1985	11.8	24.1	43.5	66.7	63.6	50.9	41.5	36.0	28.4	31.8	31.3	18.7	60.2	60.2	60.9	68.0	33.9
	No. of Station	580	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43
	Name of Station	Cosmetesti	70.5	93.4	172.9	329.8	318.7	296.5	229.4	191.6	122.5	102.3	90.8	86.6	175.4	174.0	173.1	245.2	102.6
	Catchment Area	25,666 km ²	236.0	215.0	470.0	917.0	1151.0	762.0	819.0	939.0	360.0	686.0	243.0	278.0	327.9	327.9	327.1	492.0	290.2
	period	1950 - 1993	11.0	21.9	36.7	47.7	42.2	38.9	40.1	32.8	30.0	27.0	29.0	22.3	52.0	52.0	51.3	61.5	30.8
	No. of Station	581	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	43
	Name of Station	Lungoci	88.6	114.6	208.3	368.2	352.4	330.2	254.7	211.0	139.4	119.1	107.8	104.2	199.9	199.9	198.9	276.0	123.6
	Catchment Area	36,036 km ²	265.0	242.0	517.0	1000.0	1253.0	833.0	894.0	998.0	399.0	751.0	272.0	310.0	363.9	363.9	363.0	540.8	323.6
	period	1950 - 1993	19.1	33.5	49.5	61.4	55.5	51.9	44.7	45.3	38.0	37.4	29.8	29.1	66.0	66.0	64.8	76.2	44.8
Putna	No. of Station	665	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	
	Name of Station	Colacu	4.7	5.8	10.9	24.7	27.7	17.2	13.3	10.7	7.9	6.5	5.7	5.4	11.7	11.7	11.9	16.8	6.6
	Catchment Area	1,100 km ²	18.8	17.9	32.8	51.0	101.0	39.1	51.4	49.6	48.3	53.3	15.8	17.1	21.5	21.5	21.9	31.5	15.6
	period	1950 - 1993	0.9	1.0	3.4	4.6	5.6	3.3	2.2	2.1	1.1	1.2	1.2	1.5	5.5	5.5	4.6	3.4	1.7
	No. of Station	677	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	48
	Name of Station	Sageata-Banita	14.7	21.5	34.6	52.2	46.8	41.3	36.6	21.1	13.8	13.0	15.5	17.0	27.3	27.3	27.3	35.3	19.5
	Catchment Area	3,980 km ²	60.7	76.5	99.0	108.0	151.0	116.0	154.0	110.0	44.6	125.0	98.4	67.6	49.7	49.7	51.5	68.1	50.7
	period	1945 - 1993	3.4	3.1	7.0	7.9	5.3	4.8	4.0	0.9	0.5	3.1	2.5	3.1	9.8	9.8	8.9	10.1	5.4
	No. of Station	678	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	48
	Name of Station	Racovita	15.9	21.9	34.8	52.2	46.5	40.3	36.0	20.9	14.3	14.3	15.5	16.9	27.4	27.3	27.3	35.0	19.8
Buzau	Catchment Area	5,240 km ²	85.5	76.5	96.0	133.0	175.0	116.8	167.0	110.0	57.9	154.0	57.7	67.8	54.1	54.1	55.6	71.1	53.9
	period	1945 - 1993	1.5	2.1	7.0	7.9	5.3	1.4	4.0	0.9	0.5	3.2	2.5	3.1	9.9	9.9	8.9	10.2	3.7

Source: INMH/ISPIF

表 3.2.2-1 調査対象地域の土壌特性 (1/4)

SU	Class	Symbol	Soil type and subtype	Mother material	Soil texture	Drainage	Soil depth Cm	Gravel %	pH	Elect. cond.	Total carbonic exchange capacity Time	Degree of base saturation V%	Organic matter %	N Total %	P ppm	K ppm	Slope %	Ground water depth m	Area	
																			ha	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sub-table 1 IRRIGATION STUDY AREA																				
1	Mollisols	Cztl	Typic Chernozem	alluvial deposit	L/L	Good	125	-	N	-	L	MB	L	M	L	L	<	>5	34.1	0.1
2		Ccti	Typic Chernozem with cambic B horizon (on loess deposit and loam texture)	loess (and or alluv. dep.)	L/L, SL/SL	Good	70-115	-	N	N	L	MB	L	L	M	M	<	>5	8,984.9	33.1
3		Ccti	Typic Chernozem with cambic B horizon, (on alluvial deposit with clay-loamy texture)	alluv. dep.	L-CL/L-CL	Good	90	-	Ac	-	M	MB	M	L	L	H	<	>5	1,011.9	3.7
4		Cct/e	Typic Chernozem with cambic B horizon slightly eroded	loess dep.	L/L	Excessively	80	-	Ac	-	-	-	L	-	-	-	2-5	>5	99.7	0.4
5		Ccti	Typic Chernozem with cambic B horizon moderately eroded	loess dep.	L/L	Excessively	100	-	Ac	-	L	EB	L	VL	-	-	5-10	>5	410.3	1.5
6		Ccti	Typic Chernozem with cambic B horizon slightly to very gravelly	alluv. dep.	L/L	Excessively	76-100	-	AC	-	-	-	L	-	-	-	<	>5	1,150.1	4.2
7		Ccti	Typic Chernozem with cambic B horizon, gravelly to very gravelly, gravelly substratum	alluv. dep.	CL/CL	Excessively	51-75	-	AC	-	-	-	L	-	-	-	<	>5	353.3	1.3
8		Ccti	Typic Chernozem with cambic B horizon, gravelly to extremely gravelly, gravelly substratum	alluv. dep.	SL-L/SL-L	Good	54-80	-	AC	N	L	MB	M	L	VL	L	<	>5	1,105.9	4.1
9		Cevs	Vertic Chernozem with cambic B horizon and vertisols	caly-expansive soil	CL/CL	Good	100	-	AC	-	-	-	L	-	-	-	<	>5	245.0	0.9
10		Cevs	Vertic Chernozem with cambic B horizon	expansive soil	CL/CL	Good	90-115	-	AC	N	M	MB	L	M	L	M	<	>5	137.8	0.5
11		Cegz	Gley Chernozem with cambic B horizon	alluv. dep.	CL/L	Moderately	100	-	FAC	N	M	MB	M	M	M	H	<	>5	160.0	0.6
12		Cl/e	Typic Chernozem with argillic B horizon slightly eroded	loess dep.	L/CL	Good-Exc.	90	-	Ac	-	-	-	L	-	-	-	2-5	>5	46.0	0.2
13		CNcc	Grey Soils with cambic B horizon	loess dep.	L/L	Good	90	-	Ac	-	-	MB	L	VL	M	M	<	>5	243.3	0.9
14		CNt	Typic Grey Soils	loess (and or alluv. dep.)	L/CL	Good	80-140	-	Ac	-	L	MB	L	L	M	H	<	>5	2,678.5	9.8
15		CNt/e	Typic Grey Soils slightly eroded	loess dep.	L-CL/CL	Good	110-130	-	Ac	-	M	MB	L	L	M	M	2-5	>5	2,238.0	8.6
16		CN/e	Typic Grey Soils moderately eroded	loess dep.	L/L-CL	Excessively	90	-	N	-	-	-	L	L	H	M	5-10	>5	130.6	0.5
18	Argilluvic soils	BDmo	Brown Soils with mollic B horizon and argillic B horizon	loess dep.	L/CL	Good	80-135	-	Ac	-	M	MB	L	L	L	M	<	>5	80.2	0.3
19		BDpz	Brown Soils with argillic B Horizon and surface water gley	loess dep.	L/CL	Good	120	-	Ac	-	-	-	L	-	-	-	2-5	>5	93.3	0.3
21		BD/e	Brown Soils with argillic B horizon, slightly eroded	loess dep.	L/CL	Good	90-125	-	Ac	N	L	MB	L	L	L	M	2-5	>5	1,330.8	4.9

表 3.2.2-2 調査対象地域の土壌特性 (2/4)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
22		BDu/c	Brown Soils with argillic B horizon, moderately eroded	loess dep.	L/CL	Good-Ex.	90-116	-	Ac	-	M	MB	L	L	-	-	5-10	>5	502.5	1.8	
24		BD/e	Brown Soils with argillic B horizon, and Gullied land	loess dep.	L/CL	Excessively	70-90	-	AL	-	-	MB	L	-	-	-	5-10	>5	6.8	0.0	
30	Hydromorphic soils	LCti	Eutric Humic Gley Soils	alluv.dep.	CL/CL	Imperfectly	130	-	AL	N	-	MB	M	-	-	-	<2	0.5-1	97.5	0.4	
31		GCti	Eutric Low Humic Gley Soils	alluv.dep.	CL/CL	Imperfectly	80-130	-	AL	-	-	EB	M	-	-	-	<2	1	274.8	1.0	
32		GOan	Boggy Gley Soils	alluv.dep.	L-CL/L-CL	Very slighty	120	-	N	-	-	EB	M	-	-	-	<2	0.5	46.6	0.2	
33	Vertisols	VStu	Typic Vertisols	expansive soil	L/CLC	Good	100	-	N	N	H	EB	M	M	L	H	<2	>5	555.0	2.0	
34	Undeveloped soils	RStu	Typic Regosols	loess dep.	L/L	Excessively	25	-	AL	-	-	EB	VL	M	M	H	>20	>5	240.1	0.9	
36		RStu	Typic Regosols and Gullied land	loess dep.	L/S/L	Excessively	15	-	AL	-	-	EB	VL	-	-	-	>20	>5	5.2	0.0	
38		SAu	Typic Alluvial Soils	alluv.dep.	SL-L/SL-L	Good	30-50	-	AL	N	-	EB	M	-	-	-	<2	>5	1,011.9	3.7	
39		SAu	Typic Alluvial Soils	alluv.dep.	L-CL/CL	Good	40-50	-	AL	-	-	EB	L	-	-	-	<2	>5	331.8	1.2	
40		SAu	Typic Alluvial Soils, seldom flooded	alluv.dep.	LS-L/L-S-L	Good	28-50	-	AL	-	L	EB	VL	M	VL	VL	<2	>5	452.7	1.7	
41		SAu	Typic Alluvial Soils, phreatic phase	alluv.dep.	SL/L-CL	Good	76-90	-	Ac	N	-	MB	M	L	M	H	<2	3-5	266.2	0.9	
42		SAGz	Gley Alluvial Soils	alluv.dep.	SL-L/CL	Moderately	70-90	-	Al	N	-	EB	L	L	L	H	VH	<2	911.0	3.4	
43		SAGz	Gley Alluvial Soils	alluv.dep.	L-CL/L-S-SL	Moderately	70-90	-	AL	N	-	EB	M	M	-	-	<2	2-3	180.1	0.7	
44		SAu	Typic Alluvial Soils, slightly to moderately gravelly, gravelly substratum	alluv.dep.	SL-L/L-S-SL	Excessively	45-50	6-50	AL	-	-	EB	M	L	H	H	<2	>5	374.7	1.4	
45		SAu	Typic Alluvial Soils, slightly to moderately gravelly, gravelly substratum	alluv.dep.	SL-L/L-S-SL	Excessively	50-60	6-25	AL	-	L	EB	L	VL	H	M	<2	3	140.1	0.5	
46		SAlI	Alluvial Soils very to extremely gravelly, gravelly substratum	alluv.dep.	L/L	Excessively	25	51-75	AL	-	-	EB	L	L	-	-	<2	2-3	706.4	2.6	
47		SAmo	Mollic Alluvial Soils	alluv.dep.	L/L	Excessively	50-60	-	AL	-	-	EB	L	-	-	-	<2	3-5	204.4	0.8	
48		AAIs	Alluvial Soils extremely, gravelly (rubble land)	alluv.dep.	LS/LS	Excessively	25	51-75	AL	-	-	MB	VL	VL	-	-	<2	>5	170.5	0.6	
50		AAU	Typic Alluvial Protosol, slightly to moderately gravelly seldom flooded	alluv.dep.	LS/LS	Excessively	<10	6-25	AL	-	-	EB	VL	-	-	-	<2	3-5	78.8	0.3	
Sub-total I IRRIGATION STUDY AREA																				27,191.0	100.0

表 3.2.2-3 調査対象地域の土壌特性 (3/4)

SU	Classes	Symbol	Soil type and subtype	Mother material	Soil texture	Drainage	Soil depth Cm	Gravd %	pH H2O	Elect.coef. ECe	Total cationic exchange capacity Time	Degree of base saturation V%	Organic matter humus %	N Total %	P ppm	K ppm	Slope %	Ground water depth m	Area	
																			ha	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sub-table II SOIL CONSERVATION STUDY AREA																				
2	Mollisols	Ccti	Typic Chernozem with cambic B horizon (on loess deposit and loam texture)	loess (and or alluv.dep.)	L/L, SL/SL	Good	70-115	-	N	N	L	MB	L	L	M	M	<	>5	338.5	2.0
4		Cct/e	Typic Chernozem with cambic B horizon slightly eroded	loess dep.	L/L	Excessively	80	-	Ac	-	-	-	L	-	-	-	2-5	>5	120.4	0.7
5		Ccti	Typic Chernozem with cambic B horizon moderately eroded	loess dep.	L/L	Excessively	100	-	Ac	-	L	EB	L	VL	-	-	5-10	>5	5.6	0.0
12		ClU/e	Typic Chernozem with argillic B horizon slightly eroded	loess dep.	L/CL	Good-Exc.	90	-	Ac	-	-	-	L	-	-	-	2-5	>5	107.1	0.6
14		CNt	Typic Grey Soils	loess (and or alluv.dep.)	L/CL	Good	80-140	-	Ac	-	L	MB	L	L	M	H	<	>5	655.7	3.9
15		CNt/e	Typic Grey Soils slightly eroded	loess dep.	L-CL/CL	Good	110-130	-	Ac	-	M	MB	L	L	M	M	2-5	>5	1,103.8	6.5
16		CN/e	Typic Grey Soils moderately eroded	loess dep.	L/L-CL	Excessively	90	-	N	-	-	-	L	L	H	M	5-10	>5	503.3	2.9
17		CN/e	Typic Grey Soils, moderately eroded sheet and gully erosion	loess dep.	L/CL	Excessively	35	-	N	-	-	-	L	-	-	-	5-10	>5	160.9	0.9
18	Argilluvic soils	BDmo	Brown Soils with mollic B horizon and argillic B horizon	loess dep.	L/CL	Good	80-135	-	Ac	-	M	MB	L	L	L	M	<	>5	302.2	1.8
19		BDpz	Brown Soils with argillic B horizon and surface water gley	loess dep.	L/CL	Good	120	-	Ac	-	-	-	L	-	-	-	2-5	>5	444.1	2.6
20		BDpz/e	Brown Soils with argillic B horizon and surface water gley, slightly eroded	loess dep.	L/CL	Moderately	105-130	-	Ac	-	L	MB	L	L	VL	L	<	>5	1,454.4	8.6
21		BDU/e	Brown Soils with argillic B horizon, slightly eroded	loess dep.	L/CL	Good	90-125	-	Ac	N	L	MB	L	L	L	M	2-5	>5	2,168.2	12.8
22		BDU/e	Brown Soils with argillic B horizon, moderately eroded	loess dep.	L/CL	Good-Exc.	90-116	-	Ac	-	M	MB	L	L	-	-	5-10	>5	2,019.3	12.1
23		BD/e	Brown Soils with argillic B horizon slightly to moderately eroded (sheet and gully horizon)	loess dep.	L/CL	Excessively	80-135	-	Fac	-	L	MB	L	VL	L	H	5-10	>5	1,029.8	6.1
24		BD/e	Brown Soils with argillic B horizon, and Gullied land	loess dep.	L/CL	Excessively	70-90	-	AL	-	-	MB	L	-	-	-	5-10	>5	399.0	2.4
25		BD/e	Brown Soils with argillic B horizon severely eroded	loess dep.	CL/CL	Excessively	60-80	-	AL	-	-	MB	L	-	-	-	10-15	>5	101.9	0.6
26		BPpz	Bleached Brown Soils with argillic B horizon and surface water gley	expansive dep.	L/CL	Moderately	105-120	-	Fac	-	-	MB	L	-	-	-	<	>5	107.1	0.6
27		BPpz/e	Bleached Brown Soils with argillic B horizon and surface water gley, slightly eroded	loam dep.	L/CL	Excessively	100-110	-	Fac	-	-	MB	L	-	-	-	2-5	>5	999.2	2.4

表 3.2.2-4 調査対象地域の土壌特性 (4/4)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20.0	21.0
28		BP/e	Brown Soils with argillic B horizon, moderately-severely eroded	loam dep.	L/CL	Excessively	80-90	-	Ac	-	-	MB	L	-	-	-	5-10	>5	472.4	2.8
29	Soils with cambic B horizon. (Other than mollisols)	BMu	Brown Soils with cambic B horizon	alluv.dep.	L/L	Good	110	-	N	-	-	MB	L	-	-	-	<2	>5	33.7	0.2
33	Vertisols	VSu	Typic Vertisols	expansive soil	LCLC	Good	100	-	N	N	H	EB	M	M	L	H	<2	>5	35.1	0.2
34	Undeveloped soils	RSu	Typic Regosols	loess dep.	L/L	Excessively	25	-	AL	-	-	EB	VL	M	M	H	>20	>5	839.0	4.9
35		RSu	Typic Regosols	loam dep.	SL/SL-LS	Excessively	20	-	AL	-	-	EB	L	-	-	-	>20	>5	366.4	2.2
36		RSu	Typic Regosols and Gullied land	loess dep.	L/SL	Excessively	15	-	AL	-	-	EB	VL	-	-	-	>20	>5	1,073.3	6.6
37		ERu	Severely Eroded Soils	loess dep.	L/L-CL	Excessively	12-15	-	AL	-	-	EB	VL	-	-	-	15-20	>5	324.8	1.9
38		SAu	Typic Alluvial Soils	alluv.dep.	SL-L/SL-L	Good	30-50	-	AL	N	-	EB	M	-	-	-	<2	>5	353.9	2.1
39		SAu	Typic Alluvial Soils	alluv.dep.	L-CL/CL	Good	40-50	-	AL	-	-	EB	L	-	-	-	<2	>5	22.5	0.1
40		SAu	Typic Alluvial Soils, seldom flooded	alluv.dep.	LS-L/LS-L	Good	28-50	-	AL	-	L	EB	VL	VL	M	VL	<2	>5	1,006.8	6.0
43		SAGz	Gley Alluvial Soils	alluv.dep.	L-CL/LS-SL	Moderately	70-90	-	AL	N	-	EB	M	M	-	-	<2	2-3	309.7	1.8
44		SAu	Typic Alluvial Soils, slightly to moderately gravelly, gravelly substratum	alluv.dep.	SL-L/LS-SL	Excessively	45-50	6-50	AL	-	-	EB	M	L	H	H	<2	>5	255.9	1.5
45		SAB	Typic Alluvial Soils, slightly to moderately gravelly, gravelly substratum	alluv.dep.	SL-L/LS-SL	Excessively	50-60	6-25	AL	-	L	EB	L	VL	H	M	<2	3	192.0	1.1
48		AAIs	Alluvial Soils extremely, gravelly (rubble land)	alluv.dep.	LS/LS	Excessively	25	51-75	AL	-	-	MB	VL	VL	-	-	<2	>5	151.2	0.9
49		AAgz	Gley Alluvial protosol often flooded	alluv.dep.	LS/S	Moderately	<10	-	AL	-	-	EB	VL	-	-	-	<2	2-3	39.8	0.2
Sub-total II SOIL CONSERVATION STUDY AREA																			16,891.0	100.0
TOTAL AGRICULTURAL LAND OF STUDY AREA																			44,062.0	

表 3.2.2 に対する説明

Soil texture:

Sand = 2 ~ 0.02 mm, Silt = 0.002 ~ 0.002 mm, Clay < 0.002 mm

Sand = S, Loamy Sand = LS, Sandy Loam = SL, Loam = L

Clay Loam = CL, Loamy Clay = LC, Clay = C

pH:

FAC = 5.1 ~ 5.8; Ac = 5.9 ~ 6.8; N = 6.9 ~ 7.2; AL = 7.3 ~ 8.4; FL+ = 8.5 ~ 9; MFAL > 9

Electroconductivity:

ECe : 0 ~ 1.7 mmho/cm = No saline = N

Total N (%)

VL ~ Very low < 0.100; L ~ Low = 0.100 ~ 0.140; M ~ Moderate = 0.141 ~ 0.270

H ~ High = 0.271 ~ 0.600; VH ~ Very high > 0.600

Available P (ppm)

VL = 0 ~ 8; L = 9 ~ 18; M = 19 ~ 36; H = 37 ~ 72; VH > 72

Available K (ppm)

VL = 41 ~ 65; L = 66 ~ 130; M = 131 ~ 200; H = 201 ~ 300; VH > 300

Total cationic exchange capacity (Tme, % gr.soil)

VL = 6 ~ 10; L = 11 ~ 20; M = 21 ~ 35; H = 36 ~ 55

Degree of base saturation (V, %)

OM: oligomezobazic 40 ~ 70, MB: mezobazic 71 ~ 90, EB: eubazic 91 ~ 100

Organic matter (humus)

	Texture					
	S	LS	SL	L	CL	C
VL	0.3 ~ 0.5	0.5 ~ 0.8	0.6 ~ 1.1	0.7 ~ 1.3	0.9 ~ 1.5	1.1 ~ 2.0
L	0.6 ~ 1.0	0.9 ~ 1.7	1.2 ~ 2.2	1.4 ~ 3.0	1.6 ~ 3.5	2.1 ~ 5.0
M	1.1 ~ 2.0	1.8 ~ 4.0	2.2 ~ 5.5	3.1 ~ 6.5	3.6 ~ 8.0	5.1 ~ 10.0
H	2.1 ~ 5.0	4.1 ~ 7.0	5.6 ~ 8.5	6.6 ~ 10.5	8.1 ~ 12.5	10 ~ 1-16.0

表 3.2.3 ルーマニア国における土地分級基準

Constraints	Class I	Class II	Class III	Class IV	Class V	Class VI
Texture	SL,L	LS,CL,CLSi	S,SC,C	S,C	S,C	S,C
Slope and erosion (p)	0-2% erosion no visible	2.1-10% slight moderate erosion	10.1-15% moderate-strong erosion	15.1-20% strong-very strong erosion	20.1-25% v. strong-excessive erosion	>25% excessive erosion
Water stagnation on soil surface (w)	no stagnation	short time stagnation 5-15 days	medium time stagnation 15-30 days	long time stagnation >30 days	very long time stagnation marsh	-
Depth of ground water (Q)	<3 m	2-3 m	1-2 m	0.5-1 m	<0.50	pond
Flooding (i)	no flooding	rare flooding	moderate flooding	frequent flooding	once by year	more once by year
Gravel in soil profile (q)	<6%	6-50%	26-75%	51-75%	51-75%	75% or more

Source: The Methodology of the Elaboration of Soil's Reports. Norm number 20 A/1986

表 3.3.1 調査対象地域 (19 村町) の作物作付面積、生産量及び単位収量

Crops Cultivated	Area cultivated (ha)			Production (ton)			Yield (kg/ha)			
	1985	1990	1992	1985	1990	1992	1985	1990	1992	Average
Wheat	11,756	12,953	5,959 (9.8%)	22,318	33,304	15,190	1,898	2,571	2,549	2,340
Maize	14,915	13,546	26,506 (43.6%)	70,571	35,132	43,383	4,732	2,594	1,637	2,987
Barley	2,099	2,679	1,582 (2.6%)	3,954	5,360	5,323	1,884	2,001	3,365	2,416
Bean seeds	547	12	41 (0.0%)	761	120	110	1,391	10,000	2,683	4,691
Sugar beet	495	165	224 (0.4%)	7,468	2,743	3,421	15,087	16,624	15,272	15,661
Sunflower	2,345	1,447	1,294 (2.1%)	4,469	1,869	1,656	1,906	1,292	1,280	1,492
Potatoes	975	877	485 (0.8%)	17,776	6,427	6,187	18,232	7,328	12,757	12,772
Vegetables	1,136	1,526	1,564 (2.6%)	22,302	17,868	29,254	19,632	11,709	18,705	16,682
Pasture - Perennial	3,821	5,764	4,192 (6.9%)	108,636	101,748	105,536	28,431	17,652	25,176	23,753
- Annual	0	3,592	2,045 (3.4%)	0	50,253	26,685	-	13,990	13,049	9,013
Orchards	-	-	1,705 (2.8%)	18,542	19,729	38,876	-	-	-	-
Vineyards	14,207	14,683	15,228 (25.0%)	33,068	110,378	55,474	2,328	7,517	3,643	4,496
Total	52,296	57,244	60,825 (100%)	-	-	-	-	-	-	-

Source : DJS-Vrancea

Note : including out side are of the Study Area

表 3.3.2 調査対象地域 (19 村町) の家畜保有頭数

	Name of Livestock and their production	Year				Per Farm** Household
		1986	1988	1990	1992	
Number of heads raised (heads/Family)	Cattle	32,829	29,933	31,852	21,528	0.87
	Pigs	16,523	16,472	26,285	40,995	0.72
	Sheep	97,947	95,313	80,951	59,661	2.20
	Goat	12,108	14,900	15,836	12,770	0.40
	Horse	4,887	4,780	4,690	878	0.13
	Chicken	868,831	1,014,173	1,030,673	1,086,333	28.07
	Bee	8,635	8,660	7,185	1,888	0.20
	House rabbit	7,612	32,746	9,374	703	0.26
Production	Meat(ton)	13,500	13,694	10,090	16,059	0.27
	Cattle milk (h lit)	197,971	171,361	137,425	155,835	3.74
	Sheep/Goat milk (h lit)	15,842	12,810	9,913	37,203	0.27
	Wool (kg)	179,900	159,439	118,148	124,684	3.22
	Eggs (1,000 pcs.)	27,137	28,701	44,093	47,990	1.20
	Honey (Kg)	152,900	176,766	37,789	23,804	1.03

Source : DJS-Vrancea

Notes : * including outside area of the Study Area

** in 1992

表 3.3.3 主要農業支援機關

Name of Supporting System	Location	Function	Managed by
Banca Agricola Focsani Agents: 2 in Focsani, 1 in Panciu, 1 in Adjud	Focsani	Credit Supply	S.A.
APRO (MILCOV) Cimpineanca	each village/town	Inputs Supply	S.A.
AGROSEM Vrancea	Focsani	Certified Seed	S.A.
ROMCEREAL Vrancea	Marasesi Focsani	Buyer of Grain Grain Storage	S.A.
AGROMECA Panciu, etc.	11, of which 5 in Study Area	Rental Machinery	Privatized
Centre Agricole (District)	Focsani	Extension	Public
Veterinary Offices	each village/town	Animal Health	Public
Weekly held Tric (Market)	Focsani	Livestock Trade	Public

Source: DO

表 3.3.4 調査対象地域 (19 村町) の人口、世帯数及び土地所有

NO.	Town and Village	Number of Households		Population				Acreage of Farm Land and Farmers by Farming Types						Percentage of Acceptance			
		Total	Farm	Total	Farmers Working in Active			SCM			A.A.A.s			Private Farm		Certificate	Title of Property
					in SCM	in AA & A.A.s	in Private Farm	Total Acreage	Number of Farmers	Number of Farm	Total Acreage	Number of Farmers	Number of Farm	Total Acreage	Number of Farmers		
1	RUGINESTI	1,675	1,675	2,800	0	2	2,800	0	0	0	0	0	0	2	3,213	100.0	25.0
2	PAUNESTI	2,500	2,500	3,800	200	0	3,800	0	0	0	200	0	0	0	4,521	100.0	20.0
3	PUFESTI	1,266	1,266	2,611	100	22	2,611	0	0	100	0	1	48	22	2,179	100.0	48.0
4	MOVILITA	1,650	1,650	2,200	15	85	2,115	0	0	15	1	1	120	85	2,671	100.0	18.0
5	STRAOANE	1,600	1,600	2,000	300	0	2,000	0	0	300	0	0	0	0	3,252	95.0	12.0
6	FITIONESTI	1,237	1,237	1,960	40	0	1,960	0	0	40	0	0	0	0	2,594	90.0	0.0
7	PANCIU	3,300	1,830	4,740	770	12	4,728	1	1	870	2	2	340	12	5,180	100.0	0.7
8	TIFESTI	1,975	1,975	1,500	20	0	1,500	3	0	20	0	0	0	0	4,040	98.0	16.2
9	BOLOTESI	2,056	2,056	1,751	0	0	1,751	0	0	0	0	0	0	0	1,028	85.0	1.0
10	MARASESTI	4,234	2,100	14,336	0	2,560	3,200	1	-	-	-	9	1,800	2,500	2,622	100.0	12.6
11	ODOBESTI	2,740	1,210	8,572	327	78	920	5	-	327	1	1	42	78	1,350	100.0	20.6
	Total	24,233	19,099	71,724	1,772	2,759	27,385	-	-	-	-	-	-	-	-	-	-
	%	100.0	78.8	100.0	6.4	10.0	99.6	-	-	-	-	-	-	-	-	-	-

Source : Interview survey for Mayors, JICA team, 1994

表 3.5.1 土壤保全調査地区評価一覧表

Area Number	Basin River	Area of Basin (ha)	Area of Vineyard (ha)	(%) of Vineyard	Slope (%)	Sheet Erosion Class	Sediment Capacity by Gully Erosion (m ³ /ha/yr)	Soil Losses (ton/ha/yr)	Location vs. Irrigation Area	Class of Priority
B/I/1	Putna	264	57	21.6	7-25	-	600-900	-	near irrigation border	II
B/I/2	-	16	9	56.3	6-22	-	500-800	-	-	II
B/I/3	-	164	74	45.1	5-24	-	400-600	-	-	II
B/I/4	-	26	5	19.2	7-10	-	500-700	-	outside irrigation system	III
B/I/5	-	16	0	0.0	7-12	-	400-600	-	-	III
B/I/6	-	39	5	12.8	6-11	-	500-800	-	-	III
B/I/7	-	110	40	36.4	6-14	-	400-500	-	-	III
B/I/8	-	124	9	7.3	5-14	-	400-500	-	-	III
B/I/9	-	26	6	23.1	18-30	very strong excessive	-	24-30	-	III
D/I/10	-	180	6	3.3	20-32	-	-	26-32	-	III
D/I/11	Susita	191	6	3.1	16-26	-	-	16-28	-	III
C/I/12	-	844	127	15.0	12-25	-	500-700	18-25	-	III
C/I/13	Zabraz	29	7	24.1	8-12	very strong	300-400	16-20	-	III
C/I/14	-	29	20	69.0	18-22	-	-	18-25	-	III
C/I/15	-	244	37	15.2	18-28	very strong excessive	500-600	21-27	-	III
C/I/16	-	126	0	0.0	12-18	-	300-400	24-28	-	III
C/I/17	-	235	18	7.7	14-26	very strong	400-500	20-26	-	III
B/I/18	-	318	6	1.9	14-25	very strong excessive	300-400	18-25	-	III
B/I/19	Carecna	240	11	4.6	15-25	very strong	300-400	16-24	-	III
B/I/20	-	38	0	0.0	18-22	-	300-400	17-22	-	III
A/I/21	-	131	0	0.0	12-20	-	-	14-22	-	III
A/I/22	-	192	11	5.7	12-20	-	-	12-18	-	III
A/I/23	Trotus	94	4	4.3	18-26	-	-	17-26	-	III
A/I/24	-	260	9	3.5	13-22	-	400-500	18-24	-	III
A/I/25	-	153	77	50.3	16-22	-	-	22-28	-	III
A/I/26	-	294	106	36.1	16-28	-	-	23-30	-	III
A/I/27	-	40	9	22.5	25-30	very strong excessive	300-350	14-18	-	III
A/I/28	-	180	32	17.8	14-28	-	400-500	20-26	-	III
A/I/29	-	54	0	0.0	28-35	-	-	12-16	-	III
A/I/30	Boului	250	195	78.0	18-28	-	-	12-16	-	III
sub-total		4,907	886	18.1						
B/II/1	Milcov	453	421	92.9	6-14	strong - very strong	-	12-18	outside irrigation system	III
B/II/2	Putna	214	161	75.2	12-16	-	-	13-19	-	III
B/II/3	-	185	185	100.0	10-16	-	-	13-19	-	III
B/II/4	-	142	109	76.8	8-12	-	-	10-16	-	III
B/II/5	-	104	81	77.9	8-12	-	-	10-16	-	III
B/II/6	-	1,234	785	63.6	6-12	-	-	14-18	-	III
D/II/7	Susita+Putna	138	138	100.0	6-12	strong	-	14-18	-	III
C/II/8	Zabraz	141	124	87.9	6-14	-	-	13-17	-	III
C/II/9	-	225	225	100.0	6-10	moderate-strong	-	8-14	-	III
C/II/10	Susita	176	155	88.1	5-10	moderate	-	6-12	-	III
C/II/11	Susita+Zabraz	248	171	69.0	4-18	moderate-strong	-	8-14	-	III
C/II/12	Zabraz	28	28	100.0	8-14	-	-	7-12	-	III
C/II/13	-	308	134	43.5	5-12	moderate	-	6-12	-	III
C/II/14	-	54	0	0.0	8-12	-	-	7-10	-	III
B/II/15	Carecna	179	9	5.0	6-10	-	-	6-10	-	III
A/II/16	-	329	106	32.2	5-16	moderate-strong	-	6-10	-	III
A/II/17	Trotus	42	2	4.8	7-12	moderate	-	6-8	-	III
A/II/18	-	64	55	85.9	8-14	moderate-strong	-	7-11	-	III
A/II/19	-	65	12	18.5	5-8	moderate	-	6-8	-	III
sub-total		4,329	2,901	67.0						
B/III/1	Putna	570	450	78.9	6-10	moderate	-	7-14	near irrigation border	II
B/III/2	Putna	428	362	84.6	5-10	-	-	7-14	-	II
D/III/3	Putna+Susita	520	490	94.2	3-6	-	-	4-8	-	II
C/III/4	Putna+Zabraz	1,490	1,340	89.9	4-7	-	-	5-8	-	II
B/III/5	Siret	840	790	93.9	3-7	-	-	5-9	-	II
A/III/6	-	640	560	87.5	4-8	moderate	-	5-9	-	II
A/III/7	-	300	235	78.3	4-8	moderate	-	5-9	-	II
sub-total		4,788	4,187	87.4						
C/IV/1	Siret	131	60	45.8	3-7	moderate	-	6-12	inside irrigation area	I
B/IV/2	-	290	0	0.0	3-7	-	-	6-12	-	I
B/IV/3	-	110	0	0.0	3-7	-	-	6-12	-	I
B/IV/4	-	125	0	0.0	3-7	-	-	6-12	-	I
B/IV/5	-	130	0	0.0	3-7	-	-	6-12	-	I
B/IV/6	-	85	50	58.8	3-7	-	-	6-12	-	I
A/IV/7	-	70	0	0.0	3-7	-	-	6-12	-	I
A/IV/8	-	990	30	3.0	3-7	moderate-strong	-	6-12	-	I
sub-total		1,931	140	7.3						
B/V/1	Siret	1,544	736	47.7	2-5	Slight	-	2-6	inside irrigation area	I
D/V/2	-	472	41	8.7	2-5	-	-	2-6	-	I
C/V/3	-	2,147	196	9.1	2-5	-	-	2-6	-	I
B/V/4	-	1,737	300	17.3	2-5	-	-	2-6	-	I
A/V/5	-	1,755	116	6.6	2-5	-	-	2-6	-	I
sub-total		7,655	1,389	18.1						
Total		23,610	9,503	40.2						

表 4.3.1 計画作付面積及び栽培時期

Crop	Area (%)	Cropping time		
		Sowing	Transplanting	Harvesting
Wheat	12.0	E/Oct	-	M/July
Barley	3.0	L/Sep	-	M/June
Maize	45.0	L/April	-	M/Sep
Bush bean (Soybean)	25.0 (25.0)	E/May-M/June (M/May)	-	E/Aug-M/Sep (E/Sep)
Bean seeds	(to be included in bush bean)			
Sunflower	2.5	E/May	-	M/Sep
Sugar beet	0.5	L/March	-	L/Sep
Potato	1.0	E/April	-	L/Aug-E/Sep
Maize for silo	3.0*	July	-	E.M/Oct
Cabbage				
Medium	1.5	M/Feb	E/April	July-Sep
Late	4.0*	M/June	M.L/July	Oct-Nov
Cauliflower				
Medium	1.5	(Same as Cabbage)		
Late	4.0*	(- do -)		
Cucumber				
Early	1.0	L/April	-	July-Aug
Late	4.0*	July	-	Sep-Oct
Onion	1.0	May	E.M/June	Sep-Oct
Garlic(H.quarity)	1.0	(Same as Onion)		
Green pepper	1.0	March	May	L/July-Oct
Egg plant	1.0	March	May	L/July-Oct
Carrot	1.4	March-June	-	July-Nov
Tomato	1.5	Feb-March	E.M/May	July-Oct
Annual pasture	0.1	-	-	-
Total arable land	100	-	-	-
Total cropped area	115	-	-	-

- Notes :
 1) E,M,L: 1st,2nd and 3rd 10 days of the month
 2) *: Succeeding crops
 3) Source: ICLF Vidra, SCPL Bacau and farmers in the Study Area
 4) () : Alternative

表 4.3.2 計画輪作体系

Crop rotation pattern	1st year	2nd year	3rd year	4th year
I	M	M	C	B
II	M	M	W/MC	B
III	M	M	B	W/MC
IV	M	M	B	C
V	C	W/MC	W/MC	B
VI	B	W/MC	W/MC	C

- Notes :
 M: Maize, C: Cash crop, B: Leguminous crop,
 MC: Maize for silo as a succeeding crop of barley and
 cash crop(Vegetables) as a succeeding crop of wheat

表 4.3.3 計画地区の農業機械数

(Unit : units)

Type of Machinery	Number of Machinery		Area Required (ha)	Working capacity (ha/year)	Number of Machinery Required																													
	Existing	Required			March			April			May			June			July			August			September			October								
			L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M	L	E	M		
Tractor(65Hp)	455	235	63,693	271	6	132	102	235	76	58	53	55	10	2	36	38	38																26	102
Disc Plough	258	125	22,759	182	4	125	101	104	58	44	40	42	7	1	25	30	30																17	68
Disk Harrow	69	72	22,759	316	2	7	1	72	18	14	13	13	3	1	7	8	8																5	18
Seeder(Wheat/Barley)	78	16	2,971	186																											4	16		
" (Sunflower/Maize)	56	59	10,004	170				59	3						4																			
" (Bush bean)	0	8	4,953	619					8	8	8	8																						
Combine(Cereals)	160	18	2,971	165									5			18																		
" (Maize)		89	9,509	107																											89		6	
" (Bush Bean/Forage)	19	12	4,953	413																					12	12	12	12						
" (Sunflower)		5	495	99																											5			

Notes : 1) Number of machinery required was calculated as 3.5 ha/day in operation efficiency on ploughing, 13 on harrowing, 15 on seeding and 13 on harvesting for wheat/bar 10 for maize/sunflower and 5 for sugar beet with working hours of 8-10 hours/day.

2) Existing number of machinery is the total of AGROMECS(Adjud, Panciu, Marasesti, Odobesti, Chimpineanca), ROMCEREAL and private in the IPA.

表 4.3.4 作物生産計画

Crop	Area cultivated		Yield (kg/ha)	Production (ton)
	(ha)	(%)		
Wheat	2,377	12.0	3,399	8,080
Barley	594	3.0	3,624	2,154
Maize	8,915	45.0	4,524	40,329
Bush bean	4,953	25.0	2,200	10,897
(Soy bean)	(4,953)	(25.0)	(3,000)	(14,858)
Bean seeds	(including bush bean)			
Sunflower	495	2.5	2,319	1,148
Sugar Beet	99	0.5	30,502	3,021
Potato	198	1.0	21,329	4,225
Maize for silage*	594	3.0	39,000	23,166
Cabbage				
Medium	297	1.5	43,000	12,777
Late*	792	4.0	65,000	51,480
Cauliflower				
Medium	297	1.5	17,000	5,052
Late*	792	4.0	23,000	18,216
Cucumber				
Early	198	1.0	50,000	9,905
Late*	792	4.0	28,000	22,176
Onion	198	1.0	22,000	4,358
Garlic(H.quarity)	198	1.0	7,000	1,387
Green pepper	198	1.0	22,000	4,358
Egg plant	198	1.0	33,000	6,537
Carrot	277	1.4	38,000	10,526
Tomato	297	1.5	60,000	17,829
Annual pasture	20	0.1	22,714	454
Sub-total	22,780	115.0	-	258,077
[Net area]	[19,810]	[100.0]	-	-
Perennial pasture	500	100.0	23,753	11,877
Grape	2,550	-	8,946	22,812
Total	25,830	-	-	292,764
[Net area]	[22,860]	-	-	-

Notes : * : Succeeding crop of Barley and Wheat
() : Alternative

表 4.4.1 月別灌漑用水量

(5年確率濁水)

(Unit : m3/ha/month)

Crop	Cropping Area Ratio	April	May	June	July	August	Sept.	Total
Wheat/Barley	15.00%	354	1,233	815	0	0	0	2,402
Maize (silage)	3.00%	0	0	0	527	974	707	2,208
Maize (grain)	45.00%	0	168	499	1,460	465	0	2,592
Soy Bean	25.00%	0	79	407	1,487	489	0	2,462
Sugar Beet	0.50%	0	343	673	1,460	1,118	0	3,594
Sunflower	2.50%	0	333	701	1,514	0	0	2,548
Beans	0.00%	0	203	506	1,239	0	0	1,948
Potatoes	1.00%	0	372	628	1,363	477	0	2,840
Vegetables	22.90%	51	369	1,235	1,279	343	158	3,435
Lucerne	0.10%	184	543	708	1,363	962	605	4,365
Grape	0.00%	0	96	307	549	747	0	1,699
Weight Total*		57	335	611	1,244	446	49	2,742

(2年確率濁水)

(Unit : m3/ha/month)

Crop	Cropping Area Ratio	April	May	June	July	August	Sept.	Total
Wheat/Barley	15.00%	46	965	800	0	0	0	1,811
Maize (silage)	3.00%	0	0	0	401	715	631	1,747
Maize (grain)	45.00%	0	0	355	1,211	441	0	2,007
Soy Bean	25.00%	0	0	195	1,131	484	0	1,810
Sugar Beet	0.50%	0	0	508	1,105	1,017	0	2,630
Sunflower	2.50%	0	0	524	1,217	0	0	1,741
Beans	0.00%	0	0	254	1,051	0	0	1,305
Potatoes	1.00%	0	0	501	1,015	463	0	1,979
Vegetables	22.90%	0	280	1,024	1,059	300	131	2,794
Lucerne	0.10%	0	193	505	1,048	764	510	3,020
Grape	0.00%	0	0	0	327	548	0	875
Weight Total*		7	175	461	1,002	416	42	2,104

Source : ICITID calculation results, Sep. 1994

Note : * arithmetic estimate by the Project cropping area ratio without vineyard, with vineyard irrigation shall be estimated separately

表 4.2.2 灌漑ブロック

Name of Tributaries	Total of Irrigation Blocks			Direct Area			1st Stage			2nd Stage			3rd Stage		
	Block No.	Total Area (ha)	Average Area (ha)	Block No.	Total Area (ha)	Average Area (ha)	Block No.	Total Area (ha)	Average Area (ha)	Block No.	Total Area (ha)	Average Area (ha)	Block No.	Total Area (ha)	Average Area (ha)
Trotus	9	4,052	450	-	-	-	3	1,294	431	4	2,015	504	2	743	372
Calcuna	10	4,174	417	2	792	396	2	951	476	3	1,243	414	3	1,188	396
Zabraut	11	3,947	359	1	100	100	5	1,743	349	3	1,221	407	2	883	442
Susita	8	2,983	373	2	939	470	2	718	359	2	864	432	2	462	231
Purna	11	7,204	655	3	1,865	622	3	1,996	665	3	1,826	609	2	1,517	759
Milcov	49	22,360	456	8	3,696	462	15	6,702	447	15	7,169	478	11	4,793	436

表 4.7.1 揚水機場 (SRP)

No.	Name of pump station	Service area (ha)	Design discharge (l/s)	Total head (m)	Pump				
					Type	Number	Discharge (l/s)	Diameter	Motor
1	SRP-I	2,758	1,763	44.0	MV	5	353	403C	6kv/315kw
2	SRP-IA	1,294	827	7.5	BRATES	2	298	350-410	37kw
3	SRP-II	743	475	45.0	BRATES	3	80	250-292	11kw
4	SRP-III	1,188	759	54.0	NDS	2	184	400-350-500	160kw
5	SRP-IV	2,431	1,554	41.0	LOTRU	3	36	125	37kw
6	SRP-V	6,140	3,924	41.0	NDS	2	294	350-300-430	250kw
7	SRP-VI	9,234	5,334	37.5	NC	3	57	125-100-250	55kw
8	SRP-VII	6,773	3,761	25.0	NDS	4	389	500-450-610	6kv/400kw
9	SRP-VIII	1,797	1,002	18.0	NDS	3	1,308	800-600-950	6kv/800kw
10	SRP-IX	1,996	1,088	31.0	NDS	4	1,334	800-600-910	6kv/800kw
					NDS	2	218	400-350-500	110kw
					LOTRU	3	43	125	30kw
					MV	4	941	602C	6kv/400kw
					BRATES	2	387	440-445	110kw
					BRATES	3	76	250-292	37kw
					NDS	2	427	500-450-640	200kw
					NC	3	78	200-150-315	37kw

Note: BRATES: horizontal-axial single-stage volute type mixed flow pump
 NDS, NC, LOTRU: horizontal-axial single-stage volute type centrifugal flow pump
 MV: vertical-axial multi-stage mixed flow pump

表 4.7.2 配水路 (CD)

Name of CD	Race No.	Design Discharge (m ³ /s)	Ranges		Canal Length		No. of Water Table Regulators	Spillway Control Gates	No. of Drops	Remarks	
			from	to	Race (m)	Total (m)					
CD.1	I	0.827	SRP-IA	SPP.3A-1	1,150	5,100	2	1		Spillway	
	II	0.391	SPP.3A-1	SPP.3A-2	1,655						
	III	0.268	SPP.3A-2	SPP.3A-3	2,295						
CD.2	I	1.763	SRP-I	SRP-II	3,300	7,105	3	1	1	Spillway to Carecna R.	
	II	0.750	SRP-II	SPP.2	2,500						
	III	0.269	SPP.2	SPP.1	1,305						
CD.3	I	0.475	SRP-II	SPP.3-2	2,260	2,260		1			
CD.4	I	3.924	SRP-Vn	SRP-IV	2,465	7,950	2	1			
	II	2.043	SRP-IV	SRP-I	4,785						
	III	0.500	SRP-I	Carecna R.	700						
CD.5	I	1.554	SRP-IV	SRP-III	1,500	4,070	1	1			
	II	0.309	SRP-III	SPP.6	2,570						
CD.6	I	0.466	SRP-III	SPP.8	1,060	4,535	1	1			
	II	0.300	SPP.8	Crecna R.	3,475						
CD.6A	I	0.293	SRP-III	SPP.12	1,920	1,920		1			
CD.7	I	5.334	SRP-Vn	SRP-VII	5,745	12,645	4	1	3	Spillway	
	II	0.737	SRP-VII	SPP.17A	3,000						
	III	0.459	SPP.17A	SPP.19	705						
	IV	0.300	SPP.19	Putna R.	3,195						
CD.8	I	1.145	SRP-VII	SRP-VI	3,010	3,010		1		Spillway	
CD.8A	I	2.616	SRP-VII	SRP-VIII	3,900	12,550	5	1	4	Spillway	
	II	1.072	SRP-VIII	SPP.24	4,650						
	III	0.692	SPP.24	SPP.29	1,500						
	IV	0.281	SPP.29	SPP.30	2,500						
CD.9	I	0.564	SRP-VI	SPP.16	3,450	3,450		1		Drain to Drainage Canal	
CD.10	I	1.002	SRP-VIII	SPP.18-2	2,285	5,595	2	1	2		
	II	0.707	SPP.18-2	SPP.23	2,510						
	III	0.429	SPP.23	SPP.31	800						
CD.11	I	1.008	SRP-IX	SPP.28	2,500	6,180	2	1		Spillway	
	II	0.512	SPP.28	SPP.25	1,500						
	III	0.300	SPP.25	Putna R.	2,180						
Total						76,370		22	13	10	

表 4.7.3 サイホン工

No. of Syphon	Name of CD	Crossing Length (m)	Flow Capacity (m ³ /s)	Syphon Demention Dia.(m) X No.	Name of River/Drain
1	CD.2	195	0.75	1.10 X 1	Domosita Secata R. Boulai R.
2		95	0.75	1.10 X 1	
3	CD.4	148	3.924	1.50 X 3	Zapodia Mica R.
4		175	2.043	1.30 X 2	
5		109	1.763	1.20 X 2	
6	CD.6	40	0.466	1.00 X 1	Zapodia Mica R.
7	CD.7	100	5.334	1.70 X 3	Susita R.
8		30	0.737	1.1- X 1	
9		175	0.459	1.00 X 1	
10	CD.8	30	0.945	1.20 X 1	
11	CD.8A	30	2.616	1.50 X 2	Susita R. Putna R.
12		475	2.416	1.40 X 2	
13		545	0.862	1.2 X 1	
14	CD.10	200	0.795	1.10 X 1	Putna R.
15		1365	0.707	1.10 X 1	

表 4.7.4 場內排水路

Sr. No.	Sr. No.	Name of River to be discharged	Bottom Slope	Drain Length (m)		Sr. No.	Name of River to be discharged	Bottom Slope	Drain Length (m)		Name of River to be discharged	Bottom Slope
				Type I	Type II				Type I	Type II		
1	DC-1	Calimanesti Dam drain	1/2,000	-	3,000	36	Calimanesti Dam drain	1/2,000	2,200	2,200	Marasesti	1/2,000
2	DC-2	Calimanesti Dam drain	1/1,000	-	900	37	Calimanesti Dam drain	1/1,000	1,500	1,500	Marasesti	1/2,000
3	DC-3	Calimanesti Dam drain	1/2,000	-	5,200	38	Calimanesti Dam drain	1/2,000	1,600	1,600	Trous River	1/2,000
4	DC-4	Trous River	1/1,500	-	2,000	39	Trous River	1/1,500	2,000	2,000	Susita River	1/2,000
5	DC-5	Boutui River	1/2,000	-	4,000	40	Boutui River	1/2,000	1,300	1,300	Zabraut River	1/2,000
6	DC-6	Boutui River	1/2,000	-	1,500	41	Boutui River	1/2,000	1,200	1,200	Marasesti	1/2,000
7	DC-7	Domosita River	1/2,000	-	1,900	42	Domosita River	1/2,000	1,500	1,500	Marasesti	1/2,000
8	DC-8	Boutui River	1/2,000	1,600	-	43	Boutui River	1/2,000	1,500	1,500	Marasesti	1/1,500
9	DC-9	Boutui River	1/2,000	1,700	-	44	Boutui River	1/2,000	1,700	1,700	Susita River	1/1,000
10	DC-10	Boutui River	1/1,000	-	1,500	45	Boutui River	1/1,000	-	2,300	Susita River	1/2,000
11	DC-11	Carena River	1/1,500	-	1,600	46	Carena River	1/1,500	-	3,300	Putna River	1/2,000
12	DC-12	Boutui River	1/2,000	1,600	-	47	Boutui River	1/2,000	-	2,400	Susita River	1/1,500
13	DC-13	Creana River	1/2,000	2,800	-	48	Creana River	1/2,000	-	2,900	Putna River	1/1,500
14	DC-14	Siret River	1/2,000	-	2,800	49	Siret River	1/2,000	2,200	-	Susita River	1/1,500
15	DC-15	Calimanesti Dam drain	1/2,000	-	4,800	50	Calimanesti Dam drain	1/2,000	2,300	-	Putna River	1/1,500
16	DC-16	Calimanesti	1/2,000	-	1,300	51	Calimanesti	1/2,000	1,600	-	Susita River	1/2,000
17	DC-17	Zabraut River	1/2,000	-	1,300	52	Zabraut River	1/2,000	2,200	-	Putna River	1/2,000
18	DC-18	Carena River	1/2,000	2,100	-	53	Carena River	1/2,000	-	500	Putna River	1/1,000
19	DC-19	Calimanesti	1/2,000	2,000	-	54	Calimanesti	1/2,000	-	2,400	Soimu D.	1/1,500
20	DC-20	Calimanesti	1/1,500	1,100	-	55	Calimanesti	1/1,500	-	3,000	Soimu D.	1/1,500
21	DC-21	Zabraut River	1/1,500	1,000	-	56	Zabraut River	1/1,500	-	2,000	Cocaina Noua D.	1/1,500
22	DC-22	Carena River	1/1,500	1,300	-	57	Carena River	1/1,500	-	2,700	Cocaina Noua D.	1/1,500
23	DC-23	Calimanesti	1/2,000	700	-	58	Calimanesti	1/2,000	-	1,900	Putna River	1/1,500
24	DC-24	Calimanesti	1/1,500	1,200	-	59	Calimanesti	1/1,500	-	1,400	Soimu D.	1/1,500
25	DC-25	Calimanesti	1/2,000	-	-	60	Calimanesti	1/2,000	-	2,700	Soimu D.	1/2,000
26	DC-26	Calimanesti	1/1,500	1,400	-	61	Calimanesti	1/1,500	-	1,800	Putna River	1/1,500
27	DC-27	Zabraut River	1/2,000	1,300	-	62	Zabraut River	1/2,000	700	1,600	Soimu D.	1/1,500
28	DC-28	Marasesti	1/2,000	2,000	-	63	Marasesti	1/2,000	600	500	Soimu D.	1/2,000
29	DC-29	Marasesti	1/1,500	2,000	-	64	Marasesti	1/1,500	-	1,700	Soimu D.	1/2,000
30	DC-30	Marasesti	1/2,000	800	-	65	Marasesti	1/2,000	-	1,800	Soimu D.	1/2,000
31	DC-31	Marasesti	1/2,000	900	-	66	Marasesti	1/2,000	1,300	-	Putna River	1/1,500
32	DC-32	Marasesti	1/2,000	1,900	-	67	Marasesti	1/2,000	2,500	-	Soimu D.	1/2,000
33	DC-33	Susita River	1/1,500	2,000	-	68	Susita River	1/1,500	-	3,200	Soimu D.	1/2,000
34	DC-34	Susita River	1/1,500	1,000	-	69	Susita River	1/1,500	-	4,900	Soimu D.	1/2,000
35	DC-35	Zabraut River	1/1,500	1,600	-		Zabraut River	1/1,500	-	-		
Subtotal				20,000	45,100				27,900	43,000		
Total									47,900	88,100		

表 4.7.5 農道及び維持管理用道路

Category	Road No.	Length		Effective Width (m)	Type of Pavement	No. of Structures Required				Remarks	
		Improvement (m)	New (m)			CD-C	DC-C	BD-C	GW-C		
Artery Road	DJ206H	2,000	-	5.50	Asphalt	1	-	1	-	DN2 - Domnesti	
	37	9,400	-	5.50	Asphalt	2	-	1	-	Ciorani - DN2 - Movilita	
	DJ204E	9,500	-	5.50	Asphalt	-	-	1	-	DN2 - Panciu	
	DJ205E	10,400	-	5.50	Asphalt	2	-	1	-	Tifesti - DN2 - Main Canal	
	29	2,000	-	5.50	Gravel	-	-	-	-	DN2 - R. Domosita	
Secondary Roads	No.1	7,000	-	5.50	Gravel	1	-	1	-	DN2 - Paunesti	
	26	4,800	-	5.50	Gravel	1	-	1	-	DJ206H - Ruginesti	
	35	10,000	-	5.50	Gravel	1	-	1	-	Domnesti - Main Canal	
	No.2	10,300	-	5.50	Gravel	-	-	1	-	Padureni - DN2 - Movilita	
	No.3	6,500	-	5.50	Gravel	2	-	-	-	DN2 - DJ205F	
Operation and Maintenance Road	No.4	10,200	-	5.50	Gravel	1	-	1	-	Bolotesti - Main feed canal	
	No.5	3,000	-	5.50	Gravel	-	-	-	-	Odobesti - DN2D	
	PR 1	-	8,000	5.50	Gravel	-	-	-	1	R. Domosita - No.1 - DJ206H - R. Carecna	
	PR 2	-	9,600	5.50	Gravel	-	-	-	2	R. Domosita - No.1 - DJ206H - R. Carecna	
	PR 3	-	4,500	5.50	Gravel	-	-	-	1	- Domnesti	
Total	PR 4	-	6,700	5.50	Gravel	-	-	-	1	R. Carecna - 37 - No.2	
	PR 5	-	7,300	5.50	Gravel	-	-	-	1	R. Carecna - 37 - No.2	
	PR 6	-	6,700	5.50	Gravel	-	-	-	3	37 - No.2	
	PR 7	-	2,000	5.50	Gravel	1	1	-	-	PR 5 - PR 6	
	PR 8	-	6,500	5.50	Gravel	-	-	-	-	R. Zabrut - DJ204E - DJ205F	
	PR 9	-	6,300	5.50	Gravel	-	-	-	2	DJ204E - No.3 - DJ205F	
	PR 10	-	8,600	5.50	Gravel	-	-	-	2	R. Zabrut - DJ204E - No.3 - DJ205F	
	PR 11	-	3,900	5.50	Gravel	-	-	-	-	R. Susira - DJ205E - R. Putna	
	PR 12	-	4,000	5.50	Gravel	-	-	-	-	R. Susira - DJ205E - R. Putna	
	PR 13	-	4,400	5.50	Gravel	-	-	-	-	R. Susira - DJ205E - R. Putna	
	PR 14	-	2,200	5.50	Gravel	-	-	-	-	R. Putna - No.4 - DN2D	
	PR 15	-	3,600	5.50	Gravel	-	-	-	-	R. Putna - No.4 - DN2D	
	PR 16	-	6,600	5.50	Gravel	-	-	-	-	R. Putna - No.4 - DN2D	
	PR 17	-	6,200	5.50	Gravel	-	1	-	-	DN2D - DJ205A	
	Total		53,800	97,100			7	2	5	13	

Notes: CD-C: Distribution Canal Crossing
 DC-C: Drainage Canal Crossing
 BD-C: Boundary Canal Crossing
 GW-C: Grassed Waterway Crossing
 DN2: National Motor Highway No. 2
 DN2D: National Road No. 2D
 R Putna: the Putna River

表 5.3.1 建設工事費

Description	Amount			Total (US\$)
	F/C (US\$)	L/C (Lei)	Total (Lei)	
I. Preparatory Works	515,181	5,117,641,110	6,020,754,248	3,434,543
II. Pumping Station	947,640	9,413,543,262	11,074,756,778	6,317,602
III. Conveyance Pipe Works	0	0	0	0
IV. Irrigation Canal Works	3,205,631	31,843,669,850	37,463,141,000	21,370,873
V. Booster Pumping Station	1,139,933	11,323,715,437	13,322,018,162	7,599,554
VI. Farm Land Irrigation Fac.	3,815,103	37,897,964,000	44,585,840,000	25,434,022
VII. Drainage Canal Works	174,212	1,730,562,600	2,035,956,000	1,161,412
VIII. Farm Road Works	594,627	5,906,826,800	6,949,208,000	3,964,180
IX. Reclamation Works	74,622	741,266,300	872,078,000	497,477
X. Soil Conservation Works	291,964	2,900,273,950	3,412,087,000	1,946,427
XI. Project Office	59,897	595,000,000	700,000,000	399,315
Total	10,818,811	107,470,463,309	126,435,839,188	72,125,407

Note : US\$ 1.00 = Lei 1,753

表 5.3.2 專業費

Description	Amount			Total (US\$)
	F/C (US\$)	L/C (Lei)	Total (Lei)	
I. Construction Cost				
I.1 Lot - A	2,961,929	29,422,813,481	34,615,074,684	19,746,192
I.2 Lot - B	2,876,035	28,569,573,255	33,611,262,653	19,173,567
I.3 Lot - C	3,336,439	33,143,068,552	38,991,845,355	22,242,924
I.4 Lot - D	1,644,409	16,335,008,021	19,217,656,496	10,962,725
Sub-total	10,818,811	107,470,463,309	126,435,839,188	72,125,407
II. Land Acquisition Cost	0	10,818,000,000	10,818,000,000	6,171,135
III. O/M Equipment Procurement Cost	494,200	43,317,000	909,650,000	518,910
IV. Administration Cost	0	2,641,800,000	2,641,800,000	1,507,017
V. Consulting Service	2,327,750	3,132,158,000	7,212,704,000	4,114,492
Sub-total (I. to V.)	13,640,761	124,105,738,309	148,017,993,188	84,436,961
VI. Physical Contingency	1,364,076	12,410,573,831	14,801,799,319	8,443,696
VII. TOTAL (Project cost)	15,004,837	136,516,312,140	162,819,792,507	92,880,657

Note : US\$ 1.00 = Lei 1,753

表 5.3.3 事業費年間返済計画

(Unit: US\$)

Work Item	Project Year						Total	Total L/C & F/C
	2nd Year	3rd Year	4th Year	5th Year	6th Year	Total		
I Construction Phase I								
Land Acquisition	F/C 0	0	0	0	0	0	0	0
	L/C 0	1,311,000	3,934,000	1,269,000	0	0	5,245,000	5,245,000
Lot A	F/C 0	0	1,693,000	1,269,000	0	0	2,962,000	2,962,000
	L/C 0	0	9,591,000	7,193,000	0	0	16,784,000	16,784,000
Lot B	F/C 0	0	1,079,000	1,438,000	360,000	0	2,877,000	2,877,000
	L/C 0	0	6,112,000	8,149,000	2,037,000	0	16,298,000	16,298,000
Lot C	F/C 0	0	834,000	1,668,000	834,000	0	3,336,000	3,336,000
	L/C 0	0	4,727,000	9,453,000	4,727,000	0	18,907,000	18,907,000
Sub-total	F/C 0	0	3,606,000	4,375,000	1,194,000	0	9,175,000	9,175,000
	L/C 0	1,311,000	24,364,000	24,795,000	6,764,000	0	57,234,000	57,234,000
II Construction Phase II								
Land Acquisition	F/C 0	0	0	0	0	0	0	0
	L/C 0	0	926,000	0	0	0	926,000	926,000
Lot D	F/C 0	0	206,000	822,000	617,000	0	1,645,000	1,645,000
	L/C 0	0	1,165,000	4,659,000	3,494,000	0	9,318,000	9,318,000
Sub-total	F/C 0	0	206,000	822,000	617,000	0	1,645,000	1,645,000
	L/C 0	0	2,091,000	4,659,000	3,494,000	0	10,244,000	10,244,000
III O/M Equipment Procurement	F/C 0	0	0	494,200	0	0	494,200	494,200
	L/C 0	0	0	24,710	0	0	24,710	24,710
IV Administration	F/C 0	0	0	0	0	0	0	0
	L/C 108,000	323,000	431,000	431,000	215,000	0	1,508,000	1,508,000
V Consultant Service	F/C 0	949,500	419,288	559,850	399,200	0	2,327,838	2,327,838
	L/C 0	506,175	413,109	468,063	399,306	0	1,786,653	1,786,653
Sub-total (I - V)	F/C 0	949,500	4,231,288	6,251,050	2,210,200	0	13,642,038	13,642,038
	L/C 108,000	2,140,175	27,299,109	30,377,773	10,872,306	0	70,797,363	70,797,363
VI Physical Contingency	F/C 0	94,950	423,129	625,105	221,020	0	1,364,204	1,364,204
	L/C 10,800	214,018	2,729,911	3,037,777	1,087,231	0	7,079,736	7,079,736
VII Sub-total	F/C 0	1,044,450	4,654,417	6,876,155	2,431,220	0	15,006,242	15,006,242
	L/C 118,800	2,354,193	30,029,020	33,415,550	11,959,537	0	77,877,099	77,877,099
VIII Price Escalation (3% per annual)	F/C 0	96,849	584,170	1,095,193	471,784	0	2,247,996	2,247,996
	L/C 7,235	218,297	3,768,907	5,322,231	2,320,776	0	11,637,445	11,637,445
IX Total	F/C 0	1,141,299	5,238,587	7,971,348	2,903,004	0	17,254,238	17,254,238
	L/C 126,035	2,572,490	33,797,926	38,737,761	14,280,312	0	89,514,544	89,514,544
Total		\$126,035	\$3,713,788	\$39,036,514	\$46,709,129	\$17,183,316	\$106,768,782	\$106,768,782

表 6.3.1 経済費用及び便益の年次変化

(Unit: thou. US\$)

Year in Order	Cost				Benefit			Present Value	
	Const. Cost	Replac- ment Cost	O/M Cost	Total	Irrigation	Soil Consav.	Total	Cost	Benefit
-7	2,299	0	0	2,299	0	0	0	10,192	0
-6	7,860	0	0	7,860	0	0	0	28,927	0
-5	4,154	0	0	4,154	0	0	0	12,691	0
-4	320	0	0	320	0	0	0	812	0
-3	181	0	0	181	0	0	0	381	0
-2	157	0	0	157	0	0	0	274	0
-1	175	0	0	175	0	0	0	254	0
0	184	0	0	184	0	0	0	222	0
1	0	0	0	0	0	0	0	0	0
2	98	0	0	98	0	0	0	81	0
3	8,042	0	0	8,042	0	0	0	5,542	0
4	31,359	0	0	31,359	0	0	0	17,941	0
5	33,842	0	978	34,820	9,475	99	9,575	16,538	4,547
6	12,052	0	2,797	14,849	27,090	323	27,412	5,855	10,808
7	0	0	4,217	4,217	40,841	582	41,424	1,380	13,559
8	0	0	4,913	4,913	47,585	786	48,372	1,335	13,144
9	0	0	5,112	5,112	49,510	990	50,500	1,153	11,391
10	0	0	5,112	5,112	49,510	1,120	50,630	957	9,481
11	0	0	5,112	5,112	49,510	1,141	50,651	795	7,874
12	0	0	5,112	5,112	49,510	1,141	50,651	660	6,537
13	0	0	5,112	5,112	49,510	1,141	50,651	548	5,426
14	0	0	5,112	5,112	49,510	1,141	50,651	455	4,505
15	0	0	5,112	5,112	49,510	1,141	50,651	377	3,740
16	0	0	5,112	5,112	49,510	1,141	50,651	313	3,105
17	0	0	5,112	5,112	49,510	1,141	50,651	260	2,577
18	0	0	5,112	5,112	49,510	1,141	50,651	216	2,140
19	0	0	5,112	5,112	49,510	1,141	50,651	179	1,776
20	0	1,270	5,112	6,382	49,510	1,141	50,651	186	1,474
21	0	0	5,112	5,112	49,510	1,141	50,651	124	1,224
22	0	0	5,112	5,112	49,510	1,141	50,651	103	1,016
23	0	0	5,112	5,112	49,510	1,141	50,651	85	844
24	0	0	5,112	5,112	49,510	1,141	50,651	71	700
25	0	0	5,112	5,112	49,510	1,141	50,651	59	581
26	0	0	5,112	5,112	49,510	1,141	50,651	49	483
27	0	0	5,112	5,112	49,510	1,141	50,651	40	401
28	0	0	5,112	5,112	49,510	1,141	50,651	34	333
29	0	0	5,112	5,112	49,510	1,141	50,651	28	276
30	0	2,117	5,112	7,229	49,510	1,141	50,651	33	229
31	0	0	5,112	5,112	49,510	1,141	50,651	19	190
32	0	0	5,112	5,112	49,510	1,141	50,651	16	158
33	0	0	5,112	5,112	49,510	1,141	50,651	13	131
34	0	0	5,112	5,112	49,510	1,141	50,651	11	109
35	0	1,270	5,112	6,382	49,510	1,141	50,651	11	90
36	0	0	5,112	5,112	49,510	1,141	50,651	8	75
37	0	0	5,112	5,112	49,510	1,141	50,651	6	62
38	0	0	5,112	5,112	49,510	1,141	50,651	5	52
39	0	0	5,112	5,112	49,510	1,141	50,651	4	43
40	0	0	5,112	5,112	49,510	1,141	50,651	4	36
41	0	0	5,112	5,112	49,510	1,141	50,651	3	30
42	0	0	5,112	5,112	49,510	1,141	50,651	2	25
43	0	0	5,112	5,112	49,510	1,141	50,651	2	20
44	0	0	5,112	5,112	49,510	1,141	50,651	2	17
45	0	0	5,112	5,112	49,510	1,141	50,651	1	14
46	0	0	5,112	5,112	49,510	1,141	50,651	1	12
47	0	0	5,112	5,112	49,510	1,141	50,651	1	10
48	0	0	5,112	5,112	49,510	1,141	50,651	1	8
49	0	0	5,112	5,112	49,510	1,141	50,651	1	7
50	0	-423	5,112	4,689	49,510	1,141	50,651	1	6
Total	100,723	4,234	227,610	332,567	2,204,422	49,538	2,253,959	109,260	109,264

E. B / C = 1.00004
 ENPV = 4.05
 EIRR = 20.45900

表 6.4.1 財務費用及び便益の年次変化

(Unit: thou. US\$)

Year in Order	Cost				Benefit			Present Value	
	Const. Cost	Replace- ment Cost	O/M Cost	Total	Irrigation	Soil Consav.	Total	Cost	Benefit
1	0	0	0	0	0	0	0	0	0
2	119	0	0	119	0	0	0	92	0
3	3,399	0	0	3,399	0	0	0	2,015	0
4	34,683	0	0	34,683	0	0	0	15,827	0
5	40,292	0	1,117	41,409	7,387	73	7,460	14,548	2,621
6	14,391	0	3,195	17,586	21,119	236	21,355	4,756	5,776
7	0	0	4,817	4,817	31,840	426	32,266	1,003	6,719
8	0	0	5,612	5,612	37,097	576	37,673	900	6,039
9	0	0	5,839	5,839	38,598	725	39,322	721	4,853
10	0	0	5,839	5,839	38,598	820	39,418	555	3,746
11	0	0	5,839	5,839	38,598	835	39,433	427	2,885
12	0	0	5,839	5,839	38,598	835	39,433	329	2,221
13	0	0	5,839	5,839	38,598	835	39,433	253	1,710
14	0	0	5,839	5,839	38,598	835	39,433	195	1,316
15	0	0	5,839	5,839	38,598	835	39,433	150	1,013
16	0	0	5,839	5,839	38,598	835	39,433	116	780
17	0	0	5,839	5,839	38,598	835	39,433	89	601
18	0	0	5,839	5,839	38,598	835	39,433	68	462
19	0	0	5,839	5,839	38,598	835	39,433	53	356
20	0	1,500	5,839	7,339	38,598	835	39,433	51	274
21	0	0	5,839	5,839	38,598	835	39,433	31	211
22	0	0	5,839	5,839	38,598	835	39,433	24	162
23	0	0	5,839	5,839	38,598	835	39,433	19	125
24	0	0	5,839	5,839	38,598	835	39,433	14	96
25	0	0	5,839	5,839	38,598	835	39,433	11	74
26	0	0	5,839	5,839	38,598	835	39,433	8	57
27	0	0	5,839	5,839	38,598	835	39,433	7	44
28	0	0	5,839	5,839	38,598	835	39,433	5	34
29	0	0	5,839	5,839	38,598	835	39,433	4	26
30	0	2,500	5,839	8,339	38,598	835	39,433	4	20
31	0	0	5,839	5,839	38,598	835	39,433	2	15
32	0	0	5,839	5,839	38,598	835	39,433	2	12
33	0	0	5,839	5,839	38,598	835	39,433	1	9
34	0	0	5,839	5,839	38,598	835	39,433	1	7
35	0	1,500	5,839	7,339	38,598	835	39,433	1	5
36	0	0	5,839	5,839	38,598	835	39,433	1	4
37	0	0	5,839	5,839	38,598	835	39,433	0	3
38	0	0	5,839	5,839	38,598	835	39,433	0	2
39	0	0	5,839	5,839	38,598	835	39,433	0	2
40	0	0	5,839	5,839	38,598	835	39,433	0	1
41	0	0	5,839	5,839	38,598	835	39,433	0	1
42	0	0	5,839	5,839	38,598	835	39,433	0	1
43	0	0	5,839	5,839	38,598	835	39,433	0	1
44	0	0	5,839	5,839	38,598	835	39,433	0	1
45	0	0	5,839	5,839	38,598	835	39,433	0	0
46	0	0	5,839	5,839	38,598	835	39,433	0	0
47	0	0	5,839	5,839	38,598	835	39,433	0	0
48	0	0	5,839	5,839	38,598	835	39,433	0	0
49	0	0	5,839	5,839	38,598	835	39,433	0	0
50	0	-500	5,839	5,339	38,598	835	39,433	0	0
Total	92,884	5,000	259,979	357,863	1,718,552	36,262	1,754,814	42,283	42,289

F. B / C = 1.00013

FNPV = 5.70

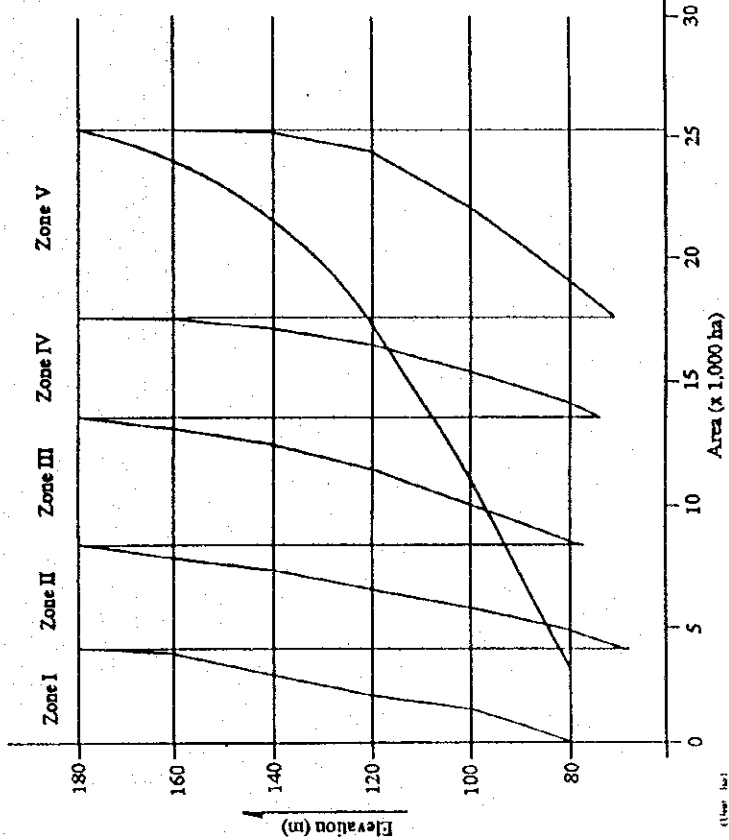
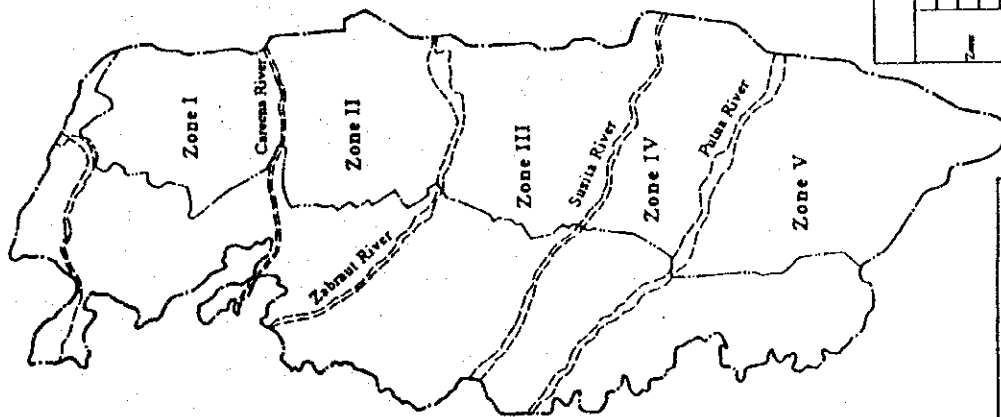
FIRR = 29.89000

表 6.6.1 環境影響因子一覽

		INITIAL STATE	IMPACT ELEMENTS OF THE PROJECT		
		ENVIRONMENTAL CONDITIONS OF THE INITIAL STATE	IMPACT OF CONSTRUCTION OF IRRIGATION WORKS	IMPACT OF IRRIGATION ACTIVITIES	IMPACT OF AGRICULTURAL DEVELOPMENT
MAJOR IMPACT SOURCES		<ul style="list-style-type: none"> Existing irrigation civil works like the Main Canal and the Calimanesi dam Upstream industrial sources of water pollution 	<ul style="list-style-type: none"> Secondary canals for irrigation and drainage 	<ul style="list-style-type: none"> Irrigation water is periodically contaminated by industrial pollutants; method of irrigation (sprinkler) 	<ul style="list-style-type: none"> Use of water for industrial and domestic purpose; increased wastewater and solid waste; increased use of agrochemical; development of commercial activity /cattle breeding activity
NATURAL ENVIRONMENT	GROUND-WATER	<ul style="list-style-type: none"> Shallow groundwater in river corridors and plain; Discharge in Siret river down-stream of the Study Area 	<ul style="list-style-type: none"> Irrigation canals are a pathway for contamination of groundwater by industrial pollutants; However this mainly concerns the main canal, with underground passages at level of Siret tributaries; effect of secondary works is minor 	<ul style="list-style-type: none"> Ground infiltration of contaminated water through irrigation of crop fields might induce severe degradation of groundwater quality; It is the major impact of the Project on environment 	<ul style="list-style-type: none"> Increased use of groundwater for satisfying new industrial and domestic demand; effects on water table; increased rate of contamination by surface pollution sources
	WATER QUALITY	<ul style="list-style-type: none"> Water quality seems acceptable from yearly average, but is not complying with required irrigation criteria in several cases (industrial pollutants); Trends toward better quality due to policy, legislation, and present economic circumstances 	<ul style="list-style-type: none"> Ground infiltration of contaminated water through conveyance of irrigation water; eutrophication of main canals; sedimentation of drainage canals; transport of nutrients in water downstream 	<ul style="list-style-type: none"> Contamination of groundwater on site due to the use of irrigation water and agrochemical; pollution of surface water downstream, directly (irrigation) or indirectly (groundwater discharge); 	<ul style="list-style-type: none"> Impairment of water quality due to new industrial / domestic pollution sources on site; Effects increased downstream due to low dilution of pollutants (increased use of water sources upstream)
	MORPHOLOGY / SOILS	<ul style="list-style-type: none"> Soil losses due to wind and mainly pluvial erosion; sheet erosion in plain, gully erosion in hills; Climatic aggressivity 	<ul style="list-style-type: none"> Risk of waterlogging and sedimentation / erosion if drainage is not adapted to local situations 	<ul style="list-style-type: none"> Irrigation might induce sheet erosion through increased humidity of soils (slopes more than 2 - 3%); contamination of soil by heavy metals 	x
	NATURAL ECOSYSTEMS	<ul style="list-style-type: none"> Natural land is mainly degraded land (pasture, erosion) and riverbeds of Siret tributaries; In existence of protective areas within the Study Area; Calimanesi dam might be a new habitat for birds; 	<ul style="list-style-type: none"> Irrigation Project concerns interfluvial land in the cultivated plain area; planned secondary works will not have effects on natural habitats 	<ul style="list-style-type: none"> Irrigation exclusively deals with agricultural land and has no predictable effects on surrounding (mainly upstream) natural environment 	<ul style="list-style-type: none"> Agricultural development is more likely to induce effects on natural environment through waste disposal siting
	WILDLIFE	<ul style="list-style-type: none"> Siret river is an important corridor for migration of birds (only passage); Fishes affected by water pollution; Mammals of forest habitat and small mammal species on site 	<ul style="list-style-type: none"> At initial state, main canal could be a major obstacle between Siret and hills for mammal species; Effects of the Project through remaining works is negligible 	<ul style="list-style-type: none"> Possible contribution to impairment of aquatic wildlife downstream by direct / indirect contamination of surface water 	<ul style="list-style-type: none"> Possible contribution to impairment of aquatic wildlife downstream by direct / indirect contamination of surface water
SOCIAL ENVIRONMENT	USE OF RESOURCES	<ul style="list-style-type: none"> Use of groundwater sources; problem of water scarcity in upper hills villages; forest managed by ROMSILVA 	x	x	<ul style="list-style-type: none"> Increased risk of water shortage / conflicts; drastic increase of cost of water supply; water resources development
	LAND USE	<ul style="list-style-type: none"> Land intensively used for human settlements and agriculture; vineyards 	<ul style="list-style-type: none"> Main canal might be an obstacle for movements of people (initial state); remaining works have no effect 	<ul style="list-style-type: none"> Increased productivity 	x
	SANITATION	<ul style="list-style-type: none"> General use of septic tanks, with probable contamination of phreatic; Non sanitary landfill sites (organic matter) 	x	<ul style="list-style-type: none"> Possible health effects through impairment of groundwater quality 	<ul style="list-style-type: none"> Increased health risk due to contamination of drinking water; more generally due to increased quantity of waste, and development of agro-industry
	USE OF AGRO-CHEMICALS	<ul style="list-style-type: none"> Use of natural fertilizers in small quantities; Agrochemical almost in existent except in vineyards (small quantities) 	x	<ul style="list-style-type: none"> Inclusion of vineyards in irrigation area might induce an increased use of pesticides in a zone with high vulnerability of groundwater 	<ul style="list-style-type: none"> Increased use of agrochemical
	LANDSCAPE CULTURAL ASSETS	<ul style="list-style-type: none"> Memorial monuments in the cultivated plain along roads; majestuous landscapes in hilly zone (Putna); wine products 	x	<ul style="list-style-type: none"> Irrigation of vineyards increases quantity but decreases quality of wine products 	<ul style="list-style-type: none"> Water resources development or siting of industry for water might induce loss of landscape value (Putna valley in particular)

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Acreage in the Study Area (1 ha = 100 a)

Zone	Irrigation		Soil Cultivation		Total
	Sub Area	Sub Area	Sub Area	Sub Area	
I	4,540	6,260	10,800		10,800
II	5,170	2,410	7,600		7,600
III	5,760	5,740	11,520		11,520
IV	4,250	2,840	7,090		7,090
V	7,980	4,730	12,710		12,710
Sub Total	27,740	21,980	49,720		49,720
Culture	100	40	140		140
Forest	300	300	600		600
Suma	250	250	500		500
Water	310	270	580		580
Sub Total	1,160	820	1,980		1,980
Total	28,900	22,800	51,700		51,700

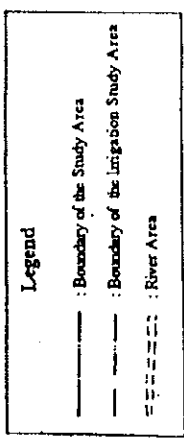


図 3.2.1 ブロック、標高別灌漑調査対象地域

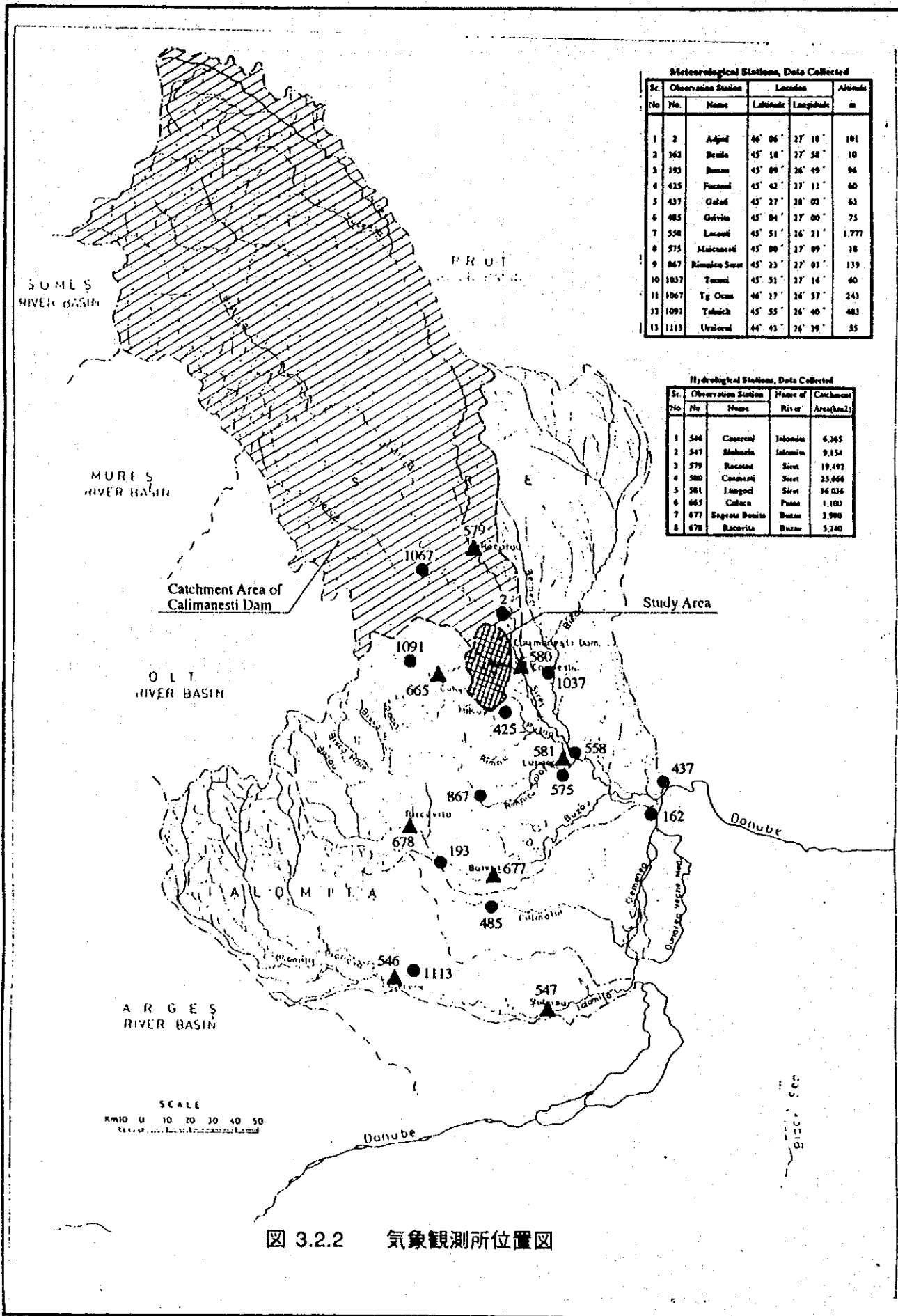


図 3.2.2 气象観測所位置図

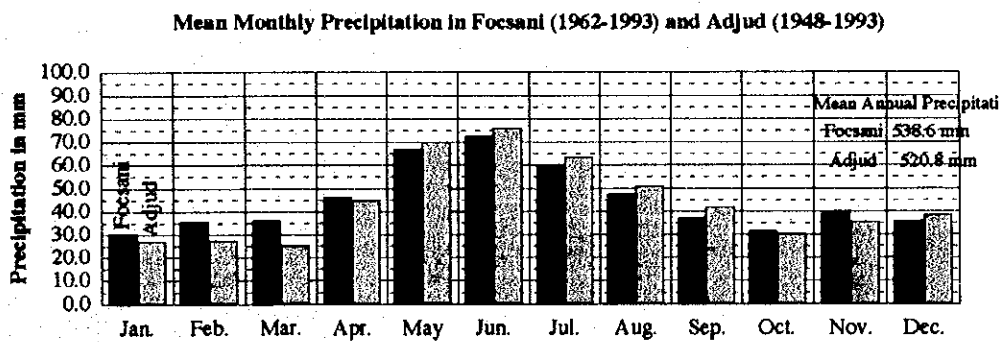
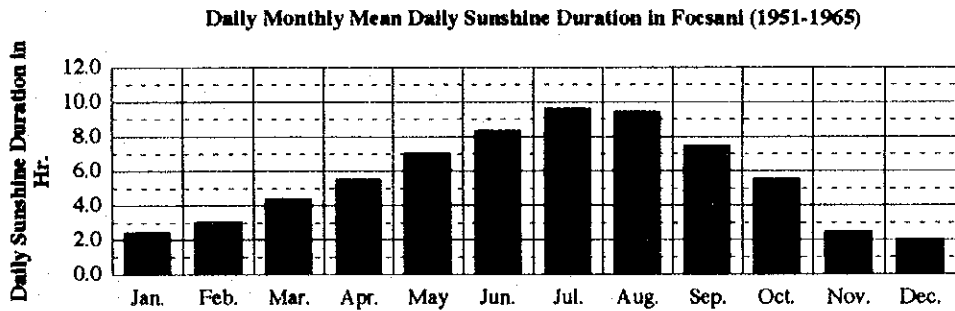
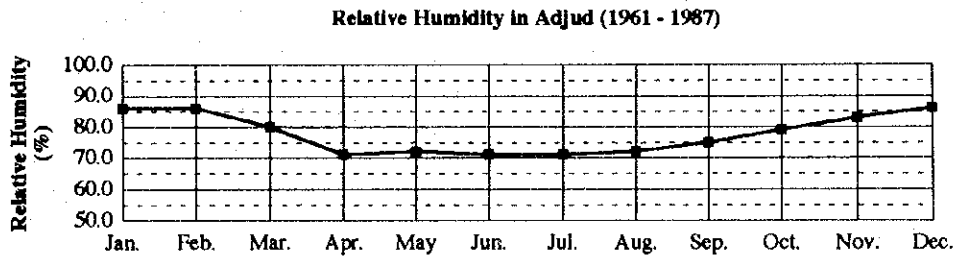
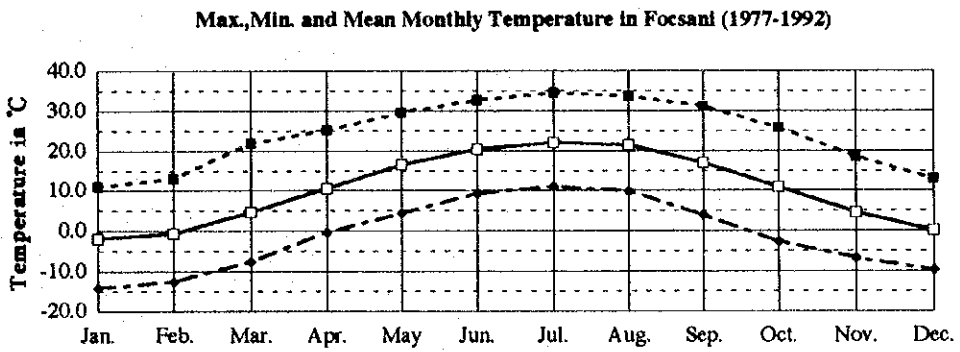
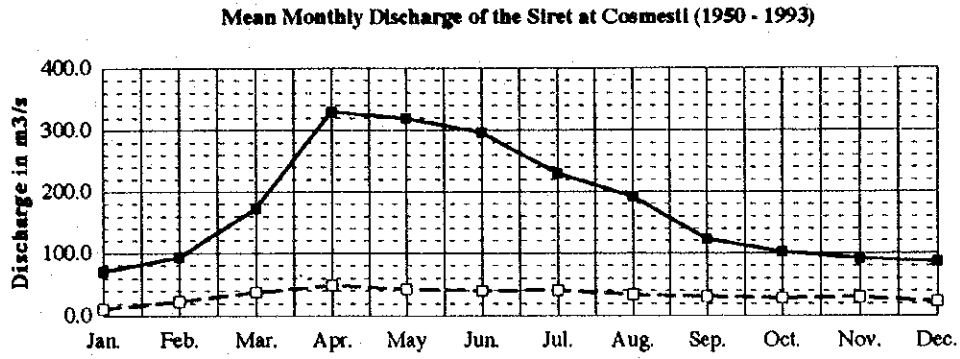
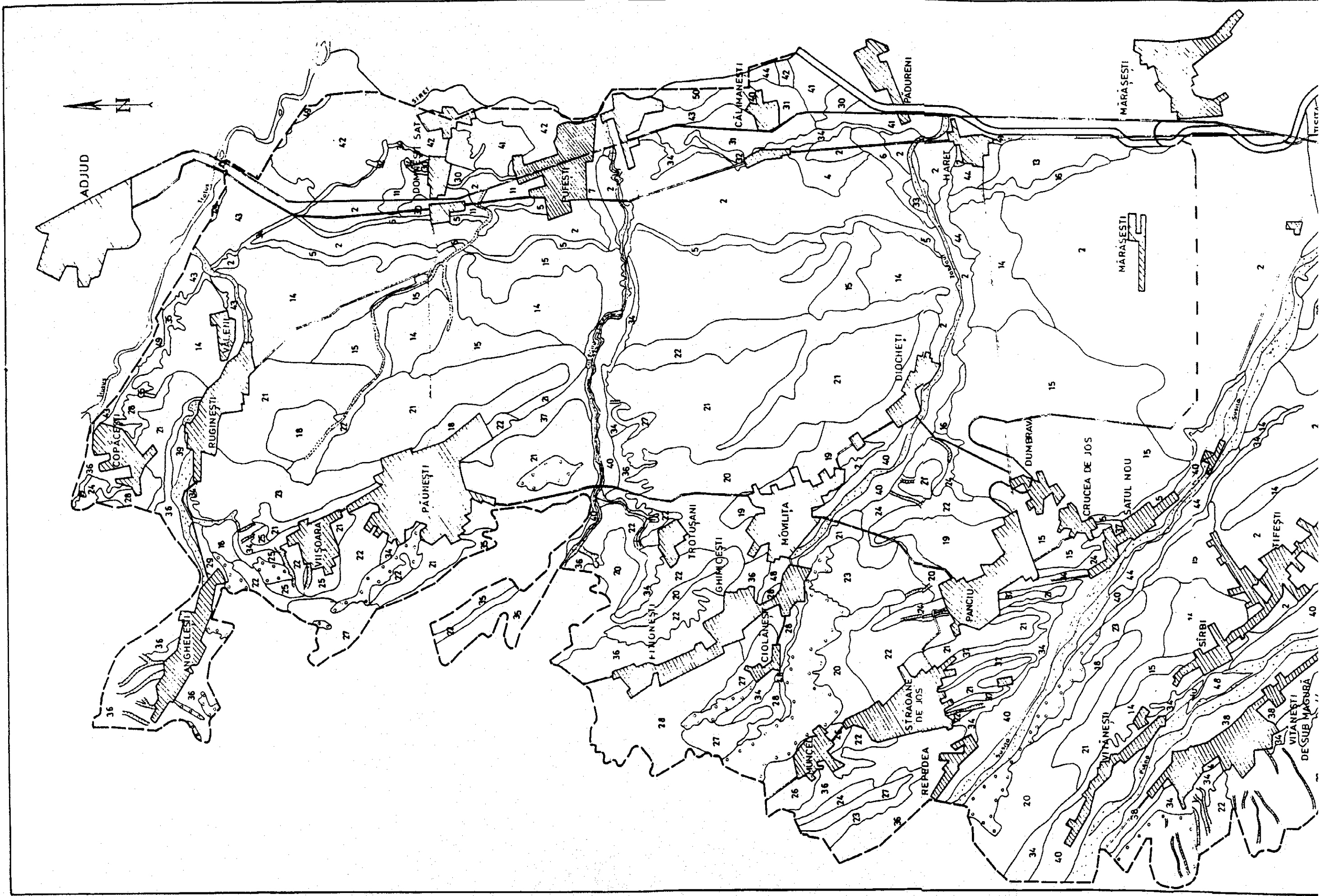


図 3.2.3 調査対象地域の気象水文概況



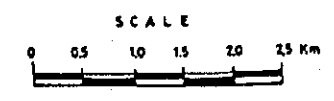
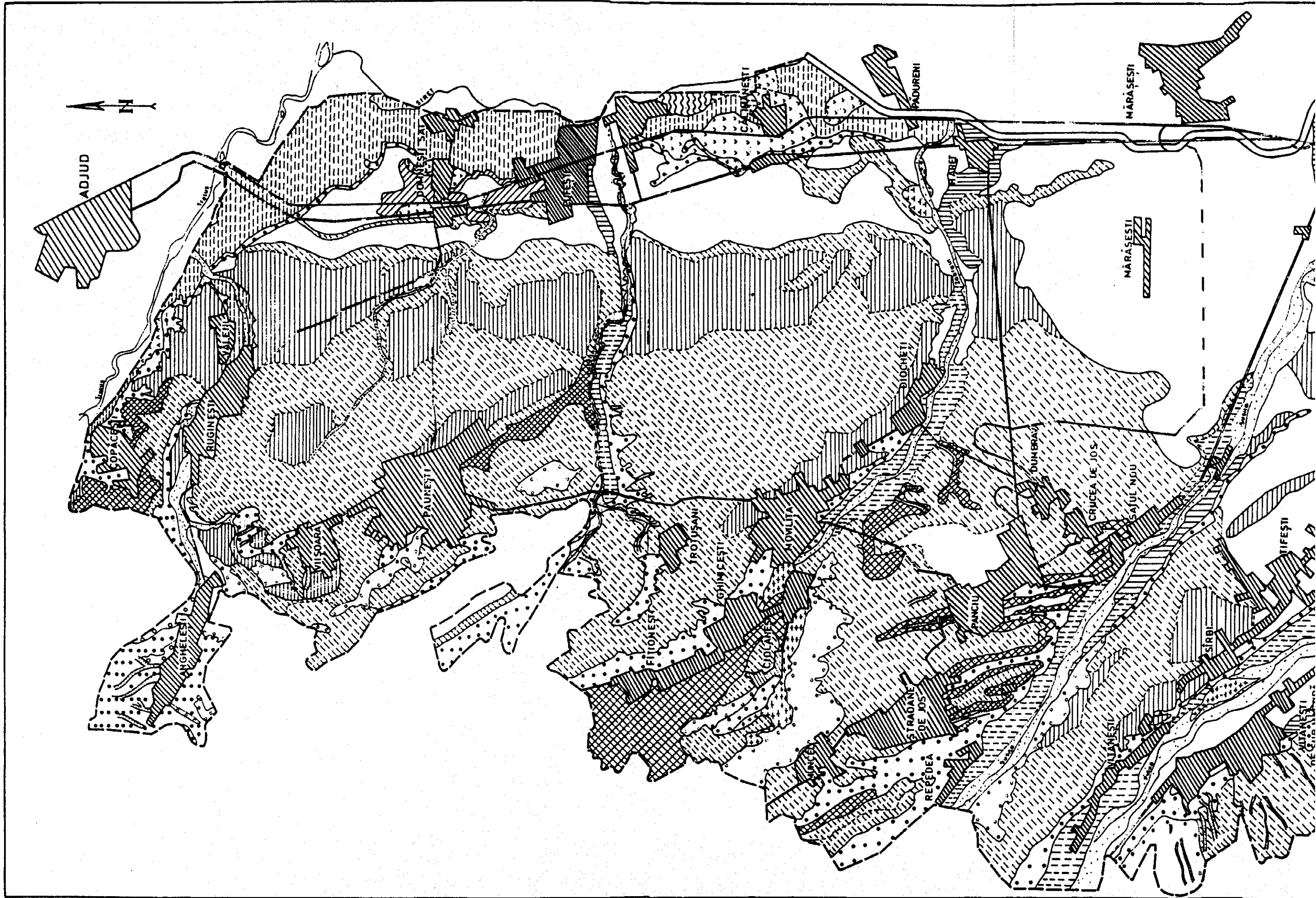
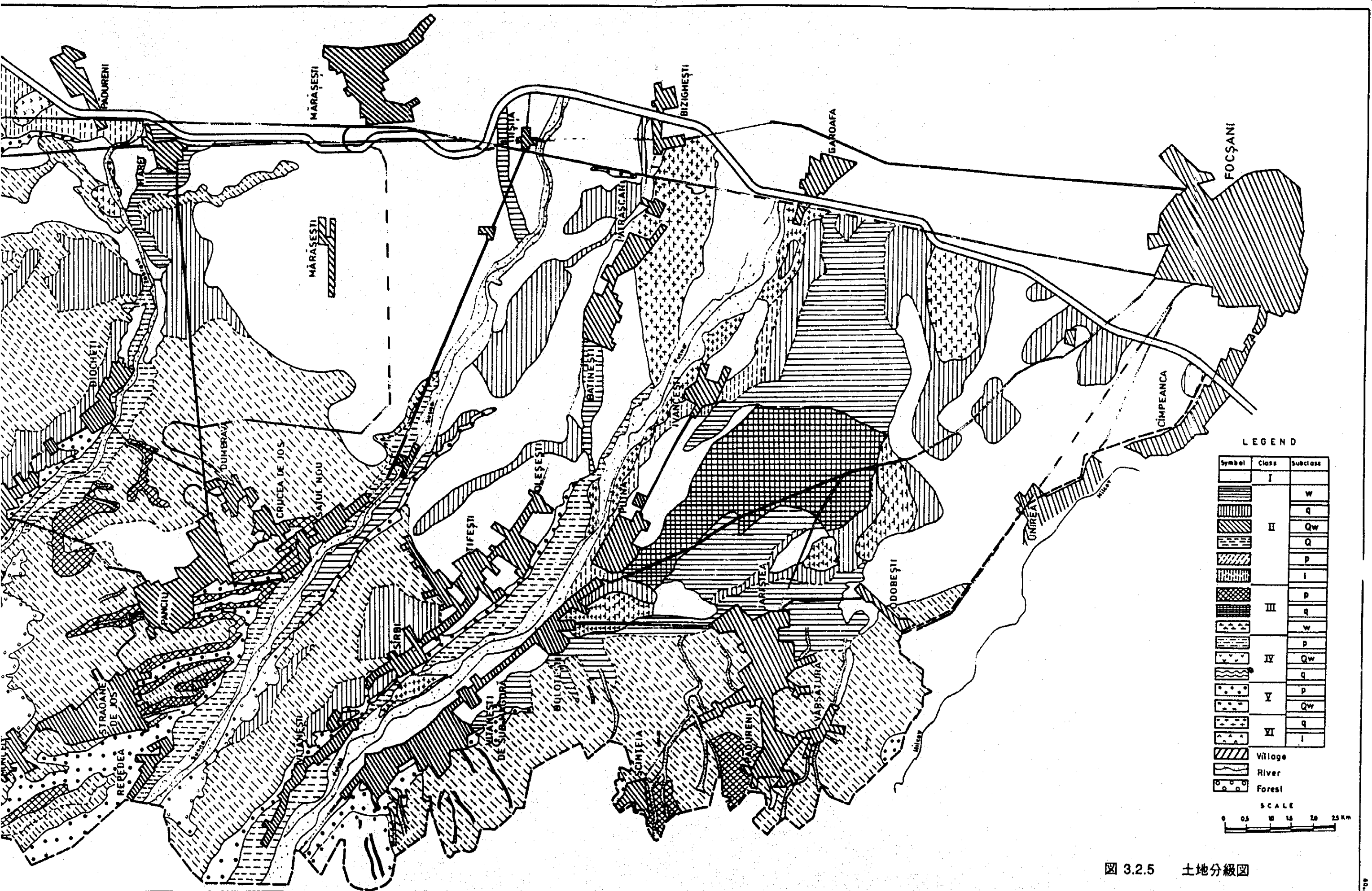


图 3.2.4 土壤图





LEGEND

Symbol	Class	Subclass
	I	
	II	w
		q
	III	Qw
		Q
		P
		I
		P
	IV	Qw
		q
	V	P
		Qw
	VI	q
		I
[Hatched]	Village	
[Wavy line]	River	
[Dotted]	Forest	

SCALE

0
0.5
1
1.5
2
2.5 km

圖 3.2.5 土地分級圖



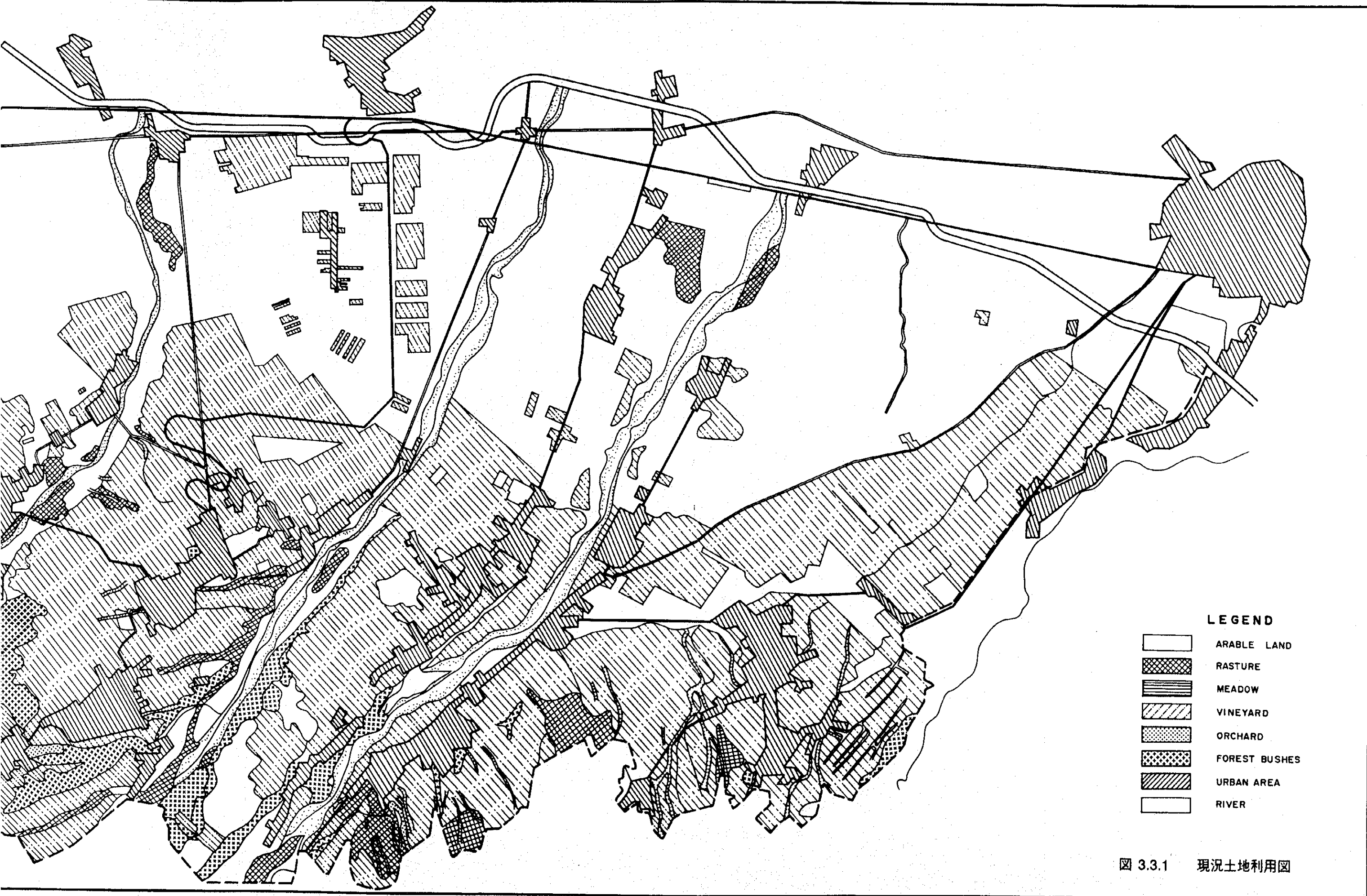


图 3.3.1 現況土地利用图



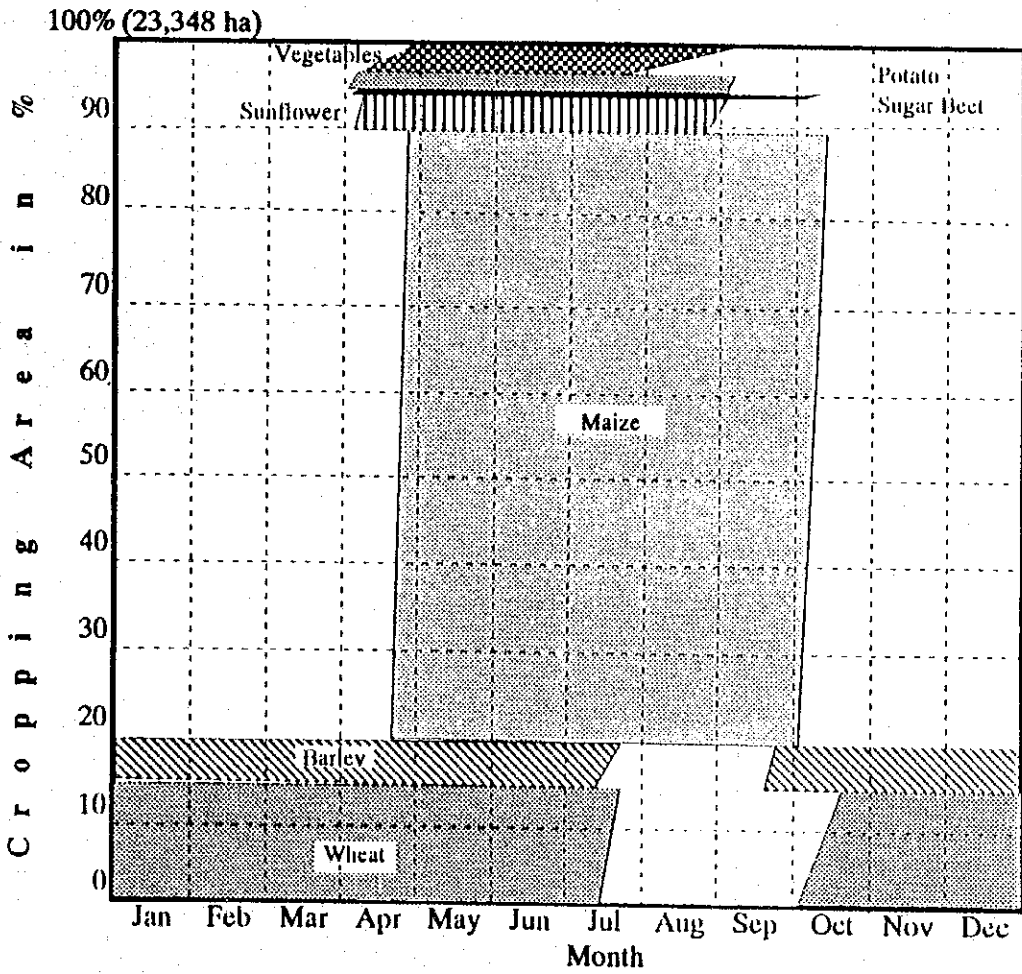
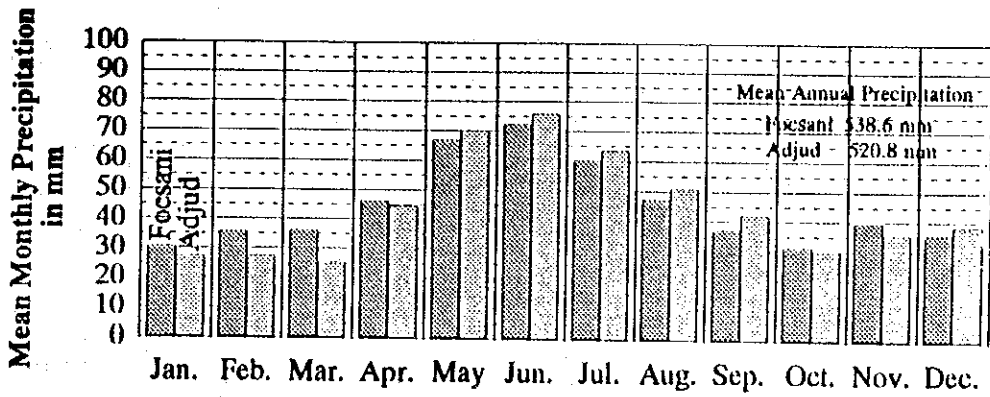


図 3.3.2 現況作付体系

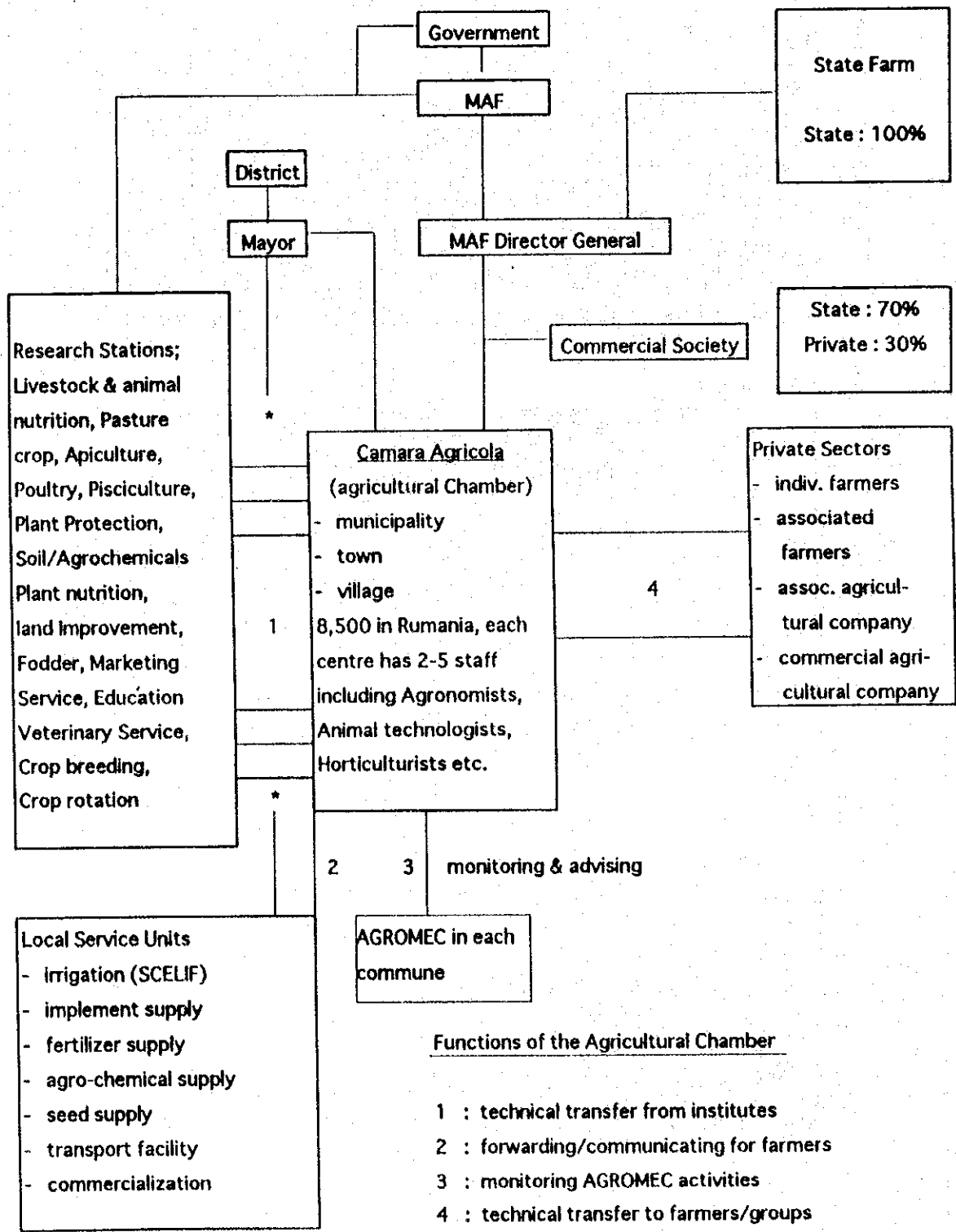


図 3.3.3 調査対象地域の農業センター

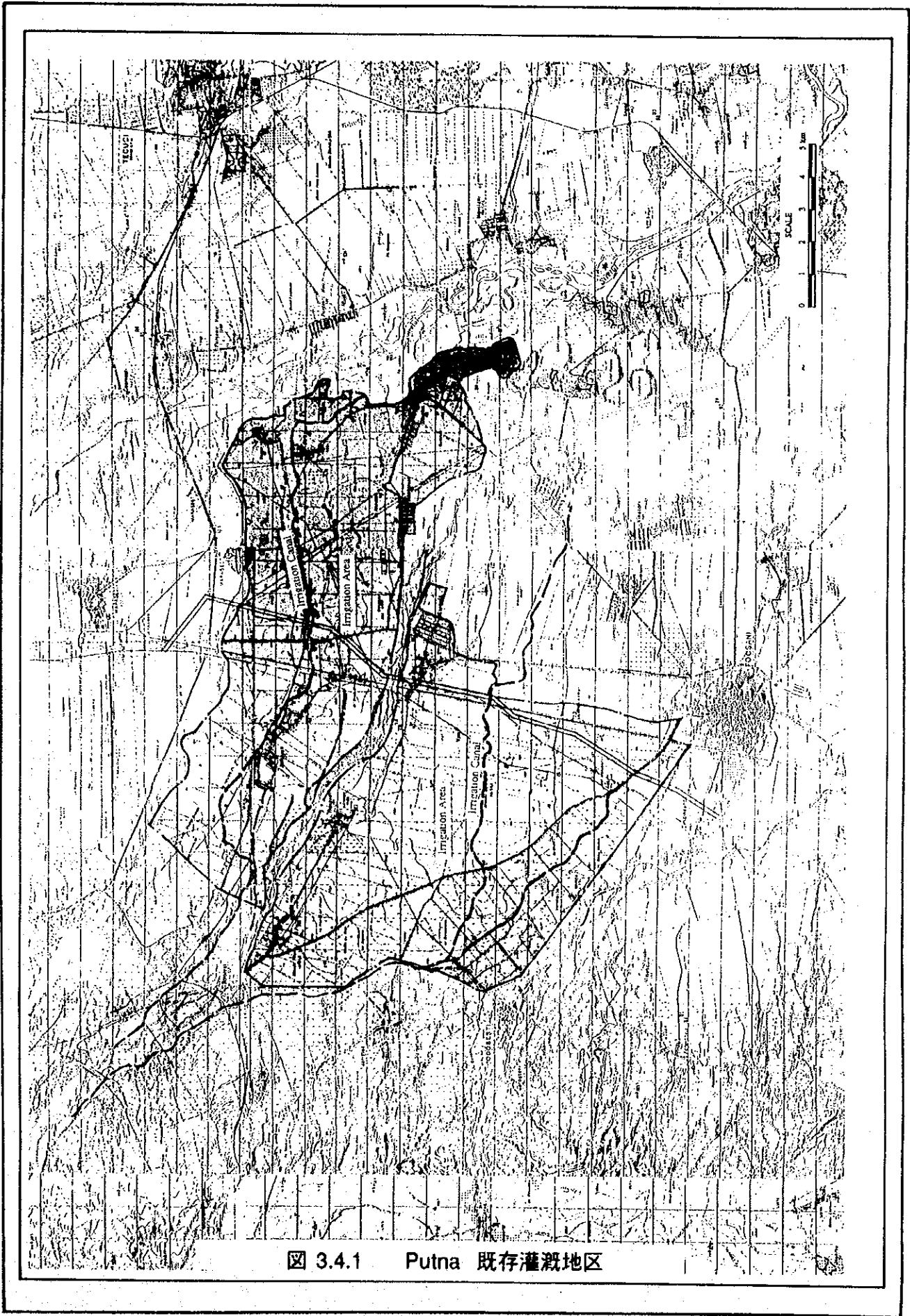


图 3.4.1 Putna 既存灌溉地区

27 15

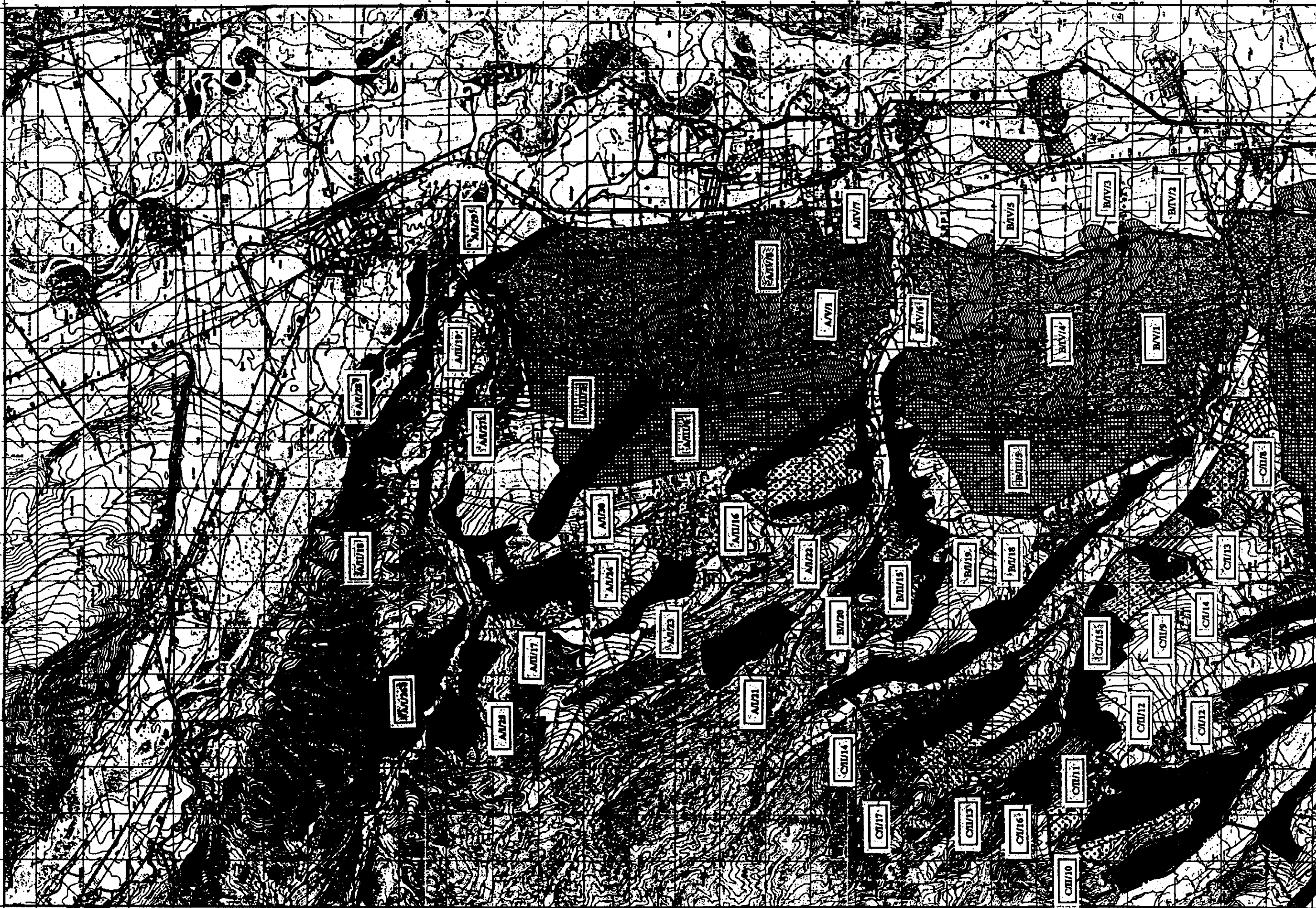
48 30

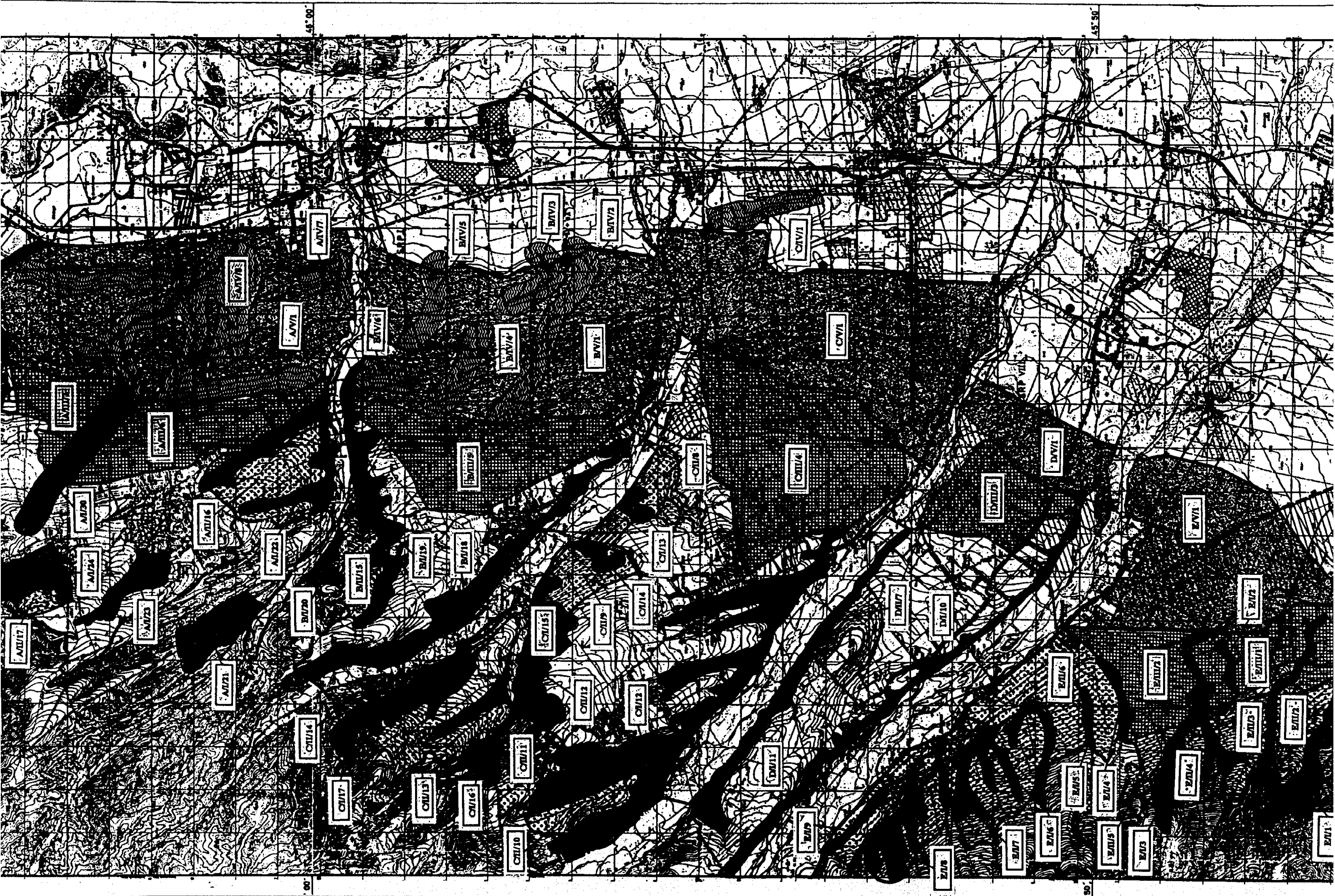
48 00

27 00

10'

00'



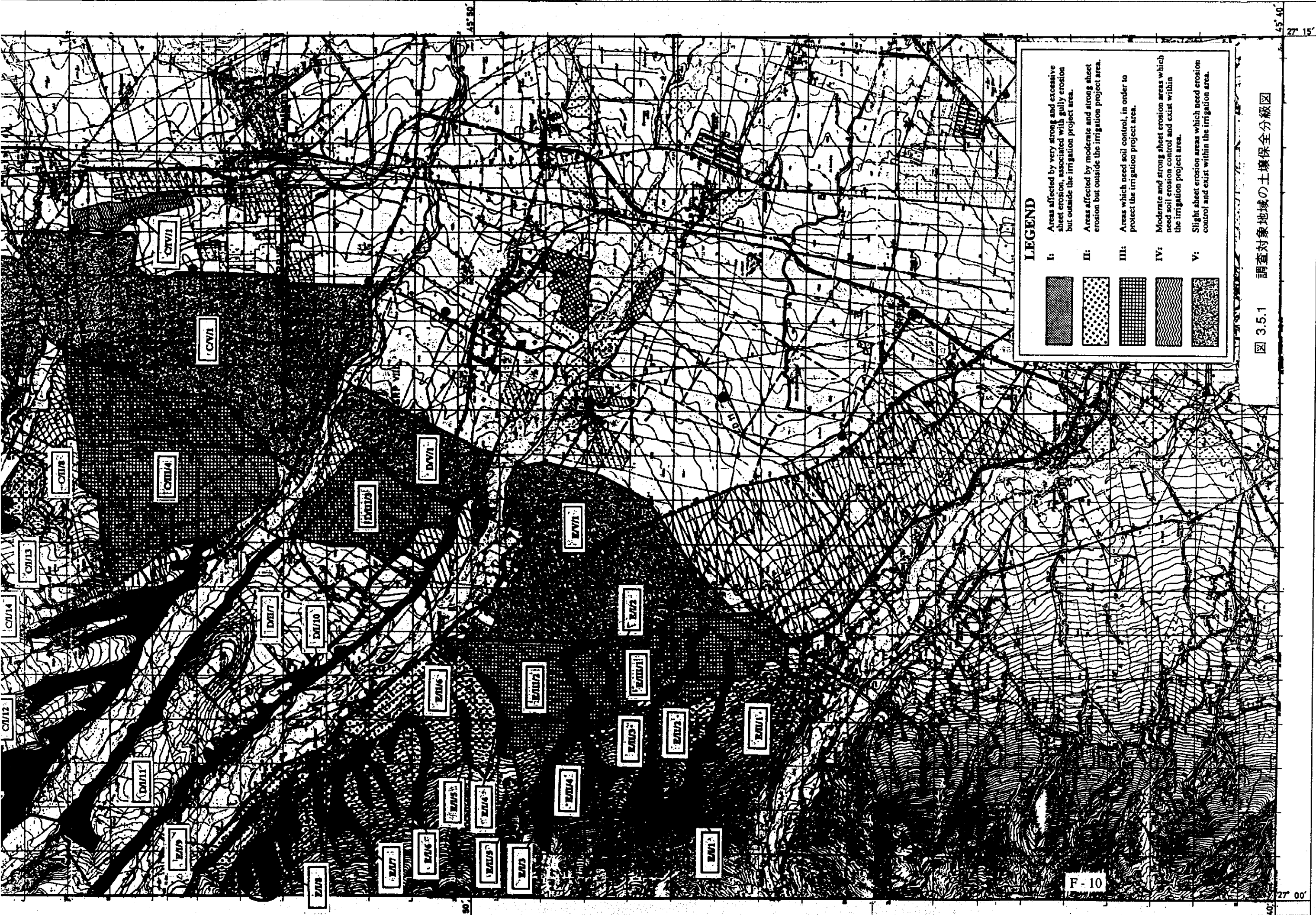


48° 00'

45° 50'

50

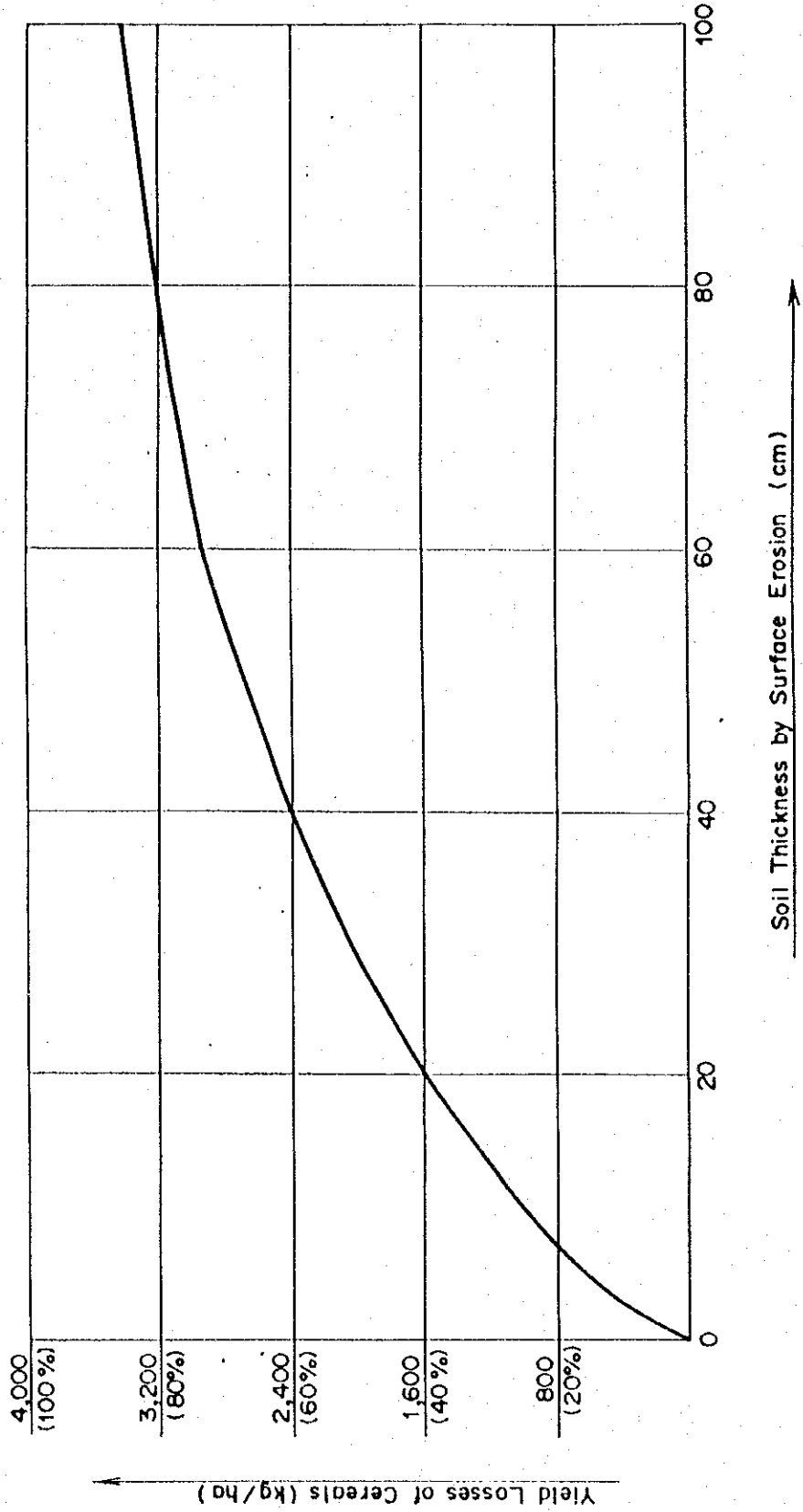
50



LEGEND

- I: Areas affected by very strong and excessive sheet erosion, associated with gully erosion but outside the irrigation project area.
- II: Areas affected by moderate and strong sheet erosion but outside the irrigation project area.
- III: Areas which need soil control, in order to protect the irrigation project area.
- IV: Moderate and strong sheet erosion areas which need soil erosion control and exist within the irrigation project area.
- V: Slight sheet erosion areas which need erosion control and exist within the irrigation project area.

図 3.5.1 調査対象地域の土壌保全分級図



Source : Soil Erosion Prevention and Remediation in Romania by Dr. N . Popescu

図 3.5.2 優食と収量減少の関係