

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF WATERS, FORESTS AND ENVIRONMENT PROTECTION
ROMANIA

THE STUDY ON THE MASTER PLAN FOR
WATER ENVIRONMENT MANAGEMENT ON
THE PRAHOVA RIVER BASIN

FINAL REPORT

Vol.III-1: SUPPORTING REPORT(1/2)
(APPENDIX A TO D)

MARCH 1999

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The cost estimates in this Study are based on the price levels indicated below and expressed in Romanian Lei according to the following exchange rates:

US\$1.00 = Romanian Lei 8800 = Japanese Yen 141.5

As of August 1998



COMPOSITION OF FINAL REPORT

VOL. I : SUMMARY REPORT

VOL. II : MAIN REPORT

VOL. III-1: SUPPORTING REPORT (1/2) (APPENDIX A TO D)

- APPENDIX A SOCIO-ECONOMIC CONDITIONS AND LAND USE
- APPENDIX B HYDROLOGY AND WATER USE
- APPENDIX C RIVER WATER QUALITY AND POLLUTION MECHANISM
- APPENDIX D DOMESTIC WASTEWATER TREATMENT

VOL. III-2: SUPPORTING REPORT (2/2) (APPENDIX E TO I)

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FINAL REPORT

Vol.III-1: SUPPORTING REPORT (1/2) (APPENDIX A to D)

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APPENDIX A

SOCIO-ECONOMIC CONDITIONS AND LAND USE

APPENDIX A

SOCIO-ECONOMIC CONDITIONS AND LAND USE

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CHAPTER I SOCIO-ECONOMIC EXISTING CONDITIONS

1.1 Administrative Division

The Prahova River Basin, which has catchment area of 3,738 km², extends mostly in the Prahova County, but slightly includes Brasov County in the north, Dimbovita County in the west, Buzau in the east and Sectorul Agricol Ilfov and Ialomita counties in the South.

Prahova County consists of 100 administrative units including 2 cities, 12 towns and 86 communes. Out of those units, the Prahova River Basin covers totally or partially, 2 cities, 11 towns, and 76 communes. In addition, the Prahova Basin extends into 1 town and 5 communes of 4 counties mentioned above besides the Prahova County. The figure of these administrative units is shown in the Figure A.1.1.

1.2 GDP

1.2.1 GDP of Romania

Romanian economy has struggled to attain the new economic structure in the transition from communism. This transition has been led by government mainly through privatization of the national companies and introduction of foreign investments. Especially privatization is essential to reform of Romanian economy, and will be scheduled to be completed in 1999 by State Ownership Fund (SOF) for 8,671 companies. Until the end of December 1997, approximate 50% of them have been privatized and 25% of the rest will be done in 1998. On the other hand, foreign capital investment reached US\$2.57 billion as of the end of July 1997 and it will be likely to accelerate in 1998.

GDP began recovering in 1993 with 1.3% extension after falling down by almost 10% in real term in 1992, and growth accelerated to 3.5% in 1994, 7.1% in 1995. However, due to the devaluation and domestic liquidity crisis, growth rate slowed down to 3.9% in 1996.

However, according to the forecast by National Commission for Economic Forecasting (hereinafter referred to as NCEF), minus growth will end despite of above-mentioned economic activities and good harvests in 1997.

	1992	1993	1994	1995	1996
Total (Billion Lei)					
At current price	6,029.2	20,035.8	49,773.3	72,136.0	108,391.0
At constant 1990 price	681.1	690.2	714.4	765.1	796.5
Real change (%)	-8.8	1.3	3.5	7.1	3.9
Per head (Thousand Lei)					
At current prices	265	881	2,190	3,180	4,794
At constant 1990 price	29.9	30.3	31.4	33.7	35.1
Real change (%)	-7.1	1.3	3.6	7.0	4.4

* Source: CNS, n.a : Not available

In Romania the industry and agriculture are most important sectors at the present. The industry sector has been continuing to decline as a proportion of GDP to approximate 36% and the agriculture sector has been maintaining at same level in 19%, and others including services has been growing steadily as tabulated below.

Sector	(Unit : %)				
	1992	1993	1994	1995	1996
Industry	38.3	34.4	36.3	35.7	36.0
Agriculture & forestry	19.1	21.1	19.6	19.7	19.1
Construction	4.8	4.7	5.3	6.5	6.6
Transport & communication	8.5	6.7	5.8	7.6	8.0
Trade	14.3	12.5	12.2	10.2	8.8
Other	15.0	20.6	20.8	20.3	21.5
Total	100.0	100.0	100.0	100.0	100.0

* Source: CNS

1.2.2 GDP in Prahova County

Prahova County has been carrying the important role to the Romanian economy. Prahova county with a population of 868,099 (2nd after Bucuresti) in 1996 followed Bucuresti in GDP which reached 2,082 thousand billion Lei (1994).

GDP in industry (incl. construction) shared more than half of GDP in Prahova in 1994 and it is much higher than 40% for whole Romania. Industry sector, especially petrochemical industry, has been important sector so far and has contributed to Romanian economy. Petrochemical industry production weights approximately 50% (much higher than 9% of whole Romania) of that of whole industry in Prahova County from 1992 to 1995 and also in 1997 (data not available for 1996).

As shown in 12% of GDP for agriculture in Prahova County, this sector is relatively minor comparing with other area in Romania.

	GDP (1000billi Lei)	Structure of GDP (%)		
		Agriculture	Industry	Services
Whole ROMANIA	49,795	21	40	39
Prahova County	2,082	12	53	35

* Data in 1994 , Directia Judeteana de Statistica, Prahova (CNS)

1.3 Population

1.3.1 Population in Romania

After the peak in 1990 reached 23,206,720, population in Romania has decreased year by year to 22,607,620 in 1996. From 1990 just after the drastic political and economical change, pro-natal policy was abolished (in addition to this, abortion was legalized) and desire for small family has spread into Romanian people under hard economic condition. In this circumstance, death rate have continued to keep higher than birth rate from to 1996 as shown in the following table, more than that, annual growth rate has accelerated to decrease from 1994 to 0.35% in 1996.

ITEM	1992	1993	1994	1995	1996
Population (Million)	22.79	22.76	22.73	22.68	22.60
Annual growth (%)	-1.73	-0.15	-0.11	-0.22	-0.35
Birth Rate /1000	11.4	11.0	10.9	10.6	10.2
Death Rate/1000	11.6	11.6	11.7	11.9	12.7
Natural Increase Rate/1000	-0.2	-0.6	-0.8	-1.3	-2.5

* Source : Statistical Year Book

1.3.2 Population in Prahova County

Prahova County has the largest population of 866,156 in 1997 and highest population density of 184.1 persons/km² among counties except Bucuresti

The population in Prahova County has been slightly declining and this tendency similar to that of whole Romania. However the rate of decrease has been reducing from -1.4% in 1993 to -0.2% in 1997 year by year.

	1990	1991	1992	1993	1994	1995	1996	1997
Prahova	880,465	878,989	878,496	876,329	874,219	871,919	868,099	866,156
Growth rate		-1.6%	-0.1%	-1.4%	-1.2%	-0.9%	-0.7%	-0.2%

* Source : Directia Judeteana de Statistica, Prahova (CNS)

1.3.3 Population in Prahova River Basin

Assuming that population of a municipality included in the Prahova River Basin is proportional to the ratio of urban/built-up area in the Basin to the total urban/built-up area of the municipality, the JICA Study Team estimated total population of the Prahova River Basin.

Number of municipalities, the urban/built-up area of which are included in the Prahova River Basin, are 2 cities, 12 towns and 73 communes (2 cities, 11 towns and 69 communes from the Prahova County) and the total population is estimated to be 754,995 as tabulated in Table A.1.1.

1.4 Agriculture

1.4.1 Agriculture in Romania

The agriculture sector is one of the most important sectors, of which GDP shared around 20% of total GDP following 36% of industry in 1996. Romania has 14.76 million ha of fertile farming land and favorable climate for agriculture. In addition to this, Romania had high-dense agricultural irrigation network. From 1970's irrigation development had been progressed until 1989 with the target at approximate 500 million ha to be irrigated. However, at the present, this precious network is estimated to be well-operated for only 20% (approx. 100 ha) due to insufficient maintenance and the overage equipment.

Main agricultural products in Romania are wheat and rye, maize, sugar beet, sunflower seed, and potatoes of which productions and evolution is shown in following table.

Item	1992	1993	1994	1995	1996
% of Agricultural Sector in GDP	19.1	21.1	19.6	19.7	19.1
Increase Rate (%)	-13.8	12.4	0.2	4.9	-3.1
Wheat (million ton)	3.2	5.3	6.0	7.7	3.1
Maize (million ton)	16.8	8.0	9.3	9.9	9.6
Sugarbeet (million ton)	2.9	1.8	3.3	2.7	2.8
Sunflower seed (million ton)	0.8	0.7	0.9	0.9	1.1
Potatoes (million ton)	2.6	3.7	2.9	3.0	3.6

Source : Statistical Yearbook, CSN

1.4.2 Agriculture in Prahova County

The weight of GDP in agriculture in Prahova County, which is only 12% in 1994, is relatively low comparing those in other counties (mostly 20% - 30%). Among the total area of 471,587 ha, 146,787 ha of agricultural land (Approx. 31% of total area of Prahova) and 10,449 ha of wine yard (2.2%) spreads in the central and southern area in Prahova County as tabulated below. Land with irrigation facilities is only 8.7% (21% for whole Romania) of the total area of Prahova.

Category	Area (ha)	Proportion (%)
Arable land	146,771	31.1
Pasture	72,150	15.3
Hay	32,406	6.9
Vine yard	10,733	2.3
Orchard	17,074	3.6
Forest	152,222	32.3
Water	9,656	2.0
Others	30,575	6.5
Total	471,587	100.0

Agricultural production in Prahova County has been increased on the whole except sugar beet as shown below.

	(Unit : Ton)						
	1991	1992	1993	1994	1995	1996	1997
Wheat	91,827	65,579	108,607	68,641	129,069	45,118	108,779
Corn	288,835	188,727	240,738	309,964	317,684	291,668	365,629
Potato	21,861	46,753	51,045	49,652	49,103	44,992	42,642
Sunflower	5,860	6,998	6,391	6,075	9,597	14,823	9,557
Sugar beet	103,631	79,905	54,688	71,484	40,565	22,662	23,771
Wine	41,839	40,484	54,017	35,979	56,848	59,471	53,607

* Source : Directia Judeteana de Statistica, Prahova (CNS)

1.5 Livestock

1.5.1 Livestock in Romania

Although live animals and animal products is important sector for the exportation of Romania and the amount of exportation in this sector shares 2.4% of total exportation, livestock numbers as a whole have gradually decreased for these 5 years. Privatization has been progressed also in this field as well as other industries. As shown in the trend, radical decrease can be found in the public sector, on the other hand the decrease of livestock numbers have been stabilized after 1994 in the private sector. Number of cow and pig has remained at same level and the number of chicken has increased in the private sector since 1995.

	(Unit : 1,000)					
	1992	1993	1994	1995	1996	1997
Total						
Cow	3,683	3,597	3,481	3,496	3,435	3,235
Pig	9,852	9,262	7,758	7,960	8,235	7,097
Sheep and Goat	12,884	12,275	11,642	11,086	10,317	9,547
Hen	87,725	76,532	70,157	80,524	78,478	66,620
Private Companies						
Cow	3,010	3,050	3,056	3,132	3,102	2,997
Pig	5,382	4,911	4,415	4,612	4,765	4,668
Sheep and Goat	11,320	11,032	10,560	10,172	9,589	9,075
Hen	46,197	44,006	46,340	50,867	54,286	54,221

* Source : CNS

1.5.2 Livestock in Prahova County

Livestock in Prahova County has been declining significantly since 1992 as shown in the following table. All the number of animals in 1997 has decreased to approximate 30% - 70% of that in 1991. Although total number of animals has decreased considerably until 1997, the number of animals in private companies and individuals was decreasing until 1993 and has been stabilizing after 1994.

	(Unit : 1,000)						
	1991	1992	1993	1994	1995	1996	1997
Total							
Cow	103.7	91.2	71.9	75.4	74.2	75.1	71.3
Pig	245.0	206.6	209.9	208.7	165.1	162.4	157.8
Sheep and Goat	310.6	295.1	250.3	255.6	239.5	226.0	200.5
Hen	4,717.0	3,704.0	2,909.0	1,886.0	1,556.0	1,740.0	1,556.0
Private Companies							
Cow	51.5	69.2	57.4	65.0	67.5	69.1	66.9
Pig	77.5	70.5	100.9	101.2	90.3	86.9	86.4
Sheep and Goat	168.0	218.3	182.4	191.3	184.6	177.5	160.4
Hen	1,507.0	1,354.0	1,296.0	1,221.0	1,203.0	1,181.0	1,201.0

* Source : Directia Judeteana de Statistica, Prahova (CNS)

1.6 Industry

1.6.1 Industry in Romania

Extreme industrial strategy in the 1980s of concentration to metallurgical and heavy industry for rapid foreign debt repayment brought the lack of capital stock which led to malfunctioned and overage plant 20-30 years behind industrially advanced countries. In accordance with the change of industrial policy, from metallurgical and heavy industry to consumer goods such as food and drink, textiles, leather goods, light machinery, production level went down just after 1989 and has recovered gradually from 1993 until 1996. Judging from the movement of industrial production by field from 1994 to 1997, it can be said that total production has increased slowly, extraction industry has declined slightly and processing industry has increased as a whole. Among the processing, furs and leather goods, publishing, machines and equipment (incl. electric equipment), and medical precision show a relatively high extension.

	1992	1993	1994	1995	1996
GDP in Industry to Total GDP(%)	38.8	34.4	36.3	35.9	36.0
Indices (1989=100)	75.0	76.1	79.1	84.7	**88.3

*Source : NCS, National Bank of Romania ** Calculated by Study Team

Items	Unit	1992	1993	1994	1995	1996
Crude steel	1000 tons	5,376	5,446	5,796	6,555	6,082
Cement	1000 tons	6,946	6,837	6,672	7,560	7,613
Plastic & resins	1000 tons	272	259	300	324	324
Synthetic rubber	1000 tons	36	30	26	42	35
Caustic soda	1000 tons	372	330	288	372	326
Passenger Cars	1000	74	94	86	88	111
Radio receivers	1000	84	80	24	18	63
Television sets	1000	318	432	264	367	273
Washing machines	1000	159	166	108	132	137
Refrigerators	1000	402	435	384	426	448
Tractors	1000	22	26	14	15	13
Beer	1000hl	10,014	9,929	9,072	8,558	7,643

* Source : CNS

1.6.2 Industry in Prahova County

GDP in industry (incl. construction) shared approximate 53% of total GDP in Prahova County in 1994 and it is much higher than 40% for whole Romania. Industry sector, especially petrochemical industry represented by Petrotel, Petrobrazi, has been important sector so far and has contributed to Romanian economy. Petrochemical industry production weights approximately 50% (much higher than 9% of whole Romania) of that in whole industry from 1992 to 1995 and also in 1997 (data not available for 1996).

Employees in industrial sector have been decreasing by 21% for 5 years from 170,047 in 1991 to 133,711 in 1996. In this situation employees have increased in a few fields as "petrochemical industry" and "transportation means". All other fields' employees have been decreasing, and in the field of furniture and metallurgy, radically decreased by 41%.

	(unit: %)			
	1992	1993	1994	1995
Industry	100.0	100.0	100.0	100.0
Extraction of energy material	3.5	3.6	4.8	1.8
Other mining	0.7	0.3	0.7	0.3
Processing	95.8	96.1	94.5	97.8
Food & drinks	4.7	5.3	4.6	5.4
Textile	2.5	2.5	2.6	2.5
Furs & leather goods	0.1	0.1	0.1	0.1
Furniture	0.7	0.1	1.1	0.5
Paper, pulp	1.4	0.9	0.6	0.8
Petrochemical	49.6	56.7	50.1	52.2
Chemical & synthetic fibers	5.7	5.2	5.4	6.9
Rubbers	4.3	4.4	4.0	4.3
Non metallic minerals	4.1	3.7	4.0	3.9
Metallurgy	1.1	0.8	0.8	0.9
Metallic construction	1.3	1.6	1.5	1.7
Machines & equipment	11.6	7.7	8.5	10.7
Electric equipment	1.8	0.5	0.5	1.4
Transport means	0.3	0.4	1.2	1.4
Other industries	1.2	1.2	1.3	1.4
Electric & thermal energy, gas & water	5.4	5.0	8.2	3.7

* Source : Directia Judeteana de Statistica, Prahova (CNS)

1.7 Tourism

1.7.1 Tourism in Romania

Romania has considerable assets to develop tourism. These includes the coastal area of the Black Sea, Danube Delta famous for the world heritage where a lot of natural animals inhabiting, Sinaia named as a pearl of Carpathia, Maramures succeeding to the traditional culture etc. Accommodation capacity is sufficient, however the facilities and service level is still remaining behind. Recently with the domestic economy struggling, the number of tourists has been declining gradually but foreign tourists, who are mostly from neighboring countries like Moldova, Bulgaria and Ukraine increased in 1997 as tabulated below.

	(Unit:1,000)					
	1992	1993	1994	1995	1996	1997
Romanian	6,830	6,718	6,149	6,304	5,833	4,894
Foreigner	1,185	848	856	766	762	833
Total	8,015	7,566	7,005	7,070	6,595	5,727

*Source : NCS

1.7.2 Tourism in Prahova County

Prahova County has advantage for developing tourism that will contribute the economic growth. Characteristics of tourism in Prahova County are summarized as follows.

- (1) Large population in Prahova County and Bucuresti as a source of tourist
- (2) Much needs of habitants to relax and to take refuge in fresh area from urban life in Ploiesti and Bucuresti
- (3) Good accessibility to points of tourist by train and by car, and
- (4) A plenty of tourism resources.

1.7.3 Potential of Tourism

Many points for tourism are dotted in the Prahova County from northern mountainous area to Danube River. As a main natural tourism resource, there are three zones in the county (Refer to Fig. A.2.2) i.e.,

(1) Bucegi Massif (Bucegi Mountain)

It is a great attraction point for the mountain climbers with a fine landscape by great array of geographic features such as narrow valleys and caves. It contains Prahova valley in which famous resort cities such as Sinaia, Breaza and Busteni are located.

(2) Ciucas Massif

Cheia is a resort area for hiking and camping at the foot of mountains with good climate. Near the Teleajen valley, there is Slanic resort with seven salty lakes.

(3) Doflana Valley

Doflana valley is a recently developed area with Paltinu Lake, Brebu and Telga resort surrounded by beautiful scenery.

Existing facility for accommodation is shown in the following table.

1.7.4 Number of Tourists

407,656 tourists in which foreign tourists are 25,000 visited Prahova County in 1996. The number of tourists has been declining year by year. Among the total tourists, 294,564 tourists corresponding to approximate 70% of total number visited the Prahova Valley, namely towns of Predeal, Azuga, Busteni, Sinaia and Breaza.

CHAPTER II PRESENT LAND CONDITIONS

2.1 Geology

From a geological point of view, within the territory of the Prahova County occur various deposits, their diversity being expressed from lithological and tectonical points of view. Tectonically, these deposits belong to the External Dacides (the Ceahlau and Bobu Nappes), to the Moldavides and the Foredeep (according to Sandulescu, 1984, Fig.A.2.1).

The formations belonging to the Ceahlau Nappe occur within the north-western part of the county, including the Bucegi and Baiului Mountains, having its southern boundary between Comarnic and Breaza localities. The formations of the Bobu Nappe occur eastwards of the Ceahlau Nappe, reaching the Teleajen Valley and its southern area.

The Moldavides occur eastward and southward of the External Dacides and they are represented by the Convolute Flysch, the Macla and the Tarcu Nappes. Within the Prahova County territory, the Moldavides' southern boundary occurs approximately close to the Cimpina locality.

2.1.1 External Dacides

The oldest outcropping formations that belong to the Ceahlau Nappe are Neocomian in age. The Sinaia Beds represent these formations with three members:

- (1) the Lower Sinaia Beds, represented by argillitic-marly shales, sandy-limestone and marly limestone;
- (2) the Middle Sinaia Beds, made of calcareous sandstones, including to their base the "Azuga Beds" interlayers (red and green shales, quartzite and jaspers);
- (3) The Upper Sinaia Beds that are represented by argillitic-marly shales with calcarenite interlayers, breccias and conglomerates.

The Barremian - Aptian deposits have both flysch and wildflysch features. The flysch characters are recorded within the Comarnic Beds facies (a rhythmic succession of marly-limestone, marly shales, sandy marls and thin calcareous sandstones) and within the Pisu cu Brazi Beds facies (rusty marly-sandstone flysch that sometimes is 1500m thick). The wildflysch characters occur within the block-bearing formation that includes Urgonian limestone reefs with various stratigraphic positions, the best-developed reefs being those from Furnica, Piatra Arsa and Sfinta Ana.

The Albian deposits have two facies, a conglomerate facies (within the eastern area of the Bucegi Mountains and within the Ciucas Mountains, belonging to the Ceahlau Nappe) and a sandstone facies (the Bobu flysch, belonging to the Bobu Nappe). The Bucegi polymictic conglomerates have all types of clasts representing the Crystalline-Mesozoic Zone, these clasts being unsorted. These conglomerates have a massive development and they can reach 1000-1500m thickness. Within the Ciucas and Zaganu Mountains, the Bucegi conglomerates have crystalline-shists clasts to which are added limestone clasts, all of them being caught within a sandstone matrix. The Bobu Flysch is made of massive and layered sandstones within the basal succession, overlain by conglomerates resembling those of Bucegi type and by a micaceous marly-sandstone complex with pelitic siderite interlayers. The whole succession can reach

2000-3000 m thickness.

Within the Ceahlau Nappe, the Vraconian deposits occurs within limited areas confined to Comarnic area and they are represented by marly-sandstones with micaceous sandstones interlayers. Over them lay the Cenomanian deposits made of a dominant marly-sandstone flysch, often of reddish colour, with thin micaceous sandstone interlayers. The Turonian - Coniacian deposits are represented by grey or reddish marly sandstones and secondary by thin sandstone interlayers.

The Pridvarea – Magura Nebunii syncline is included to the Bobu Unit within the southern area of the Ciucas-Zaganu Mountains. In it, the Vraconian deposits are represented by grey sandy marls and by whitish marly-limestone. Reddish-cherry marls represent the Cenomanian deposits, with a few hundred meters thickness. Continuously overlaying, there occur grey coloured argillitic and marly shales, being around 40m thick. They are followed stratigraphically within the Magura Nebunii area by a flysch with micaceous, greenish sandstones and breccias and within the Cheia-Pridvarea zone by red and green clays with sporadic sandstone and bentonitic tuffs interlayers. These deposits have not sure age identification, being initially attributed to the Turonian-Coniacian interval, the younger alternative (Palaeocene) being not excluded.

2.1.2 The Moldavides

(1) The Convolute Flysch Nappe

The Convolute Flysch Nappe can reach 2000m thickness and it is well represented within the Prahova County territory, spreading on an area occurring from north-east towards east of Comarnic, being covered towards west.

The deposits belonging to this nappe are mainly Albian-Vraconian in age, being represented by a monotonous succession of convolute sandstones and grey marly-sandy clays with greenish stripes. At various levels, thin sideritic marls interlayers occur while massive sandstones and even conglomerates occur upwards.

Locally, Cenomanian deposits (rhythmic successions of sandy-limestone, marls and reddish-greenish clays) and Turonian-Coniacian deposits (rhythmic successions of sandstones, grey marls and violet-greenish clays sometimes with sideritic marls interlayers) occur.

(2) The Macla Nappe

It is connected to the external flank of the Convolute Flysch Nappe, being recorded towards the Dofstana Valley. The age of the included formations is Albian-Turonian. The deposits resemble those of the convolute flysch but include also red and green clay interlayers, breccias with red granodiorites, grey or black, bituminous shales with dyssodilic aspect.

(3) The Tarcau Nappe

It presents important lateral facies variations. With regard to the main provenance source, there can be distinguished proximal facies (massive sandstone flysch) and distal facies (pellitic and calcareous deposits).

The Paleocene - Eocene deposits are developed within the Tarcau proximal lithofacies,

the Doamna distal lithofacies and the Tazlau intermediary facies.

The Tarcau lithofacies is recorded in the Prahova County within the structure named "the Homoricu Spur", being represented by calcareous or marly sandstones with advanced grain vertical sorting, with 1-10m thick beds separated by thin clay interlayers with very evident hieroglyphs. Upwards occur green and red clays with rare calcareous sandstone interlayers (the Plopu Layers). These deposits are around 250m thick.

The Doamna and Tazlau lithofacies are confounding when gaining a typical sandstone flysch character. This flysch is represented by a rhythmical and monotonous succession of calcareous sandstones, sometimes convoluted and of greenish-grey and red marls (the Colti facies), all recorded within the Valeni Spur.

The Oligocene deposits are recorded as the Fusaru - Pucioasa proximal facies and Kliwa distal facies. To these is added the Slon facies, developed on the internal flank of the Slanic syncline and on its northeastern continuation.

The Fusaru-Pucioasa facies is recorded within the Homoricu Spur zone and it has been divided into a series of lithological horizons:

- (a) The Lower menilites and dyssodilic shales, with rare brown marls, bituminous interlayers.
- (b) The Pucioasa Beds with interlayered Fusaru sandstone beds (1000-2000m). These deposits are made of mica bearing, calcareous sandstones, of marls and of grey clays with thin calcareous sandstone, dyssodilic shales and sideritic limestone interlayers;
- (c) The Vinetisu Beds (250m) are represented by a marly-sandstone flysch with convoluted sandstones bearing dacitic cineritic interlayers;
- (d) The Upper menilites and dyssodiles with bentonitic interlayers (10cm – 2m thick) occur north of the Batrini locality.

The Kliwa facies is typical for the Valeni Spur and it can be followed eastwards to the Cimpina neighborhood.

The deposits' thickness can reach 1500m and their succession includes the following terms:

- (a) The Lower dyssodiles and menilites (100m), with rare interlayers of bituminous clays, being white in altered colour;
- (b) The Lower Kliwa Sandstone (650-700m) is associated with dyssodilic shales, being a siliceous, oligomictic, white or yellowish sandstone, sometimes with Pucioasa beds interlayers;
- (c) The Podu Morii Beds (150m) correspond to a typical flysch episode, being made of mica bearing, calcareous sandstones with hieroglyphs and a pronounced convoluted character. This character alternate rhythmically with grey and greenish marls, often mica bearing. To the middle part, these beds present dacitic tuffs interlayers;

- (d) The Upper Kliwa Sandstone (500m) or the Bustenari Sandstone is less cemented than the lower one, it has a yellow colour and occurs in thick beds separated by dyssodilic shales;
- (e) The Upper menilites (10-40m) are represented by dyssodilic shales and menilites with associated diatomite.

The Slon facies has as a characteristic element the presence of breccias that are included within sedimentary klippen of variable dimensions that can reach few hundred meters. These breccias are dominant to the upper and middle sequence of the series, its basal part being made of Pucioasa Beds with Fusaru Sandstone and dyssodiles with menilites in the base.

The Oligocene – Miocene boundary is conventionally established immediately under the first gypsum level that occurs within the Cainozoic successions.

The Aquitanian - Burdigalian deposits are represented by the Cornu Beds. Within the succession of the beds, two terms are recorded:

- (a) The lower gypsum (5-40m) made of massive gypsum with argillitic shales interlayers;
- (b) The argillitic and marly shales horizon (100-250m), grey or black, often bituminous, with rare sandstone, grey conglomerates, local glauconite sandstones or marls, lens shape interlayers.

With the Cornu Beds, the stratigraphic succession of the Tarcau Nappe ends. The rest of the Miocene deposits of this unit, beginning with the Upper Burdigalian, belong to the post-nappe deposits.

2.1.3 The Foredeep

The foredeep represents a mollassic depression formed to the margin of the folded systems. It has two zones:

- (1) The internal foredeep, folded, corresponding to the diapiric folds zone;
- (2) The external foredeep, very narrow.

The upper part of the Burdigalian deposits is represented by:

- (1) The Brebu Conglomerates (locally reaching 200m thickness) are sandstone matrix conglomerates, the clasts being represented by crystalline shales, limestone, etc.
- (2) The sandstone and marly-argillitic deposits are sandstone-dominated beds, less consistent, grey or reddish, separated by usual clays and by marly or sandy clays. Dacitic tuff interlayers, gypsum and carbonated shales either occur.

The Badenian deposits are un-uniformly spread, they occurring mainly within the Slanic and Drajna syncline axes, being represented by:

- (1) The Globigerine tuff's horizon (10-50m), known also under the name of Slanic tuffs. It is made of white or green dacitic tuffs with tuffitic marls with Globigerines;

- (2) The salt bearing formation is represented by a breccia with clasts such as crystalline shales, Eocene sandstones, red marls, the matrix being argillitic and marly. Within this formation, the diapiric core of Slanic is defined;
- (3) The horizon of the shale with Radiolarians (70m) is represented by argillitic shales with gypsum and yellow, crumbly sandstone interlayers;
- (4) The Spirialis marls horizon (200m) is made of marls with sandstone and cineritic interlayers;

Less consistent sandstones and sands, bearing spheroid concretions and alternating with grey marls represent the Sarmatian deposits. To the external margin of the diapiric folds, towards the contact with the plain, the Sarmatian deposits have a littoral, neritic character. In this way, at northeast of Mizil, at Istrita Peak, these deposits are represented by oolitic, lumashelle or reef limestone.

The Meotian deposits are probably continuously overlaying the Sarmatian deposits on the external flank of the foredeep. On the internal flank, these deposits are unconformably overlaying the Sarmatian. Between the Teleajen and Prahova Valleys, two horizons are separated:

- (1) The lower horizon (50m) is represented by oolitic, ferruginous sandstone and secondary by clays;
- (2) The upper horizon (250m) has downwards a tuffitic level that is overlain by alternating marls, sands and sandstone, ending with a lumashelle level with Congerias.

The diapiric movement affected these deposits that contain oil and gas in many structures.

- (1) The Pontian deposits (500-700m) are made of a complex of beds that begins with marls and grey clays, followed stratigraphically by sandy marls and grey sands.
- (2) The Dacian (the first stage of the Pliocene) deposits are made of sands, marls, clays with coals (at Filipești and Ceptura) and gravels. Their thickness varies from 200 to 700m.
- (3) The Romanian deposits are represented by a monotonous series of clays and sands. In the same way as the Dacian deposits, they contain coal beds at Filipești de Padure and Ceptura.
- (4) The Lower Pleistocene (100-500m) deposits are represented by a complex of gravels, sands with clay interlayers (the Cindesti Beds) or conglomerate lens.
- (5) The Middle Pleistocene deposits have at their basal-most part red sandy clays that pass upwards in loessoid, yellowish, dusty deposits with 10-15m thickness.
- (6) The Upper Pleistocene (10-25m) deposits include high terrace sediments (terrace gravels covered by clay deposits) and alluvial deposits (gravels also covered by loessoid deposits).
- (7) Alluvial deposits made of pebbles, sands and clays (10-15m) represent the Holocene sediments.

- (8) The structural image of the flysch zone is characterised by the mixing of the raised elements (the spurs) with lower elements. These lower elements represent the adjacent synclines that form a complex of parallel folds having NE-SW direction, affected by a longitudinal faults system with northwestern vergence).

2.2 Geomorphology

As a result of the direct interaction between the geological structure and the external erosion factors, the relief of the Prahova County reflects perfectly its geological structure and includes three main morphological units superposed on each structural unit. So, the following geomorphological units represent the relief: the bending zone of the Carpathians, the bending zone of the Subcarpathians and the Romanian Plain (Refer to Fig.A.2.2).

2.2.1 Bending Zone of the Carpathians

These mountains cover, in the northern area, a 49km long and 25km wide strap, representing over 26% of the 4668km² surface of the county.

To the composition of the mountainous relief participate from east towards west the Bucegi Mountains, the Teleajen Mountains and a part of the Siriu Mountains. All these mountains are characterised by the existence of some more or less parallel ridges. They are north-south oriented, with maximal altitudes in the northern perimeter and minimal southwards. The peaks over 1600m are characterised by the occurrence of the alpine vacuum with a significant development in the Bucegi Mountains (5-6km width of the area that belongs to the county), in the Baiului and Ciucas Mountains, the last two with alpine vacuums of maximum 15km width and lengths that can surpass 45km.

(1) The Bucegi Mountains

They occur in the north-western part of the county, in the western flank of the Prahova Valley, where it makes spectacular steep slopes, with vertical walls up to 600m generated by the erosion resistance of the Bucegi conglomerates stronger than that of the subjacent marls and sandstone.

The main crest has a well-developed alpine vacuum and it reaches 2504m altitude at the Omu peak, in the northwestern extremity of the county. The altitude decreases to 2103m (the Furnica Peak) and reaches 1338m at Gurguiatu Peak and even 1000m to the boundary with the Subcarpathians. Being made of conglomerates with a massive structure, with steep walls, to the upper part a plateau occurs with a slight southwestern slope.

(2) The Teleajen Mountains

They cover the area between Prahova and Teleajen Valleys, being composed at their turn by the Baiului, Grohotisului and Ciucasului Mountains.

The Baiului Mountains, between the Prahova and Doftana Valleys, are made of less resistant rocks than the Bucegi Mountains are made, this fact giving them a rounded, slight ridges aspect. The maximal altitude is reached by the Paltinul peak (1899m), on the northern boundary, from where, southwards, they begin having decreased altitudes at Baiul mare (1895m) and Mierlei (1660m) Peaks. Like in the Bucegi case, the alpine vacuum has a large development and spruce fir forests bound it.

The Grohotisului Mountains, between the Doftana and Teleajenului Valleys, have the maximal altitude in the Grohotisului Peak (1767m), the altitude decreasing northwards and especially southwards, reaching 1381m in the Radila Mare Peak. Beneath this peak springs the Varbilau River that divides the Grohotis Massive in two parts:

- (a) south-westwards, the main ridge with an alpine vacuum continues to the Clabucet Peak (1394m) and the Netrebnicu Mountain, ends in the Barbes Peak (1013m), that dominates the subcarpathian Berta depression;
- (b) south-eastwards, the main ridge continues with the Trifoiu Mountain and Plaiul lui Serban Voda, reaching the Mare Peak (1058.8m) close to the Slanic depression.

The Ciucas Mountains occur in the north-eastern part of the Grohotis Mountains, between Teleajen and Teleajenel rivers, forming a prominent ridge that resembles a lot the Bucegi ridge due to the similar lithology (the Ciucas-Zaganu conglomerates). The highest altitudes are reached by the Ciucas Peak (1954m) and Zaganu Peak (1882m).

(3) The Siriu Mountains

They are represented within the county only by their southern end. The Tatarului ridge begins with the Tataru Mare Peak (1475m), out of the county, continues with the Varful lui Crai peak (1472m) and ends with the Tiganului Peak (1080m), over the subcarpathian Drajna depression.

2.2.2 Bending Zone of the Subcarpathians

It represents a geomorphologic unit with numerous particularities. The bending zone of the Subcarpathians cover approximately 39% of the county's surface, and occurs between the Pripor, Salciei and Dealu Mare Hills eastwards where it is 37.5km wide and Dealul Sultanul – Teisu westwards, with 30km width. In front of the Prahova Valley this zone has only 16km width.

The Subcarpathian sector of the Prahova County has an average altitude of 580m, being represented by numerous hills with altitudes between 305m in the Jercalai Peak, north of Urlati and the Sultanul Peak (848m), west of Irimesti, within the right slope of the Provita river.

The morphology of the bending zone of the Carpathians accurately reflects the geological structure marked mainly by the existence in the internal sector of Paleogene flysch deposits, represented by the southwestern endings of the Homoricu (internal) and Valeni (external) Spurs, both of them ending in the Teleajen Valley. Westward of the Teleajen Valley, the Paleogene deposits, sometimes associated with Cretaceous sediments, outcrop only on faults, as patches.

Secondary, the existence of some folded geological structures with folds separated by profound faults, some of them of overthrusting nature, determines the general orientation of the subcarpathian hills. The lithology of the deposits is either involved: the sandstone and the conglomerates give the ridges and the marls, clays and sands determine the occurrence of depressionary zones. The existence, within the bending zone of the Subcarpathians' external part, of an area of maximal subsidence (the Gherghitei plain) determines the extremely active erosion. This existence of the maximal subsidence area is correlated actually with the rising of the Carpathians as an izostatic effect, making possible the increase of the erosion effects.

All causes shown above influenced the nowadays aspect of the Subcarpathians' relief, determining the existence, in the internal – western sector, of some ridges oriented NE-SW (the two flysh spurs) and in the external sector of some E-W oriented ridges. Westwards of the Teleajen Valley are frequent ridges parallelly oriented with the main transversal valleys.

Generally, in the Prahova County, the Carpathians show the aspect of middle altitude of around 580m, separated by large depressions, some of them communicating within clear limits, fact that generated the issue of numerous opinions regarding the boundaries and the names of each geomorphologic subunit. Within our report, we adopted the ideas of the authors G. Posea and I. Badea for the geomorphologic zonation of Romania (Fig. A 2.2). According to them, the bending zone of the Subcarpathians are made, in the Prahova Valley, by the western part of the Buzau Subcarpathians and the Prahovei Subcarpathians.

(1) The Buzau Subcarpathians

They represent a 37km wide strip at the western limit of the county and they are bounded westwards by the Cricovul Sarat Valley, between Urlati and Apostolache, by the Teleajen Valley, northwards of Valeni.

The morphology of this sector is characterised by the existence in the internal part of ridges belonging to the two Paleogene spurs, oriented NE-SW and separated by the Drajna Depression. Morphologically, to the Valeni Spur correspond the Proporului Hills, with the Proporului (823m), Lazuri (770m) and La Peri (673m) peaks. The altitude decreases from northeast to southwest, while the Valeni Spur dives under Miocene deposits.

Southeastwards of the Priporului Hill occurs the Salcia Hill (689m) dominating northwards the Cricovul Sarat Depression.

In the external sector, to the boundary with the plain are uprising in the following of the Istrita Hill (Buzau County) the Dealul Mare (595m), Ciortea (615m) and Ceptura (445m) Hills. Their altitudes are strongly contrasting with those of the plain that has altitudes between 128 and 174m. These three hills are bounded northwards by the Cricovul Sarat Depression and by the Magurele Depression, the last one surpassing westwards the Teleajen Valley and reaching closely the Doftanei Valley.

(2) The Prahova Subcarpathians

They include two other subunits: the Teleajen Subcarpathians, between the Cricovul Sarat and the Doftana Valley and the eastern part of the Ialomita Subcarpathians.

Eastwards of the Cricovul Sarat river is rizing Dealul Bucovelului Hill (347m), between the plain southwards and the Magurele Depression northwards. This depression continues west of the Teleajen River, along the Mislea Valley and it is bounded southwards by the hills that have their maximal altitude in the Ciobu Hill (618m).

North of the Magurele Depression occurs the Cosminele Hill, with its maximal altitude in the Macesu Peak (814m), being separated by the Varbilau Hill by a small depressionary zone along the Cosmina river.

Between the Varbilau Hill and the mountainous zone occur two subcarpathian depressions: the Berta and Slanic Depressions.

The Teleajen Subcarpathians end with the Doftana Hills (the Sotrile Peak, 789m), N-S oriented, between the depression of the Prahova Valley in west and the Brebu Depression in east. The Brebu Depression is bounded westwards by the Cosminele Hill and it is connected southwards to the Magurele Depression.

The eastern sector of the Ialomita Subcarpathians includes the Sultan-Teisu Hill (Sultanu Peak, 848m), separated of the Gurga ridge (678m) by the Provita Depression, bounding westwards the last cited ridge.

2.2.3 The Romanian Plain

The plain relief covers around 35% of the Prahova County. Among the different subunits of the Romanian Plain, within the Prahova County the best development has the pre-mountainous plain of Prahova, especially the Ploiesti Plain formed by the alluvial cone of the Prahova River. This plain has altitudes between 04m south of Gorgota, on Ialomita River to 319m close to Floresti.

Eastwards of the Teleajen Valley, from Urlati locality, to the slopes of the Subcarpathians, is developed the Istrita glacis, having 5-7km width, 128m altitude at Arioneesa westwards and 111m close to Mizil locality.

In the southern part of the county occurs the Gherghita Plain, with altitudes between 71 and 89m, characterised by an active subsidence, reflected by the strong meandering of the Prahova, Teleajen and Cricovul Sarat Rivers.

Continued eastwards and southwards of the Gherghitei Plain, occurs the Sarata Plain, with similar characteristics.

On the whole plain area of the Prahova County the terrace systems of the Prahova, Provita, Teleajen, Cricovul Sarat, Balana and Ialomita Rivers are developed.

2.3 River Basins

2.3.1 Division of Prahova River Basin

The Prahova River Basin which has catchment area of 3738.0 km² can be subdivided into 18 subbasins, 45 sub-sub-basins and further 23 sub-sub-sub basins in accordance with "*ATLASUL CADASTRULUI APELOR DIN ROMANIA*" published under the authority of MINISTERUL MEDIULUI (Ministry of Environment) in 1992 (hereinafter referred to as "the Ledger") as indicated in Fig. A.2.3. The catchment area of these subdivided basins is obtained from 100,000 scale hydrological map with GIS. Table A.2.1 indicates catchment area of subdivided basins obtained by JICA Study Team together with the area indicated in the Ledger for comparison. The difference of the two (2) catchment areas is small except for 120.r of the residual basin of the Prahova River and 120.16.r of the residual basin of the Cricovul Sarat River. The area of 120.r by the JICA Study Team is larger than that by the Ledger by some 200 km², while the area of 120.16.r by the JICA Study Team is smaller by the Ledger by some 200 km².

In consideration of the coincidence in difference of the area mentioned above and careful measurement of the area done by the JICA Study Team, it is concluded that the area of 120.16.r by the Ledger included erroneously some 200 km² of residual basin of 120.r. Therefore, also considering small difference in other areas, the area obtained by the JICA Study Team is decided to be used in this study.

The river basin code used in Table A.2.1 contains tentatively “r”, meaning of residual basin such as 120.r or 120.16.r mentioned above.

2.3.2 Catchment Area of Sampling Point

In this project, supplementary water quality observation is conducted at 26 sampling points consisting of 15 regular sampling points established by the Romanian Waters and 9 points which are additionally set by the JICA Study Team for more detailed observation for the Prahova River.

Based on these water quality sampling points, water quality modeling and simulation was made as explained in Appendix C. Therefore, sampling point is called as model points and catchment area of sampling point is defined as model block.

Fig. A.2.4 shows the location and catchment area of 26 sampling points (model block) and Table A.2.2 tabulates catchment area (residual catchment area) of each sampling points (model block).

2.4 Land Use

2.4.1 Land Use Classification

The spatial land use distribution of the county is shown on the cadastral map with scale of 1:50,000, published by Institut de Geodezie, Photogrammetrie, Cartografie si Orbanizarea Teritoriului. This map has not been updated since 1976. Hence, satellite image was analyzed to prepare the current land use map for the Prahova river basin using GIS software (Arc Info/View).

A field survey was conducted to compare the actual land use condition with the color tone or pattern on the remote sensing image for each land use unit and to extract typical training samples from each land use unit. The field sample data are used for improving the accuracy of the land use map newly produced by satellite image analysis.

Based on the field survey, the present land use of the River Basin is classified into seven (7) categories as shown below.

(1) Current Agricultural Land

This refers to the land currently used for the crop cultivation. Most of the agricultural lands extend over the flood plain in the downstream of the Prahova Main River and their farm size is relatively large. The land is mainly covered by maize, sunflowers and wheat in growing, mature or herbaceous stages.

(2) Fallow land

This refers to current fallow land under the cycle of cultivation. This category can only be seen within the agricultural area in the low-lying areas.

(3) Pasture/Hay Land

This category includes also grass/bush area. In the Prahova River Basin, pastures/hay land is especially predominant in the hilly area, and alpine pasture is also identified in elevated spots.

(4) Forest

The forest is defined as the area with densely planted trees. The forest is mostly composed of *Quercus* Spp. (Deciduous), but coniferous forest (mostly *Abies alba*, *Picea abies*) is partially observed in the mountain areas.

(5) Orchard

This category includes growing and mature orchards. This also contains the small villages with garden orchards. In this basin, apple, apricot, and grape are major orchards. Most of the orchards are distributed in hilly areas and vineyards are seen in the hilly lands facing to the south.

(6) Urban/Built up area

This category includes urban residential/commercial area as well as large factories. The settlements along to the major roads can not be identified clearly on the satellite image since their size is smaller than the limit of satellite resolution.

(7) Water Body

This category mainly consists of small lakes/reservoirs.

2.4.2 Land Use in Catchment Area of Sampling Points

Fig. A.2.5 indicates land use classification explained above in the model block and Table A.2.3 tabulates the area of each land use in the model block in order to estimate land load flowing from each catchment area in Appendix C.

2.4.3 Characteristics of the Land Use in the Basin

The current land use area in subdivided basins is also obtained as shown in Table A.2.4. In order to understand the characteristics of the study area, the Prahova River Basin is divided into the four (4) major sub-basins, namely, Prahova Main River Basin, Doftana River Basin, Teleajen River Basin, and the Cricovul Sarat River Basin. In the Prahova River Basin, forest is the most predominant land use and it occupies the northern mountain areas. Agricultural land including current agricultural land and fallow land is second land use and it is distributed in the southern flood plain. Orchards are mostly located on the foot of the mountains and in the river valleys. Small agricultural lands are identified in the upper reaches of the respective rivers.

The current land use area by sub-basin and by category is summarized as follows.

Land Use	(unit: ha)				
	Prahova	Doftana	Teleajen	Cricovul Sarat	Total
Current Agricultural Land	33,750 (31.8%)	35 (0.1%)	31,627 (19.1%)	7,355 (12.1%)	72,767
Fallow Land	11,590 (10.9%)	58 (0.1%)	14,730 (8.9%)	2,784 (4.6%)	29,162
Pasture/Hay	14,742 (13.9%)	10,440 (25.2%)	30,875 (18.7%)	11,876 (19.6%)	67,933
Forest	42,831 (40.4%)	30,101 (72.7%)	77,525 (46.8%)	32,323 (53.2%)	182,780
Orchard	2,456 (2.3%)	410 (1.0%)	7,554 (4.6%)	6,273 (10.3%)	16,693
Urban/Built-up area	498 (0.5%)	214 (0.5%)	2,864 (1.73%)	88 (0.1%)	3,664
Water	209 (0.2%)	169 (0.4%)	395 (0.2%)	28 (0.1%)	801
Total	106,076	41,427	165,570	60,727	373,800

The land use characteristics of each sub-basin are summarized below.

(1) The Prahova Main River Basin

The Prahova Main River Basin covers the land extending from Carpathian mountains range to the confluence with the Ialomita river in the north-south direction. The basin contains a wide variety of the landscapes. The major land uses in the upper reaches of Cimpina City are limited to forest and pasture /hay land due to the steep slope topography. The land is not suitable for any kinds of crop cultivation. Land slides and soil erosion are observed in some steep slopes along the rivers. In the middle to downstream reaches of the Basin, agricultural lands with fertile soil widely extends. It covers 42.7 % (the highest percentage among the four (4) sub-basins) of the total basin area.

(2) The Doftana River Basin

Doftana River Basin is characterized by the rich natural land resources. Forest covers 30,101 ha (72.7%) of the total basin area. Most areas are covered by dense vegetation and alpine pasture (10,462 ha, 25.2%) is distributed in the high land. In this sub-basin, no large cities and settlements are located and then, agriculture land is less distributed (35ha, 0.1%). Land slides and bare soil can be observed in the steep slopes along the river banks. These area are also understood as source of the turbidity in river water.

(3) The Teleajen River Basin

In the Teleajen river basin, various kinds of orchards are widely distributed. Most of them are located in the middle reaches of this basin. Size of the orchard is relatively smaller than other types of farmlands developed in the down reaches. Most of the orchards existing in the flat areas are apricot and apples. On the contrary, orchard in is developed in the foot of the hills facing to the south.

(4) The Cricovul Sarat River Basin

The upper reaches of Cricovul Sarat River Basin is relatively low in elevation, compared to the other three (3) basins. Low land pastures are widely distributed in the middle reaches of the basins.

2.4.4 Past Change of Land Use in the Basin

The statistical data on the existing land use of the Prahova River Basin is available in the Cadastral Department of the Prahova County. The land use of each administrative unit is classified into eight (8) categories: arable land, pasture, hay land, vine yard, orchard, forest, water body and others. Yearly changes of the land use during 1990 to 1996 in the Prahova County are shown below.

	(unit: ha)						
	1990	1991	1992	1993	1994	1995	1996
Arable	146,741	146,741	146,741	146,741	146,756	146,758	146,771
Pasture	71,615	71,615	71,648	71,928	71,953	72,137	72,150
Hay	32,414	32,414	32,414	32,452	32,452	32,427	32,406
Vine yard	11,101	11,101	11,101	10,877	10,856	10,705	10,733
Orchard	17,248	17,248	17,215	17,121	17,107	17,107	17,074
Forest	152,245	152,245	152,245	152,222	152,222	152,222	152,222
Water Bodies		9,661	9,661	9,661	9,656	9,656	9,656
Others	40,223	30,562	30,562	30,585	30,585	30,575	30,575
Total	471,587	471,587	471,587	471,587	471,587	471,587	471,587

Source: cadastral department of Prahova County

As shown in the above table, no significant land use change has occurred since 1990. The existing largest land use in 1996 is forest, covering 152,222 ha (32.3%) of the total land area of 471,587. Agricultural lands is classified into five (5) types of land use such as arable (146,771 ha, 31.1%), pasture (72,150 ha, 15.3%), hay (3,246 ha, 6.9%), vine yard (10,733 ha, 2.3%), and orchard (170,74 ha, 3.6%). The total agriculture area covers more than half of the county (279,134 ha, 60.2%).

2.5 Others

2.5.1 Area of Administrative Units

Many of the area calculations for various analyses were carried out using GIS. Table A.2.5 shows the amount area and percentage of area of administrative units which are included in the respective model blocks. This area and percentage was calculated by overlaying each model block and administrative units. Figure A.2.6 shows the spatial relationship between boundaries of model blocks and boundaries of the administrative units

2.5.2 Area of Urban/Built-up Zone

Table A.2.6 shows the area and percentage of the urban/built-up zone for each administrative unit which are included in the model block. Figure A.2.7 shows the spatial relationship between boundaries of the model blocks and urban/built-up area in this study area.

CHAPTER III FUTURE FRAMEWORK

3.1 General

The future framework of the Prahova County is explained hereunder. The forecast items are population, industry production, livestock and tourism in the target year 2015 and also the years of 2005 and 2010 which are necessary to formulate the master plan for water environment management with phased program.

3.2 Population

The World Bank predicted the population of Eastern Europe up to 2010 including the Romania. According to this prediction, population growth rate in Romania is estimated at -0.1%/year from 1995 to 2010 as tabulated below. Actually from 1992 to 1996, growth rate has shown -0.2%, -0.6%, -0.8%, -1.3%, -2.5% respectively.

Country	Total Population (million)			Average Annual Growth Rate	
	1980	1995	2010	1980-95	1995-2010
Romania	22	23	22	0.1	-0.1
Bulgaria	9	8	8	-0.3	-0.3
Czech	10	10	10	0.1	0.0
Hungary	11	10	10	-0.3	-0.2
Moldova	4	4	5	0.5	0.3
Poland	36	39	40	0.5	0.3
Slovak	5	5	6	0.5	0.2
Slovenia	2	2	2	0.3	0.0
Ukraine	50	52	50	0.2	-0.2
Yugoslavia	10	11	11	0.7	0.2

Source: World Development Indicators 1997, World Bank

Term	1970-75	1980-85	1990-95
Urban population	46.2%	51.1%	55.4%

Source: World Bank

On the other hand, the concentration of population to the urban area is accelerated in Romania as well as other European countries. The rate of urban population to the total population in Romania has shown for the duration of 1970-75, 1980-85 and 1990-95, at 46.2%, 51.1% and 55.4% respectively. It has reached to 65% in other east-central European countries like Hungary, Poland and Zec in 1995. In addition to it, the tendency of the concentration to the big cities which have the population more than one million (only Bucharest in Romania) is conspicuous and it is predicted to be 10% in 2015 from 9% in 1995 by World Bank.

The future population in Bucharest was predicted in the "The Study for Waste Disposal in Bucharest" conducted by JICA in 1995. The growth rate of the population in Bucharest from 1995 to 2010 was predicted at 0.772% by year in this study. Prahova county is next to Bucharest and well-communicated area connected with the big capital city by roads and railways. Ploiesti will become a sate-light city of Bucharest in the future.

Considering this situation the growth rate of population in Prahova County is assumed to be 0.00 % until the year of 2000 and 0.50% from 2001 to 2015 in this study.

3.3 GDP

The World Bank forecast the growth rate of the Romania to be 4% from 1998 to 2002 in the publication titled "ROMANIA, an Economic Update, April 1994. The NCEF has also predicted GDP in Romania as shown in the following table.

However, the central or local government makes no GDP prediction of the Prahova County. Therefore, the latest growth rate prediction for total Romania made by the NCEF will be applied to that of Prahova county in this study.

Year	1995	1996	1997	1998-2002
Growth rate	1.2%	1.5%	2.5%	4.0%

Source: World Bank Report,

Year	1996	1997	1998	1999	2000
GDP	4.1%	-6.5%	0.0%	2.3% ¹⁾	3.5% ¹⁾
Industrial Production	9.9%	-5.0%	-0.5%	1.7% ¹⁾	2.7% ¹⁾
				2.9% ²⁾	4.3% ²⁾

¹⁾Minimum case ²⁾Maximum case

Source: National Commission for Economic Forecasting, GDP Division, Romania

Romanian economy has been struggled for the market economy through the privatization in the various economic activities. Until the end of the year of 1999 this privatization will be completed, however, economic recovery has not yet been vivid and privatization will be stabilized gradually after the year of 2000.

According to the forecast revised in July by the NCEF, GDP growth rate will be minus and recovery will be delayed. However, 2.7% of GDP growth rate will be attained in 2000 and growth rate of export will change from minus to plus in 1998.

Accordingly, GDP growth rate is assumed to be 0.00% in this study until the year of 2000 and 4.2% which is the average of the minimum case and the maximum case predicted originally by the NCEF in this study.

3.4 Industry Production

The NCEF has predicted the extension of the industrial production in Romania until the year of 2000 as shown in table mentioned above. The industrial production, which fell down at the beginning of 1990's recovered from 1994 to 1996. However, it has been faced to difficulty to grow at the present. According to these prediction and the present situation, the growth rate of industrial production is assumed to be 0.0% until the year of 2000 and 3.5% from the year of 2001 to 2015, which is the average of the minimum case and the maximum case predicted by the NCEF in this study.

3.5 Livestock

Although the number of livestock has been declining continuously in 1990's in Prahova as well as in Romania, this tendency has slow down especially in the private sector year by year. Also in the field of agriculture and livestock privatization has spread and gradually stabilized. After the privatization, life standard in Romania would level up in accordance with the economic growth,

which will lead the consumption of meats and eggs increasing slightly.

The number of livestock will keep constant level and growth rate is assumed to be 0.00% until the year of 2015.

3.6 Number of Tourist

Development plan for tourism in Sinaia, which was conducted by Ministry of Tourism, Romania, shows the prediction of number of future tourists in Sinaia until the year of 2000. According to that, the growth rate of the number of tourists is 5.5%, 5.3% and 4.9% in 1998, 1999 and 2000, respectively. The growth rate of the number of tourists is assumed to be 0.00% until the year of 2000, and to be 5% after 2001 until 2015.

Estimated number of tourists in Sinaia

Year	1998	1999	2000
No. of tourists	222,600	234,500	246,000
Growth rate	5.5%	5.3%	4.9%

3.7 Future Framework

In this master plan the target year is 2015. In each year until 2015, growth rate of population, GDP, industrial production, livestock, number of tourist and GNP per capita is shown in the following table.

Year	Population	GDP	Industrial Production	Livestock	No. of Tourists
1998	1.000	1.000	1.000	1.000	1.000
1999	1.000	1.000	1.000	1.000	1.000
2000	1.000	1.000	1.000	1.000	1.000
2001	1.005	1.042	1.035	1.000	1.050
2002	1.010	1.086	1.071	1.000	1.103
2003	1.015	1.131	1.109	1.000	1.158
2004	1.020	1.179	1.148	1.000	1.216
2005	1.025	1.228	1.188	1.000	1.276
2006	1.030	1.280	1.229	1.000	1.340
2007	1.036	1.334	1.272	1.000	1.407
2008	1.041	1.390	1.317	1.000	1.477
2009	1.046	1.448	1.363	1.000	1.551
2010	1.051	1.509	1.411	1.000	1.629
2011	1.056	1.572	1.460	1.000	1.710
2012	1.062	1.638	1.511	1.000	1.796
2013	1.067	1.707	1.564	1.000	1.886
2014	1.072	1.779	1.619	1.000	1.980
2015	1.078	1.854	1.675	1.000	2.079

Future framework in Prahova County in 2015 is estimated by using growth rate assumed above as shown in the following table.

	Unit	1997	2015
Population of Prahova River Basin	Person	754,995	813,885
Industrial Production	Mill lei	10,696,445	17,916,545
Livestock			
Cow	1000 head	71.3	71.3
Pig	1000 head	157.8	157.8
Sheep and Goat	1000 head	200.5	200.5
Hen	1000 head	1,556.0	1,556.0
Number of Tourists in Prahova Valley	Person	294,564	612,377

TABLES

**Table A.1.1 Municipalities in Prahova River Basin
and Population in 1997 (1/2)**

No.	Code	Municipality	County	Class of Municipality	Prahova Basin	Total Population	Built-up Area in Basin (%)	Population in Basin
1	2150	Cimpina	Prahova	City	Totally in	40,903	100.0	40,903
2	2000	Ploiesti	Prahova	City	Totally in	253,414	100.0	253,414
3	2188	Azuga	Prahova	Town	Totally in	6,256	100.0	6,256
4	2064	Baicoi	Prahova	Town	Totally in	20,292	100.0	20,292
5	2085	Boldesti-Scaileni	Prahova	Town	Totally in	11,583	100.0	11,583
6	2165	Breaza	Prahova	Town	Partially in	19,035	83.6	15,908
7	2185	Busteni	Prahova	Town	Totally in	12,053	100.0	12,053
8	2190	Comarnic	Prahova	Town	Totally in	13,576	100.0	13,576
9	5025	Mizil	Prahova	Town	Totally out	17,175	0.0	-
10	2079	Plopeni	Prahova	Town	Totally in	10,315	100.0	10,315
11	2180	Sinaia	Prahova	Town	Totally in	15,063	100.0	15,063
12	2101	Slanic	Prahova	Town	Totally in	7,382	100.0	7,382
13	2041C	Urleti	Prahova	Town	Partially in	11,893	85.0	10,114
14	2100	Valenii de Munte	Prahova	Town	Totally in	14,005	100.0	14,005
15	2166	Adunati	Prahova	Commune	Totally out	2,480	0.0	-
16	2041	Albesti-Paleologu	Prahova	Commune	Partially in	5,960	100.0	5,960
17	2117	Alunis	Prahova	Commune	Totally in	3,917	100.0	3,917
18	2141	Apostolache	Prahova	Commune	Totally in	2,429	100.0	2,429
19	2071	Aricesatii Rahtivani	Prahova	Commune	Totally in	8,007	100.0	8,007
20	2140B	Aricesatii Zeletin	Prahova	Commune	Totally in	1,474	100.0	1,474
21	5030	Baba Ana	Prahova	Commune	Totally out	4,204	0.0	-
22	2036	Balta Doamnei	Prahova	Commune	Partially in	2,719	40.7	1,107
23	2131	Baltesti	Prahova	Commune	Totally in	3,547	100.0	3,547
24	2173	Banesti	Prahova	Commune	Totally in	5,761	100.0	5,761
25	2026	Barcanesti	Prahova	Commune	Totally in	9,134	100.0	9,134
26	2028	Berceni	Prahova	Commune	Totally in	5,871	100.0	5,871
27	2117B	Bertea	Prahova	Commune	Totally in	3,491	100.0	3,491
28	2047	Blejoi	Prahova	Commune	Totally in	7,594	100.0	7,594
29	5033	Boldesti-Gradistea	Prahova	Commune	Totally out	2,056	0.0	-
30	2011	Brazi	Prahova	Commune	Totally in	8,133	100.0	8,133
31	2169	Brebu	Prahova	Commune	Totally in	7,884	100.0	7,884
32	2038	Bucov	Prahova	Commune	Totally in	10,282	100.0	10,282
33	5028	Calugareni	Prahova	Commune	Partially in	1,436	0.0	-
34	2139	Carbunesti	Prahova	Commune	Partially in	1,964	100.0	1,964
35	2051	Ceptura	Prahova	Commune	Totally out	5,403	0.0	-
36	2122	Cerasu	Prahova	Commune	Partially in	5,266	100.0	5,266
37	2142	Chiojdeanca	Prahova	Commune	Partially in	1,919	100.0	1,919
38	2053	Ciorani	Prahova	Commune	Totally in	7,206	93.8	6,762
39	2179	Cocorastii Mislui	Prahova	Commune	Totally in	3,650	100.0	3,650
40	5038	Colceag	Prahova	Commune	Partially in	5,673	0.0	-
41	2157	Cornu	Prahova	Commune	Totally in	4,413	100.0	4,413
42	2083	Cosminele	Prahova	Commune	Totally in	1,308	100.0	1,308
43	2119	Drajna	Prahova	Commune	Totally in	5,856	100.0	5,856
44	2055	Draganesti	Prahova	Commune	Totally in	5,065	100.0	5,065
45	2056	Dumbrava	Prahova	Commune	Totally in	4,163	100.0	4,163
46	2081	Dumbravesti	Prahova	Commune	Totally in	3,667	100.0	3,667
47	2067	Filipestii de Padure	Prahova	Commune	Totally out	10,610	0.0	-
48	2076	Filipestii de Targ	Prahova	Commune	Partially in	8,052	0.0	-
49	5036	Fantanele	Prahova	Commune	Totally out	4,147	0.0	-
50	2065	Floresti	Prahova	Commune	Partially in	7,633	42.9	3,272
51	2044	Fulga	Prahova	Commune	Totally out	3,977	0.0	-
52	2059	Gherghita	Prahova	Commune	Totally in	3,964	100.0	3,964
53	2034	Gorgota	Prahova	Commune	Totally in	5,637	94.1	5,306
54	2143	Gornet Cricov	Prahova	Commune	Partially in	2,760	100.0	2,760
55	2130	Gornet	Prahova	Commune	Totally in	3,254	100.0	3,254
56	5026	Gura Vadului	Prahova	Commune	Totally out	2,529	0.0	-
57	2112	Gura Vitioarei	Prahova	Commune	Totally in	6,024	100.0	6,024
58	2041B	Iordacheanu	Prahova	Commune	Partially in	5,175	100.0	5,175
59	2102	Izvoarele	Prahova	Commune	Totally in	6,908	100.0	6,908

**Table A.I.1 Municipalities in Prahova River Basin
and Population in 1997 (2/2)**

No.	Code	Municipality	County	Class of Municipality	Prahova Basin	Total Population	Built-up Area in Basin (%)	Population in Basin
60	5029	Jugureni	Prahova	Commune	Partially in	792	0.0	-
61	2148	Lapos	Prahova	Commune	Partially in	1,561	90.7	1,416
62	2088	Lipanesti	Prahova	Commune	Totally in	4,875	100.0	4,875
63	2129	Magurele	Prahova	Commune	Totally in	4,824	100.0	4,824
64	2161	Magureni	Prahova	Commune	Partially in	6,677	29.9	1,998
65	2104	Maneciu	Prahova	Commune	Totally in	11,453	100.0	11,453
66	2019	Manesti	Prahova	Commune	Partially in	7,489	19.1	1,432
67	2135	Pacureti	Prahova	Commune	Totally in	2,278	100.0	2,278
68	2048	Paulesti	Prahova	Commune	Totally in	5,073	100.0	5,073
69	2039	Plopu	Prahova	Commune	Totally in	2,219	100.0	2,219
70	2133	Podenii Noi	Prahova	Commune	Totally in	4,787	100.0	4,787
71	2158	Poiana Campina	Prahova	Commune	Partially in	5,315	100.0	5,315
72	2022	Poenarii Burchii	Prahova	Commune	Partially in	6,339	29.0	1,839
73	2126	Posesti	Prahova	Commune	Partially in	4,482	38.6	1,732
74	2109	Predeal Sarari	Prahova	Commune	Totally in	2,681	100.0	2,681
75	2163	Provita de Jos	Prahova	Commune	Partially in	2,683	0.0	-
76	2164	Provita de Sus	Prahova	Commune	Totally out	2,449	0.0	-
77	2033	Puchenii Mari	Prahova	Commune	Totally in	9,115	100.0	9,115
78	2029	Rafov	Prahova	Commune	Totally in	5,514	100.0	5,514
79	2149	Salcia	Prahova	Commune	Totally in	1,350	100.0	1,350
80	2054	Salciile	Prahova	Commune	Totally out	2,423	0.0	-
81	2177	Scorteni	Prahova	Commune	Totally in	6,015	100.0	6,015
82	2194	Secaria	Prahova	Commune	Totally in	1,394	100.0	1,394
83	2146	Singeru	Prahova	Commune	Totally in	5,444	100.0	5,444
84	2128	Starchiojd	Prahova	Commune	Partially in	6,957	0.0	-
85	2140	Surani	Prahova	Commune	Totally in	1,879	100.0	1,879
86	2017	Sirna	Prahova	Commune	Totally in	5,599	87.7	4,912
87	2137	Soimari	Prahova	Commune	Totally in	3,159	100.0	3,159
88	2156	Sotriile	Prahova	Commune	Totally in	3,505	100.0	3,505
89	2116	Stefesti	Prahova	Commune	Totally in	2,510	100.0	2,510
90	2196	Talea	Prahova	Commune	Partially in	1,260	69.5	875
91	2144	Tataru	Prahova	Commune	Partially in	1,314	65.7	863
92	2107	Teisani	Prahova	Commune	Totally in	4,072	100.0	4,072
93	2167	Telega	Prahova	Commune	Totally in	6,720	100.0	6,720
94	2018	Tinosu	Prahova	Commune	Totally in	2,536	100.0	2,536
95	2016	Targoru Vechi	Prahova	Commune	Totally in	8,260	100.0	8,260
96	5040	Tomsani	Prahova	Commune	Partially in	4,653	0.0	-
97	2040	Valea Calugareasca	Prahova	Commune	Totally in	10,655	100.0	10,655
98	2171	Valea Doftanei	Prahova	Commune	Totally in	7,051	100.0	7,051
99	2115	Varbilau	Prahova	Commune	Totally in	7,145	100.0	7,145
100	2082	Valcanesti	Prahova	Commune	Totally in	4,104	100.0	4,104
101	2211	Predeal	Brasov	Town	Partially in	7,182	82.0	5,890
102	8219	Nuci	Sectorul	Commune	Partially in	3,093	25.5	787
103	8216	Adincata	Ialomita	Commune	Partially in	3,184	11.5	366
104	5191	Cislau	Buzau	Commune	Partially in	5,076	25.0	1,269
105	0289	Moroeni	Dimbovita	Commune	Partially in		0.0	-
106	8218	Brazi	Ialomita	Commune	Partially in	3,405	45.0	1,532
107	8224	Dridu	Ialomita	Commune	Partially in		0.0	-
							754,995	

Table A.2.1 Catchment Area of the Prahova River Basin (1/2)

(Unit: km²)

Code	Basin	Sub-Basin	Sub-sub-Basin	Sub-sub-sub-Basin	Area in		B-A	(B-A) /A*100
					Ledger (A)	Area by HCA (B)		
120	Prahova				3738	3738.0	0	0.0
120.1		Azuga			88	88.9	0.9	1.0
120.1.1			Unghia Mare		10	10.7	0.7	7.0
120.1.2			Limbasel		14	14.3	0.3	2.1
120.1.a			Valea Turcului		7	7.2	0.2	2.9
120.1.r			Remaining		57	56.7	-0.3	-0.5
120.1a		Valea Fetei			10	9.7	-0.3	-3.0
120.2		Valea Cerbului			26	25.9	-0.1	-0.4
120.3		Zamora			10	9.5	-0.5	-5.0
120.4		Valea Rea			15	14.5	-0.5	-3.3
120.5		Peles			6	6.5	0.5	8.3
120.6		Izvorul Dorului			33	32.8	-0.2	-0.6
120.7		Valea Belici			36	35.4	-0.6	-1.7
120.7.1			Talea		20	20.5	0.5	2.5
120.7.r			Remaining		16	14.9	-1.1	-6.9
120.8		Cimpea (Cimpina)			30	30.5	0.5	1.7
120.9		Doftana			410	414.3	4.3	1.0
120.9.1			Musita		32	31.9	-0.1	-0.3
120.9.1.1				Manole	12	12.3	0.3	2.5
120.9.1.r				Remaining	20	19.6	-0.4	-2.0
120.9.2			Neagra		22	23.5	1.5	6.8
120.9.3			Orjogoia		13	12.9	-0.1	-0.8
120.9.4			Prislop		39	38.3	-0.7	-1.8
120.9.5			Negras		47	48.6	1.6	3.4
120.9.5.1				Cucioaia	12	13.8	1.8	15.0
120.9.5.r				Remaining	35	34.8	-0.2	-0.6
120.9.6			Ernieareas		11	13.7	2.7	24.5
120.9.7			Florei		43	41.5	-1.5	-3.5
120.9.8			Paltinoasa		19	18.6	-0.4	-2.1
120.9.9			Secaria		15	14.7	-0.3	-2.0
120.9.10			Purcaru		29	29.8	0.8	2.8
120.9.r			Remaining		140	140.8	0.8	0.6
120.10		Viroaga			37	35.7	-1.3	-3.5
120.11		Poenari			35	34.6	-0.4	-1.1
120.12		Viisoara			30	30.4	0.4	1.3
120.13		Teleajen			1656	1656.0	0	0.0
120.13.1			Gropsoarele		13	13.7	0.7	5.4
120.13.2			Stina		9	9.4	0.4	4.4
120.13.3			Bobu		14	14.5	0.5	3.6
120.13.4			Carpen		15	14.7	-0.3	-2.0
120.13.5			Telejenel		74	83.7	9.7	13.1
120.13.6			Valea Mare		18	17.5	-0.5	-2.8
120.13.7			Crasna		51	49.9	-1.1	-2.2
120.13.8			Drajna		106	105.9	-0.1	-0.1
120.13.8.1				Ogretineanca	30	30.3	0.3	1.0
120.13.8.r				Remaining	76	75.6	-0.4	-0.5
120.13.9			Stilpul		11	11.5	0.5	4.5
120.13.9a			Gura Vitiorei		15	15.1	0.1	0.7
120.13.10			Bughea		27	28.0	1	3.7
120.13.11			Varbilau		217	213.2	-3.8	-1.8
120.13.11.1				Alunis	63	63.2	0.2	0.3
120.13.11.2				Slanic	44	41.8	-2.2	-5.0
120.13.11.r				Remaining	110	108.2	-1.8	-1.6
120.13.12			Telega (Mislea)		182	188.6	6.6	3.6
120.13.12.1				Mislei	13	12.5	-0.5	-3.8
120.13.12.2				Runc (Runcu)	11	10.5	-0.5	-4.5
120.13.12.3				Doftanet	27	27.1	0.1	0.4
120.13.12.4				Cosmina	67	66.1	-0.9	-1.3
120.13.12.r				Remaining	64	72.4	8.4	13.1

Table A.2.1 Catchment Area of the Prahova River Basin (2/2)

(Unit: km²)

Code	Basin	Sub-Basin	Sub-sub-Basin	Sub-sub-sub-Basin	Area in		B-A	(B-A) /A*100
					Ledger (A)	JICA (B)		
120.13.13			Iazul Morilor		174	173.9	-0.1	-0.1
120.13.13.1				Bucovel	102	101.7	-0.3	-0.3
120.13.13.a				Lipanesti	22	22.0	0	0.0
120.13.13.r				Remaining	50	50.2	0.2	0.4
120.13.14			Dimbul (Dimbu)		190	188.1	-1.9	-1.0
120.13.14.1				Valea Larga	29	28.1	-0.9	-3.1
120.13.14.r				Remaining	161	160.0	-1	-0.6
120.13.15				Ghighiu	23	23.6	0.6	2.6
120.13.16				Piriul Rece	45	45.0	0	0.0
120.13.16a				Soava	13	13.2	0.2	1.5
120.13.17				Leaotul	175	173.3	-1.7	-1.0
120.13.r				Remaining	284	273.2	-10.8	-3.8
120.14		Vitman			80	80.2	0.2	0.3
120.15		Tuiaņa			67	67.7	0.7	1.0
120.16		Cricovul Sarat			809	607.2	-201.8	-24.9
120.16.1				Lapos	19	18.5	-0.5	-2.6
120.16.2				Salcia	26	26.4	0.4	1.5
120.16.3				Chiojdeanca	34	33.7	-0.3	-0.9
120.16.4				Matita	234	234.0	0	0.0
120.16.4.1				Lopanta	85	85.3	0.3	0.4
120.16.4.2				Saratel	80	80.3	0.3	0.4
120.16.4.a				Tulburea	14	14.0	0	0.0
120.16.4.r				Remaining	55	54.4	-0.6	-1.1
120.16.5				Saratica	13	12.7	-0.3	-2.3
120.16.6				Varbila	17	17.2	0.2	1.2
120.16.7				Cring	19	20.7	1.7	8.9
120.16.r				Remaining	447	244.0	-203	-45.4
120.17		Maia			47	45.7	-1.3	-2.8
120.r		Remaining			319	512.5	193.5	60.7

Table A.2.2 Catchment Area of Model Block

Code of Model Points	Name of Model Points	Catchment Area (Km ²)	Code of Model Points	Name of Model Points	Catchment Area (Km ²)
180	Predeal	17.96	Dam2	Maneciu Dam	194.21
190	Azuga	83.89	J	Piatra	223.35
195	Amonte Sinaia	104.36	240	Gura Vitioarei	25.29
A	Posada	123.99	K	Sipotu	479.31
200	Cornu	112.24	L	Coslegi	206.73
205	Amonte Traisteni	32.30	M	Baicoi	35.31
Dam 1	Paltinu Dam	300.73	250	Goga	152.00
B	Ac. Voila	32.80	260	Moara Domneasca	38.36
C	Cimpina	48.46	270	Tufani	273.37
217	Nedelea	76.01	275	Sangeru	112.85
220	Prahova Tinosu	49.34	O	Popesti	370.65
E	Finari	150.09	280	Ciorani	112.89
230	Cheia	49.09	H	Adincata	268.03

Note: Points with 3 digit code are under the Romanian Waters, while those with alphabet code are tentative points set by the JICA Study Team.

Table A.2.3 Land Use in Model Block

(unit:ha)

Model Block	Current			Forest	Orchard	Urban/Built-up Area	Water	Total
	Agricultural Land	Fallow Land	Pasture/Hay Land					
180	0	0	124	1,672	0	0	0	1,796
190	0	0	2,040	6,349	0	0	0	8,389
195	0	1	2,571	7,849	15	0	0	10,436
A	0	6	3,434	8,934	25	0	0	12,399
200	100	53	2,308	7,604	1,091	67	1	11,224
205	0	0	354	2,876	0	0	0	3,230
Dam1	7	35	7,243	22,541	42	36	169	30,073
B	15	8	1,173	2,048	36	0	0	3,280
C	13	15	1,670	2,637	332	179	0	4,846
217	1,090	897	989	3,553	683	380	9	7,601
220	2,164	1,656	333	759	0	20	2	4,934
E	7,515	3,309	1,401	2,780	0	0	4	15,009
230	0	0	1,137	3,772	0	0	0	4,909
Dam2	1	0	2,879	16,230	64	0	247	19,421
J	175	165	7,305	14,050	640	0	0	22,335
240	43	49	1,254	1,053	68	62	0	2,529
K	1,275	1,589	11,912	30,884	2,152	100	19	47,931
L	3,983	2,784	3,856	6,739	3,039	219	53	20,673
M	461	804	531	1,021	627	86	1	3,531
250	7,614	3,382	1,031	1,043	965	1,104	61	15,200
260	2,241	563	114	344	0	571	3	3,836
276	17,161	5,576	1,146	2,718	0	722	14	27,337
275	3	13	943	9,469	854	3	0	11,285
O	846	933	9,627	22,125	3,485	25	24	37,065
280	5,921	1,397	1,269	707	1,935	60	0	11,289
H	17,506	4,836	1,159	2,533	639	30	100	26,803
Remains	4,633	1,092	128	492	0	0	94	6,439
Total	72,767	29,163	67,931	182,782	16,692	3,664	801	373,800

Table A.2.4 Land Use in Subdivision of the Prahova River Basin (1/3)

Code	Basin Name	Current				Pasture/Hay				Urban/			Total
		Agricultural Land	Fallow Land	Land	Land	Forest	Orchard	Built-up	Water	Forest	Orchard	Built-up	
120.r	Prahova	14,993	6,239	5,283	22,415	1,695	465	167	51,257				
120.1.r	Azuga	0	0	1,165	4,505	0	0	0	5,670				
120.1.1	Unghia Mare	0	0	638	452	0	0	0	1,070				
120.1.2	Limbasel	0	0	1	1,424	0	0	0	1,425				
120.1.a	Valea Turcului	0	0	364	360	0	0	0	724				
120.10	Viroaga	1,444	520	405	1,200	0	0	0	3,569				
120.11	Poenari	1,844	1,063	446	104	0	0	0	3,457				
120.12	Viisoara	1,686	938	209	209	0	0	0	3,042				
120.13.r	Teleajen	4,158	1,992	6,620	13,408	665	197	278	27,318				
120.13.1	Gropsoarele	0	0	167	1,199	0	0	0	1,366				
120.13.10	Bughea	9	13	1,083	1,655	37	0	0	2,797				
120.13.11.r	Varbilau	38	254	2,411	7,783	331	3	1	10,821				
120.13.11.1	Alunis	0	17	2,702	3,505	97	0	0	6,321				
120.13.11.2	Slanic	4	28	563	3,219	335	28	0	4,177				
120.13.12.r	Telega (Mislea)	576	525	1,693	3,982	410	53	2	7,241				
120.13.12.1	Mislei	1	10	137	1,063	39	0	0	1,250				
120.13.12.2	Runc(Runcu)	0	8	234	694	111	0	0	1,047				
120.13.12.3	Doftanet	20	9	290	2,329	64	0	0	2,712				
120.13.12.4	Cosmina	127	130	903	5,132	320	0	0	6,612				
120.13.13.r	Iazul Morilor Teleajen	1,557	677	978	180	1,532	59	32	5,015				
120.13.13.1	Bucovel	649	711	2,086	5,651	1,047	22	4	10,170				
120.13.13.a	Lipanesti	65	418	449	830	437	0	0	2,199				
120.13.14.r	Dimbul (Dimbu)	7,674	3,590	1,191	1,297	1,082	1,108	61	16,003				
120.13.14.1	Valea Larga	444	596	374	802	511	83	1	2,811				
120.13.15	Ghigiu	1,323	382	29	48	0	571	3	2,356				
120.13.16	Pirul Rece	2,614	1,543	107	47	0	183	4	4,498				
120.13.16a	Soava	742	221	82	277	0	0	0	1,322				
120.13.17	Leacotul	11,515	3,526	566	1,174	0	540	7	17,328				
120.13.2	Suna	0	0	398	542	0	0	0	940				
120.13.3	Bobu	0	0	464	983	0	0	0	1,447				

(unit : ha)

Table A.2.4 Land Use in Subdivision of the Prahova River Basin (2/3)

(unit : ha)

Code	Basin Name	Current					Pasture/Hay			Urban/			Total
		Agricultural Land	Fallow Land	Land	Forest	Orchard	Built-up	Water	Forest	Orchard	Built-up	Water	
120.13.4	Carpen	0	0	111	1,357	0	0	0	1,468	0	0	0	1,468
120.13.5	Telejanel	0	0	1,289	7,043	41	0	0	8,375	0	0	0	8,375
120.13.6	Valea Mare	1	5	399	1,262	84	0	0	1,751	0	0	0	1,751
120.13.7	Crasna	5	52	592	4,247	92	0	0	4,988	0	0	0	4,988
120.13.8.f	Drajna	97	8	2,739	4,527	193	0	0	7,564	0	0	0	7,564
120.13.8.1	Ogreţineanca	3	3	1,092	1,855	73	0	0	3,026	0	0	0	3,026
120.13.9	Strîpul	0	5	444	635	49	21	0	1,154	0	0	0	1,154
120.13.9.a	Gura Vînoarei	6	14	681	798	9	0	0	1,508	0	0	0	1,508
120.14	Vîţman	5,031	1,329	439	552	639	29	2	8,021	0	0	0	8,021
120.15	Tuianca	5,111	545	344	771	0	0	0	6,771	0	0	0	6,771
120.16.r	Cricovul Sarat	5,472	1,967	3,782	10,001	3,097	76	4	24,399	0	0	0	24,399
120.16.1	Lapos	0	0	245	1,482	119	0	0	1,846	0	0	0	1,846
120.16.2	Salcia	1	8	211	2,136	282	0	0	2,638	0	0	0	2,638
120.16.3	Chiojdeanca	2	5	623	2,366	374	0	0	3,370	0	0	0	3,370
120.16.4.r	Matita	22	146	1,799	3,005	465	0	7	5,444	0	0	0	5,444
120.16.4.1	Lopanta (Lopatna)	1	13	1,331	6,864	325	0	0	8,534	0	0	0	8,534
120.16.4.2	Saratel	796	473	2,973	2,922	860	0	6	8,030	0	0	0	8,030
120.16.4.a	Tulburea	2	6	182	1,163	33	12	0	1,398	0	0	0	1,398
120.16.5	Saratica	0	1	211	899	157	0	3	1,271	0	0	0	1,271
120.16.6	Varbila	0	19	259	1,325	108	0	8	1,719	0	0	0	1,719
120.16.7	Crîng	1,057	147	259	157	454	0	0	2,074	0	0	0	2,074
120.17	Maia	3,410	942	85	96	0	0	41	4,574	0	0	0	4,574
120.1.a	Valea Fetei	0	0	316	657	0	0	0	973	0	0	0	973
120.2	Valea Cerbului	0	0	668	1,920	0	0	0	2,588	0	0	0	2,588
120.3	Zanora	0	0	337	616	0	0	0	953	0	0	0	953
120.4	Valea Rea	0	4	503	943	1	0	0	1,451	0	0	0	1,451
120.5	Peles	0	0	283	368	0	0	0	651	0	0	0	651
120.6	Izvorul Dorului	0	0	1,469	1,813	0	0	0	3,282	0	0	0	3,282
120.7.r	Valea Belici	1	9	258	1,182	41	0	0	1,491	0	0	0	1,491
120.7.1	Talea	2	0	1,141	896	7	0	0	2,046	0	0	0	2,046

Table A.2.4 Land Use in Subdivision of the Prahova River Basin (3/3)

(unit : ha)

Code	Basin Name	Current				Pasture/Hay		Forest		Urban/		Total
		Agricultural Land	Fallow Land	Land	Land	Forest	Orchard	Built-up	Water			
120.8	Cumpea (Cimpina)	230	0	386	0	2,356	71	3	0	3,046		
120.9.r	Doftana	31	34	3,840	0	9,462	358	204	147	14,076		
120.9.1.r	Musita	0	0	398	0	1,565	0	0	0	1,963		
120.9.1.1	Manole	0	0	238	0	987	0	0	0	1,225		
120.9.10	Purcaru	0	0	1,090	0	1,864	23	0	0	2,977		
120.9.2	Neagra	0	0	738	0	1,612	0	0	0	2,550		
120.9.3	Orjogoaita	0	0	117	0	1,173	0	0	0	1,290		
120.9.4	Prislop	0	0	926	0	2,908	0	0	0	3,834		
120.9.5.r	Negras	0	0	1,061	0	2,418	3	0	0	3,482		
120.9.5.1	Cucioaita	0	0	441	0	942	0	0	0	1,383		
120.9.6	Ernieasca	0	0	149	0	1,224	0	0	0	1,373		
120.9.7	Florei	3	13	1,105	3,011	6	11	11	0	4,149		
120.9.8	Palinoasa	0	0	71	1,776	1	1	0	10	1,858		
120.9.9	Secaria	1	11	268	1,161	19	19	0	13	1,473		
Total		72,768	29,169	67,931	182,766	16,697	3,668	801	373,800			

Table A.2.5 Administrative Area in Model Block (1/5)

Model Block	County Name	Municipality Name	Administrative Code	Administrative Type	Total Area of Municipality (ha)	Area in Block (ha)	Area in Block (%)	
180	Brasov	Predeal	2211	Town	-	1794	-	
190	Prahova	Azuga	2188	Town	8139	6118	75.17	
	Prahova	Valea Doftanei	2171	Commune	28077	123	0.44	
	Brasov	Predeal	2211	Town	-	2149	-	
195	Prahova	Azuga	2188	Town	8139	1980	24.33	
	Prahova	Busteni	2185	Town	7285	6931	95.14	
	Prahova	Sinaia	2180	Town	8690	198	2.28	
	Brasov	Predeal	2211	Town	-	1329	-	
200	Prahova	Breaza	2165	Town	4872	3101	63.65	
	Prahova	Comarnic	2190	Town	8840	5982	67.67	
	Prahova	Cornu	2157	Commune	1466	690	47.07	
	Prahova	Secaria	2194	Commune	4423	96	2.17	
	Prahova	Sotriile	2156	Commune	2907	137	4.71	
	Prahova	Talea	2196	Commune	2451	1219	49.73	
	205	Prahova	Valea Doftanei	2171	Commune	28077	3232	11.51
217	Prahova	Aricescii Rahtivani	2071	Commune	8011	179	2.23	
	Prahova	Banesti	2173	Commune	2097	407	19.41	
	Prahova	Breaza	2165	Town	4872	29	0.60	
	Prahova	Cimpina	2150	City	2563	1532	59.77	
	Prahova	Cornu	2157	Commune	1466	776	52.93	
	Prahova	Filipestii de Targ	2076	Commune	3556	108	3.04	
	Prahova	Floresti	2065	Commune	2951	764	25.89	
	Prahova	Magureni	2161	Commune	4732	999	21.11	
	Prahova	Poiana Campina	2158	Commune	1446	1308	90.46	
	Prahova	Provita de Jos	2163	Commune	2572	107	4.16	
	Prahova	Sotriile	2156	Commune	2907	1394	47.95	
	220	Prahova	Aricescii Rahtivani	2071	Commune	8011	753	9.40
		Prahova	Brazi	2011	Commune	4634	331	7.14
Prahova		Filipestii de Targ	2076	Commune	3556	297	8.35	
Prahova		Manesti	2019	Commune	7418	1959	26.41	
Prahova		Sirna	2017	Commune	4949	191	3.86	
Prahova		Targoru Vechi	2016	Commune	4621	1012	21.90	
Prahova		Tinosu	2018	Commune	1872	405	21.63	
230	Prahova	Maneciu	2104	Commune	23588	4908	20.81	
240	Prahova	Gura Vitioarei	2112	Commune	3212	218	6.79	
	Prahova	Teisani	2107	Commune	2855	883	30.93	
	Prahova	Valenii de Munte	2100	Town	2057	1430	69.52	
250	Prahova	Aricescii Rahtivani	2071	Commune	8011	241	3.01	
	Prahova	Baicoi	2064	Town	6516	3383	51.92	
	Prahova	Banesti	2173	Commune	2097	421	20.08	
	Prahova	Berceni	2028	Commune	3124	1618	51.79	
	Prahova	Blejoi	2047	Commune	1946	1280	65.78	
	Prahova	Floresti	2065	Commune	2951	1252	42.43	
	Prahova	Magureni	2161	Commune	4732	120	2.54	
	Prahova	Paulesti	2048	Commune	5345	4245	79.42	
	Prahova	Ploiesti	2000	City	6013	2404	39.98	
	Prahova	Rafov	2029	Commune	4198	237	5.65	
	260	Prahova	Barcanesti	2026	Commune	3682	342	9.29

Table A.2.5 Administrative Area in Model Block (2/5)

Model Block	County Name	Municipality Name	Administrative Code	Administrative Type	Total Area of Municipality (ha)	Area in Block (ha)	Area in Block (%)
260	Prahova	Berçeni	2028	Commune	3124	304	9.73
	Prahova	Blejoi	2047	Commune	1946	202	10.38
	Prahova	Dumbrava	2056	Commune	6103	538	8.82
	Prahova	Paulesti	2048	Commune	5345	221	4.13
	Prahova	Ploiesti	2000	City	6013	992	16.50
	Prahova	Rafov	2029	Commune	4198	1236	29.44
275	Prahova	Calugareni	5028	Commune	2028	238	11.74
	Prahova	Jugureni	5029	Commune	2642	111	4.20
	Prahova	Lapos	2148	Commune	2879	2041	70.89
	Prahova	Salcia	2149	Commune	2089	1788	85.59
	Prahova	Singeru	2146	Commune	3962	3766	95.05
	Prahova	Tataru	2144	Commune	2003	617	30.80
	Buzau	Cislau	5191	Commune	-	2722	-
270	Prahova	Ariceştii Rahtivani	2071	Commune	8011	6837	85.35
	Prahova	Barcanesti	2026	Commune	3682	3337	90.63
	Prahova	Brazi	2011	Commune	4634	3684	79.50
	Prahova	Draganesti	2055	Commune	8529	597	7.00
	Prahova	Dumbrava	2056	Commune	6103	970	15.89
	Prahova	Floresti	2065	Commune	2951	317	10.74
	Prahova	Gherghita	2059	Commune	5507	1149	20.86
	Prahova	Paulesti	2048	Commune	5345	124	2.32
	Prahova	Ploiesti	2000	City	6013	1774	29.50
	Prahova	Puchenii Mari	2033	Commune	5230	3034	58.01
	Prahova	Rafov	2029	Commune	4198	2428	57.84
	Prahova	Targoru Vechi	2016	Commune	4621	3086	66.78
	280	Prahova	Albesti-Paleologu	2041	Commune	5144	4100
Prahova		Ciorani	2053	Commune	8018	1494	18.63
Prahova		Colceag	5038	Commune	6148	43	0.70
Prahova		Draganesti	2055	Commune	8529	1549	18.16
Prahova		Dumbrava	2056	Commune	6103	251	4.11
Prahova		Tomsani	5040	Commune	3894	278	7.14
Prahova		Urlati	2041C	Town	4350	2691	61.86
Prahova		Valea Calugareasca	2040	Commune	5180	885	17.08
A	Prahova	Busteni	2185	Town	7285	338	4.64
	Prahova	Comarnic	2190	Town	8840	2720	30.77
	Prahova	Secaria	2194	Commune	4423	60	1.36
	Prahova	Sinaia	2180	Town	8690	8458	97.33
	Dambovita	Moroeni	0289	Commune	-	822	-
B	Prahova	Brebu	2169	Commune	5712	2048	35.85
	Prahova	Sotriile	2156	Commune	2907	1233	42.41
Dam1	Prahova	Bertea	2117B	Commune	5072	260	5.13
	Prahova	Brebu	2169	Commune	5712	405	7.09
	Prahova	Comarnic	2190	Town	8840	115	1.30
	Prahova	Secaria	2194	Commune	4423	4267	96.47
	Prahova	Sotriile	2156	Commune	2907	143	4.92
	Prahova	Valea Doftanei	2171	Commune	28077	24881	88.62
C	Prahova	Banesti	2173	Commune	2097	466	22.22
	Prahova	Brebu	2169	Commune	5712	2780	48.67

Table A.2.5 Administrative Area in Model Block (3/5)

Model Block	County Name	Municipality Name	Administrative Code	Administrative Type	Total Area of Municipality (ha)	Area in Block (ha)	Area in Block (%)	
C	Prahova	Cimpina	2150	City	2563	1009	39.37	
	Prahova	Cosminele	2083	Commune	2459	30	1.22	
	Prahova	Telega	2167	Commune	3970	559	14.08	
B	Prahova	Balta Doamnei	2036	Commune	3633	480	13.21	
	Prahova	Brazi	2011	Commune	4634	625	13.49	
	Prahova	Gherghita	2059	Commune	5507	325	5.90	
	Prahova	Gorgota	2034	Commune	3360	2458	73.15	
	Prahova	Manesti	2019	Commune	7418	480	6.47	
	Prahova	Poenarii Burchii	2022	Commune	3060	1996	65.23	
	Prahova	Puchenii Mari	2033	Commune	5230	2183	41.74	
	Prahova	Rafov	2029	Commune	4198	134	3.19	
	Prahova	Sirna	2017	Commune	4949	4331	87.51	
	Prahova	Targsoru Vechi	2016	Commune	4621	523	11.32	
	Prahova	Tinosu	2018	Commune	1872	1461	78.04	
	H	Prahova	Albesti-Paleologu	2041	Commune	5144	786	15.28
Prahova		Balta Doamnei	2036	Commune	3633	1937	53.32	
Prahova		Ciorani	2053	Commune	8018	2734	34.10	
Prahova		Draganesti	2055	Commune	8529	6212	72.83	
Prahova		Dumbrava	2056	Commune	6103	4256	69.74	
Prahova		Gherghita	2059	Commune	5507	4033	73.23	
Prahova		Gorgota	2034	Commune	3360	194	5.77	
Prahova		Rafov	2029	Commune	4198	73	1.74	
Prahova		Valea Calugareasca	2040	Commune	5180	2472	47.72	
Ialomita		Adincata	8216	Commune	4677	1171	25.04	
Ialomita		Brazii	8218	Commune	4904	1566	31.93	
Agricol Iffov		Nuci	8219	Commune	5180	1368	26.41	
J		Prahova	Cerasu	2122	Commune	11452	4523	39.50
		Prahova	Drajna	2119	Commune	5599	5194	92.77
	Prahova	Izvoarele	2102	Commune	7255	6890	94.97	
	Prahova	Maneciu	2104	Commune	23588	3085	13.08	
	Prahova	Posesti	2126	Commune	5457	1291	23.66	
	Prahova	Starchiojd	2128	Commune	12951	193	1.49	
	Prahova	Stefesti	2116	Commune	4393	79	1.80	
	Prahova	Teisani	2107	Commune	2855	992	34.75	
	Prahova	Valenii de Munte	2100	Town	2057	90	4.38	
Dam2	Prahova	Cerasu	2122	Commune	11452	3633	31.72	
	Prahova	Maneciu	2104	Commune	23588	15788	66.93	
K	Prahova	Alunis	2117	Commune	2598	2596	99.92	
	Prahova	Baicoi	2064	Town	6516	959	14.72	
	Prahova	Banesti	2173	Commune	2097	36	1.72	
	Prahova	Bertea	2117B	Commune	5072	4811	94.85	
	Prahova	Blejoi	2047	Commune	1946	52	2.67	
	Prahova	Boldesti-Scaieni	2085	Town	3387	520	15.35	
	Prahova	Brebu	2169	Commune	5712	501	8.77	
	Prahova	Cocorastii Mislii	2179	Commune	3157	3153	99.87	
	Prahova	Cosminele	2083	Commune	2459	2430	98.82	
	Prahova	Dumbravesti	2081	Commune	2400	2400	100.00	
	Prahova	Gornet	2130	Commune	2204	158	7.17	

Table A.2.5 Administrative Area in Model Block (4/5)

Model Block	County Name	Municipality Name	Administrative Code	Administrative Type	Total Area of Municipality (ha)	Area in Block (ha)	Area in Block (%)	
K	Prahova	Gura Vitloarei	2112	Commune	3212	2995	93.24	
	Prahova	Izvoarele	2102	Commune	7255	361	4.98	
	Prahova	Lipanesti	2088	Commune	1784	453	25.39	
	Prahova	Magurele	2129	Commune	2782	1086	39.04	
	Prahova	Paulesti	2048	Commune	5345	756	14.14	
	Prahova	Plopeni	2079	Town	857	857	100.00	
	Prahova	Predeal Sarari	2109	Commune	2421	353	14.58	
	Prahova	Scorteni	2177	Commune	4130	3694	89.44	
	Prahova	Slanic	2101	Town	3742	3725	99.55	
	Prahova	Stefesti	2116	Commune	4393	4289	97.63	
	Prahova	Teisani	2107	Commune	2855	980	34.33	
	Prahova	Telega	2167	Commune	3970	3261	82.14	
	Prahova	Valcanesti	2082	Commune	2641	2641	100.00	
	Prahova	Valea Doftanei	2171	Commune	28077	49	0.17	
	Prahova	Valenii de Munte	2100	Town	2057	539	26.20	
	Prahova	Varbilau	2115	Commune	4270	4270	100.00	
L	Prahova	Baltesti	2131	Commune	3578	1136	31.75	
	Prahova	Berceni	2028	Commune	3124	1202	38.48	
	Prahova	Blejoi	2047	Commune	1946	410	21.07	
	Prahova	Boldesti-Scaieni	2085	Town	3387	2868	84.68	
	Prahova	Bucov	2038	Commune	5032	5043	100.22	
	Prahova	Iordacheanu	2041B	Commune	5314	527	9.92	
	Prahova	Lipanesti	2088	Commune	1784	1331	74.61	
	Prahova	Magurele	2129	Commune	2782	798	28.68	
	Prahova	Ploiesti	2000	City	6013	842	14.00	
	Prahova	Plopu	2039	Commune	4336	4335	99.98	
	Prahova	Podenii Noi	2133	Commune	3749	126	3.36	
	Prahova	Rafov	2029	Commune	4198	95	2.26	
	Prahova	Urlati	2041C	Town	4350	137	3.15	
	Prahova	Valea Calugareasca	2040	Commune	5180	1821	35.15	
	M	Prahova	Baicoi	2064	Town	6516	2177	33.41
		Prahova	Banesti	2173	Commune	2097	766	36.53
Prahova		Scorteni	2177	Commune	4130	436	10.56	
Prahova		Telega	2167	Commune	3970	150	3.78	
O	Prahova	Apostolache	2141	Commune	2027	2027	100.00	
	Prahova	Aricestii Zeletin	2140B	Commune	2130	2130	100.00	
	Prahova	Baltesti	2131	Commune	3578	2442	68.25	
	Prahova	Carbunesti	2139	Commune	2029	1453	71.61	
	Prahova	Chiojdeanca	2142	Commune	3187	3024	94.89	
	Prahova	Drajna	2119	Commune	5599	389	6.95	
	Prahova	Gornet	2130	Commune	2204	2046	92.83	
	Prahova	Gornet Cricov	2143	Commune	2872	2485	86.53	
	Prahova	Iordacheanu	2041B	Commune	5314	4708	88.60	
	Prahova	Magurele	2129	Commune	2782	898	32.28	
	Prahova	Pacureti	2135	Commune	2708	2708	100.00	
	Prahova	Podenii Noi	2133	Commune	3749	3623	96.64	
	Prahova	Posesti	2126	Commune	5457	136	2.49	
	Prahova	Predeal Sarari	2109	Commune	2421	2068	85.42	

Table A.2.5 Administrative Area in Model Block (5/5)

Model Block	County Name	Municipality City	Administrative Code	Administrative Type	Total Area of Municipality (ha)	Area in Block (ha)	Area in Block (%)
O	Prahova	Salcia	2149	Commune	2089	144	6.89
	Prahova	Singeru	2146	Commune	3962	193	4.87
	Prahova	Soimari	2137	Commune	3711	3696	99.60
	Prahova	Surani	2140	Commune	1596	1596	100.00
	Prahova	Tataru	2144	Commune	2003	741	36.99
	Prahova	Urlati	2041C	Town	4350	562	12.92
					Total	367360	ha

Table A.2.6 Urban/Built-up Area in Model Block (1/3)

Model Block	County Name	Municipality Name	Administrative Code	Total		
				Urban/Built-up Area (ha)	Area in Block (ha)	Area in Block (%)
180	Brasov	Predeal	2211	-	151	-
195	Prahova	Azuga	2188	84	84	100.00
	Prahova	Busteni	2185	412	412	100.00
200	Prahova	Breaza	2165	846	707	83.57
	Prahova	Comarnic	2190	1153	1134	98.35
	Prahova	Cornu	2157	402	252	62.69
	Prahova	Sotriile	2156	751	34	4.53
	Prahova	Talea	2196	154	107	69.48
217	Prahova	Banesti	2173	351	56	15.95
	Prahova	Cimpina	2150	734	369	50.27
	Prahova	Cornu	2157	402	150	37.31
	Prahova	Floresti	2065	210	76	36.19
	Prahova	Magureni	2161	508	153	30.12
	Prahova	Poiana Campina	2158	246	246	100.00
	Prahova	Sotriile	2156	751	478	63.65
220	Prahova	Aricestii Rahtivani	2071	505	46	9.11
	Prahova	Brazi	2011	429	25	5.83
	Prahova	Manesti	2019	680	55	8.09
	Prahova	Targoru Vechi	2016	370	82	22.16
	Prahova	Tinosu	2018	158	35	22.15
230	Prahova	Maneciu	2104	941	87	9.25
240	Prahova	Teisani	2107	715	424	59.30
	Prahova	Valenii de Munte	2100	447	389	87.02
250	Prahova	Baicoi	2064	1360	878	64.56
	Prahova	Banesti	2173	351	44	12.54
	Prahova	Berceni	2028	346	134	38.73
	Prahova	Blejoi	2047	155	129	83.23
	Prahova	Floresti	2065	210	14	6.67
	Prahova	Paulesti	2048	369	369	100.00
	Prahova	Ploiesti	2000	1834	1249	68.10
260	Prahova	Barcanesti	2026	400	19	4.75
	Prahova	Dumbrava	2056	428	107	25.00
	Prahova	Ploiesti	2000	1834	450	24.54
	Prahova	Rafov	2029	575	214	37.22
275	Prahova	Lapos	2148	344	312	90.70
	Prahova	Salcia	2149	286	254	88.81
	Prahova	Singeru	2146	558	558	100.00
	Prahova	Tataru	2144	207	19	9.18
	Buzau	Cislau	5191	-	113	-
270	Prahova	Aricestii Rahtivani	2071	505	459	90.89
	Prahova	Barcanesti	2026	400	381	95.25
	Prahova	Brazi	2011	429	369	86.01
	Prahova	Draganesti	2055	732	140	19.13
	Prahova	Dumbrava	2056	428	99	23.13
	Prahova	Gherghita	2059	540	94	17.41
	Prahova	Ploiesti	2000	1834	105	5.73
	Prahova	Puchenii Mari	2033	527	174	33.02
	Prahova	Rafov	2029	575	308	53.57
	Prahova	Targoru Vechi	2016	370	241	65.14

Table A.2.6 Urban/Built-up Area in Model Block (2/3)

Model Block	County Name	Municipality Name	Administrative Code	Total		
				Urban/Built-up Area (ha)	Area in Block (ha)	Area in Block (%)
280	Prahova	Albesti-Paleologu	2041	419	419	100.00
	Prahova	Ciorani	2053	438	411	93.84
	Prahova	Draganesti	2055	732	20	2.73
	Prahova	Urlati	2041C	628	463	73.73
	Prahova	Valea Calugareasca	2040	840	97	11.55
A	Prahova	Busteni	2185	414	1	0.24
	Prahova	Comarnic	2190	1153	18	1.56
	Prahova	Sinaia	2180	464	464	100.00
B	Prahova	Brebu	2169	940	169	17.98
	Prahova	Sotriile	2156	751	233	31.03
Dam1	Prahova	Secaria	2194	249	249	100.00
	Prahova	Valea Doftanei	2171	1006	1006	100.00
C	Prahova	Banesti	2173	351	85	24.22
	Prahova	Brebu	2169	940	550	58.51
	Prahova	Cimpina	2150	734	366	49.86
	Prahova	Telega	2167	693	119	17.17
E	Prahova	Brazi	2011	429	35	8.16
	Prahova	Gorgota	2034	341	283	82.99
	Prahova	Manesti	2019	680	75	11.03
	Prahova	Poenarii Burchii	2022	517	150	29.01
	Prahova	Puchenii Mari	2033	527	353	66.98
	Prahova	Rafov	2029	575	53	9.22
	Prahova	Sirna	2017	701	615	87.73
	Prahova	Targoru Vechi	2016	370	46	12.43
	Prahova	Tinosu	2018	158	123	77.85
H	Prahova	Balta Doamnei	2036	339	138	40.71
	Prahova	Draganesti	2055	732	572	78.14
	Prahova	Dumbrava	2056	428	222	51.87
	Prahova	Gherghita	2059	540	446	82.59
	Prahova	Gorgota	2034	341	38	11.14
	Prahova	Valea Calugareasca	2040	840	277	32.98
	Agricultural	Nuci	8219	499	2	0.40
	Ialomita	Adincata	8216	322	37	11.49
	Ialomita	Brazii	8218	360	17	4.72
J	Prahova	Cerasu	2122	621	621	100.00
	Prahova	Drajna	2119	773	773	100.00
	Prahova	Izvoarele	2102	603	589	97.68
	Prahova	Maneciu	2104	941	700	74.39
	Prahova	Posesti	2126	616	238	38.64
	Prahova	Teisani	2107	715	220	30.77
Dam2	Prahova	Cerasu	2122	621	3	0.48
	Prahova	Maneciu	2104	941	154	16.37
K	Prahova	Alunis	2117	977	977	100.00
	Prahova	Baicoi	2064	1360	8	0.59
	Prahova	Berteasca	2117B	42	42	100.00
	Prahova	Boldesti-Scaieni	2085	406	7	1.72
	Prahova	Brebu	2169	940	221	23.51
	Prahova	Cocorastii Mislii	2179	346	346	100.00
	Prahova	Cosminele	2083	335	335	100.00

Table A.2.6 Urban/Built-up Area in Model Block (3/3)

Model Block	County Name	Municipality Name	Administrative Code	Total		
				Urban/Built-up Area (ha)	Area in Block (ha)	Area in Block (%)
K	Prahova	Dumbravesti	2081	330	330	100.00
	Prahova	Gornet	2130	266	1	0.38
	Prahova	Gura Vitioarei	2112	294	294	100.00
	Prahova	Izvoarele	2102	603	14	2.32
	Prahova	Lipanesti	2088	311	5	1.61
	Prahova	Magurele	2129	247	169	68.42
	Prahova	Plopeni	2079	28	28	100.00
	Prahova	Predeal Sarari	2109	677	138	20.38
	Prahova	Scorteni	2177	552	496	89.86
	Prahova	Slanic	2101	257	257	100.00
	Prahova	Stefesti	2116	245	245	100.00
	Prahova	Teisani	2107	715	72	10.07
	Prahova	Telega	2167	693	574	82.83
	Prahova	Valcanesti	2082	316	316	100.00
	Prahova	Valenii de Munte	2100	447	58	12.98
Prahova	Varbilau	2115	1021	1021	100.00	
L	Prahova	Berceni	2028	346	212	61.27
	Prahova	Blejoi	2047	155	26	16.77
	Prahova	Boldesti-Scaieni	2085	406	399	98.28
	Prahova	Bucov	2038	293	293	100.00
	Prahova	Lipanesti	2088	311	306	98.39
	Prahova	Magurele	2129	247	78	31.58
	Prahova	Ploiesti	2000	1834	30	1.64
	Prahova	Plopu	2039	230	230	100.00
	Prahova	Valea Calugareasca	2040	840	466	55.48
M	Prahova	Baicoi	2064	1360	474	34.85
	Prahova	Banesti	2173	351	166	47.29
	Prahova	Scorteni	2177	552	56	10.14
O	Prahova	Apostolache	2141	295	295	100.00
	Prahova	Aricestii Zeletin	2140B	462	462	100.00
	Prahova	Baltesti	2131	357	357	100.00
	Prahova	Carbunesti	2139	271	268	98.89
	Prahova	Chiojdanza	2142	345	345	100.00
	Prahova	Gornet	2130	266	265	99.62
	Prahova	Gornet Cricov	2143	401	401	100.00
	Prahova	Iordacheanu	2041B	332	332	100.00
	Prahova	Pacureti	2135	502	502	100.00
	Prahova	Podenii Noi	2133	684	684	100.00
	Prahova	Predeal Sarari	2109	677	539	79.62
	Prahova	Salcia	2149	286	32	11.19
	Prahova	Soimari	2137	340	340	100.00
	Prahova	Surani	2140	319	319	100.00
	Prahova	Tataru	2144	207	117	56.52
	Prahova	Urlati	2041C	628	71	11.31

FIGURES

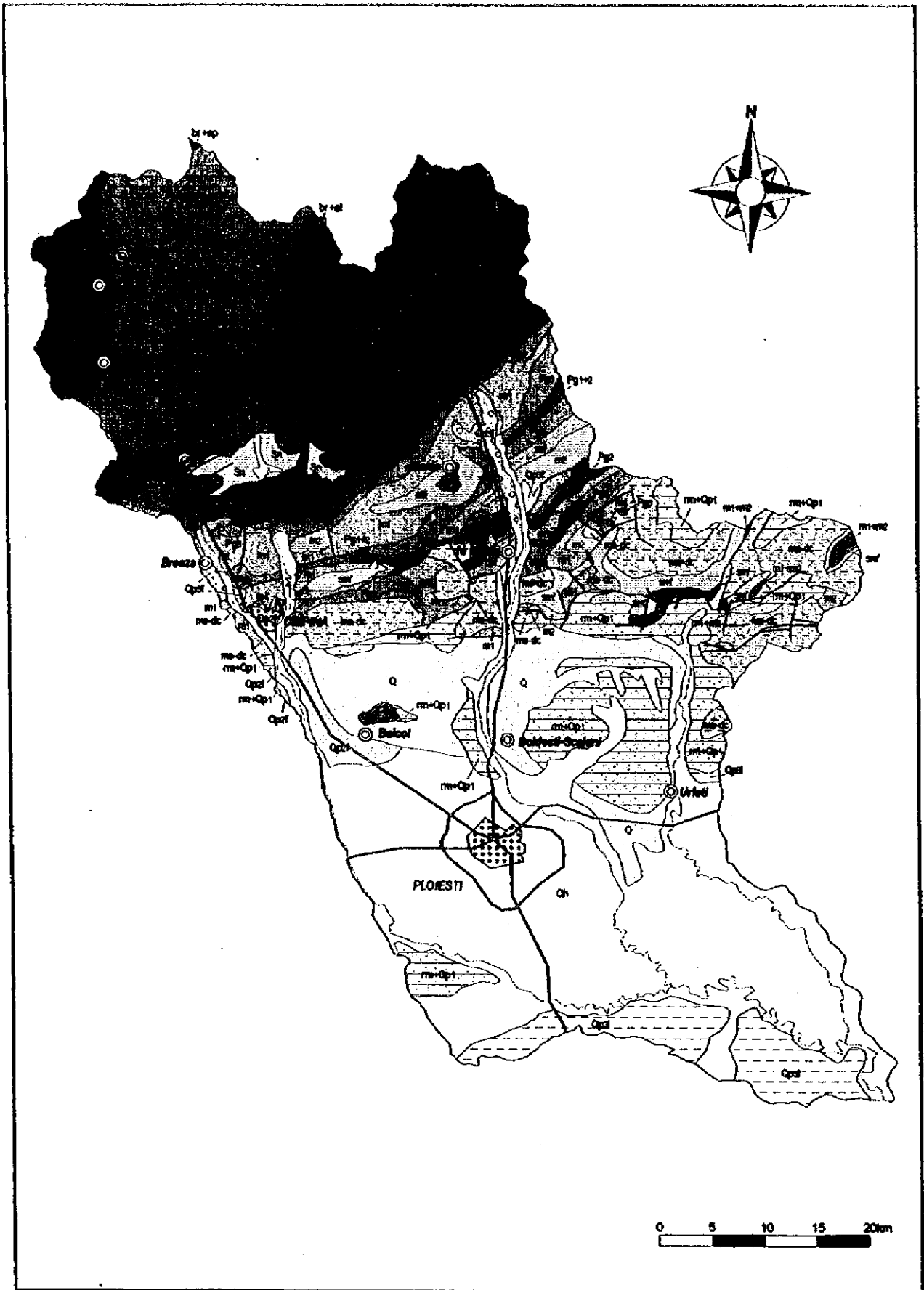
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2	2090	Flăcăi	41	2059	Gherghia
3	2188	Arguș	51	2034	Gorjita
4	2064	Bătrâni	54	2143	Gornici-Cricov
5	2085	Bădești-Seacă	55	2130	Gornet
6	2165	Bucasa	56	5026	Gura Vadului
7	2185	Buzoiu	57	2112	Gura Vîrtoarei
8	2130	Comarnic	58	2041	Iordănești
9	5025	Mizil	59	2102	Tevoarele
10	2079	Pipești	60	5029	Jugureni
11	2180	Simona	61	1188	Lăpeș
12	2105	Slănic	62	2088	Lipănești
13	2041	Uzuni	63	2129	Măgurele
14	2100	Valeni de Munte	64	2161	Măgureni
15	2186	Adunani	65	2104	Mănești
16	2041	Albești-Paleologu	66	2019	Mănești
17	2117	Atunis	67	2135	Pacurari
18	2181	Apostolache	68	2048	Paulești
19	2071	Arcești-Rahivani	69	5039	Plopo
20	2140	Arcești-Zelceni	70	2133	Podeni Noi
21	5030	Baba Ana	71	2158	Poiana Căminu
22	2036	Băla Doamnei	72	2022	Poenari-Bucur
23	2131	Bălești	73	2126	Posesti
24	2123	Bănești	74	2169	Predeal-Sarai
25	2026	Bărcănești	75	2183	Previța de Jos
26	2028	Beșeni	76	2164	Previța de Sus
27	2117	Bețica	77	2033	Puceni-Mun
28	2047	Bigoi	78	2029	Rafoc
29	2033	Bădești-Grăditea	79	2149	Săfina
30	2011	Brazi	80	2054	Sălcude
31	2109	Brașu	81	2177	Scăreni
32	2038	Bucov	82	2194	Secarici
33	5028	Calugăreni	83	2145	Singure
34	2139	Carbonesti	84	2128	Știrbicioi
35	2051	Căptura	85	2135	Svirani
36	2122	Ceravu	86	2017	Sirna
37	2142	Chirădeanca	87	2177	Soimari
38	2053	Ciurani	88	2136	Sotile
39	2179	Coarșeni-Mun	89	2116	Stănești
40	2038	Colteș	90	2196	Tălea
41	2157	Coroiu	91	2134	Tătaru
42	2033	Cosănele	92	2107	Teicani
43	2119	Dărgina	93	2167	Telega
44	2055	Droșnești	94	2038	Timosu
45	2056	Dumbrava	95	2036	Tărgșoru Vechi
46	2081	Dumbrăvești	96	5043	Toarnu
47	2067	Filipești de Pajure	97	5040	Valca Calugărească
48	2076	Filipești de Târg	98	2171	Valeni Doamnei
49	5026	Fântânele	99	2115	Vădina
50	2065	Flăcăi	100	2082	Vălcănești



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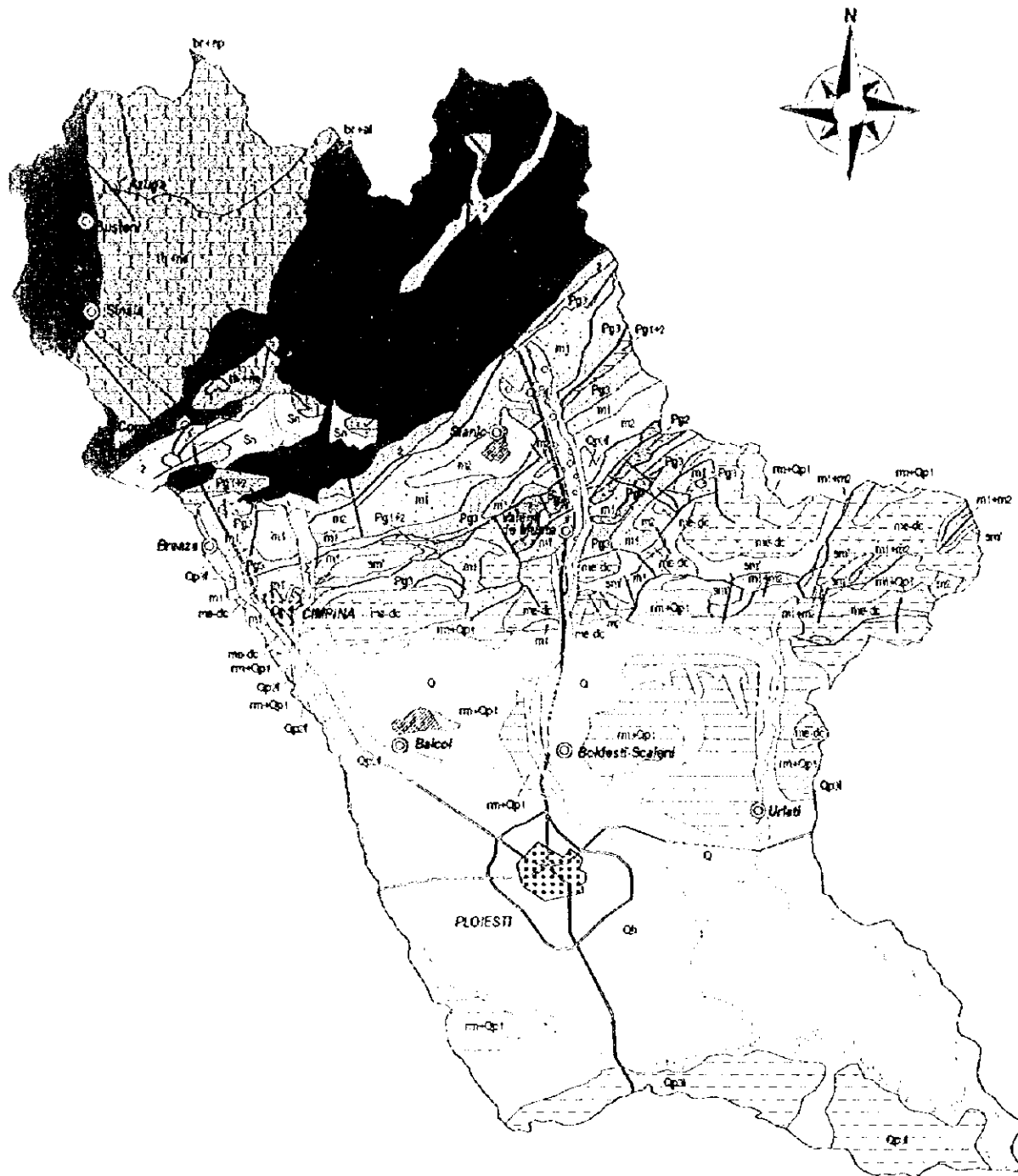
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Fig. A.1.1 Administrative Boundary in Prahova County



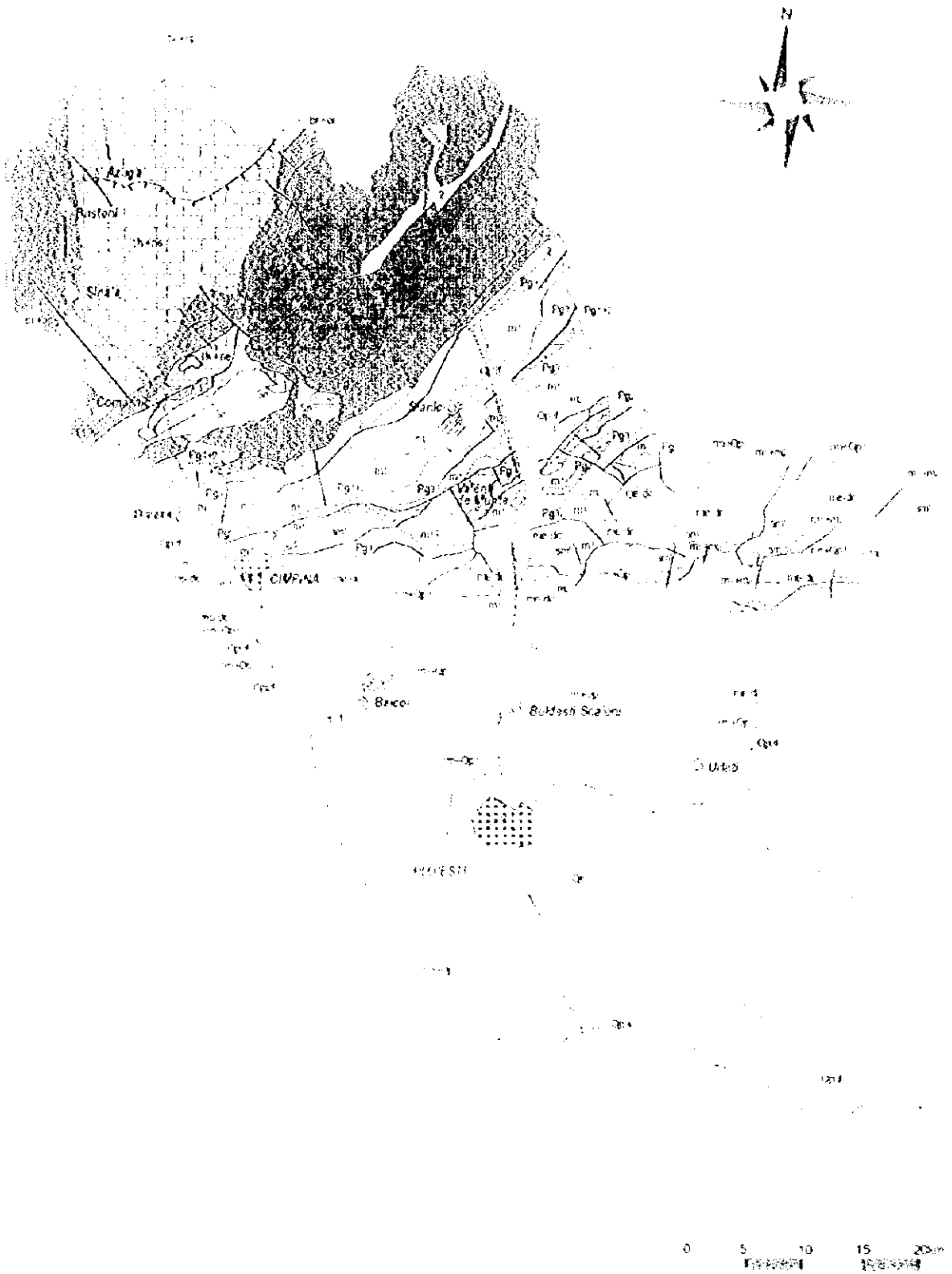
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Fig. A.2.1 Geological Map (1/2)



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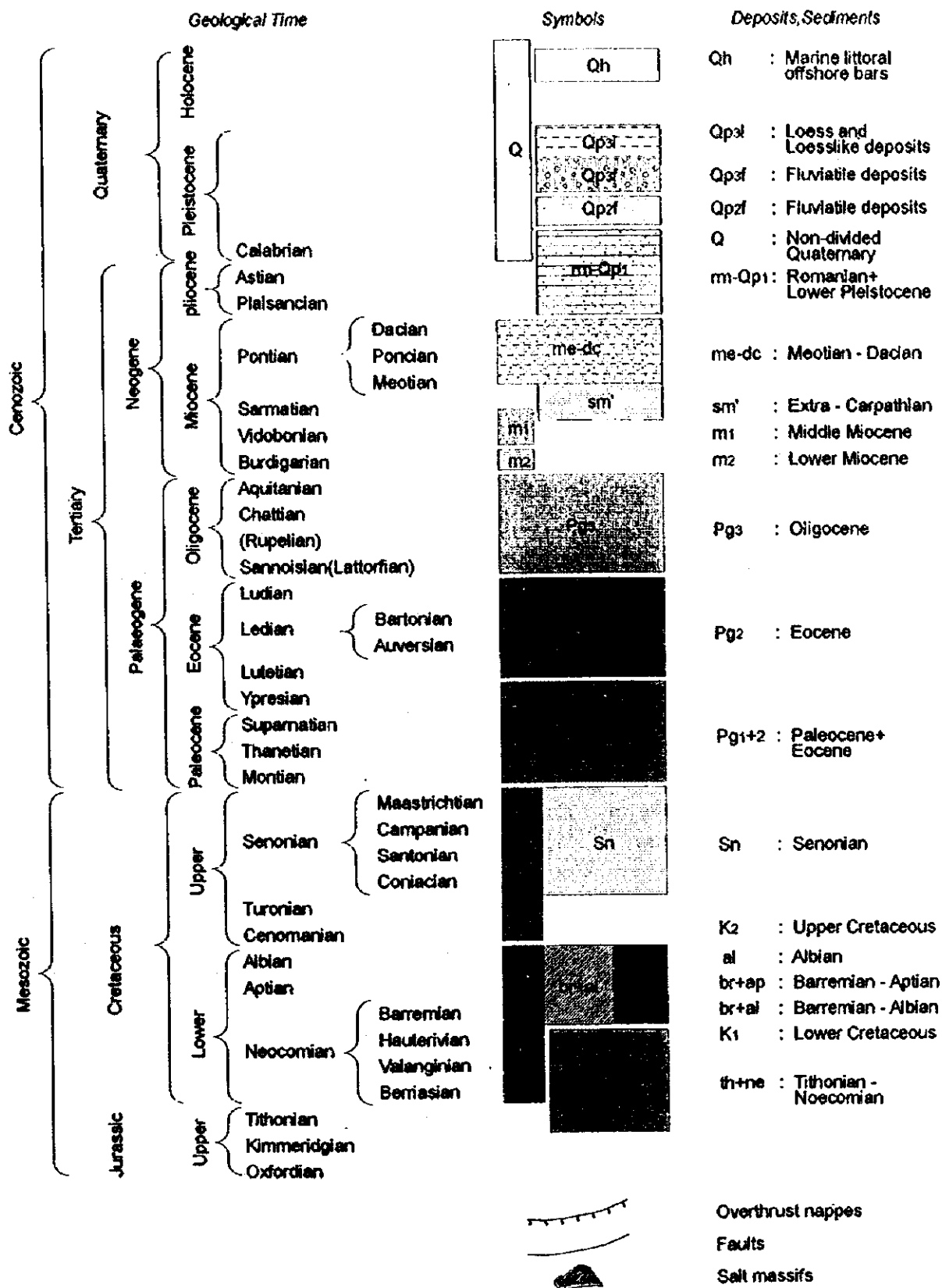
Fig. A.2.1 Geological Map (1/2)



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Fig. A.2.1 Geological Map (1/2)

LEGEND

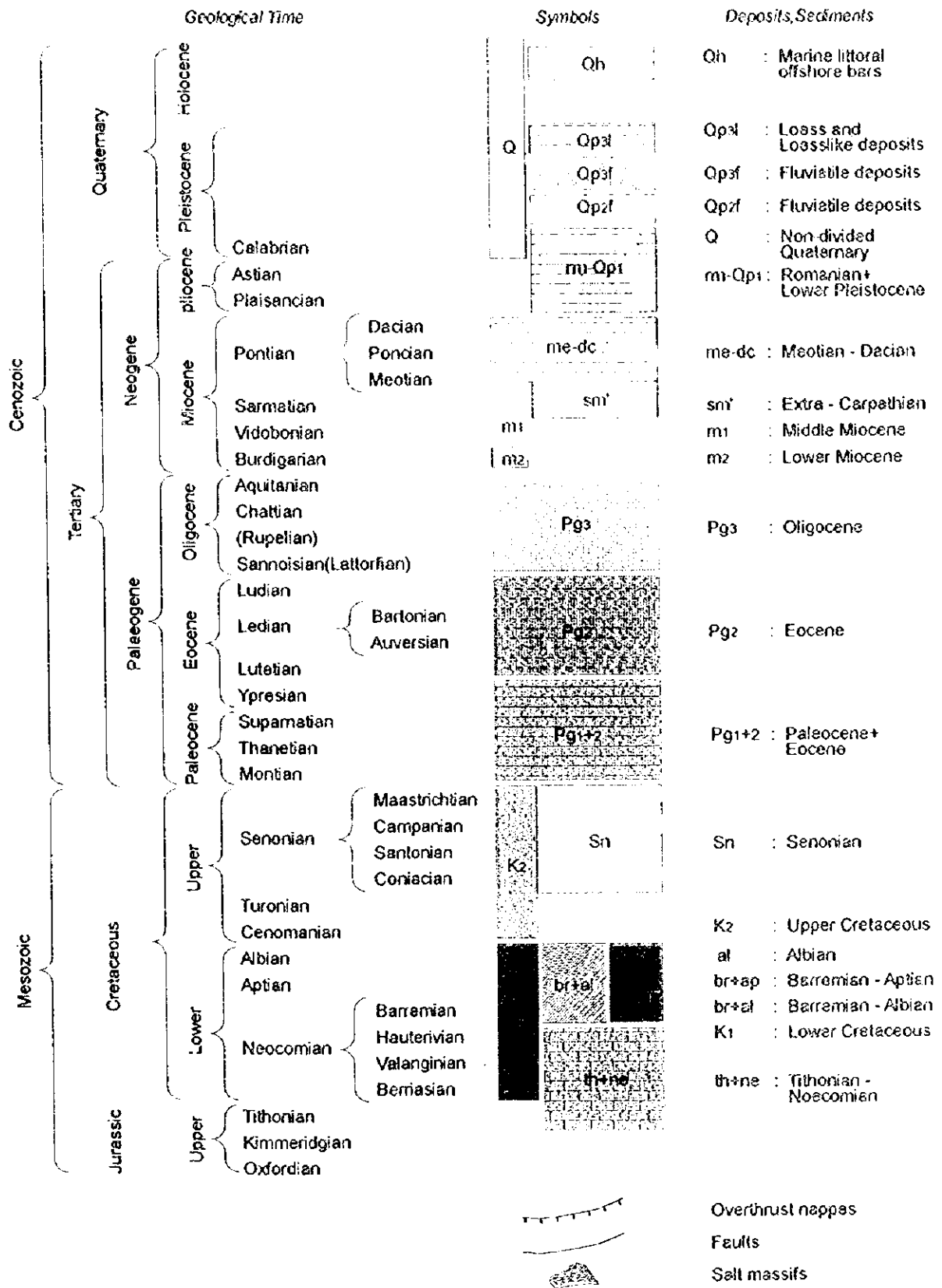


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Fig. A.2.1 Geological Map (2/2)

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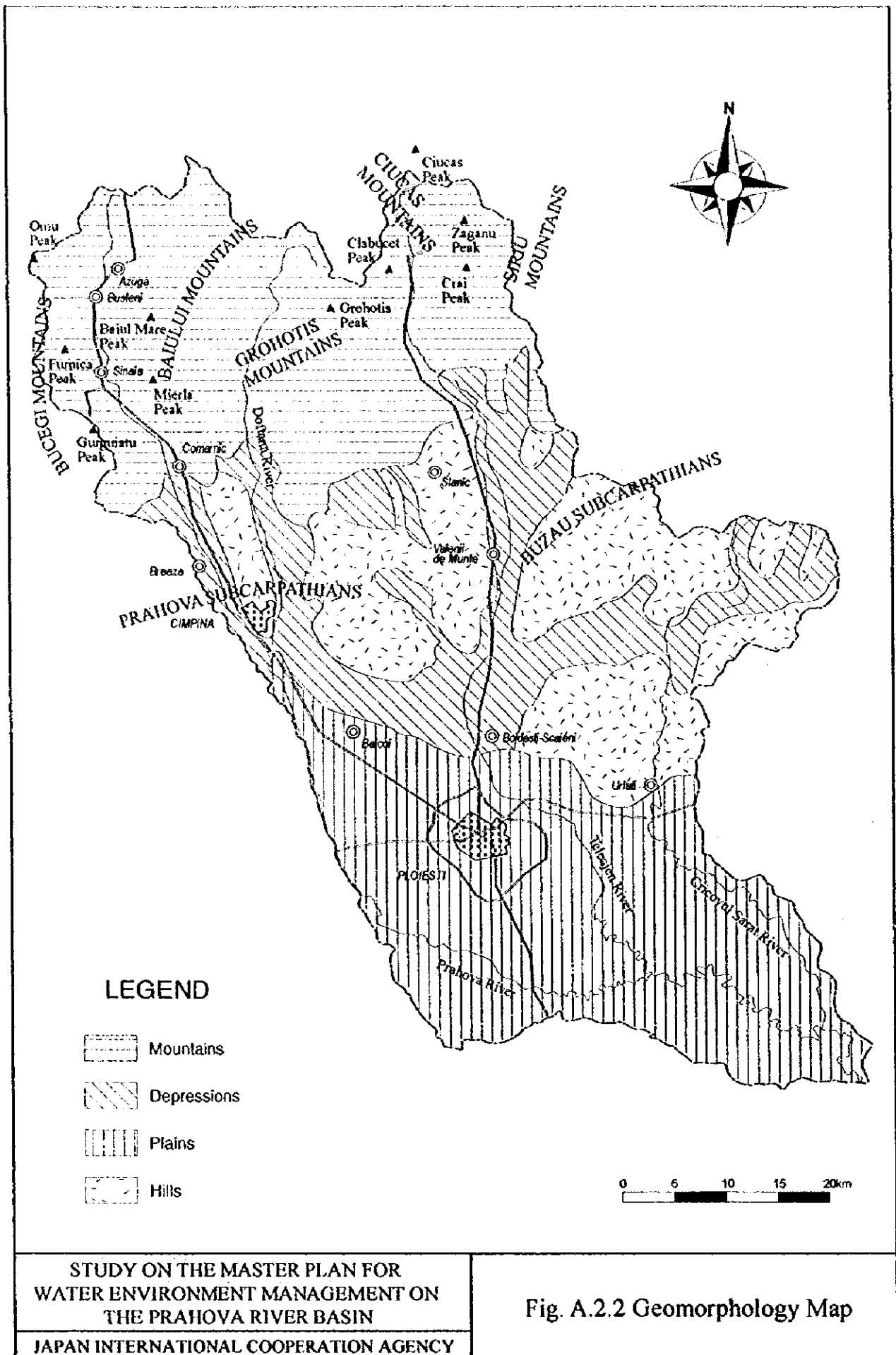
Fig. A.2.1 Geological Map (2/2)

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		Geological time		Synonyms		Geological units		
Cenozoic	Quaternary	Pliocene - Pliocene		Qm	Qm	Qm	Quaternary (Pliocene)	
				Qp4	Qp4	Qp4	Quaternary (Pliocene)	
				Qp3	Qp3	Qp3	Quaternary (Pliocene)	
				Qp2	Qp2	Qp2	Quaternary (Pliocene)	
				Qp1	Qp1	Qp1	Quaternary (Pliocene)	
	Neogene	Pliocene	Calabrian		m Qp1	m Qp1	m Qp1	Calabrian (Pliocene)
			Astian					Astian (Pliocene)
			Plaisancian					Plaisancian (Pliocene)
		Miocene	Dacian		me dc	me dc	me dc	Dacian (Miocene)
			Pontian	Ponuan				Pontian (Miocene)
		Oligocene	Sarmatian		sm	sm	sm	Sarmatian (Oligocene)
			Vidoborian		m	m	m	Vidoborian (Oligocene)
			Burdigalian		m	m	m	Burdigalian (Oligocene)
			Aquitanian					Aquitanian (Oligocene)
			Chattian (Rupelian)		Pg3	Pg3	Pg3	Chattian (Oligocene)
Paleogene	Eocene	Lutian					Lutian (Eocene)	
		Ledan	Bartonian		Pg2	Pg2	Ledan (Eocene)	
	Paleocene	Lutetian	Zuversian					Lutetian (Paleocene)
		Ypresian						Ypresian (Paleocene)
		Supernobian			Pg1+2	Pg1+2	Supernobian (Paleocene)	
		Thanetian						Thanetian (Paleocene)
		Montian						Montian (Paleocene)
			Maastichtian					Maastichtian (Paleocene)
	Mesozoic	Cretaceous	Upper	Senonian		Sn	Sn	Senonian (Cretaceous)
					Campanian			
				Santonian				Santonian (Cretaceous)
			Coniacian		K2		Coniacian (Cretaceous)	
Lower			Turonian					Turonian (Cretaceous)
		Cenomanian					Cenomanian (Cretaceous)	
		Albian					Albian (Cretaceous)	
		Aptian					Aptian (Cretaceous)	
			Barremian					Barremian (Cretaceous)
Jurassic		Upper	Neocomian	Hauterivian				Neocomian (Jurassic)
			Valanginian				Valanginian (Jurassic)	
			Berriasian				Berriasian (Jurassic)	
			Tithonian				Tithonian (Jurassic)	
			Kimmeridgian				Kimmeridgian (Jurassic)	
	Oxfordian					Oxfordian (Jurassic)		

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Fig. A-2-1 Geological Map (2/3)

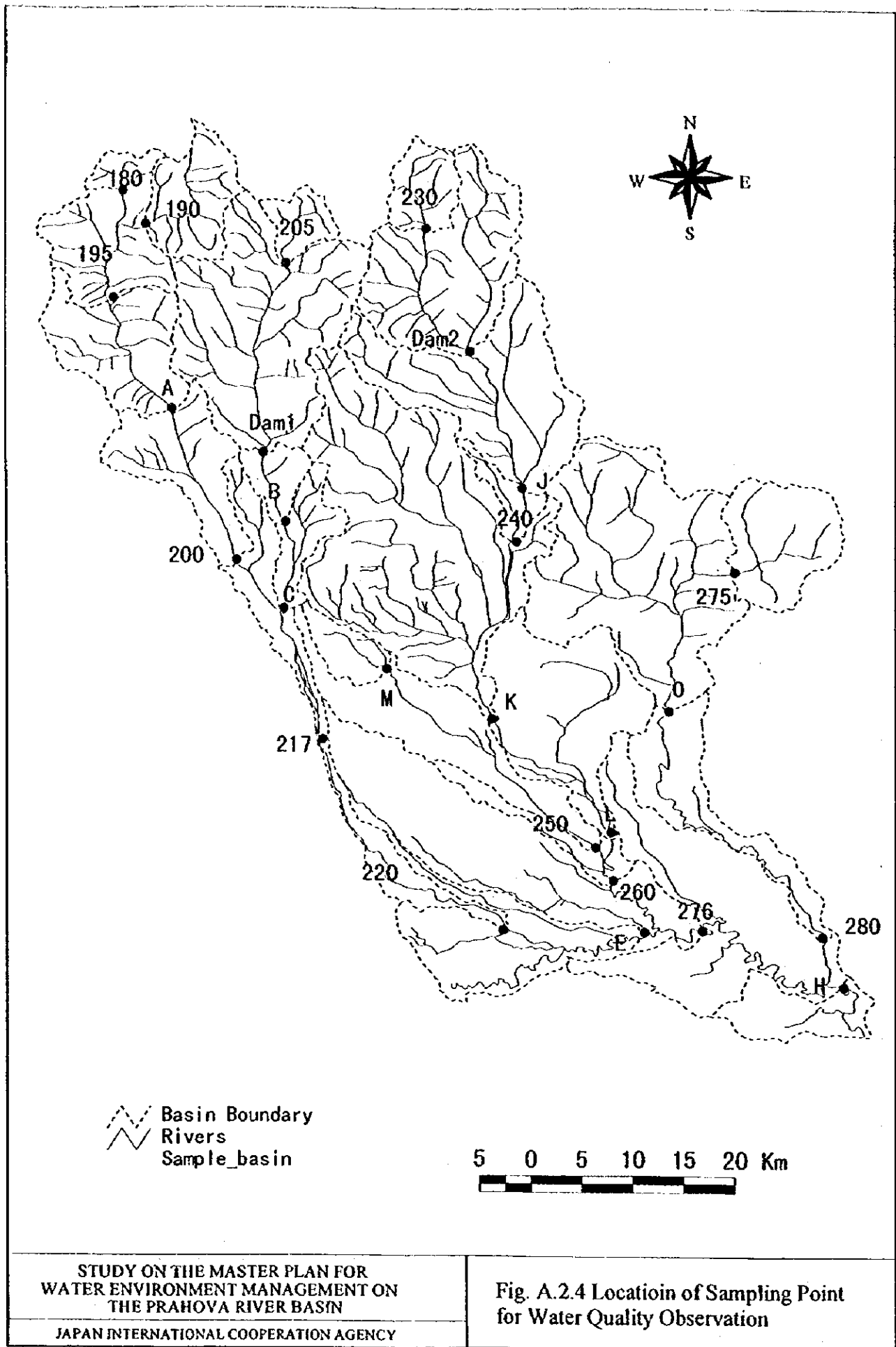




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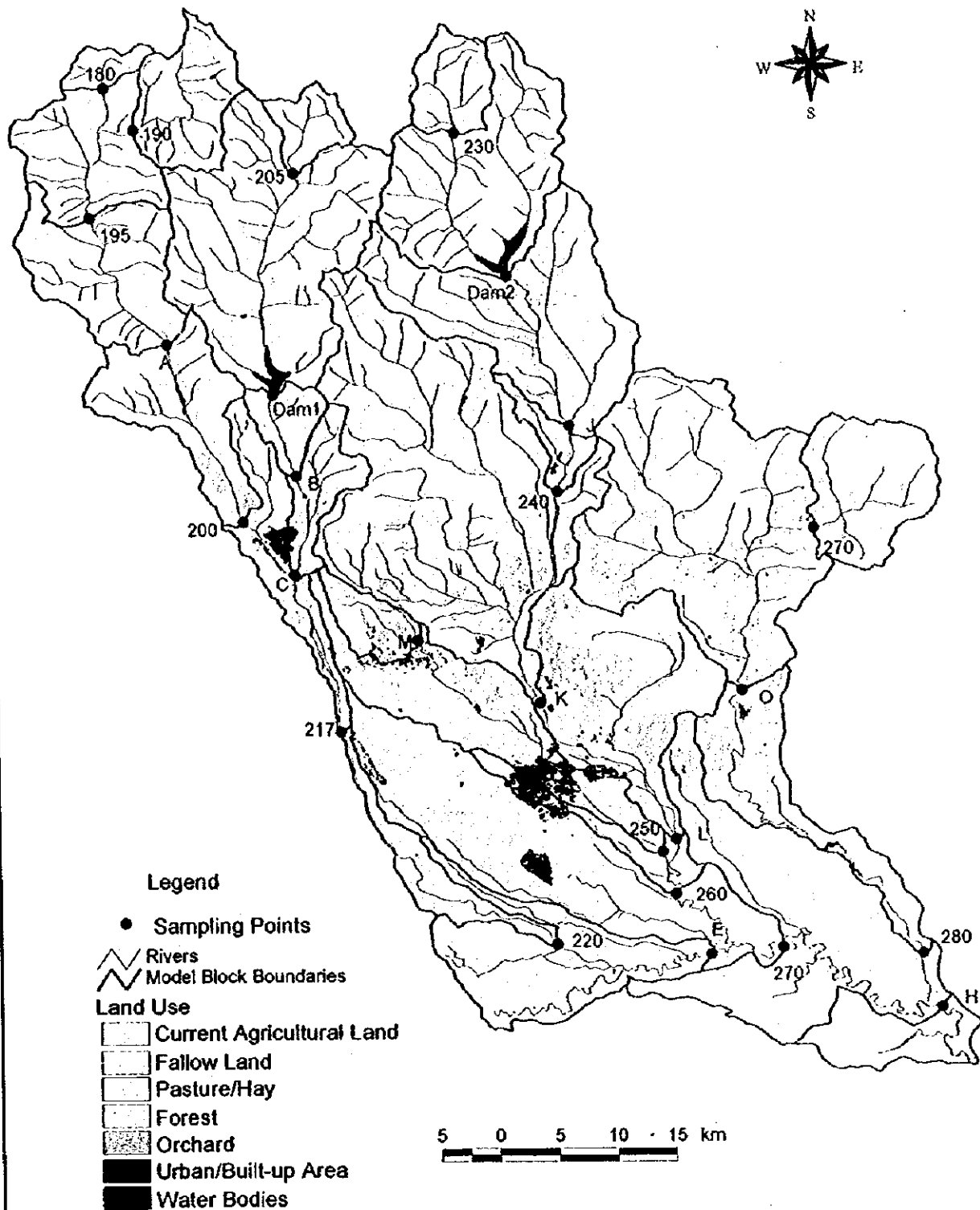
Fig. A.2.3 Prahova River Basin and Basin Boundary



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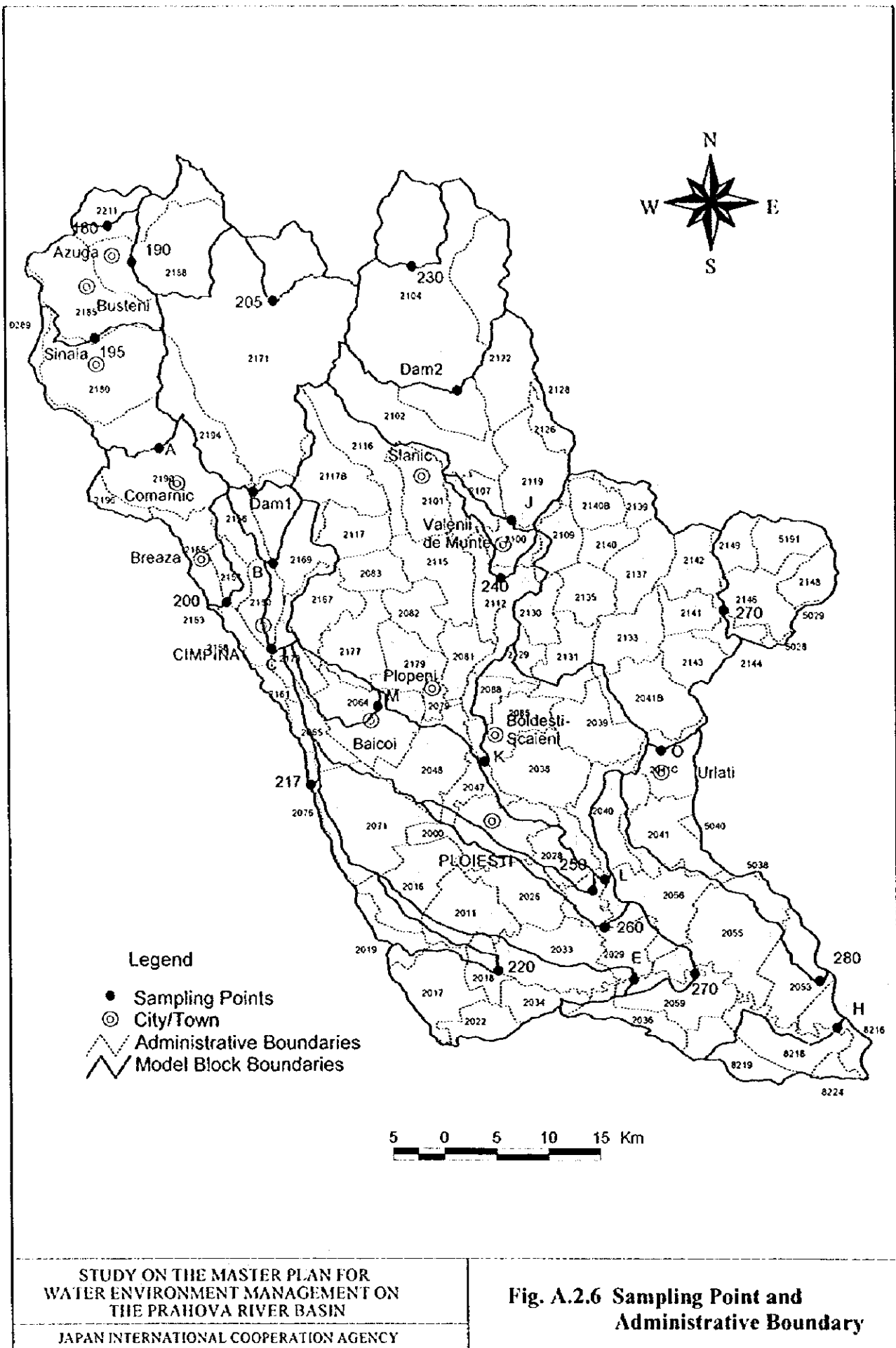
Fig. A.2.4 Location of Sampling Point
for Water Quality Observation



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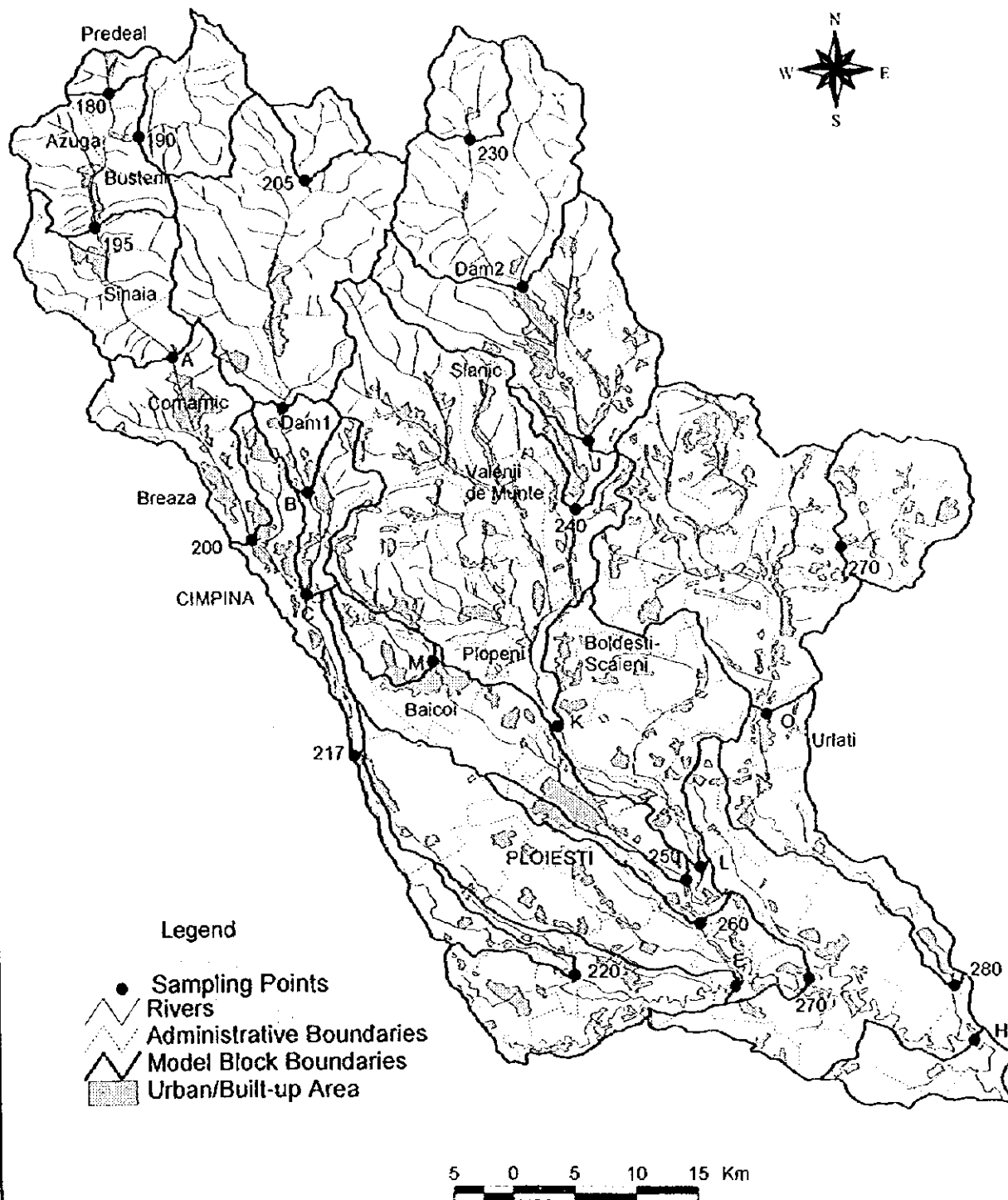
Fig. A. 2.5 Land Use in Model Block



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**Fig. A.2.6 Sampling Point and
Administrative Boundary**



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Fig. A.2.7 Sampling Point and
Urban/Built-up Area