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#### JAPAN INTERNATIONAL COOPERATION AGENCY

## THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA MINISTRY OF MACEDONIA

#### THE STUDY ON INTEGRATED WATER RESOURCES DEVELOPMENT AND MANAGEMENT MASTER PLAN IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

### FINAL REPORT

### VOLUME IV SUPPORTING REPORT 2

### WATER DEMAND PROJECTION AND WATER BALANCE STUDY

MAY 1999

NIPPON KOEI CO., LTD. KRI INTERNATIONAL CORPORATION

#### THE STUDY ON ON INTEGRATED WATER RESOURCES DEVELOPMENT AND MANAGEMENT MASTER PLAN IN

#### THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

### **COMPOSITION OF FINAL REPORT**

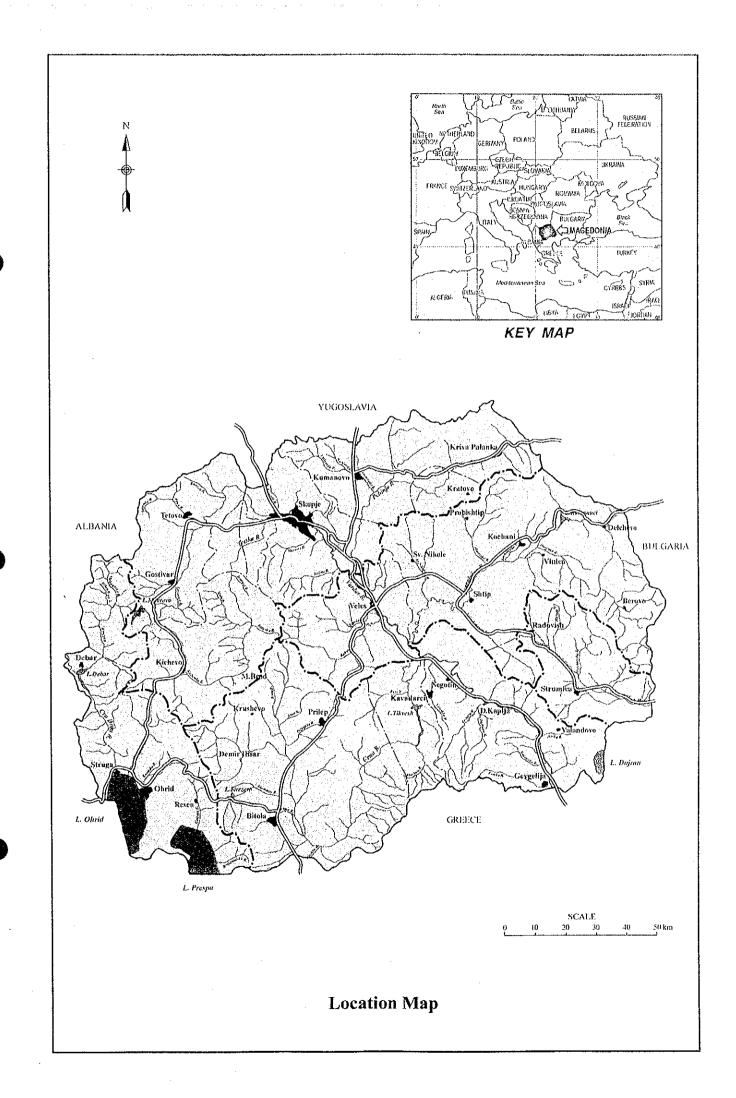
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- Volume II Main Report

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EXCHANGE RATES

The exchange rates used in this Study are: US Dollar (US\$)1.00 = Macedonian Denar (MKD) 52.00 Deutsche Mark (DM) 1.00 = Macedonian Denar (MKD) 30.98 as of Jan.1999





#### THE STUDY ON INTEGRATED WATER RESOURCES DEVELOPMENT AND MANAGEMENT MASTER PLAN IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

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#### ON

### INTEGRATED WATER RESOURCES DEVELOPMENT AND MANAGEMENT MASTER PLAN

#### IN

#### THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

#### FINAL REPORT

#### ABBREVIATIONS AND ACRONYMS

. . . .

ACU .	-	Aid Coordination Unit	
a.s.l	÷	above sea level	
BOD	-	Biological Oxygen Demand	
CE(s)	-	Communal Enterprise(s)	
DO	-	Dissolved Oxygen	
EBRD	-	European Bank for Reconstruction and Development	
ECM	-	Electric Power Company of Macedonia	
EC	-	European Community	
EL	-	Elevation	
EU	-	European Union	
FRY	-	Federal Republic of Yugoslavia	
FYROM	-	The Former Yugoslav Republic of Macedonia	
GDP	~	Gross Domestic Product	
GEF	-	Global Environment Facility	
GNP	-	Gross National Product	
GOJ	-	Government of Japan	
GOM	-	Government of Macedonia	
GTZ	-	Deutsche Gesellschaft für Technische Zusammenarbeit	
HMI	-	Republic Hydrometeorological Institute	
I/R	-	Interim Report	
IEE	-	Initial Environmental Examination	
IBRD	-	International Bank for Reconstruction and Development	
IDA	-	International Development Association	
IMR	-	Infant Mortality Rate	
JICA	-	Japan International Cooperation Agency	
JUS	-	Jugoslavian Standards	
MAFWE	-	Ministry of Agriculture, Forestry and Water Economy	
MCIC	-	Macedonian Center for International Cooperation	
MKS	-	Macedonian Standards	
MOD	-	Ministry of Development	
MOE	-	Ministry of Economy	
MOH	-	Ministry of Health	
MUPC	-	Ministry of Urban Planning and Construction	
MOEn	-	Ministry of Environment	
MOS	-	Ministry of Science	
MOFA	-	Ministry of Foreign Affaires	
NDS	-	National Development Strategy 1997	
NEAP	-	National Environmental Action Plan 1997	
NEHAP	-	National Environmental Health Action Plan	
NGO(s)	-	Non Governmental Organization(s)	

#### ABBREVIATIONS AND ACRONYMS (Continued)

-	Official Development Assistance
-	Operation and Maintenance
-	Project Cycle Management
-	Project Design Matrix
-	Pologne et Hongri Aide a Reconstruction Economique
	(Poland and Hungary Aid for Economic Reconstruction)
-	Program for Public Sector Investment in the Republic of Macedonia 1998-2000
-	Progress Report
-	Public Water Management Enterprise
-	Republic Institute for Health Protection
-	Scope of Work
-	Suspended Substances
-	Socialist Federal Republic Yugoslavia
-	United Nations Development Program
-	United Nations Educational, Scientific and Cultural Organization
-	United Nations Children's Fund
-	World Health Organization
-	Water Development Institute
-	Water Management Organization(s)
-	Water Users' Association(s)

## WEIGHTS AND MEASURES Metric System

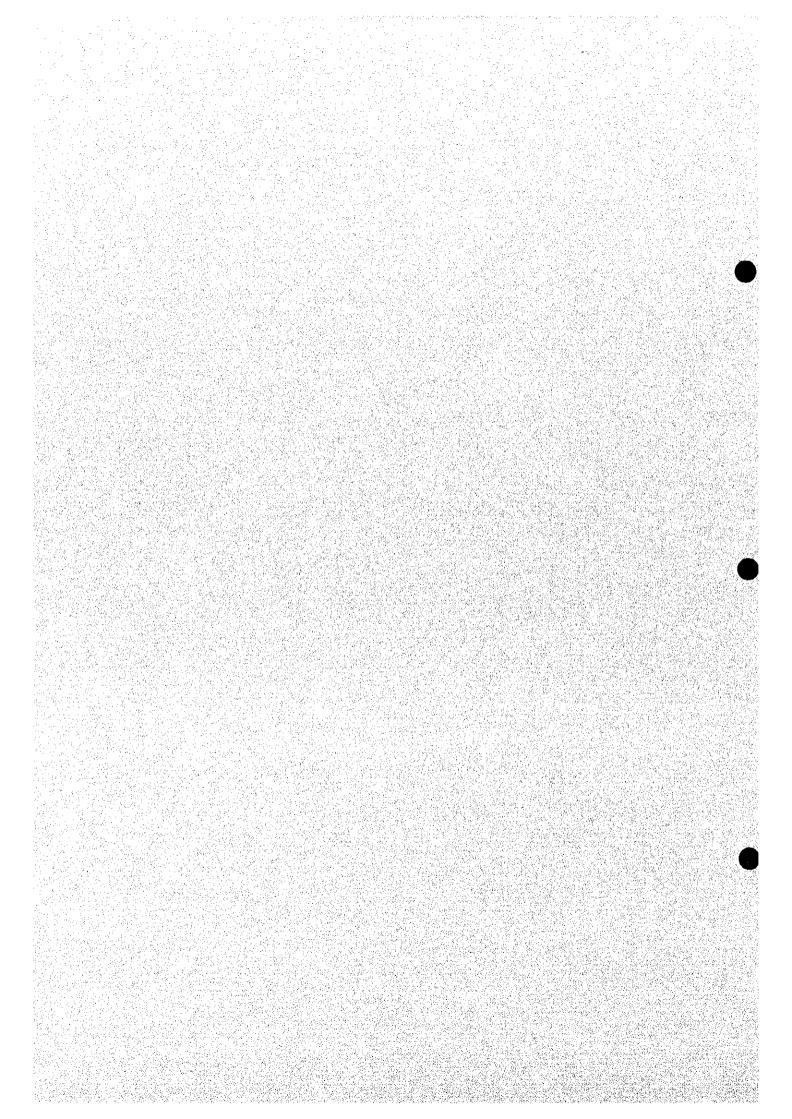
mm m		Millimeter(s) Meter(s)			Hectare (100m x 100m) Liter(s)
m <sup>2</sup>	-	Square meter(s)	lit/sec (l/sec)	-	Liter per second
km <sup>2</sup>	-	Square kilometer(s)	m <sup>3</sup>	-	Cubic meter(s)
lpcd	•	litre/capita/day	$m^3/sec (m^3/s)$	-	Cubic meter(s) per second
			p.e.	-	population equivalent

#### **CURRENCY**

MKD	-	Macedonian Denar	DM	-	Deutsche Mark
USD	-	United States Dollar	JPY		Japanese Yen

## Appendix I

## Current Conditions of Water Utilization



#### Appendix I CURRENT CONDITION ON WATER UTILIZATION

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#### Appendix I CURRENT CONDITION ON WATER UTILIZATION

#### I.1 Present Water Utilization

#### I.1.1 Municipal Water Utilization

The present municipal water utilization was analyzed by three different approaches in order to provide a comprehensive picture of municipal water use in Macedonia. The approaches taken are as follows:

- 1) Analysis of historical water consumption records, obtained from the Statistical Office, for all municipalities in the Republic
- More detailed assessment of the water supply situation in the principal municipal water supply companies (Communal Enterprises)
- 3) Domestic water utilization survey of consumers, by conducting detailed interview surveys with a sample of end-users in the field

#### (1) Municipal Water Demand Model

Historical water consumption records for supplies by municipal water companies, for the period 1990 to 1996, were obtained from the Statistical Office sub-divided into the following six categories:

- 1) Domestic households
- 2) Communal facilities (parks, hospitals, schools etc.)
- 3) Commercial establishments (shops, offices, hotels etc.)
- 4) Potable supplies to industry (excluding water from own sources)
- 5) Supplies to others (unspecified)
- 6) System losses (network leakage and treatment plant usage)

These data, together with population data from the Statistical Office, were input into a water demand model which was used to determine actual per-capita water consumption rates for each municipality.

This model was applied to produce municipal water demand projections up to the year 2025, using projected population figures, projected network coverage and per-capita consumption, projected tourist expansion and predicted future leakage rates, etc.

#### (2) Information from Municipal Water Companies

Information was also obtained from the municipal water supply companies (Communal Enterprises) in Macedonia covering the following criteria:

- 1) Available water resources (groundwater and surface water)
- 2) Existing water demands (municipal and industrial)
- 3) Identified water shortages
- 4) Un-accounted-for water (un-metered water and leakage losses)
- 5) Current water tariffs
- 6) Billing collection rates

This information, from 14 principal water companies, was used to validate the water consumption and loss data supplied by the Statistical Office was also used to calibrate the water demand model. The information on tariffs and billing collection rates will be used to assist in assessing willingness-to-pay for water and the identified water shortages was used to estimate any suppressed demand. All these criteria are useful for deriving the future water demand projections.

#### (3) Municipal Water Utilization Survey

A municipal water utilization survey was carried out from a sample of 1,200 domestic households selected across all municipalities in Macedonia. The survey covered the following principal issues:

- 1) Source of water (public network, rural supply or own source)
- 2) Present water consumption per household
- 3) Sufficiency of supplies (water shortages)
- 4) Water acceptability (water quality)
- 5) Current tariff levels
- 6) Willingness-to-pay for improved service
- 7) Wastewater treatment

The results of this survey were used to calibrate the water demand model by assessing network coverage, verifying per-capita consumption, identifying suppressed demand and estimating willingness-to-pay for water. All of which were used by the model in deriving future municipal water demands.

#### I.1.2 Agricultural Water Utilization

Existing data and information with regard to the agricultural water utilization are as follows:

(1) Integrated Development of the Vardar/Axios River Basin Master Plan (1978) Integrated Development of the Vardar/Axios River Basin Master Plan, 1978 that had been prepared by United Nations was used to estimate the present irrigation water utilization.

#### (2) Land Reclamation Systems (1988)

Land Reclamation Systems, 1988, National Commission on Irrigation and Drainage from Macedonia was used to estimate the present irrigation water utilization.

(3) Irrigation Rehabilitation and Restructuring Project (1997)

Chapter 2 and Annex A of the World Bank Staff Appraisal Report Irrigation Rehabilitation and Restructuring Project, 1997 was used to grasp the present irrigation water utilization.

(4) Irrigation Rehabilitation and Restructuring Project Environmental Statement (1997)

Annexes A, B and C of the Irrigation Rehabilitation and Restructuring Project, 1997, that had been prepared by the Project Management Team (PMT) under the MAFWE, was used to grasp the present irrigation water utilization.

(5) ICID Paper, Regional and Local Water Management Systems (1988)

The part of The Water Shortage - Essential Condition for Water Requirement Satisfaction in the SR of Macedonia in the International Commission on Irrigation and Drainage (ICID) Proceedings Volume 4 Regional and Local Water Management Systems, 1988 was used to grasp the present irrigation water utilization.

(6) Professional Paper, (1996)

The part of Situation of Polluted Waters and Soil in the Republic of Macedonia and Protective Measures in Terms of Irrigation of Professional Paper, published in 1996 was used to grasp the present irrigation water utilization.

(7) National Environmental Action Plan (1997)

National Environmental Action Plan, 1997, that had been prepared by the former MUPCE, was referred to grasp the present irrigation water utilization.

(8) Agricultural Water Utilization Survey

An agricultural water utilization survey was carried out from a sample of 200 farmers selected across all municipalities in Macedonia. The survey covered the following principal issues:

- 1) Source of water
- 2) Present water consumption
- 3) Sufficiency of supplies (water shortages)
- 4) Water acceptability (water quality)
- 5) Current tariff levels
- 6) Willingness-to-pay for improved service

#### I.1.3 Industrial Water Utilization

The present industrial water utilization is also assessed by three different approaches in order to provide a comprehensive picture of water use by industry and mining across Macedonia. The approaches taken are as follows:

- 1) Analysis of historical water consumption records, obtained from the Statistical Office, for each type of industrial activity
- 2) More detailed assessment of the water supply situation of selected principal industries
- 3) Industrial water utilization survey of industrial consumers, by conducting detailed on-site interview surveys with selected factories

#### (1) Industrial Water Demand Model

Historical water consumption records for supplies to industry and mining covering the whole of Macedonia, for the period 1990 to 1996, were obtained from the Statistical Office sub-divided by type of activity and separated into the following two categories:

- a) Water used for production (including re-cycled water)
- b) Water supplied to industry and mining

These data were also input into a water demand model which had been used to identify recent trends in industrial water usage. The water supplied to the industry and mining comprises both process water, usually from their own sources, and potable water supplied by the water companies.

This model was used for the study to project future industrial water demands for each type of activity, using industrial production projections, and hence to produce an overall industrial water demand projection up to the year 2025.

(2) Information from Selected Industries

The information was also obtained from selected principal industries from eight municipalities covering the following criteria:

- 1) Source of supply (public network or own source);
- 2) Process water used for production;
- 3) Cooling water;
- 4) Potable water (drinking and sanitation);
- 5) Wastewater.
- (3) Industrial Water Utilization Survey

An industrial water utilization survey was carried out from a sample of 100 industries selected across 25 municipalities. The survey covered the following principal issues:

- 1) Source of water (river intake, groundwater or public network);
- 2) Sufficiency of supplies (water shortages);
- 3) Water acceptability (water quality);
- 4) Expenditure on water;
- 5) Water resource management;
- 6) Willingness-to-pay for improved service.

The results of this survey was used to assist in calibration of the industrial water demand model.

#### I.1.4 Hydropower Water Utilization

The information on water utilization by hydropower plants in Macedonia was obtained from two sources:

- 1) Electric Power Company of Macedonia (ECM);
- 2) Statistical Office.

The data from ECM are more detailed and cover all hydropower plants and were therefore used in preference to that from the Statistical Office. Monthly discharges from major hydropower plants were provided directly by ECM, but discharges from small hydro plants needed to be estimated from energy generation records and power plant characteristics.

#### I.2 Current Water Requirement

The current water requirement, which was set for the year 1996, consists of that of municipal, agricultural, and industrial sectors. The biological minimum will be added from the ecological standpoint.

#### I.2.1 Municipal Water Utilization

#### (1) Composition of Municipal Water and Water Consumption Records

The current municipal water requirement is calculated as the sum of historical water consumption records broken down into 1) to 7) in the following table, and also referring to the municipal water utilization survey of consumers which was carried out from February to March in 1998 during the first fieldwork.

Breakdown	Period of Water Consumption Records
1) Domestic households	1960 - 1996
2) Communal facilities	1960 - 1996
(parks, hospitals, schools, etc.)	
3) Commercial establishments	1960 - 1996
(shops, offices, hotels, etc.)	
4) Potable water to industry	1960 - 1996
5) Water supplied to others	1960 - 1996
(unspecified)	
6) Network system loss	1960 - 1996
(network leakage and treatment plant usage)	
7) Rural water consumption	Not available

Breakdown of Munici	pal Water and Water (	Consumption Records

As seen above, historical water consumption records for supplies by the water supply companies (Communal Enterprises) were obtained from the Statistical Office for the period from 1990 to 1996 for each municipality, together with population figures from the recent census in 1994 and without the rural water consumption.

The rural water consumption was calculated with the estimate of population served by Communal Enterprises, etc.

(2) Estimated Population Served by Communal Enterprises

Communal Enterprises supply predominantly urban areas and a small proportion of rural areas. There is no national data available giving the population served by all the Communal Enterprises across Macedonia. However, the following were obtained:

- (a) Certain information on supply coverage from Communal Enterprises in the major cities
- (b) Data on urban and rural populations for each municipality by the Statistical Office
- (c) Data on supply coverage in rural areas from the Republic Institute for Health Protection (RIHP)

The population distribution across Macedonia is approximately 60 % urban and

40% rural, ranging from 81.5% urban within the Skopje municipality to 100% rural in Makedonski Brod and Demir Hisar. In the Skopje urban area, 426,000 citizens out of an urban population of 449,000 were supplied by Communal Enterprises Skopje in 1995, which represents coverage of 95% of the urban population. Skopje is easily the most representative urban center and the UNICEF data gives the public water supply coverage of 99% of the urban population. Therefore, it is reasonable to adopt the 95% coverage for all urban areas in Macedonia. Likewise in rural areas, the health statistics of RIHP shows that 20% of the rural population in 1991 were supplied by Communal Enterprises.

#### (3) Current Municipal Water Requirement across Macedonia

The current municipal water requirement, which is set at the gross municipal consumption in Macedonia, is taken as the sum of domestic households, communal, commercial supplies, including potable supplies to industry, supplies to others, system losses and rural water consumption for the year of 1996. The requirement on the national level in 1996 is tabulated as follows:

	(Unit: 10°m
Category of Municipal Water	Current Municipal Water Requirement
1) Domestic households	70.0
2) Communal facilities	11.2
3) Commercial establishments	8.9
4) Potable water to industry	34.9
5) Water supplied to others	10.6
6) Network system loss	55.4
7) Rural water consumption	39.9
Total	230.9

The rural water consumption is estimated assuming a gross per-capita consumption of 250 liter per capita per day (lpcd).

Mean system losses for 1996 across all municipalities were assessed at 35%, which was midway between the range of 20% to 50% quoted by many water supply companies. The municipal water consumption in Macedonia for the year 1996 is tabulated in Table I.1 for each municipality.

#### (4) Per Capita Water Consumption

Per capita water consumption (lpcd) from 1990 to 1996 has been estimated from water supply records and population data. Population census data for 1961, 1971, 1981, 1991 and 1994 were used to determine population trend to fill in data for years of 1995 and 1996.

#### Per-capita Consumption on National Level from 1990 to 1996

(Unit: lpcd)

Year	(1) Domestic Household Use		(3) Commercial Use	(4) Others (Loss, etc.)	(5) Gross of Municipal Water	
1990	137	17	24	79	257	
1991	131	21	19	76	247	
1992	140	24	19	111	294	
1993	151	16	22	97	286	
1994	155	16	17	97	285	
1995	148	18	19	87	272	
1996	149	24	19	70	262	

The per-capita consumption estimates compare well with those experienced elsewhere in Europe.

#### I.2.2 Agricultural Water

The requirement of agricultural water consists of irrigation water and livestock water. The water consumption of the agricultural water, however, was not recorded in Macedonia like that of the municipal water, and consequently was assessed by analysis on the existing irrigation systems, climate conditions, cropping pattern as well as on results of a water utilization survey of agricultural water.

The fishery water requirement was not considered, because the fishery method in Macedonia involved the continuous flow of water taken from a river into a fish pond and then back to the original river.

#### (1) Irrigation Water

(a) Survey of existing irrigation systems

In order to grasp more concretely the present condition of the existing irrigation systems, a questionnaire survey was conducted for all the systems in Macedonia. Questionnaires were distributed to 27 water management organizations (WMOs) now (PWME) that cover 103 irrigation systems. In response to the distributed questionnaires, 12 WMOs presented their answers, from which 50 irrigation systems were clarified about their present conditions such as (i) location of intake, (ii) irrigation service area, (iii) cropping pattern and area, major features of irrigation, (iv) drainage and road facilities, (v) maintenance and repair conditions, and so on.

As for the remaining 81 irrigation systems for which no answers were received, the report titled Analysis of Conditions and Problems in Utilization of Irrigation Systems in Macedonia 1993, Ministry of Agriculture, Forestry and Water Economy, was mainly referred to for grasping the conditions. In parallel with the above, actual conditions of various systems' facilities were examined through five separate field investigations.

A net registered service area of 168,112 ha is irrigated under the existing 131 systems, as broken down below for each river basin, and tabulated in Tables I.2 (1/2) to (2/2) with a location map shown in Figure I.1.

No. & Area(ha)	No. of System	Designed Irri. Area (ha)	Existing Irri. Area(ha)	Incomplete Area(ha)
- Vardar, upper reaches	42	40,034	38,676	1,358
- Vardar, middle reaches	17	39,980	34,099	5,881
- Vardar, lower reaches	42	63,247	61,352	1,895
- Cra Drim	23	16,047	12,437	3,610
- Strumica	7	21,698	21,548	150
Total	131	181,006	168,112	12,894

**Existing Irrigation (Irri.) System** 

According to the Statistical Yearbook 1997, however, the actual irrigated area in 1996 was only 51,677ha, corresponding to 31% of 168,112ha. This was regarded as just a reference.

Further the Sretenovo system of 120 ha irrigated by Lake Dojran shown in the Tables I.2 (1/2) to (2/2) was excluded from the water balance calculation and hence 130 systems were adopted in this Study.

(b) Basic conditions for estimate

For estimate of the current irrigation water requirement, the following conditions were applied;

- C1:Irrigation water requirement is calculated on 10-day basis in accordance with the Penman-Monteith method with reference to the report Expert Consultation on Revision of FAO Methodologoies for Crop Water Requirements, May 1990. The crop water requirement is actually calculated with use of the computer program introduced by FAO Irrigation Drainage Paper 33 CROPWAT Computer Program for Irrigation Planning and Management 1992.
- C2:Effective rainfall is, in principle, calculated in accordance with the USDA Soil Conservation Service method introduced by FAO Irrigation Drainage Paper 33 CROPWAT Computer Program for Irrigation Planning and Management 1992. In the method, the effective rainfall is calculated on not 10-day but monthly basis with use of monthly rainfall, and consequently monthly effective rainfall calculated by the original equation was distributed into three 10-day effective rainfalls with use of such ratio as obtained through the following equation which is modified from the original method for estimation of 10-day effective rainfall ( $ER_{10}$ ) with use of 10-day rainfall ( $RA_{10}$ ).

 $ER_{10}=3 \times RA_{10} \times (125 - 0.2 \times 3 \times RA_{10})/125/3 \text{ for } RA_{10} <= 250 \text{ mm/3} (1)$  $ER_{10}=(125 + 0.1 \times 3 \times RA_{10})/3 \text{ for } RA_{10} > 250 \text{ mm/3} (2)$ 

C3: For the efficient estimate work, 130 irrigation systems are classified into the following five (5) regions, according to the climate conditions such as temperature and rainfall, in particular.

No. of Climatic Region	District in Macedonia	Meteorological Station of Adopted Data (No. of Sta.)		
I	Western part	Tetovo (ST001)		
Π	Southwestern part	Bitola (ST025)		
III	Northern and central part	Shtip (ST040)		
IV	Eastern part	Berovo (ST050)		
v	Southeastern part	Gevgelija (ST279)		

Climatic Region

(See Figure I.1)

It is considered that the water requirement estimated on the basis of the above classification would fulfill the accuracy practically required for the water balance calculation.

C4:As for the cropping pattern, since there is paddy rice cultivation in the Bregalnica irrigation system in the climatic region (III), six (6) kinds of the pattern are formulated as follows, adding the paddy rice cultivation to the region III as one pattern.

No. of Cropping Pattern	Climatic Region Applied for the Pattern		
1	I the second sec		
2	П		
<u>3a</u>	III (excluding Bregalnica system)		
3Ъ	III (for Bregalnica system only)		
4	IV		
5	V		

#### Cropping Pattern

(See Figures I.2 (1/3) to (3/3))

In preparation of the cropping pattern, crop kind and cropping area of each crop were carefully examined and determined with reference to the Statistical Yearbook 1997 so as to obtain reasonable results on not only the total cultivation area in Macedonia but also the regional cultivation area of each crop.

C5: The current irrigation efficiency of the workable system is estimated to be at 0.58, composed of the following, with reference to Table 37 in FAO Irrigation and Drainage Paper 24 revised in 1977 Crop Water Requirements.

- Conveyance efficiency : 0.8
- Field canal efficiency : 0.9
- Field application efficiency: 0.8

#### (c) Irrigation water requirement

The irrigation water requirement is calculated for each intake node in the basin model for the water balance calculation, which amounts to 41 nodes in total, on 10-day basis for the period of 36 years from 1961 to 1996 with the following process;

- P1: Gross unit irrigation water requirements (lit/s/ha) for the abovementioned 6 cropping patterns are estimated taking the effective rainfall and irrigation efficiency into the calculation. The gross unit irrigation requirements for the period of 36 years from 1961 to 1996 are tabulated in Tables I.3 (1/6) to (6/6).
- P2: Intake discharges at the 41 intake nodes are estimated taking the gross unit water requirement (lit/s/ha) and the total irrigation service area (ha) commanded under the concerned intake point into the calculation. The intake discharges at the 41 intake nodes calculated on the basis of the average gross unit water requirement of 36 years are tabulated in Tables I.4 (1/2) to (2/2).

Total demand for irrigation water was thus calculated for the 36 years and averaged as follows for each river basin.

Basin	No. of Intake Node	Total Service Area (ha)	Water Demand (1,000 m <sup>3</sup> /year)
1. Vardar (mainstream)	13	38,513	252,186
2. Tresca	1	2,080	16,406
3. Pchinja	4	12,162	103,661
4. Bregalnica	8	37,628	378,264
5. Croa	5	49,205	402,723
6. Strumica	4	15,967	137,336
7. Cm Drim	6	12,437	94,872
Total	41	167,992	1,385,448

Summary of Irrigation Water Demand

Through the above process, the gross irrigation water requirement per crop for the respective crops and regions were obtained. Those in the climatic region III are presented below, for example, in order of large requirement obtained in this Study.

Kind of Crop	This Study (Climate Region III)	Prevailing Standard in Macedonia
1) Paddy rice	22,100	22,500
2) Orchards	8,500	6,250
3) Vineyard	7,100	4,375
4) Maize	6,400	6,250
5) Vegetable	6,200	7,875
6) Wheat	3,700	2,875

Unit Irrigation Water Requirement per Crop in Region III (m<sup>3</sup>/ha/cropping)

Note: Prevailing standard values are obtained from Proceeding of Papers Meeting "Faculty with Farmers" 96 Volume 4 issued by the University

#### (2) Livestock Water

(a) Basic conditions for estimate of livestock water

For estimate of the current livestock water requirement, the following conditions were applied.

- C1:Unit water requirement per head of livestock was determined referring to the criteria provided by the Faculty of Agriculture of the University.
- C2:Number of livestock in each (old) municipality as of 1994 was estimated referring to The Book X Agricultural Holdings in the 1994 Census of Population, Households, Dwellings and Agricultural Holdings in the Republic of Macedonia and Statistical Yearbook 1997.
- (b) Livestock water requirement

The livestock water requirement in 1994 was calculated for each municipality with use of the above-mentioned unit water requirement and number of livestock. The requirement at the national level is tabulated below.

Kind of Livestock	(1) Unit Water Require- ment (lit/day/head)	(2) Number (heads)	(3) = (1) x (2) Water Requirement (m <sup>3</sup> /day)
1) Cattle	95	281,336	26,727
2) Horse	60	61,797	3,707
3) Pig	25	171,571	4,289
4) Sheep	11	2,466,099	27,127
5) Poultry	1	4,685,021	4,685
Total			66,535

#### Livestock Water Requirement

The requirement of the livestock water requirement is calculated at  $66,535 \text{ m}^3/\text{day}$  (or 24.3 million m<sup>3</sup>/year, which is 1.8 % of the requirement of irrigation water of 1,385 million m<sup>3</sup>/year). The requirement at the municipality level is tabulated in Table I.5.

#### I.2.3 Industrial Water

The current industrial water requirements were assessed by analysis of historical water consumption records, assessment of water utilization in selected industries, and from a water utilization survey of industrial consumers.

#### (1) Analysis of Historical Consumption Records

Historical water consumption records for water supplied to industry and water used for production, sub-divided by type of activity for the period from 1990 to 1996, were obtained from the Statistical Office.

It should be noted that numerous inconsistencies were found with this data, but as several years of data were available for each type of industrial activity, it has been possible to identify the types of activity with particular years having suspect data. Such inconsistencies were generally not difficult to identify, being often an order of magnitude different to the data from other years. In these cases the suspect data were re-estimated by observing the trend over the other years for the particular type of activity. This screening process produced a much more consistent data set and a clear picture emerged as to the change in industrial water use over the past decade.

Historical data were obtained for over 30 industrial activities for the period from 1990 to 1996.

#### (2) Water Supplied to Mining and Industry

The total water supplied to mining and industry for all Macedonia was assessed by adding the water supplies of raw process water including groundwater and surface water.

The results, regarded as requirement of industrial water, show a pronounced downward trend in industrial water consumption that reflects the reduction in industrial activity witnessed over the past decade following the break-up of former Yugoslavia. This downward trend is particular to Eastern Europe following the break-up of the Soviet Union.

The industrial water requirement from the historical data is tabulated for the period from 1990 to 1996. The industrial water requirement as of 1996 supplied with surface water is set on each node of the industrial water intake.

				(Unit: 10°m°)
Year	(1)	Industrial W	Total	
	Potable Water	(2) Surface	(3) Groundwater	(3) = (1)  to  (3)
1990	43,101	81,944	45,097	170,142
1991	40,890	75,678	41,648	158,216
1992	38,027	74,772	41,150	153,949
1993	38,244	68,605	37,756	144,605
1994	38,678	59,518	32,755	130,951
1995	39,047	54,090	29,768	122,905
1996	34,920	50,933	28,030	113,883

Industrial Water Requirement for the Period 1990 - 1996.

#### I.2.4 Biological Minimum

The biological minimum and/or ecological need was determined from the ecological standpoint, as being 10 % of the average flow, according to the Water Economy Basis of Macedonia as mentioned in the National Development Strategy 1997.

According to the hydrological study presented in Appendix A1 in Supporting Report I (Volume III) average flows in major rivers for the 36 years from 1961 to 1996 are as follows, together with 10 % of them as the ecological need.

Basin/Gauging Station (Catchment Area)	(1) Average Flow (m <sup>3</sup> /s)	(2)= (1) x 10% ( $m^{3}/s$ )	Annual Amount of (2) $(10^6 \text{m}^3)$
1. Vardar/Gevgelija (22,301km <sup>2</sup> )	136.0	13.6	429
<ol> <li>Treska/Sveta Bogorodica (1,880km<sup>2</sup>)</li> </ol>	23.3	2.3	73
3. Pchinja/Katlanovska Banja (2,794km <sup>2</sup> )	11.9	1.2	38
4. Bregalnica/Shtip (2,897 km <sup>2</sup> )	11.3	1.1	35
5. Crna/Rasimbegov Most (4,526 km <sup>2</sup> )	22.4	2.2	70
6. Strumica/Novo Selo (1,401 km <sup>2</sup> )	3.8	0.4	12
7. Cm Drim/Lozani	23.4	2.3	73
	Total		730

#### **Biological Minimum from Ecological Standpoint**

#### I.2.5 Current Water Requirement in 1996

From the above, the current water requirement in 1996 is summarized as follows, including the ecological need:

Sector	Water Requirement (10 <sup>6</sup> m <sup>3</sup> /year)
1) Municipal Water	196* (362)
2) Agricultural Water	1,410 (950)
3) Industrial Water	114 (270)
4) Ecological Need	730 (653)
Total	2,450 (2,235)

**Current Water Requirement in 1996** 

Note: \*) Water requirement of potable water to industry is included in the 3) industrial water.

Figures in () are those for the year of 1995 in the National Development Strategy in 1997.

	Aunicipality	Source	l		by Water S	upply Compa	any (10 <sup>6</sup> m <sup>3</sup> )			by Rural Supply	. (9)	(10)	(11)	(12)	(12)
"	lamopanty			(2)	(3)	(4)	(5)	(6)	(7)	(8)	Total	Totai	Urban	Rural	Total
			Domestic	Communal	Commerce	Industry	Others	System	Total	Domestic,etc.	exci.(4)	(1) to (8)	Population	Population	Population
			household			(potable)		Loss	excl.(4)	$(10^6 m^3)$	(10 <sup>6</sup> m <sup>3</sup> )	$(10^{6}m^{3})$			657 500
	Skopje	Spring, well	24.8	4.0	3.1	13.5	10.4	23.3	65.5	5.2	144.6	158.1	454,480	103,242	557,722
		Spring	2.9	0.5	0.4	2.1	0.0	2.1	5.8	3.4	13.8	15.9	41,768	68,418	110,186
3	Tetovo	Spring	4.0	0.6	0.5	2.7	0.0	2.9	8.0	6.2	18.8	21.5	51,300	124,140	175,440
4		Spring	1.6	0.3	0.2	0.5	0.0	1.2	3.3	1.4	7.0	7.5	25,460	28,196	53,656
1 1	Makedonski Brod	Spring	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.5	0.5	.0	10,974	10,974
6	Kumanovo	Reservoir	4.4	0.7	0.6	1.2	0.0	3.1	8.8	2.8	18.8	20.0	72,717	56,634	129,351
7	Kratovo	River intake	0.4	0.1	0.0	0.7	0.0	0.3	0.8	0.2	2.2	2.9	6,419	4,375	10,794
8	Kriva Palanka	Spring	0.7	0.1	.0.1	0.4	0.0	0.5	1.4	0.7	3.3	3.7	11,060	13,831	24,891
9		Well, river in- take, reservoir	2.7	0.4	0.3	1.0	0.0	1.9	5.3	1.0	11.6	12.6	47,107	19,270	66,377
10		Reservoir	0.8	0.1	0.1	0.1	0.0	0.6	1.6	0.4	3.2	3.3	13,276	8,142	21,418
		Well	2.3	0.4	0.3	1.2	0.0	1.6	4.6	0.5	10.4	11.6	42,329	9,113	51,442
		Well	0.6	0.1	0.1	0.7	0.0	0.4	1.2	0.3	3.1	3.8	10,253	6,482	16,735
-		Well, reservoir	1.6	0.3	0.2	0.5	0.0	1.2	3.3	1.1	7.0	7.5	26,653	22,417	49,070
		Well, river in-	0.6	0.1	0.1	0.1	0.0	0.4	1.2	0.5	2.6	2.7	10,097	9,207	19,304
		take													
15	Delchevo	Well, river in- take	0.7	0.1	0.1	0.3	0.0	0.5	1.4	0.7	3.2	3.5	10,685	14,916	25,601
16		Reservoir	0.6	0.1	0.1	0.3	0.0	0.4	1.2	0.5	2.8	3.1	9,804	10,065	19,869
		Well	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.5	0.5	0.5	0	10,304	10,304
		Spring	0.4	0.1	0.0	0.1	0.0	0.3	0.7	0.3	1.5	1.6	5,498	6,488	11,986
	Bitola	River intake,	4.4	0.7	0.6	1.8	0.0	3.1	8.7	1.5	19.3	21.1	77,764	30,858	108,622
		reservoir						2.7	7.7	1.3	16.5	17.7	68,364	26,118	94,482
	Prilep	Well, spring	3.8	0.6	0.5	1.2	0.0	1.3	3.6	0.5	8.3	9.3	33,193	9,281	42,474
21	Kavadarci	Spring, river intake	1.8	0.3	0.2								Í		
22	Negotino	Spring, river intake	0.8	0.1	0.1	0.6	0.0	0.6	1.6	0.5	3.7	4.3	12,713	10,807	23,520
23	Valandovo	Well, spring	0.3	0.1	0.0	0.1	0.0	0.2	0.6	0.4	1.4	1.5	4,420	7,847	12,267
24	Gevgelija	Well	1.0	0.2	0.1	0.7	0.0	0.7	2.0	1.0	4.7	5.4	15,192	20,132	35,324
25	Ohrid	Spring, Lake	2.4	0.4	0.3	1.6	0.0	1.7	4.8	1.0	11.1	12.7	41,675	19,869	61,544
	Struga	Spring	I.4	0.2	0.2	0.6	0.0	1.0	2.7	2.4	6.0	6.6	16,286	47,366	63,652
27	Debar	Spring	0.8	0.1	0.1	0.3	0.0	0.5	1.5	0.7	3.4	3.7	11,727	14,203	25,930
$\overline{2}\overline{8}$		Well, spring	0.5	0.1	0.1	0.4	0.0	0.4	1.1	0.5	2.6	3.0	8,667	8,979	17,646
29	Radovis	Well	1.0	0.2	0.1	0.2	0.0	0.7	1.9	0.8	4.1	4.3	15,263	15,657	30,920
30	Strumica	Reservoir	2.4	0.4	0.3	1.0	0.2	1.8	5.2	2.9	11.3	12.3	34,545	57,780	92,325
	Total		70.0	11.2	8.9	34.9	10.6	55.4	156.1	39.9	196.0	230.9	1,178,715	795,111	1,973,826

## Table I.1 Municipal Water Consumption in Macedonia for Year 1996

•

o.	Code No.	Irrigation System	Designed Irri. Area (ha) I	Existing rri. Area (ha)	Incompleted Area (ha)	0	River of W	2	3
I.		ver Basin, Upper Reaches		<u> </u>					
1.	Valuat Ki	ter basin, opper reaches							
1.	I-I	Shkoza	142	142	0	Vardar			
2.	1-2	Zdunje i & Il	2,200	2,200	0	Vardar			
3,	I-3	Gostivarsko pole	4,311	3,914	397	Vardar			
4.	1-4	Banjica	531	400	131	Vardar			
5.	I.4a-1	Lakavica	161	161	0		Lakavichka	N	
6,	1.4a.1a-1	Melca	230	230	0			Melca	
7,	I.4b-1	Vrapcishka reka	280	280	0		Vrapchishka	10. 11	
	1.4b.1a-1	Balin dol	116	116	0	., .		Tributary	
9.	1-5	Stenche	500	500	0	Vardar	Mazdracha		
	1.5a-1	Mazdracha	1,180	1,180	0	Vardar	Ivrazuracija		
11.		Radiovce-Bistrica	8,187	8,187	0		ongs to 11. Radio	Nee-Bistrica)	
12.	1-7	Miletino-Chelopek	856	856	0	varuar (oer	(Tetovska)	Tributary	
13.	1,7a.0a-1	Rechica	114	114	0				diovce-Bistric
	1.76-1	Ratae	1,040	1,040	0				diovce-Bistric
	1.7c-1	Djepishte	160 114	160 114	0				adiovce-Bistri
	1.7d-1	Neproshteno			0		Tributaries		
	1.7e-1	Stari Raduzka	2,500 71	2,500 71	0	Vardar	11104440103		
	1-8 1-9	Radusha Rashche	325	325	0	Vardar			
	1-9 1-10		14	14	ŏ	Vardar			
	1-10 1.10a.0a-1	Saraj Bigor-Dolenci	590	590	ŏ		(Treska)	Zajashka	
		Zaec-Greshnica	450	450	õ		(110344)	Tributary	
	1.10a.00-1	Kichevosko pole	1,450	1,040	410		Treska	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	I.10a-1	Shishevo	56	56	0		Treska		
	I.10a-2 I.10a-3	Glumovo	14	14	õ		Treska		
	1.108-1	Vuchidol-Orman	85	85	ŏ		Lepenec		
	1.10b-2	Novo selo	68	68	ŏ		Lepenec		
	I.10b-3	Bardovci-Zlokukjani	140	140	Ō		Lepenec		
	I.10c-1	Radishani	27	27	0		Cicerska		
	I.10d-1	Drachevo-Batinci	110	110	0		Markova		
	1.10e-1	Kamnik	1,300	1,300	ō		Tributaries		
	1.10f-1	Petrovec	100	100	0		Tributary		
	1.10g-1	Shamak	30	30	0		Tributary		
	I.10i-1	Dragomanci	136	136	0		Pchinja		
	1.10i.1a-1		250	250	0			Kriva	
36.	1.10i.1a-2		400	290	110			Kriva	
37.		Davezence-Jachince-Klechov	c 250	175	75			Kriva	
38.	I.10i-2	Klechovce	500	265	235		Pchinja		
39.	1.10i-3	Shupli kamen-Zubovce	122	122	· 0		Pchinja		
40.	1.10i.3a.0	- Rechica	60	. 60	0		(Kumanovsk	a) Rechica (we	:11)
41.	I.10i.3a.0	a-Izvor Jovica	44	44	0			Lojanska	
42.	I.10i.3a.0	-Lipkovo	10,820	10,820	0			Lipkovska	
		Sub-total	40,034	38,676	1,358				
11,	Vardar F	liver Basin, Middle Reaches			-				
43	11.0a-1	Mladost (Otovica)	1,200	1,200	0	(Vardar)	Otovica		
	II.0a-1 II.0b-1	Topolka	400	400	0	(	Topolka		
	11.0c-1	Vitanci	.98	98	ő		Babuna		
46		Babuna	100	100	õ	•	Babuna		
	. 11-1	Kochilari	80	80	ŏ	Vardar			
	. 11-2	Zgropulci	24	24	ō	Vardar			-
	. II-3	Vinichani	150	150	ō	Vardar			
	. 11.3a.0a-1		80	80	· 0		(Bregalnica)	Cm Dol	
	. 11.3a.0b-1		3,014	917	2,097			Tributary	
	. 11.3a-1	Sandanski (Delchevo)	250	250	0		Bregalnica	•	
	. 11.3a.1a-1	· · ·	164	164	0		-	Tributaries	
	. 11.3a-2	Milkovo (Delchevo)	540	495	45		Bregalnica		
	. II.3a-3	Bregalnica	32,100	28,890	3,210		Bregalnica		· .
	. II.3a,3a-1		415	415	0		-	Osojnica	$(1,2,\ldots,n)$
	11,32.32.1		915	500	415				Blateshka
		Belashnica-Zletovo	200	200	0			Zletovska	· ·
59		Mavrovica	250	136	114			Orlica	

h

 Table I.2
 Existing Irrigation Systems (1/2)

No.	Cal-M-	Imigation Suman	Designed		Incomplete Area (ha)	1	River of Wa	iter Source	
	Code No.	Irrigation System	un. ruca (na)	Irri. Area (ha)	74 CA (112)	v		<u>_</u>	J
т.	Vardar River	Basin, Lower Reaches							
60.	Ш.0a.0a-1	Obednichki	30	30	0	(Vardar)	(Cma)	Tributary	
61.	11.0a.0b-1	Demir hisar	. 10	10	0			Tributary	
62,	III.0a-1	Buchin	120	120	0		Crna		
63.	III.Oz.   a.Oa-1	Debreshte	251	251				(Blato)	Tributary
64.	II.02.12-1	Crna upper reach	250	250	0			Blato	e
65.	Щ Qa.la.la-l	Brailovo	240	240	0				Suvodolich Suvodolich
66. 67.	Ш.Qa.la.la-2	Desovo Krushevo	280 220	280 220	0				Selishva
67. 68.	III.0a.1a.1b-1 III.0a.1a.1c-1	Borino (Lazhani)	666	666	ŏ				Tributary
69.	III.Oallald 1	Prilep	6,200	6,200	ŏ				Stara
70.	III.0a.16-1	Strezhevo	20,200	20,200	ō			Shemnica	
71.	10.0a,15-2	Shemnica upper reach	50	50	0			Sazdaica	
72.	II.Oa.lc-l	Dihevo	270	140	130			Dihovska	
73.	11.0a.1d-1	Bistrica	40	40	0			Ziokuchanska	
74.	11.02.1d.12-1	Velushka river	75	75	0			<b>T</b> (1	Velushka
75.	111.0a.1e-1	Graeshnica	20	20	0			Tributary	
76.	Щ.0a,1f-1	Dabnichka reka	300 20,290	200 19,225	100 1,065		Ста	Dronska	
77. 78.	Ш.0а-2 Щ.0а-3	Tikvesh Vozarci	20,290	28	1,005		Crna		
79.		Trstenik-Gradsko	960	960	ŏ		Cma		
80.		Boshavica	1,935	1,935	ŏ		Vatashka		
\$1.		Pepelishko pole	1,600	1,000	600	Vardar			
82.	Ш.1а-1	Demir kapija	300	300	0		Boshava		
83.		Gradec	264	264	0	Vardar			
84,		Udovo-Valandovo	3,624	3,624	0	Vardar		<b>_</b>	
85.		Petrushka river	100	100	0		(Stara)	Petrushka	
86.	10.3a-1	Miravci Carbishan Lond W	100	100	. 0	Vardar	Stara		
87. 88.		Grehishte I and II Smokvica I and II	423 110	423 110	0	Vardar Vardar			
89		Prdejci	200	200	ŏ	Vardar			
	10.6a-1	Kovanska, Senneninska rivers	200	200	ŏ		Kovanska		
91.		Vinojug	150	150	Ō	Vardar (wells			
92.		Gjavoto	1,340	1,340	0	Vardar	,		
93.	III.8a-1	Paljurci	800	800	Ó		C. Luda Mara		
94.		Konska reka	571	571	0		Konjska		
95.		Sehovo	200	200	0	Vardar			
96. 00	<u>III-10</u>	Granica	120 120	120	0	Vardar	Variation (as	لماله	
	III.i0a⊪1 III-11	Pod anot Avlakjot	40	120 40	ŏ	Vardar (wells	Konjushka (w	ens)	
	III-12	Keramadnica	80	80	0	Vardar	9		
100.		Selemli	350	350	ŏ		Tributary		
101.	DL13	Sretenovo	120	120	ŏ	Dojran			
		Sub-total	63,247	61,352	1,895				
IV.									
	Cra Drim Riv	er Basin							
	Crn Drim Rh					<b>7.1</b> D			
102.	IV.0a-1	Ljubojno	84	84	0	(Lake Prespa	) Brajchinska Kranska		
102. 103.	IV.0a-1 IV.0b-1	Ljubojno Krani	153	153	0		) Brajchinska Kranska		
102. 103. 104.	IV.0a-1 IV.0b-1 IV-1	Ljubojno Krani Asamati	153 2,811	153 2,811	0 0	(Lake Prespa Lake Prespa	Kranska		
102. 103. 104. 105.	IV.0a-1 IV.0b-1 IV-1 IV.1a-1	Ljubojno Krani Asamati Pretor	153	153	0				
102. 103. 104. 105. 106.	IV.0a-1 IV.0b-1 IV-1	Ljubojno Krani Asamati	153 2,811 41	153 2,811 41	0 0 0		Kranska Pretorska		
102. 103. 104. 105. 106.	IV.0a-1 IV.0b-1 IV-1 IV.1a-1 IV.1a-1 IV.1b-1	Ljubojno Krani Asamati Pretor Kurbinovo	153 2,811 41 78	153 2,811 41 78	0 0 0	Lake Prespa Lake Prespa	Kranska Pretorska		
102. 103. 104. 105. 106. 107.	IV.0a-1 IV.0b-1 IV-1 IV.1a-1 IV.1b-1 IV-2 IV.2a-1	Ljubojno Krani Asemati Pretor Kurbinovo Sithan	153 2,811 41 78 2,788 142 50	153 2,811 41 78 2,788 142 50	0 0 0 0 0	Lake Prespa Lake Prespa	Kranska Pretorska Kurbinovska	Tributary	
102. 103. 104. 105. 106. 107. 108. 109.	IV.0a-1 IV.0b-1 IV-1 IV.1a-1 IV.1b-1 IV-2 IV-2 IV.2a-1 IV.2b.0a-1 IV.2b.0b-1	Ljubojno Krani Asamati Pretor Kurbitovo Sithan Ljubanishta Trebenishta Leskoec	153 2,811 41 78 2,788 142 50 100	153 2,811 41 78 2,788 142 50 100	0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid)	Kranska Pretorska Kurbinovska Ljubanishta	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 109. 110. 111.	IV.0a-1 IV.0b-1 IV-1 IV.1a-1 IV.1b-1 IV-2 IV-2a-1 IV.2b.0a-1 IV.2b.0b-1 IV-3	Ljubojno Krani Asanati Pretor Kurbinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte	153 2,811 41 78 2,788 142 50 100 60	153 2,811 41 78 2,788 142 50 100 60	0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid	Kranska Pretorska Kurbinovska Ljubanishta		
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112.	IV.0a-1 IV.0b-1 IV-1 IV.1a-1 IV.2a-1 IV-2 IV.2a-1 IV.2b.0a-1 IV.2b.0b-1 IV-3 IV-4	Ljubojno Krani Asamati Pretor Kurdinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik	153 2,811 41 78 2,788 142 50 100 60 250	153 2,811 41 78 2,788 142 50 100 60 250		Lake Prespa Lake Prespa (Lake Ohrid)	Kranska Pretorska Kurbinovska Ljubanishta (Tributary)		
102. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113.	IV.0a-i IV.0b-1 IV.1a-1 IV.1b-i IV.2a-i IV.2b.0a-1 IV.2b.0b-1 IV.2b.0b-1 IV.2b.0b-1 IV.4a-1	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Ljubanishta Leskoec Velgoshta Leskoec Velgoshte Ovoshtamik Ledeglavje	153 2,811 41 78 2,788 142 50 100 60 250 700	153 2,811 41 78 2,788 142 50 100 60 250 700		Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska		
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114.	IV.0a-1 IV.0b-1 IV.1a-1 IV.1a-1 IV.1b-1 IV.2a-1 IV.2b.0a-1 IV.2b.0b-1 IV.2b.0b-1 IV.3 IV.4a-1 IV.4a-1 IV.4a-1	Ljubojno Krani Asamati Pretor Kurbinovo Sirhan Ljubanishta Ljubanishta Leskoec Velgoshte Ovoshtamik Ledeglavje Slatino	153 2,811 41 78 2,788 142 50 100 60 250 700 700	153 2,811 41 78 2,788 142 50 100 60 250 700 400	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid	Kranska Pretorska Kurbinovska Ljubanishta (Tributary)	Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115.	IV.0a-1 IV.0b-1 IV.1a-1 IV.1a-1 IV.1a-1 IV.2a-1 IV.2a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.4a-1 IV.4a-1 IV.4a-1a-1	Ljubojno Krani Asamati Pretor Kurbisovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodglavje Slatino Belchisha-Velmej	153 2,811 41 78 2,788 142 50 100 60 250 700 700 700 1,400	153 2,811 41 78 2,788 142 50 100 60 250 700 400 440	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116.	IV.0a-i IV.0b-1 IV-1 IV.1a-1 IV.1b-i IV-2 IV.2b-0b-1 IV.2b.0b-1 IV.4a,1a-1 IV.4a,1a-1 IV.4a,1b-2	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Luskoec Velgoshte Ovoshtamik Lotegiavje Slatino Belchishta-Velmej Sateska	153 2,811 41 78 2,788 142 50 60 250 700 700 700 1,400 1,250	153 2,811 41 78 2,788 142 50 100 60 250 700 400 440 400	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska	Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117.	IV.0a-1 IV.0b-1 IV.1a-1 IV.1a-1 IV.1b-1 IV.2a-1 IV.2b.0a-1 IV.2b.0a-1 IV.4b.0b-1 IV.4a-1 IV.4a-1a-1 IV.4a-1a-1 IV.4a-1a-1 IV.4a-2	Ljubojno Krani Asanati Pretor Kurbinovo Sinhan Ljubanishta Ljubanishta Leskoec Velgoshte Ovoshtamik Ledeglavje Slatino Belchishta-Velmej Sateska Batun	153 2,811 41 78 2,788 142 100 60 250 700 700 700 1,400 1,250 50	153 2,811 41 78 2,788 142 50 100 60 250 700 400 440	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117. 118.	IV.0a-i IV.0b-1 IV-1 IV.1a-1 IV.1b-i IV-2 IV.2b-0b-1 IV.2b.0b-1 IV.4a,1a-1 IV.4a,1a-1 IV.4a,1b-2	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Luskoec Velgoshte Ovoshtamik Lotegiavje Slatino Belchishta-Velmej Sateska	153 2,811 41 78 2,788 142 50 60 250 700 700 700 1,400 1,250	153 2,811 41 78 2,788 142 50 100 60 250 700 400 440 400 50	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Sateska	Tributary Tributary	
102. 103. 104. 105. 106. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119.	IV.0a-1 IV.0b-1 IV-1 IV-1 IV-2 IV-2a-1 IV.2b.0a-1 IV.2b.0b-1 IV.2b.0b-1 IV.4a.1a-1 IV.4a.1a-1 IV.4a.1a-1 IV.4a.1b-1 IV.4a-1	Ljubojno Krani Asamati Pretor Kurbisovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodeglavje Slatino Belchishta-Velmej Sateska Batun Stuur-Vishni	153 2,811 41 78 2,788 142 50 60 250 700 700 1,400 1,250 50 305	153 2,811 41 78 2,788 142 50 100 60 250 700 400 440 400 400 50 305	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Sateska	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120.	IV.0a-i IV.0b-1 IV-1 IV-1 IV.1b-i IV-2 IV.2b-0b-1 IV.2b.0b-1 IV.4a,1a-1 IV.4a,1a-1 IV.4a,1a-1 IV.4a,1a-2 IV.4b-1 IV-5	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Lubanishta Leskoec Velgoshte Ovoshtamik Izdeglavje Slatino Belchishta-Velmej Sateska Batun Shum-Vishni Lozhani	153 2,811 41 78 2,788 142 50 100 60 250 700 700 700 1,400 1,250 50 305 550	153 2,811 78 2,788 142 50 100 60 250 700 400 440 400 50 305 550 745 1,060	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Sateska Belichka	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122.	IV.0a-1 IV.0b-1 IV-1 IV-1 IV.1b-1 IV.2b-1 IV.2b.0b-1 IV.2b.0b-1 IV.4a-1 IV.4a-1 IV.4a-1 IV.4a-1 IV.4a-1 IV.4a-1 IV.4a-1 IV.4b-1 IV.5 IV.4b-1 IV.5 IV.4b-1 IV.5 IV.4b-1 IV.5 IV.4b-1 IV.5 IV.4b-1 IV.5 IV.4b-1 IV.4b-1 IV.4b-1 IV.4b-1 IV.4b-1 IV.4b-1 IV.4b-1 IV.4b-1 IV.4b-1 IV.2b-1 IV.4a-1I	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Lubanishta Leskoec Velgoshte Ovoshtamik Izdeglavje Slatino Belchishta-Velmej Satska Batun Shum-Vishni Lozhani Sturi Sturi Sturi Sturi	153 2,811 41 78 2,788 142 50 100 60 250 700 1,400 1,250 50 50 305 550 745 1,600 150	153 2,811 41 78 2,788 142 50 100 60 250 700 400 440 400 50 305 550 745 1,060 150	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R.	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123.	IV.0a-1 IV.0b-1 IV.1 IV.1a-1 IV.2a-1 IV.2a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.4a-1 IV.4a,1a-1 IV.4a,1a-2 IV.4a-2 IV.4a-2 IV.4a-2 IV.4a-1	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Ledegiavje Slatino Belchishta-Veimej Statino Belchishta-Veimej Statino Batun Shum-Vishni Lozhani Stari Stari Stari Stari Gradinar	153 2,811 78 2,788 142 50 100 60 250 700 700 1,400 1,250 50 305 550 745 1,600 150 60	153 2,811 78 2,785 142 50 100 60 250 700 400 400 400 50 305 550 745 1,060 150 66	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Graeshnica	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122.	IV.0a-1 IV.0b-1 IV.1 IV.1a-1 IV.2a-1 IV.2a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.4a-1 IV.4a,1a-1 IV.4a,1a-2 IV.4a-2 IV.4a-2 IV.4a-2 IV.4a-1	Ljubojno Krani Asamati Pretor Kurbisovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Izdeglavje Slatino Belchishta-Velmej Sateska Batun Staun-Vishni Lozhani Stari Stari Stari Stari Debarsko pole Banjiste Gradinar Debarsko pole	153 2,811 41 78 2,788 142 50 100 60 250 700 1,400 1,250 305 550 745 1,600 150 60 1,980	153 2,811 78 2,788 142 50 60 250 700 400 440 400 50 305 550 745 1,060 150 60 1,080	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R.	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123.	IV.0a-1 IV.0b-1 IV.1 IV.1a-1 IV.2a-1 IV.2a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.2b.0a-1 IV.4a-1 IV.4a,1a-1 IV.4a,1a-2 IV.4a-2 IV.4a-2 IV.4a-2 IV.4a-1	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Ledegiavje Slatino Belchishta-Veimej Statino Belchishta-Veimej Statino Batun Shum-Vishni Lozhani Stari Stari Stari Stari Gradinar	153 2,811 78 2,788 142 50 100 60 250 700 700 1,400 1,250 50 305 550 745 1,600 150 60	153 2,811 78 2,785 142 50 100 60 250 700 400 400 400 50 305 550 745 1,060 150 66	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Graeshnica	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 121. 122. 123. 124.	IV.0a-1 IV.0b-1 IV-1 IV-1 IV-2 IV-2a-1 IV-2b.0b-1 IV-2b.0b-1 IV-2b.0b-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-5 IV-6 IV-7 IV-7-1 IV-7-1 IV-7-1 IV-7-1	Ljubojno Krani Asamati Pretor Kurbinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodglavje Slatino Belchishta-Velmej Sateska Batun Statino	153 2,811 41 78 2,788 142 50 100 60 250 700 1,400 1,250 305 550 745 1,600 150 60 1,980	153 2,811 78 2,788 142 50 60 250 700 400 440 400 50 305 550 745 1,060 150 60 1,080	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Graeshnica	Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 110. 111. 112. 113. 114. 115. 116. 117. 118. 122. 123. 124. V.	IV.0a-1 IV.0b-1 IV-1 IV.1a-1 IV.1b-1 IV.2b-1 IV.2b.0b-1 IV.2b.0b-1 IV.4a,1a-1 IV.4a,1a-1 IV.4a,1a-1 IV.4a,1a-2 IV.4a-2 IV.4a-2 IV.4a-2 IV.4a-1 IV.4a,1b-2 IV.4a-1 IV.4a,1b-1 IV.	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Ledeglavje Slatino Belchishta-Velmej Sateska Batun Shum-Vishni Lozhani Stari Stuni Stari Stari Stari Stuniko pole Banjiste Gradinar Debarsko pole Sub-total	153 2,811 78 2,788 142 50 100 60 250 700 1,400 1,250 50 305 550 745 1,600 150 60 1,980	153 2,811 78 2,785 142 50 60 250 60 250 400 400 400 400 50 305 550 745 1,060 150 66 1,080	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim Crn Drim Crn Drim Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Graeshnica Radika	Tributary Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 121. 122. 123. 124. V.	IV.0a-1 IV.0b-1 IV-1 IV-1 IV-2 IV-2a-1 IV-2b.0b-1 IV-2b.0b-1 IV-3 IV-4 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-5 IV-6 IV-7 IV-7 IV-7-1 IV-7b-1 IV-9-1 IV-9-1 IV-9-1	Ljubojno Krani Asamati Pretor Kurbinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodglavje Slatino Belchishta-Velmej Sateska Batun Statino	153 2,811 41 78 2,788 142 50 60 250 700 700 1,400 1,250 1,400 1,250 5,581	153 2,811 78 2,788 142 50 100 60 250 700 400 400 400 400 400 50 305 550 550 745 1,060 150 60 1,080 12,437	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Cm Drim Cm Drim Cm Drim Cm Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Sateska Belichka Banjishka R. Græshnica Radika (Bregalnica)	Tributary Tributary	ica
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 121. 122. 123. 124. V.	IV.0a-1 IV.0b-1 IV-0 IV-1 IV-1 IV-2 IV-2a-1 IV-2b-0b-1 IV-2b-0b-1 IV-2b-0b-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-5 IV-6 IV-7 IV-7 IV.7b-1 IV.7b-1 IV.7b-1 IV.9-1 IV.0a-0a-1 V.0b-1	Ljubojno Krani Asamati Pretor Kurbinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Izdeglavje Slatino Belchishta-Velmej Sateska Batun Shum-Vishni Lozhani Stari Strushko pole Banjiste Gradinar Debarsko pole Sub-total	153 2,811 41 78 2,788 142 50 100 60 250 700 1,400 1,250 50 305 550 745 1,600 150 60 150 60 15,047	153 2,811 78 2,788 142 50 100 60 250 700 400 440 400 50 305 550 745 1,060 150 66 1,080 12,437	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Crn Drim Crn Drim Crn Drim Crn Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Sateska Belichka Banjishka R. Graeshnica Radika (Bregalnica) Orahovachka	Tributary Tributary Tributary	
102. 103. 104. 105. 106. 107. 108. 109. 111. 112. 113. 114. 115. 114. 115. 121. 123. 124. 125. 126. 127.	IV.0a-1 IV.0b-1 IV-1 IV-1 IV-2 IV-2a-1 IV-2b-1 IV-2b-0b-1 IV-2b-0b-1 IV-3a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4b-1 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodegiavje Slatino Belchishta-Velmej Sateska Batun Shum-Vishni Lozhani Stari Stari Stari Stari Stushko pole Banjiste Gradinar Debarsko pole Sub-total	153 2,811 78 2,788 142 50 60 250 700 700 1,400 1,250 50 305 550 745 1,600 150 60 1,980 16,047	153 2,811 78 2,788 142 50 60 250 400 400 400 400 50 305 550 745 1,060 150 66 1,080 12,437	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Cm Drim Cm Drim Cm Drim Cm Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Graeshnica Radika (Bregalnica) Orahovachka Plavaja	Tributary Tributary Tributary	ica
102. 103. 104. 105. 105. 107. 108. 109. 110. 111. 112. 113. 114. 115. 121. 122. 123. 124. V. 125. 126. 127. 128.	IV.0a-1 IV.0b-1 IV-1 IV-1 IV-2 IV-2a-1 IV-2b.0b-1 IV-2b.0b-1 IV-3 IV-4 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-5 IV-6 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7	Ljubojno Krani Asamati Pretor Kurbinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodglavje Slatino Belchishta-Velmej Sateska Batun Statino Belchishta-Velmej Sateska Batun Statino Stum-Vishni Lozhani Stati Strushko pole Banjiste Gradinar Debarsko pole Sub-total	153 2,811 78 2,788 142 50 100 60 250 700 700 1,400 1,250 1,250 1,250 1,250 150 60 1,980 16,047 5,581 67 250 10,050	153 2,811 78 2,788 142 50 100 60 250 700 400 400 400 400 400 50 305 550 550 550 150 60 1,080 12,437	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Cm Drim Cm Drim Cm Drim Cm Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Græshnica Radika (Bregalnica) Orahovachka Plavaja Nivichanska	Tributary Tributary Tributary	ica
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 117. 118. 117. 121. 122. 123. 124. V. 128. 129. 129.	IV.0a-1 IV.0b-1 IV-0 IV-1 IV-1 IV-2 IV-2a-1 IV-2b-0b-1 IV-2b-0b-1 IV-2b-0b-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-5 IV-6 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7	Ljubojno Krani Asamati Pretor Kurbinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodeglavje Slatino Belchishta-Velmej Sateska Batun Shum-Vishni Lozhani Stari Shum-Vishni Lozhani Stari Strushko pole Banjiste Gradinar Debarsko pole Sub-total	153 2,811 41 78 2,788 142 50 100 60 250 700 1,400 1,250 50 305 550 745 1,600 1,980 16,047 5,581 67 250 10,050 4,000	153 2,811 78 2,788 142 50 100 60 250 700 400 400 400 400 50 305 550 745 1,060 150 60 10,080 12,437	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Cm Drim Cm Drim Cm Drim Cm Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Belichka Banjishka R. Graeshnica Radika (Bregalnica) Orahovachka Plavaja Nivichanska Tributary	Tributary Tributary Tributary	ica
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 111. 112. 113. 114. 115. 120. 121. 122. 123. 125. 125. 127. 128. 129. 129. 120. 121. 123. 124. 129. 129. 129. 120.	IV.0a-1 IV.0b-1 IV-1 IV-1 IV-1 IV-2 IV-2a-1 IV-2b-0b-1 IV-2b-0b-1 IV-3a-1 IV-4a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1a-1 IV-4a-1 IV-4a-1 IV-4b-1 IV-5 IV-5 IV-5 IV-5 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7	Ljubojno Krani Asamati Pretor Kurbinovo Sithan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Izdeglavje Slatino Belchishta-Velmej Sateska Batun Shum-Vishni Lozhani Stari Sturi Stari Sturi Stari Sturi Sta	153 2,811 78 2,788 142 50 60 250 700 1,400 1,250 50 305 550 745 1,600 150 60 1,980 16,047 5,581 67 250 10,050 4,000 1,555	153 2,811 78 2,785 142 50 100 60 250 400 440 400 50 305 550 745 1,060 150 66 1,080 12,437	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Cm Drim Cm Drim Cm Drim Cm Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Græshnica Radika (Bregalnica) Orahovachka Plavaja Nivichanska	Tributary Tributary Tributary	ica
102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 121. 123. 124. 125. 125. 126. 127. 128. 129. 130. 121. 123. 124. 129. 129. 120.	IV.0a-1 IV.0b-1 IV-0 IV-1 IV-1 IV-2 IV-2a-1 IV-2b-0b-1 IV-2b-0b-1 IV-2b-0b-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-4a-1 IV-5 IV-6 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7 IV-7	Ljubojno Krani Asamati Pretor Kurbinovo Sirhan Ljubanishta Trebenishta Leskoec Velgoshte Ovoshtamik Lodeglavje Slatino Belchishta-Velmej Sateska Batun Shum-Vishni Lozhani Stari Shum-Vishni Lozhani Stari Strushko pole Banjiste Gradinar Debarsko pole Sub-total	153 2,811 41 78 2,788 142 50 100 60 250 700 1,400 1,250 50 305 550 745 1,600 1,980 16,047 5,581 67 250 10,050 4,000	153 2,811 78 2,788 142 50 100 60 250 700 400 400 400 400 50 305 550 745 1,060 150 60 10,080 12,437	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lake Prespa (Lake Prespa (Lake Ohrid) Lake Ohrid Cm Drim Cm Drim Cm Drim Cm Drim	Kranska Pretorska Kurbinovska Ljubanishta (Tributary) Sateska Sateska Belichka Banjishka R. Graeshnica Radika (Bregalnica) Orahovachka Plavaja Nivichanska Tributary Tributarjes	Tributary Tributary Tributary	ica

### Table I.2 Existing Irrigation Systems (2/2)

 Table I.3 Gross Unit Water Requirements (1/6)

### I. Cropping Pattern in Climatic Region 1 (at present) (using Data at Tetovo Meteo. Station)

(Unit: lit/s/ha)

						1			14-5			Ame		r	May		r	Jun.			Jul.		<b></b>	Aug.			Sep.			Oct.			Nov.			Dec.	
No.	Year		Jan.			eb.			Mar.			Apr.		<b>-</b> .		-		2	2	1	2	3	<u> </u>	2	3	1	2		1	2	3	1	2	3	1	2	3
		1	2 3		<u> </u>	2	3	1	2	3	1	2	3	<u> </u>	2	3						2										<u> </u>					
			0.00 0.0		~ ~			0.00	0.77	0.00	0.05	0.47	0.00	0.45	0.00	0.18	0.04	0.05	0.18	0.08	0.20	0.37	0.54	0.63	0.64	0.50	0.60	0,48	0.07	0.22	0.00	0.00	0.00	0.00	0.00	0.00 0	),00
1.					00 0.	11 0.	^^ I	0.00	A 66	0.00	0 00	0.00	053	10.22	0.65	0.60	10.04	0.02	0.97	10.19	0.12	0.45	10.21	0.37	0.04	[U.Oo	0.00	0.01 1	0.30	0.00	0.03	0.00	0.00	0.00	0.00	0.00 0	).00
2.	1962	0.04						0.00	0.14	0.00	0.12	0.21	∩ 1 <i>4</i>	10.45	0.07	0.10	በብ ስተ	0.04	0.20	0.74	0.25	0.12	10.13	0.65	0.28	0.03	0.60	0.33	0.00	0,09	0.00	0.02	0.00	0,00	0.00	0.00 0	0,00
3.	1963	0.00			00 0.	00 0.	~^ I	0.00	0.00	0.15	0 12	0.47.	0.11	0.51	0.33	0.00.	0.05	0.04	0.02	0.17	0.03	0.21	10,48	0.35	0.64	0.00	0.60	0.12 ]	0.00	0,00	0.00	0.00	0.00	0.02	0.00	0.00 0	),00
4.	1964	0.04	0.04 0.0	0 0.0	00 0.	00 0.	.00	0.00	0.00	0.05	0.15	0.00	0.20	0.11	0.45	0.44	0.05	0.03	0.18	0.20	0.27	0.43	0.52	0.29	0.39	0.58	0.60	0.48	0.38	0.27	0.16	0.00	0.00	0.00	0.00	0.00 0	).00
5.	1965	0.00	0.00 0.0	0100	0 B	00 0	00	0.00	0.16	0.05	0.28	0.05	0.23	1045	0.63	017	10.04	0.03	0:24	0.09	0.23	0.21	10.30	0.65	0.39	10,34	0.20	- V.46 (	0,22	0.24	0.00	0.00	0,00	0.00	0.00	0.00 0	).00
6.	1966	0.00	0.00 0.0	مام	07 0.	04 D	16	0.14	0.00	0.28	0.28	0.00	0.00	0.57	0.27	0.17	10.05	0.05	0.17	0.07	0.00	0.12	10.21	0.59	0.26	0.64	0.40	0,40 ]	0.20	V.27	0.00	0.00	0,00		0.00	0.00 0	).00
7.	1967		0.00 0.0	، ا ، ،	<u>.</u>	<u> </u>	A4 1	0.12	0.00	0.12	0.36	0.00	0.55	10.61	0.00	0.00	10.01	0.00	0.02	10.24	0.22	0.43	10.07	0.45	0,05	0.50	0.40	0.10	0.30	0,01	0.00	10,00	0.00	0.00		0.00 0	).00
8.	1968	0.00	0.00 0.0		00 0.	00 0.	04	0.15	0.00	0.00	0.00	0.00	0.07	0.57	0.65	0.60	0.00	0.06	0.22	0.00	0.17	0.32	0.31	0,61	0.59	0.48	0.16	0.37	0,38	0.27	0,16	0.00	0.02	0,00	0.00	0.00 0	).00
9.	1969		0.00 0.0		00 0. 00 0	00 0	00	0.00	0.00	0.00	0.00	0.00	0.55	0.30	0.63	0.00	10.05	0.06	0 13	10.00	0.14	0.34	10.34	0.00	0.55	10.1Z	0.00	0.46	V.U9	0.00	0.00	10.00	0.00	0.00	0.00	0.02 0	).00
10.	<u>1970</u> 1971	0.00		A 44	00 0	00 0	00	0.00	0.00	0.00	0.07	0.14	0.55	10.43	0 47	0.20	10.00	0.07	0.74	10.07	0.02	0.09	10.19	0.47	0.03	10.40	0.00	0.371	0.15	0.01	0.10	10.00	0.00	0.00			
11.	1971	0.00				~ ~	~~ I	0.00	0.00	0.78	0.20	0.04	0 07	10.00	0.51	035	0.01	0.06	0.22	0.14	0.04	0.35	0.21	0.23	0.33	0.20	0.00	0.00	0.00	0.00	0,00	0.04	0,00	0.00	0.00	0.02 0	).03
12.	1972	0.00	0.00 0.0	مام	00 0	00 0	. nn !	0.00	0.00	0.00	0 14	0.00	0 33	1045	0 13	0.60	10.04	0.05	0.19	0.02	0.20	0.00	10.03	0.02	0,00	0.08	0,00	0.46	0.20	0,27	0.10	0.04	0.04	0.02	10.02	0.02 0	0.00
13. 14.	1973	0.00	0.00 0.0	، ما م	00 0	00 0	07 I	0.00	0.20	0.00	0.36	0.00	0.22	10.39	0.02	0.13	10.06	0.00	0.15	10.22	0.27	0.43	10.54	0,65	0.02	U.40	0.00	0.17	Q.14	0.00	0.00	10.00	0.04	0.00	10.00	0.00 0	0.05
14.	1974	0.00	0.04 0.0	مام	07 0	00 0	00	0.14	0.00	0.00	0.00	0.22	0.09	0.41	0.14	0.03	10.03	0.00	0,06	0.05	0.22	0.41	10.41	0.08	0.32	0.44	0.40	0.40	0.05	0.00	0.00	0.00	0.00	0.00		0.00 0	_
16	1975			0.0	~ ~	00 0	10	A 00	0.44	0 00	0.14	A 72	JU 25	10 14	0.23	0 03	10.00	0.05	0.02	10.64	024	0.04	10.35	0.33	0.35	10.34	0.40	0.42	0.31	0.00	0.00	10.04	0.04	0.04		0.02 0	
17.	1977		0.00 0.0	، ا م	<u> </u>	<u>00 0</u>	14	0.14	0.05	0.08	0.00	0.18	0.55	10.25	0 47	0 44	10.02	0.03	0.11	0.19	0.27	0.08	10.12	0.59	0.48	10.58	0,40	0.00	0.34	0.01	0,16	0,00	0.00	0,00	0.00	0.00 0	).00
17.	1978			~ I ~ ·	~ ~	AA A	001	0.00	0 00	0 00	0 00	0.00	0 27	10.00	047	0.08	10.06	0.07	0.15	1024	0.11	0.43	10.54	0.33	0.63	10.00	0.07	0.101	0.52	0.20	0.00	10.04	0.04	0.02	10.04	0.04 1	0.02
19.	1979	0.00	0.00 0.0	نمام	00 0	<u>00 0</u>	161	0 13	0.00	0.24		0.11	0.53	10.00	013	011	10.05	0.06	0.12	10.03	0.27	0.39	10.09	0.35	0.24	10.22	0.60	0.42	0.00	0.00	0.00	10.00	0.00	0.00	10.00	0.00 0	0.00
20.	1980	0.00	0.00 0.0	~ I ^ .	~ ~	<u>~</u>	لمب	0.00	0.00	A AA	0.04	0.20	0.41	10.22	• <u>0 00</u>	0.00	10.03	0.04	0.24	10 19	0.27	0.43	10.54	0.4.1	0.64	10.48	0.28	0.371	0.20	0.00	0.00	00.00	0.00	0.00	10.00	0.00 0	0.00
21.	1981	0.00	0.00 0.0	0 0	02 0	00 0	00	0.00	0.00	0.28	10.38	0.00	0.51	10.45	0.11	033	10.03	0.02	0.22	10.24	0.07	0.25	{U.34	0.29	0.00	10.01	V.ZZ	0.30	0,10	0.00	0.00	10.00	0.00	0.00	0.00	0.00 0	0.00
22.	1982			ر ما م	~ ~	0e 0		0.00	0.00	0.07	0.20	0.05	0 27	10.55	0.19	0.03	10.02	0.06	6.74	10.06	0.16	0.35	10.35	0.47	0.46	10.60	0.16	0.46	0,00	0.00	0,14	10.04	0:00	0.00	10.00	0.00 (	0.00
23.	1983		0.00 0.0	، ما م	00 0	00 A	1	0 00	A 72	0.00	10 22	0.43	0.51	10.20	0.67	0.07	10.04	0.01	0.02	10.08	0.10	0.14	10.45	0.33	0.52	10,00	0.00	0,46	0.20	U,10	0.00	[0.00	0.00	0.00	10.00	0.00 (	0.00
24.	1984	0.00	0.00 0.0	010	00 A	00 D	nn b	0.00	0.05	0.00	00 01	0.02	0 14	10.25	035	0 44	10.05	0.02	0.16	10.15	0.27	0.32	10.1Z	0.45	0,12	10.0a	V.10	0.05	V.47	0.11	0.10	10.02	0.00	0.00	10.02	0.00	0.00
25.	1985	0.00	0.00 0.0	0 0.	00 0.	00 0	.16	0.00	0.00	0.18	0,38	0.35	0.05	0.14	0,63	0.24	0.03	0.07	0.19	10.17	0.23	0.43	10,48	0.02	0,04	10.50	0.00	0.40	0.20	0.24	0.00	10.00	0.00	0.00	+	0.00 (	_
26.	1986		0.00.00		0 0	11 0	1.0	0.00	0.05	0.70	0.40	0.21	0 42	10.05	0.55	0.26	FU 00	0.03	0.03	10.02	015	0.09	10.12	0.65	0.64	10.08	0.60	0.03	50.38	0.27	0,00	10.00	0.04	0.02		0.00 (	
27.	1987	0.00			~ ~	~~ ~	00	0.14	0.00	0.00	0.04	0 47	0.14	60.14	035	0.03	10.06	0.02	0.02	0.24	0.25	0.43	0.00	0.59	0.64	0.68	0.60	0.01	0.11	0.00	0.08	0.00	0.00	0.00	0.00	0.00 0	0.03
28.	1988				AA ' A		00	0.00	A 64	0 0 0	0.22	A 20	0.25	10 40	ባልነ	0 56	10.04	0.03	ា ាទ	1074	0.27	0.35	10.54	0.0	0.57	10.08	0.32	0.33	10.03	0.27	0,09	10.00	0.00	0.00	10.00	0.00	0.00
29.	1989	0.00		~ I o .	0 0		00	0.00	0 12	A 70	10.40	0 47	0.45	1033	0.11	0.46	10.00	0.07	0.00	10.00	0 16	0.00	10.41	0.55	0.32	10.08	V.32	0.33	0.00	0,01	0.10	10.00	0.04	0.00	10.00	0.02 1	0.00
30.	1990		0.04 0.0	5 0.	07 0.	00 0	.16	0.07	0 72	0 12	10.00	0.00	0.11	10 59	035	077	10.06	0.07	. (11.19)	10.24	0.02	0.45	10.33	0.02	0.33	10.40	0.24	0,40	0.30	0.29	0.11	10.00	0.00	0.00	10.00	0.00	v.v.
31.	1991	0.04	0.01. 0.0	6 0	07 0	<u> </u>	14	0.07	0 22	0.22	10.00	0.00	031	10.59	035	0.27	10.06	0.07	. 0 18	0.24	0.02	0.43	10.33	0.63	0.55	10.48	0.34	0,40	0.30	0.24	0.11	10.00	0.00	0.00	10.00	0,00 0	0.04
32.		0:04	0.04 0.0	0 0.	04 0.	.00 0	.18	0.18	0.20	0.23	0.00	0.00	0.49	0.61	0.63	0,55	0.02	0.02	0.14	0.24	0.27	0.43	0.54	0.65	0.64	10.68	0.56	0.42	0.00	0.00	0.00	0.04	0.00	0.02	0.00	0.00 (	0.00
33.	1993	0.00	0.04 0.0	~ I ~ .	07 0	A4 0	001	0 00	0.00	0.00	0.00	0 27	0 27	0 41	0.63	047	10.01	0.06	0.12	1024	0.27	0.34	10.07	0.63	0.50	{0.34	0.42	0.40	10.00	0.27	0.13	10.00	0.00	0,00	10.00	0.00 0	0.00
34.	1004	0 00	A 00 A 0	0 0	<u>^</u>	00 0	00.1	0 16	0.23	0.23	0.00	0.22	0 4 9	10.22	0.65	0.60	10.05	0.05	0.20	10.01	0.21	0.12	10.52	0.65	V.04	10.00	0.09	0.46	0.22	0.27	0.00	10.00	0.00	0.02	10.02	0.00	0.00
35.			A AA . A /		~ ~	<u> </u>	00	0.00	A 19	0.00	A 28	0 22	0.00	En na	037	0 42	10.02	0.05	0.16	1020	0.01	0.00	10.19	0.25	0.12	10.12	0.58	0.00	10.38	0.27	V, 10	10.00	0.00	0.00	10.00	0,00 1	0.00
36.	1996	0.00	0.00 0.0	0 0	00 0.	00 0	.00	0.18	0.00	0.00	0.00	0.00	0.55	0.47	0.02	0.00	0.06	0.02	0.14	0.24	0.20	0.43	0.08	0.65	0.33	0.22	0.00	0.00	0.13	0.06	0.01	0.04	0.00	0.00	10,00	0.00	0.00
		1 .		- 1													1			1			L			{			1			;			1 · ·		
	Average	10.01	0.01 0.	01 0	.02 0	0.02 (	0.06	0,04	0.08	0.09	0.16	0.16	0.30	0,34	0.36	0.26	0.03	0.04	0.14	0.14	0.17	0.28	0.32	0.50	0.44	0.42	0.41	0.30	0.20	0.12	2 0.05	0.01	0.01	0.00	1 0.00	0.00	0.01

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### Table I.3 Gross Unit Water Requirements (2/6)

#### II. Cropping Pattern in Climatic Region 2 (at present) (using Data at Bitola Meteo. Station)

		·									r							<del></del>									C			Oat			Nov.			nit: lit Dec.	
No.	Year		Jan.			Feb.			Mar.			Apr.			May			Jun.			Jul.		<u> </u>	Aug.		<u> </u>	Sep.			Oct.		l,					
÷		1	2	3	1	2	3.	1	2	3	<u>i</u>	2	3	1	2	3	1	2	3	1	2	3	1.	2	3	<u> </u>	2	3	1	2	3		2	3	<u>↓ · ·</u>	2	3
																			A 40	0.77	0.46	0.00	0 71	0.00	0.00	0.00	0.71	0 72	0.27	0 37	0.00	0.00	0.00	0.03	0.00	0.00	0.00
1.	1961	0.00	0.00	0.00	0.00	0.11	0.18	0.00	0.27	0,16	0.19	0.59	0.45	0.27	0.38	0.59	0.14	0.08	0.40	0.27	0.40	0.33	0.71	0.00	0.00	0.03	0.21	0.75	0.57	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.	1962	0.00	0.00	0.00	0.00	0.00	0,00	0.00	. 0,00	0.09	0.02	0.26	0.69	0.59	0.84	0.75	0.12	0.00	0.37	0.35	0.42	0.00	0.77	0.71	0.00	0.73	0.63	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.	1963	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.38	0.59	0.03	0.67	0.00	0.28	0.08	0.12	0.47	0.17	0.52	0.30	0.71	0.02	0.75	0.14	0.65	0.14	0.20	0.13	0.00	0.00	0.00	0.03	0.00	0.00	0.00
4	1964	0.00	0.03	0.00	0.05	0.00	0.10	0.00	0.11	0:20	0.34	0.55	0.47	0.35	0.18	0.00	0.15	0.10	0.10	0.44	0.37	0.17	0.37	0.54	0.04	0.10	0.03	0.31	0.20	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.		<u> </u>	0.00	0,00	0.00	0.00	0.00	0.11	0.27	0.03	0.44	0.13	0.67	0.31	0.70	0.62	0.15	0.14	0.40	0.50	0.52	0.50	0.77	0.01	0.75	0.91	0.85	0.73	0.00	0.23	0.25	0.00	0.00	0.00	0.00	0.00	0.00
б.		0.00	0.00	0.00	0.08	0.00	0.12	0.00	0.08	0.13	0.42	0.43	0.41	0.18	0.82	0.08	0.00	0.14	0.47	0.35	0.20	0.33	0.77	0.07	0.75	0.60	0.35	0.71	0.45	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.	1967	0.00	0.00	0.04	0.00	0.06	0.18	0.16	0.00	0.13	0.30	0,49	0.27	0.73	0,22	0.00	0.13	0.13	0.10	0.09	0.05	0.20	0.77	0.72	0.75	0.00	0.75	0.52	0.55	0.34	0.00	0.00	0.00	0.02	0.00	0.00	0.00
8.	1968	0.00	0.00	0.00	0.00	0.00	0.06	0.13	80.0	0.23	0.49	0.29	0,09	0.77	0.18	0.17	0.05	0.00	0.31	0.50	0,52	0.30	0.00	0.70	0.35	0.02	0.75	0.52	0.55	0.37	0.02	0.00	0.00	0.00	0.00	0.00	0.00
9.	1969	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.42	0.00	0.35	0.77	0.00	0.75	0.12	0,10	0.40	0.44	0.30	0.55	0.50	0.97	0.94	0.05	0.92	0.73	0.00	0.05	0.20	0.00	0.00	0.00	0.00	0.03	0.00
10.			0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.13	0.34	0.27	0.07	0.18	0.72	0.20	0.12	0.10	0.00	0.00	0.55	0.30	0.00	0.60	0.60	0.70	0.00	0.73	0.10	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11.	1971	0.00	0.00	0.00	0.02	0.00	0,00	0.00	0.13	0.00	0.40	0.19	0.09	0.03	0.64	0.40	0.00	0.17	0.40	0.11	0.50	0.92	0.75	0.50	0.09	0.20	0.67	0.75	0.00	0.00	0.00	0.06	0.00	0.00	0.02	0.03	0.00
12.			0,00	0.00	0.00	0.00	0.00	0.00	0,02	0.33	0.40	0.00	0.00	0.31	0.02	0,07	0.14	0.13	0.47	0.48	0.00	0.17	0.75	0.01	0.00	0.00	0.07	0.55	0.60	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
13.	1973	0.00	0.00	0,00	0.05	0.00	0.00	0.18	0.00	0.00	0.38	0.33	0.39	0.77	0.34	0.75	0.14	0.14	0.97	0.21	0.17	0.40	0.34	0.00	0.44	0.95	0.00	0.75	0.24	0.30	0.20	0.00	0.03	0.00	0.00	0.00	0.00
14.	1974	0.00	0,00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	10,40	0.14	0.41	0.24	0.08	0.31	10.13	0.04	0.37	0.50	0.31	0.00	0.34	0.00	0.82	10.6	0.00	0.75	0.24	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.01
15.			0.03	0.03	0.05	0.00	0.00	0.18	0.00	0.03	0.43	0.37	0,19	0.33	0.24	0,40	0.13	0.10	0.23	0.00	0.51	0.17	0.34	0.60	0.62	0.00	0.75	0.71	0.26	0.00	0.06	0.00	0.00	0.00	0.03	0.03	0.0
16.	1976	0,00	0.03	0.00	0.00	0.00	51,0	0.10	0.11	0.22	0.32	0.11	0.55	0.41	0.54	0.04	0.00	0.13	0.05	0.32	0.50	0.00	0.34	0.84	0.60	0.45	0.75	0.27	0.60	0.27	0.23	0.00	0.00	0.00	0.00	0.00	0.00
17.	1977	0,00	0.00	0.00	0.00	0.00	0.18	0.08	0.03	0.33	0.24	0.01	0.37	0.45	0.02	0.74	0.10	0.14	0.47	0.52	0.52	0.51	0.77	n so	0.92	0.35	0.05	0.41	0.60	0.34	0.00	0.06	0.05	0.00	0.00	0.00	0.00
18.	1978	0.00	0.00	0.00	0.00	0.02	0.12	0,03	0.00	0.00	0.00	0.41	0.55	0.43	0,40	0.35	0.13	0.16	0.47	0.30	0.50	0.56	0.75	0.00	0.00	0.30	0.00	0.73	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
19.	1979	0.00	0.00	0.00	0.00	0.00	0.18	0.10	0.08	0.22	0.00	0.11	0.37	0.10	0.00	0.40	0.15	0.10	0.51	0.30	0.52	0.56	0.77	0.61	0.55	0.50	0.83	0.46	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20.	1980		0.00	0.00	0,00	0.00	0.18	0.05	0.00	0.00	0.15	0.43	0.57	0.35	0.19	0.51	0.10	0.15	0.47	0.40	0.07	0.30	0.77	0.38	0.00	0.30	0.60	0.73	0.02	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21.	1981	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.33	0.20	0.00	0.05	0.31	0,04	0.00	0.10	0.00	0.47	0.50	0.07	0.42	0.50	0.06	0.21	0,00	0.00	0.67	0.00	0 13	0.20	0.05	0.00	0.00	0.00	0.00	0.00
22.	1982	0.00	0.00	0.01	0.06	0.11	0.00	0.00	60.03	0.22	0.20	0.00	0.00	0.77	0.08	0.20	0.00	0,10	0.47	0.54	0,46	0.50 A ≮2	0.50	0.00	0.92	0.14	0.54	0.07	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23.	1983	0.02	0.00	0,00	0.00	0.00	0.06	0.00	0.26	0.32	0.18	0.00	0.03	0.55	0.78	0.00	0.00	0.00	0,20	0.00	0.01	0.33	0.75	0.30	0.00	10.03	0.58	0.77	0.00	0.24	0.21	0.00	0.00	0.00	0.03	0.00	0.00
24.	1984	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.10	0.15	0.32	0.21	0.31	0.71	0.80	0.71	0.14	0.14	0.20	0.40	0.32	0.40	0.02	0.50	0.12	0.55	0.53	0.72	0.00	0.20	0.00	0.00	0.00	0.00	0.03	0.00	0.00
25.	1985		0.00	0.00	0.06	0.00	0.18	0.03	0.14	0.12	0.49	0.00	0.33	0.41	0.44	0.10	0.15	0.17	0.20	0.50	0.50	0.50	0.77	0.04	0.04	0.02	0.03	0.75	0.00	0.37	0.00	0.00	0.00	0.00	0.03	0.00	0.00
26.	1986	0.00	0.00	0.00	0.08	0.11	0.18	0,00	0.00	0.25	0.49	0.49	0.01	0.00	0.42	0.24	0.00	0,10	0.20	0.22	0.15	0.29	0.15	0.04	0.00	0.55	0.00	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27.	1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.43	0,51	0.45	0.70	0.00	0.15	0.18	0.11	0.24	0.50	0.50	0.50	0.04	0.00	0.70	0.75	0.02	0.02	0.05	0.00	0.00	0.00	0.00	0.00		
28.	1988	0.00	0.02	0.00	0.00	0.06	0,00	0,00	0.11	0.04	0.40	0,45	0.51	0.75	0,84	0.55	0.12	0.10	0.23	0.50	0.52	0.47	0.75	0.00	0.00	10.03	0.00	0,37	0.05	0.57	0.10	0.00	0.00	0.00	0.00	0.00	0.00
29.	1989	0.02	<b>0</b> .03	0,04	0.08	0.00	0.00	0.00	0.24	0.09	0.49	0.31	0.49	0.19	0,50	0.19	0.08	0,12	0.35	0.02	0.48	0.00	0.77	0,82	0.07	0.02	0.58	0,39	0.00	0.00	0.20	0.00	0.05	0.00	0.00	0.00	0.00
30.	1990		0.00	0.04	0.06	0.00	0.00	0.13	0.27	0.19	0.19	0.27	0.53	0.73	0.54	0.42	10.15	0.15	0.45	0.50	0.52	0.13	0.58	0.09	0.40	0.02	0.25	0.04	0.00	0.37	0.02	0.00	0.00	0.00	0.00	0.00	0.00
31.	1991	0.00	0.00	0.00	0.00	0.00	0.00	0,18	0.06	0.23	0.00	0.02	0.35	0.69	0.30	0.35		0.17	0.47	0.32	0.23	0.23	0.08	0.07	0.00	0.93	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32.	1992		0.03	0.00	0.02	0.03	0,18	0.21	0.03	0.04	0.00	0.00	0.69	0.77	0,48	0.29	0.10	0.00	0.13	0.52	0.40	0.41	10.11	0.09	0.00	0.72	0.79	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	- 0.00
33.	1993	0.00	0.03	0.00	0.08	0.00	0.00	0.00	0.27	0.16	0.32	0.59	0.07	0.43	0.44	0.53	0.03	0.10	0.47	0.58	0.52	0,00	0.93	0.00	0.00	0.70	0.75	0.72	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	- 0.00
34.	1994	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.27	0,26	0.05	0.55	0.00	0.55	0.78	0.75	0,12	0.13	0.47	0.28	0.33	0.33	0.57	0.00	0.01	0.95	0.73	0.75	0.00	0.37	0.00	0.00	0.00	0.00	0.03	0.00	0.00
35.	1995	0.00	0.00	0.00	0.08	0.00	0.18	0.06	0,13	0,13	0.50	0.41	0.33	0.10	0.74	0.22	0.12	0.14	0.47	0.03	0.10	0.47	0.30	0.00	0.71	0.20	0.73	0.00	0.00	0.00	0.00	0.06	0.00	0.00	10.00	0.00	0.00
36.	1996	0.00	0.03	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0,40	0.22	Q.67	0.73	0.06	0.39	0.14	0.13	. V,4/	0.50	0.47	0.23	0.59	0,00	0.27	0.00	0.20	0.00	0,39	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
		J	0.01		<b></b>			ļ									1						100			1 0 00	0.64	0.62	0.07	0.00	0.07	10.00	0.01	0.01	0.01	0.00	0.00

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### Table I.3 Gross Unit Water Requirements (3/6)

# IIIa. Cropping Pattern in Climatic Region 3 excluding Bregalnica System (at present) (using Data at Shtip Meteo. Station)

(Unit: lit/s/ha)

							· · ·	,			·																See.			O <sub>n</sub> t		<u> </u>	Nov.		<u> </u>	Dec.	
No.	Year		Jan.			Feb.			Mar.			Apr.			May			Jun.			Jul.			Aug.		<u> </u>	Sep.	the second day of the second d		Oct.		ļ			<u> </u>		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	. 3	1	2	3	1	2	3	<u> </u>	2	3	<u> </u>	2	د
١.	1961	0.00	0.00	0.00	0.00	0.10	0.16	0.11	0.23	0.12	0.31	0.56	0.37	0.33	0.35	0.19	0.17	0.28	0.44	0:49	0.65	0.68	0.79	0.91	0.85	0.83	0.74	0.70	0.37	0.30	0.14	0.00	0.00	0.04	0.00	0.00	0.0
2	1962	0.00	0.00	0.00	0.00	0.09	0.00	00.00	0.00	0.12	0.23	0.11	0.65	1039	0.73	0.70	0.21	0.00	0.39	0:56	0.65	0.50	10.81	0.58	0,85	0.71	0.80	0,52	0.57	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.0
3.	1963	0.00	0.00	0.00	0.00	0.00	0.00	10.17	0.22	0.00	0.25	0.56	0.19	071	0.37	0.17	i 0.19	0.20	0.59	i 0.49	0.57	0.48	10.65	0.91	0,80	10.67	0.80	0.50	0.33	0.00	0.00	10,00	0.01	U.U4	0.00	0.00	0.0
з. 4	1964		0.04	0.00	0.07	0.06	0.07	10.00	0.18	0.26	0.29	0.56	0.07	0 67	0.39	0.10	10.28	0.19	0.57	0.58	0.06	0.50	0.69	0.80	0.67	0.29	0.68	0.24	0.00	0.07	0.02	10.00	0.00	0.04	10.00	0.00	0.0
5.	1965		0.00	0.00	0.00	0.00	0.03	0.10	0.23	0.16	0.37	0.18	0.45	0.11	0.73	0,21	0.25	0,13	0.57	0.52	0.00	0.68	0,83	0.00	0.72	0.81	0.80	-0.70	0.57	0.30	0.17	0.00	0.00	0.00	0.00	0.00	0.
6.	1966	0.00	0.00	0.00	0.07	0.00	013	0.01	0 14	013	0.35	0.38	0.45	0.47	0.71	0.54	0.00	0.25	0.61	0,60	0.61	0.66	0.79	0.90	0,85	0.67	0.52	0.65	0.45	0.07	0.00	0.00	0.00			0.00	
7.	1967		0.00	0.04	0.07	0.10	0.10	0.18	0.01	0.24	0.38	0.30	0.22	0.57	0,41	0.32	0.18	0.22	0.30	0.13	0.00	0.38	0.73	0.60	0,85	0.75	0.40	0.66	0.45	0.30	0.06	0.01	0.00			0.00	
8.	1968	0.00	0.00	0.00	0.04	0.00	0.00	0.17	0.17	0.21	035	0.22	0.65	071	0.06	0.00	10.13	0.08	0.20	0.62	0.65	0.66	10.57	0.76	0,23	J 0,81	0.78	0,46	0.53	0.30	0.05	10,00	0.00	0.00	0.00	0.00	0.
9.	1969	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.03	0.35	0.07	0.57	0.71	0.75	0,74	0.12	0.29	0.55	0.54	0.61	0.59	0.55	0,74	0.76	0.79	0.74	0.70	0.57	0.30	0,17	0.06	0.05	0,00	0.00	0.00	0.0
10.	1970	0.00					0.04	0,17	0.06	0.25	6.25	0.28	0.63	0.14	0.77	0.27	0.26	0.32	0.28	0.14	0.17	0.62	0.77	0,88	0.83	0.55	0,80	0.70	0.05	0,00	0.00	0.05	0.00	0,00	10.00	0.02	υ,
11.	1971	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.33	0,36	0.65	0.24	0.75	0.23	0.00	0.31	0.61	0.22	0.49	0.23	0.61	0.86	0.65	0.73	0.00	0.70	0.57	0.15	0.17	0.06	0.05	0.00	0.00	0.01	0.0
12.	1972	0.00	0.00	0.00	0.00	0.02	0.00	0.14	0,14	0.27	0.29	0,38	0.00	0.24	0.57	0.72	0.24	0.23	0.59	0,56	0.09	0.14	0.71	0.42	0,54	0.61	0.13	0.05	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.02	0.
13.	1973	0.00	0,01	0.00	0.05	0.00	0.04	0.16	0.00	0.00	0.17	0.34	0.24	0.57	0.63	0.74	0.28	0.32	0.61	0.11	0,65	0.38	0.71	0.91	0.05	0.89	0.80	0.70	0.57	0.30	0.17	0.06	0.05	0.04	0.02	0.02	0.
14,	1974	0.00	0.00	0.00	0.00	0,00	0.00	0.00	0.17	0.27	0.35	0.00	0.47	0.19	0.01	0.25	0.12	0.10	0.16	0.49	0.65	0.68	0.83	0.91	0.60	0.33	0.80	0,30	0.37	0.03	0.00	0.00	0.05	0.00	0.00	0.00	0.
15.	1975	0.00	0.04	0.03	0.07	0.00	0.15	0.18	0.02	0.13	0.38	0.54	0.47	0.22	0.31	0.54	0.28	0.05	0.00	0.04	0.51	0.57	0.25	0.82	0.82	0,83	0.56	0.70	0.35	0.00	0.00	0.00	0.00	0.00	0.02	0.00	
16.	1976	0.01	0.04	0.00	0.02	0.02	0,16	0.18	0,20	0.24	0.18	0.42	0.61	0.37	0.45	0.03	0.00	0.31	0.45	0.03	0.55	0.06	0.55	0.72	0,72	0.85	0.68	0.70	0.55	0.00	0.14	0.00	0.05	0.04	0.02	0.02	0. 0
17,	1977	0.02	0.00	0.00	0.00	0.00	0.16	0.18	0.04	0.27	0.22	0.46	0.65	0.55	0.61	0.30	0.16	0.13	0.42	0.42	0.65	0.36	0;30	0.86	0.71	0.89	0.80	0,58	0.49	0.19	0.17	0.00	0.00	0.00	0.00	0.00	0.
18.	1978	0.02	0.01	0.00	0.00	0.04	0.12	0.18	0.10	0.09	0.07	0.23	0.55	0.35	0.73	0.19	0.25	0.32	0.61	0.62	0.55	0.59	0.83	0.68	0.85	0,27	0.46	0.50	0.57	0.29	0.00	0.00	0.05	0.00	0.00	0.00 0.00	U.
19.	1979	0.02	0.00	0.00	0.00	0,05	0,16	0.18	0.17	0,14	0.00	0.32	0.51	0.45	0.17	0.66	0.28	0.19	0.30	0.32	0.61	0.46	0,79	0.20	0.42	0.49	0.78	0,70	0.41	0.19	0.08	0.00	0.00	0,00	0.02		
20.	1980	0.00	0.04	0.00	0.05	0,02						0.36	0.53	0.49	0.17	0,17	0.13	0.26	0.61	0.49	0.65	0.57	0.63	0.54	0.85	0.75	08.0	0.20	0.55	0.00	0,00	0.00	0.00	0.02	0.00	0.00	
21.	1981	0,01	0.00	0.00	0.00	0,00	0.06	0.12	0.04	0.27	0.29	0.00	0.61	0.63	0.77	0.57	0.16	0.19	0.51	0.62	0.15	0.43	0.73	0.66	0.43	0.02	0.52	0.48	0.43	0.10	0.00	0.00	0.00	0.00	0.00	0.00	
22.	1982	0.00	0.02	0.04	0.07	0.07	0.00	0.17	0,00	0.25	0.37	0.06	0.00	0.63	0.27	0.46	0.28	0.24	0:61	0.30	0.53	0.64	0,67	0.90	0,76	0.89	0.72	0,70	0.37	0.20	0,17	0.00	0.00	0.02	0.00	0.00	0. 0.
23.	1983	0.02	0.01	0.00	0.00	0.02	0,13	0.13	0.23	0.11	0.11	0,46	0.63	0.71	0.29	0.10	0.19	0.00	0.10	0.39	0,17	0.27	0.83	0.78	0.40	0.00	0.70	0.04	0.37	0.30	0,00	0.00	0.00	0.00	0.00	0.01	0. 0.
24.	1984	0.00	0.00	0.00	0.00	0.00	0,12	0.02	0,11	0.10	0.11	0.22	0.59	0.59	0.65	0.70	0.19	0.30	0,51	0.45	0.65	0.60	0.71	0.17	0.09	0.89	0.00	0.10	0.55	0.21	0.17	0.00	0.00	0.00	0.02	0,02 0.00	. D
25.	1985	0.00	0.02	0.00	0.06	0.00	0.16	0.08	0,00	0.15	0.36	0.40	0.35	0.51	0.33	0.05	0.28	0.29	0.44	0.60	0.59	0.68	0.39	0.90	0.71	0.77	0.00	0.70	0.57	0.27	0.00	0.00	0.00	0.00		0.00	
26.	1986	0.00	0,00	0.00	0.07	0.10	0,16	0.02	0.20	0.23	0.38	0.34	0.31	0.25	. 0,57	0.36	0.18	0,30	0.47	0.07	0.20	0.02	0.79	0.30	0.00	0.69	0.00	0.52	0.57	0.30	0.00	0.00	0.00	0.02			
27.	1987	0.00	0,00	0.00	0.07	0.04	0.07	0,02	0.13	0,00	0.00	0.46	0.45	0.35	0.63	0.57	0.29	0.32	0,42	0.62	0.01	0.00	0.30	0.72	0,71	0.07	0.70	0.40	0.04	0.08	0.10	0.00	0.00	0.00	0.00	0.00	, ă
28.			0.02	0.03	0.06	0.10	0.00	0.05	0.14	0.16	0.24	0.52	0.43	0.35	0.49	0.37	0.22	0.12	0.00	0.02	0.05	0.30	0.65	0.74	0.65	0.07	0.76	0.64	0.37	0.07	0.16	0.00	0.05	0.00	0.00	0.00 0.02	. 0
29.	1989	0,02	0.04	0.04	0.07	0.06	0.07	0,12	0.23	0.22	0.38	0.04	0,20	0.25	0.09	0.39	0.00	0.05	0.00	0.27	0,03	0.44	0.05	0.00	0.50	0.07	0.70	0.64	0.30	0.07	0.10	0.00	0.02	0.02	0.00		
30.	1990		0.04	0.03	0.07	0.06	0.13	0.14	0,23	0.27	0.25	0.04	0.47	0.33	0.69	0.52	0.29	0.20	0.33	0.02	0.40	0.00	0.45	0.74	0.07	0.07	0.70	0.15	0.57	0.30	0.00	10.00	0.00	0.00	0.02	0.00	- n
31.	1991		0.00	0.00	0.00	0.00	0,15	0.17	0,10	0,11	0.27	0.13	0.07	0.53	0.57	0.32	0.10	0.32	0.01	0.50	0.02	0.45	0.47	0.74	0.00	0.07	0.76	0.15	0.57	0.15	0.00	0.06	0.00	0.04	1	0.00	
32.	1992		0.04	0.04	0.07	0.10	0.16	0,18	0.20	0.09	0.00	0.00	-0.47	0.73	0.24	0.50	0.23	0.20	0.49	0.02	0.39	0,57	0.03	0.01	0.95	0.87	0.76	0.36	0.15	0.30	0.10	0.00					
33.	1993		0.04	0.00	0.07	0.06	0.00	0.08	0.23	0.00	0.29	0.52	0.33	0.01	0.39	0,32	0.28	0.23	0.03	0.02	0.37	0.39	0.75	0.21	0.00	0.00	0.70	0.70	0.53	0.00	0.00	0.02	0.00	0.04	0.02	0.00	
34.	1994	0.00	0.00	0.04	0.00	0.00	0.09	0.17	0.23	0.24	0.14	0.34	0.10	0,43	0.81	0.74	0.20	0.27	0.57	0.34	0.40	0.15	0.75	0.20	0.72	0.07	0.00	0.00	0.57	0.50	0.16	0.00	0.00	0.00	10.00	0.00	ំ
35.	1995	0.00	0.00	0.00	0.02	0.06	0.16	10.00	0.19	0.13	0.36	0.42	0.59	0.14	0.79	0.10	0.23	0.23	0.51	0.55	0.01	0.13	0.31	0.00	0.02	0.67	0.10	0.20	0.52	0.30	0.15	0.06	0.00	0.00	10.00	0.00	
36,	1996	0.00	0.04											1					· · ·	1			1			1		0.20	ŀ			1					
	Average	0.01	0.01	0.01	0.03	0.03	0.05	0 11	013	0.15	0.25	0.31	0.42	0.45	0.52	0.39	0.20	0.22	0.45	0.43	0.45	0.48	0.67	0.73	0.66	0.69	0,66	0.52	0.43	0.18	0,08	0.03	0.01	0.01	0.01	0.01	, 0

### Table I.3 Gross Unit Water Requirements (4/6)

### IIIb. Cropping Pattern in Bregarnica System in Climatic Region 3 (at present) (using Data at Shtip Meteo. Station)

	(using	Dat	a ai	SIIU	ih w	ICICI	J. 131		п,				÷ .					÷																	(Ur	nit: lit/s	√ha)
No.	Year		Jan.			Feb.			Mar.			Apr.			May			Jun.	1.		Jul.			Aug.			Sep.	:		Oct.			Nov.			Dec.	
110.		$\vdash_{1}$	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
	· · · · ·				<u> </u>			t			<u> </u>																										
1.	1961	0.00	0.00	0.00	0.00	0.08	0.14	0.09	0.19	0.10	0.54	0.78	0.59	0.43	0.45	0.30	0.35	0,49	0.61	0.67	0.82	0.81	0.93	1.03	0.95	0.93	0.84	0.79	0.33	0.30	0.12	0.00	0.00	0.03	0.00	0,00	0.00
2.	1962	0.02	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.10	0.44	0.31	0,87	0.49	0.83	0.81	0.40	0.14	0.56	0.74	0.82	0.64	0.95	0.69	0.95	0.81	0.90	0.61	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.	1963	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.18	0.00	0,47	0.78	0.40	0,81	0.47	0.28	0.37	0.39	0.76	0.67	0.74	0.62	0.79	ì.03	0,89	0.77	0.90	0.59	0.30	0.00	0.00	0.05	0.01	0.03	0.00	0.00	0.00
4.	1964	0.02	0.03	0.00	0.06	0.05	0.06	0.00	0.15	0.22	0.52	0,78	0.27	0.77	·0.49	0,19	0,49	0.38	0.74	0.76	0.23	0.64	0.83	0.91	0.77	0.39	0.78	0.33	0.00	0.07	0.02	0.00	0,00	0.03	0.00	0.00	0.00
5.	1965	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.19	0.14	0.62	0.39	0.67	0.19	0.83	0.32	0,45	0.31	0.74	0.70	0.14	0,81	0.97	0.09	0.82	0.91	0.90	0.79	0.50	0.30	0.15	0.00	0.00	0.00	0.00	0.00	0.00
6.	1966	0.00	0.00	0.00	0.06	0.00	0.11	0.01	0.12	0.11	0,58	0.60	0.67	0.57	0,81	0.64	0.11	0.46	0.78	0.78	0.78	0.80	0.93	1.01	0.95	0.77	0.62	0.75	0.40	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.	1967	0.00	0.00	0.04	0.06	0.08	0.09	0.15	0.01	0.20	0.63	0.52	0.43	0.67	0.51	0.43	0.36	0.42	0.48	0.30	0.15	0.52	0.87	0.71	0.95	0.85	0.50	0.75	0,40	0,30	0.06	0.01	0.00	0.00	0.00	0.00	0.00
8.	1968	0.00	0.00	0.00	0.03	0.00	0.07	0.14	0,14	0.17	0.58	0.43	0.87	0,81	0.14	0.08	0.30	0.24	0.38	0.80	0.82	0.80	0.71	0,87	0.33	0.91	0.88	0.55	0.46	0.30	0.05	0.00	0,00	0.00	0.00	0.00	0.00
9.	1969		0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.03	0.58	0.27	0.79	0.81	0,85	0,84	0.28	0.51	0.72	0.72	0.78	0.72	0.69	0.85	0.86	0.89	0.84	0.79	0.50	0.30	0.15	0.05	0.04	0.00	0.00	0.00	0.00
10.	1970	0.00	0.00	0.00	0.00	0.00	0.04	0.14	0.05	0.21	0.47	0.59	0.85	0.23	0.87	0.37	0.46	0.54	0.46	0,32	0.34	0.76	0.91	0.99	0.93	0.65	0.90	0.79	0.04	0.00	0.00	0.04	0.00	0.00	10.00	0.02	0.00
- H,	1971	0.00	0.01	0.00	0.00	0,01	0.00	0.00	0.01	0.00	0.57	0.58	0.87	0.34	0.85	0.34	0,10	0.53	0.78	0.40	0.67	0.36	0.75	0.97	0.75	0.83	0.03	0,79	0.50	0,14	0.15	0.05	0.04	0.00	0.00	0.01	0.01
12.	1972	0.00	0.00	0.00	0.00	0.02	0.00	0.12	0.12	0.23	0.52	0.60	0.18	0.34	0.67	0.83	0.44	0,43	0.76	0.74	0.26	0.28	0.85	0.53	0.64	0.71	0.21	0.13	0.00	0.00	0.01	0.05	0.00	0.00	0.01	0.02	0.02
13.	1973	0.00	0.01	0.00	0.04	0.00	0.04	0.13	0.00	0.00	0.37	0.56	0.45	0.67	0.73	0,84	0.49	0.54	0.78	0.28	0.82	0.52	0.85	1.03	0.12	0.99	0.90	0.79	0.50	0.30	0.15	0.05	0.04	0,03	0.02	0.02	0.02 :
14.	1974	•		0.00	0.00	0.00	0,00	0,00	0.14	0.23	0.58	0.19	0.69	0.28	0.09	0.35	0.28	0.27	0.33	0.67	0.82	0.81	0,97	1.03	0.69	0.43	0.90	0.39	0.33	0.03	0.00	0.00	0.04	0.00	0.00	0.00	0.00
15.	1975	0.00	0.03	0.03	0.06	0,00	0.12	0.15	0.02	0.11	0.63	0.76	0.69	0.31	0.42	0.64	0.48	0.21	0,12	0.19	0.68	0.71	0.38	0.93	0.91	0.93	0.65	0.79	0.31	0.00	0.00	0.05	0.00			0.00	
16.	1976	0.01	0.03	0.00	0.02	0.02	0.14	0.15	0,17	0.20	0.39	0.64	0.83	0,47	0.55	0.12	0.12	0.53	0.03	0,18	0.72	0.20	0.09	0.03	0.02	0.95	0,78	0.79	0,40	0.00	0.12	0.05	0.04			0.02	
17.	1977	0.02	0.00	0.00	0.00	0,00	0,14	0.15	0.03	0.23	0.43	0.68	0.87	0.65	0,71	0,41	0.34	0.31	0.39	0.00	0.82	0,30	0.44	0.97	0.80	0.99	0,90	0.07	10.45	0.10	0.15	0.05	0.00	0,00	0.00	0.00 0.00	0.01
18.	1978	0.02	0.01	0.00	0,00	0.03	0.10	0.15	0.08	0,07	0.27	0.44	0.17	0.45	0.83	0.30	0.45	0.34	0.78	0,80	0.72	0.72	0.97	0.79	0.95	0.57	0,00	0.39	0.50	0,29	0.00	0.05	0.04	0.00	0.00	0.00	0.00
19.	1979	0.02	0.00	0.00	0.00	0.04	0.14	0.15	0.14	0.12	0.12	0,54	0.75	0.55	0.20	0.77	0,49	0.30	0.40	0.50	0.70	0.00	0.55	0.52	0.01	0.35	0.00	0.72	0.30	0.10	0.07	0.00	0.00	0.00	0.02	0.00	0.00
20.	1980	0.00	0.03	0.00	0.04	0.02	0.14	10.10	0.10	0.03	0.50	0.56	0.75	0.39	0.20	0.20	0.30	0.47	0.70	0.07	0.02	0.57	0.97	0.05	0.53	0.05	0.50	0.27	0.70	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
21.	1981	0.01	0.00	0.00	0.00	0,00	0.05	0.10	0.03	0.23	0.52	0.10	0.02	10.75	0.07	0.00	0.34	0.30	0.00	0.00	0.33	0.78	0.07	1.01	0.35	0.10	0.02	0.70	0.30	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.	1982	0.00	0.02	0.04	0.00	0,00	0.00	0.14	0.00	0.21	0.02	0.20	0.10	0.75	0.30	0.37	0.42	0.07	0.70	0.56	0.70	0.70	0.01	0.80	0.00	0.07	0.86	0.73	0.50	0.30	0.00	0.00	0.00	0.02	0.00	0.01	0.00
23.	1983	0.02	0.01	0.00	0.00	0.02	0.11	0.11	0.19	0.09	0.31	0.08	0.00	0.61	0.40	0,15	0.37	0.02	0.68	0.63	0.87	0.74	0.85	0.28	0.78	0.00	0.76	0.23	0.48	0.21	0.15	0.05	0.00	0.00	0.02	0.02	0.00
24. 25.	1984 1985	0.00	0.00	0.00	0.00	0.00	0.10	0.02	0.09	0.00	0.60	0.45	0.57	0.05	0.75	0.15	0.48	0.50	0.61	0.05	0.76	0.81	0.73	1.01	0.80	0.87	0.90	0.79	0.50	0.29	0.00	0.00	0.00	0.00	0.02	0.00	0.00
26.	1985		0.02	0.00	0.05	0.00	0.14	0.07	0.00	0.19	0.63	0.56	0.51	0.35	0.67	0.46	0.36	0.52	0.65	0.23	0.37	0.76	0.93	0.67	0.95	0.99	0.90	0.61	0.50	0.30	0.00	0.00	0.04	0.02	0.02	0.00	0.00
20.	1987	0.00	0.00	0.00	0.00	0.00	0.06	0.02	0.11	0.00	0.18	0.68	0.67	0.45	0.73	0.68	0.50	0.54	0.59	0.80	0.78	0.81	0.44	0.83	0.80	0.99	0.80	0.55	0.03	0.08	0.14	0.05	0.00	0.00	0.00	0.00	0.02
27.	1988	0.00	0.00	0.00	0.00	0.05	0.00	0.02	0.17	0.00	0.46	0.74	0.67	0.65	0.59	0.68	0.41	0.30	0.68	0.80	0.82	0.52	0.97	0.83	0.95	0.97	0.86	0.73	0.28	0.30	0.14	0.00	0.00	0.00	0.00	0.00	0.00
29.	1989	0.02		0.03	0.05	0.05	0.06	0.04	0.12	0.14	0.63	0.23	0.41	0.35	0.79	0.50	0.21	0.21	0.07	0.45	0.82	0.38	0.83	0.71	0.68	0.97	0.86	0.73	0.33	0.07	0.14	0.00	0.04	0.00	0.00	0.02	0.00
30.	1990	0.02		0.04	0.06	0.05	0.00	0.12	0.19	0.23	0.47	0.23	0.69	0.63	0.79	0.63	0.50	0.47	0.70	0.80	0.65	0.80	0.59	1.03	0.77	0.99	0.88	0.79	0.35	0.30	0.01	0.00	0.02	0.02	0.00	0.00	0.00
31.	1991	0.01	0.00	0.00	0.00	0.00	0.12	0.14	0.08	0.09	0.49	0.34	0.27	0.63	0.67	0.43	0.33	0.54	0.78	0.48	0.18	0.57	0.63	0.85	0,93	0.99	0.88	0.23	0.50	0.21	0.00	0.00	0.00	0.00	0.02	0.02	0.00
32.	1992	0.02		0.04	0.06	0.08	0.14	0.15	0.17	0.07	0.17	0.12	0.69	0.83	0.34	0.61	0.42	0.39	0.66	0.80	0.76	0.71	0.97	1.03	0.80	0.97	0.86	0.45	0.46	0.14	0.11	0.05	0.00	0.03	0.00	0.00	0.00
33.	1993	0.00	0.03	0.00	0.06	0.05	0.00	0.07	0.19	0.00	0.52	0.74	0.77	0.71	0.69	0.63	0.48	0.43	0,70	0.80	0.74	0.72	0.93	1.03	0,95	0.93	0.86	0.79	0.14	0.30	0.08	0.00	0.00	0.00	0.00	0.00	0.00
34.	1994	0.00	0.00	0.04	0.00	0.00	0.07	0.14	0.19	0.20	0.35	0.76	0.36	0.53	0,91	0.84	0.39	0.48	0.54	0.72	0.63	0.29	0.89	1.01	0.82	0.99	0.70	0.77	0.46	0.30	0.00	0.02	0.00	0.03	0.02	0.00	0.00
35.	1995	0.00	0.00	0.00	0.02	0.05	0.14	0.00	0.16	0.11	0.60	0.64	0.61	0.23	0.89	0.52	0.45	0.43	0.68	0.51	0.16	0.29	0.65	0,97	0.09	0.37	0,86	0.23	0.50	0.30	0.14	0.00	0.00	0.00	0.00	0.00	0.00
36.	1996	0.00	0.03	0,00	0.00	0,00	0,00	0.13	0.06	0,06	0.27	0.66	0.87	0.55	0.61	0.19	0.49	0.50	0.78	0.80	0.50	0.36	0.91	1.01	0.33	0.77	0,17	0.29	0.46	0.17	0.13	0.05	0.00	0.00	0.00	0.02	0.00
		1									i			1			1						i i			1						}					
	Average	0.01	0.01	0.01	0.03	0.03	0.07	0.09	0.11	0.13	0.47	0.52	0,64	0.55	0.62	0.49	0.38	0.41	0.61	0.61	0.61	0.61	0.81	0.84	0.75	0.79	0.76	0.61	0.38	0.18	0.07	0.02	0.01	0,01	0,01	0.01	0.00

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### Table I.3 Gross Unit Water Requirements (5/6)

# IV. Cropping Pattern in Climatic Region 4 (at present) (using Data at Berovo Meteo. Station)

(Unit: lit/s/ha)

<u></u>	Vaan		Jan.	<b>T</b>	E	eb.		· · · · ·	Mar.			Apr.			May			Jun.			Jul.			Aug.			Sep.			Oct.			Nov.			Dec.	<u> </u>
No.	Year					2	- 1	1	7	3		2	- 1		2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
<u> </u>			2 3	_	<u>.</u>						<u> '</u>			<u>                                      </u>								_															
		c	0.00 0.0	. I		<b>01</b>	0.02	0.02	0.02	0.00	0.04	0 17	n in	0.01	0.03	0.04	0.17	0.21	0.57	0.61	0,74	0.70	0.75	0.73	0.63	0.57	0.51	0.43	0.02	0,03	0.01	0.00	0.00	0.00	0.00	0.00 (	0.00
1.					00 U. NA A	.01 00 .	0.02	0.02	~ ~ ~	0 00	0 00	A A 1	0 22	10.00	0.31	0.07	11111	0.072	- 11 K.K.	111 34	11.49	11 n / -	10.75	U.3.3	- <b>U.OI</b> - I	10.22	0.55	0.214	0.02	0.00	0.00	0.00	0.00	v.vv			****
2.	1962		0.00 0.0			~~	a 00 /	0.01	0.01	0.00	0.00	A 32	0.10	10.20	0.02	0.00	1 n n n	0.03	0.56	1040	0 74	1111	10.51	0.67	0.01	0.33	0.55	0.02	0.02	0,02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.	1963		0.00 0.0	ر م ا م	~ ~	0.0	0.00	0.00	0.01	0.01	0.02	0.23	0.03	10.22	0.01	0.00	i∩ 39	0.00	0.23	0.69	0.72	0.27	10.39	0.53	0.58	0.07	0.45	0.011	0.02	0,00	0.00	0.00	0.00	0.00	0.00	0.00 (	0.00
4.	1964			0   0.1	00 0.	.00	0.00	0.00	0.01	0.01	0.02	0.25	0.05	0.22	0.01	0.00	0.5	0.00	0.48	0.21	0.39	0.70	0.75	0.00	0.45	0.55	0.55	0.43	0.05	0.03	0.02	0,00	0.00	0.00	0.00	0.00 (	0.00
5.	1965		0.00 0.0	0 0.0	00 0.	.00	0.00	0.00	0.03	0.03	0.03	0.00	0.14	0.00	0.35	0.01	0.00	0.43	0.50	0.61	0.74	0.65	0.45	0.69	0.63	0.53	0.39	0.39	0.04	0.03	0,00	0.00	0,00	0.00	0.00	0.00 (	0.00
6.	1966	0.00	0.00 0.0					0.00		0.02	0.00	0.00	0.01	1010	0.25	0 12	1017	0.16	D 48	10.56	0.04	0.50	112.57	0.39	0.12	10.35	0.13	0.43	0.05	0,05	0.00	0.00	0.00	A'00		0.00 (	
7.			0.00 0.0	0   0.0	00 0.	.01	0.00	0.01	0.00	0.03	0.02	0.02	0.01	0.10	0.25	0.15	0.17	0.10	0.40	0.75	0.76	0.67	0.39	0.37	0.19	0.35	0.25	0.35	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00 (	0.00
8.	1968	0.60	0.00 0.0	0   0.0	01 0.	.00	0.00	0,00	0.01	0.03	0,04	0.19	0.28	0.38	0.00	0.00	0.19	0.00	0.25	0.75	0.70	0.67	0.57	0.41	0.56	0.23	0.49	0.41	0.05	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
9.	1969	0.00	0.00 0.0	0 0.0	00 0.	.00	0.00	0.00	0.02	0.00	0.02	0.01	0.12	0.20	0.21	0.46	0.19	0.39	0.52	0.46	0.47	0.65	0.23	0.73	0.61	0.33	0.31	0.43	0.01	0.00	0.00	0.00	0.00	0,00	0.00	0.00	0,00
10.	1970					.00	0.01	0.00	0.00	0.01	0.01	0.01	0.12	0.00	0.33	0.00	0.41	0.51	0.01	0.50	0.00	0.59	0.33	0.37	0.59	0.43	0.00	0.43	0.04	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
11.	1971	0.00	0.00 0.0	0 0.0	00 0.	.00	0,00	0.00	0.00	0.00	0.03	0.05	0.30	0.04	0.42	0.00	0.00	0.39	0.09	0.65	0.04	0.25	0.63	0.35	0.25	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
12.				0   0.	00 . 0.	.00	0.00	0.01	0.01	0.03	0.03	0.01	0.03	0.01	0.29	0.44	0.07	0.17	0.61	0.00	0.13	0.20	0.51	0.73	0.01	0.63	0.55	0.43	0.05	0.03	0.02	0.01	0.00	0,00	0.00	0,00	0.00
13.	1973	0:00	0.00 0.0	0 0.4	01 Q.	.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.20	0.02	0.94	0.40	0.31	0.05	0.00	0.76	0.45	0.71	0.73	0.19	0.55	0.55	0.29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.	1974	0.00	0.00 0.0	0 0.	00 0.	.00	0.00	0.00	0.01	0.03	0.03	9.00	0,18	0.02	0.01	0.19	0.01	0.00	0.03	0.00	0.07	0.56	0.33	0.51	0.58	0.25	0.49	0.33	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
15	1975	0.00	0.01 0.0	0 0.	<u>01 0.</u>	.00	0.01	0.02	0.00	0.00	0.02	0.09	0.00	0.01	0.01	0.40	0.55	0.10	0.05	0.05	0.54	0.00	0.33	0.21	0.38	0.21	0.41	0.27	0.05	0.00	0.00	0.01	0.00	0.00	<u> </u>	0.00	
16.	1976	0.00	0,01 0.0	0 0.	01 0.	.00	0.02	0.02	0.02	0.01	0,00	0.02	0.00	0.02	0.09	0.00	0.00	0.41	0.40	0.11	0.34	0.00	0.33	0.25	0.50	0.63	0.51	0.07	0.04	0.03	0.02	0.00	0.00	0.00	1	0.00	
17.	1977	0.00	0.00 0.0	0 0.	00 0.	.00	0.02	0.01	0,00	0.03	0.03	0,03	0.30	0,20	0.25	0.01	0.07	0.50	0.50	0.25	0.76	0.10	0.75	0.00	0.63	0.00	0.01	0.03	0.04	0.03							
18,	1978	0.00	0.00 0.0	0 0.	00 0.			0.02	0.00	0,00	0.00	0,00	0.10	0.03	0,02	0.00	0.00	0.00	0.71	0.75	0.02	0.07	0.75	0.07	0.05	0.01	0.53	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.0
19.	1979	0.00	0.00 0.0	0 0.	00 0.	.00	0.02	0.02	0,00	0.01	0.00	0.03	0.14	0,12	0.02	0,06	0.41	0.57	0.50	0.38	0.62	0.52	0.75	0.00	0.00	0.07	0.55	0.45	0.00	0.02	0,00	0.00	0.00	0.00		0.00	
20.	1980	0.00	0.00 0.0	0 0.	01 0.	.00	0.02	0.00	0.01	0.01	0.02	0.07	0.00	0.01	0.00	0,04	0.00	0,32	0.50	0.20	0.60	0.39	0.75	0.35	0.50	0.41	0.33	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00		
21.	1981	0.00	0.00 0.0	0 0.	00 0.	.00	0.00	0.01	0.00	0,03	0.04	0.02	0.22	0.01	0.33	0.24	0.46	0.21	0.05	0.54	0.52	0.11	0.73	0,45	0.10	0.00	0.51	0.02	0.05	0.01	0.00	0.00	0.00				
22.	1982	0.00	0.00 0.0	1 0.	00 0.	.01	0.00	0.02	0.00	0.03	0.04	0.00	0.00	0,18	0.09	0,00	0.48	0.14	0.71	0:50	0.62	0.39	0.00	0.65	0.39	0.39	0.05	0.41	0.02	0.02	0.02	0.00					
23.	1983																																0.00	0.00	0.00	0.00	
24.	1984	0.00			AA A	~~	~ ~ ~	1000	0 0 0	0.00	0.02	0.07	A 19	10.24	0.03	0.33	10.16	0.50	0.67	10.54	11.76	0.58	10.45	0.00	0.20	10.05	0.47	0.05	10.04	0.05	0.02	10.01	0.00	0.00	10.00	0.00	0.0
25.	1985			~ I ^ .	A* A	00	0.02	0.01	0 00	0.01	0 04	0.03	0.03	10 18	0.07	0.03	10.00	0.32	0.54	10.71	0.20	0.70	10.35	0.71	0.10	10.47	Q.49	0.40	10.00	0.05	0.01	0.00	0.00	0.00	10.00	0.00	
26.	1986	0.00		A A.	A1 A	01	0.00	0.00	0.00	0.02	0.04	0.01	0.20	10.01	0.01	0.12	1035	035	0.71	10.29	0.68	0.58	10.53	0.09	0.03	10.05	0.33	0.21	10.04	0.03	0.00	10.00	0.00	0.00	{ 0.00	0.00	0.0
27.	1987	0:00			- ·	~~	0.00	0.00	0.00	A 66	0.00	0.02	0.10	10.02	0.25	0.00	1043	0.59	0.00	1075	0.49	0.70	10.31	0.29	0.63	10.03	0.37	V.22	10.00	0.00	0.01	[0,00	0,00	V.00	0.00	0.00	
28.	1988	0.00		~ ~		~ ~	0.00	0.00	0.01	0.00	0.00	0.16	0.00	10.22	A 00	0.06	1014	0.10	0.12	10.75	0.76	0.40	10.75	- U. Z I	0.05	10.27	0.47	0.39	10,04	0.05	0.02	10.00	0.00	0.00	10.00	0,00	0.0
29.	1989					~ ~				A A 3	1004	A A A	A 10	10.01	0.27	0.05	10.16	- 11 71.	0.01	111100	11 54		111 19	0.71	0.14	10.37	0.47	0.37	10.00	0.00	V.V.4	10.00	v.vv	V.VV	10404	0.00	w
30.	1990		0.01 0.0	0 0.	01 D	00	0.01	10.01	0.02	0.02	10.01	0.00	0.02	10.28	0.39	0.15	10.41	0.17	0.61	10.73	0.52	0.58	10.31	0.75	0,47	10.57	0,47	0.41	10.00	0.05	0.00	10.00	0.00	0.00	0.00	0.00	
31.	1991			A 1 A	00 0	00	A AA	1.0.00	0.01	Δ Δ I	10 02	A 00		10.06	പറ	- 0.00	10781	- D 6D	0.21	111 44	- 11 A D	0.50	10.33	- U.UY.	0.39	10.05	0.33	0.01	10.03	0.04	0,00	10.00	0.00	0.00	10.00	0,00	···
32.	1992	0.01	0.00 0.0	0 0.	01 0	.00	0.02	0.02	0.02	0.01	10.00	0.00	0.06	10.38	0.21	0.01	1046	0.01	0.42	10.69	0.41	0.61	10.51	0.73	0.52	10.01	0.27	0.19	10,04	0.00	0,00	{ 0.01	0,00	0.00	10.00	0.00	0.0
33.	1993	0.00		- I -	A 4 A	A1	A AA	10.00	A A A	0.00	10.00	0.02	0.16	10.20	0.05	0.02	1046	-0.53	0.69	10.75	0.52	0.61	10.71	0.73	0.03	10.37	0.47	V,40	10.01	0.05	0.00	10.00	0.00	0.00	10.00	0.00	¥.v
34.	1994					00	0.00	0.00	.0.02	0.00	0.00	0.21	0.00	10.01	0.11	0.48	1035	0.43	0.50	0.40	0.60	0.13	10.55	0.55	0.47	10.55	0.55	0.15	10,00	0.03	0.00	10.01	0,00	0.00	10.00	0.00	0.0
34. 35.	1994	0.00	0.00 0.0	n n	01 0	00	0.02	0.00	0.01	0.00	0.02	0.11	0.10	10.00	n 39	0.00	10.51	0.25	0.61	10.21	0.00	0.23	10.55	0.07	0,00	10.07	0.21	0.00	10.05	0.03	0.01	0,00	0.00	0.00	10.00	0.00	0.0
<u> </u>	1995	0.00	0.01 0.0		00 0	00	0.00	0.01	0.00	0.00	0.00	0.01	0.30	0.14	0.07	0.24	0.03	0.37	0.71	0.75	0.56	0.30	0.39	0.55	0.01	0.27	0.03	0.00	0.05	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.0
50.	1990	0.00						1			1		1.1	1			1 ·						1			1			L .								
	Average	0.00	0.00 0.	00 0	00 (	0.00	0.01	10.01	0.01	0.01	0.02	0.05	011	0 12	0.15	0.11	0.23	0.30	0.46	0.47	0.50	0.45	0.52	2 0.46	0.40	0.39	0.38	0.26	0.03	3 0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.0

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## Table I.3 Gross Unit Water Requirements (6/6)

## V. Cropping Pattern in Climatic Region 5 (at present) (using Data at Gevegelija Meteo. Station)

	(using	; Da	la a 1	Ge	rege	nja i	WICU		JLALI	011)							:													_					(Ur	nit: lit/s	s/ha)
No.	Year		Jan.		1	Feb.		Γ	Mar.			Apr.			May			Jun.			Jul.			Aug.			Sep.			Oct.		1	Nov.		1	Dec.	
	1 011	$\vdash_{T}$	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	T	2	3	1	2	3	I	2	3	1	2	3	1	2	3
	·	1						1																							·				1		
1.	1961	0.00	0.00	0.00	0.00	0.02	0.08	0.08	0.13	0.18	0.00	0.00	0.01	0.27	0.33	0.29	0.26	0.30	0.41	0.49	0.56	0.62	0.92	0.94	0.82	0.83	0.73	0.62	0.21	0.04	0.00	0.00	0.00	0.00	0,00	0.00	0.00
2.	1962	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0.00	0.11	0.18	0.23	0.61	0.67	0.62	0.24	0.28	0.37	0.57	0,64	0.69	0.89	0.90	0.77	0.73	0.63	0.52	0.00	0.00	0.00	0.00	0,00	0.00	0.00	0.00	0.00
3.	1963	0.00	0,00	0.00	0.00	0.00	0.00	0,00	0.05	0.10	0.24	0.37	0,45	0.13	0.17	0.14	0.26	0.30	0.41	0,49	0.56	0.63	0.87	0.88	0,75	0,59	0,49	0.36	0.09	0.01	0.00	0.00	00,00	0.00	0.00	0.00	0.00
4.	1964	0.00	0.00	0.00	0,00	0.00	0.04	0.00	0.00	0,00	0.20	0.31	0.35	0.09	0,13	0.13	0.13	0.17	0.20	0.42	0,48	0,53	0,87	0.88	0.79	0.35	0.26	0,16	0.27	0.06	0.03	0.00	0.00	0.00	0.00	0.00	0.00
5.	1965	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.08	0.12	0.55	0.61	0.58	0.34	0.38	0.49	0.63	0,70	0.71	0.87	0.88	0.77	0.83	0.73	0.62	0.45	0.10	0.06	0.00	0.00	0.00	0.00	0.00	0.00
6.	1966	0.00	0.00	0,00	0.05	0.00	0.14	0.00	0,16	0.08	0.29	0.37	0.37	0,13	0.67	0.54	0.12	0.36	0.59	0.38	0.62	0.78	0.41	0.52	0.79	0,31	0.07	0.62	0.35	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00 }
7.	1967	0.00	0.00	0,01	0.05	0.05	0.14	0.14	0,20	0.23	0.29	0.41	0,27	0.51	0.23	0.00	0.32	0.28	0.15	0.22	0.00	0.69	0.71	0.20	0.42	0.73	0,06	0.62	0.39	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.	1968	0.00	0,00	0.00	0.00	0.00	0.12	0.10	0.20	0.23	0.31	0.39	0.59	0.67	0.10	0.42	0.25	0.01	0.19	0.69	0.76	0.63	0.89	0.80	0.52	0.81	0.73	0.54	0.47	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9.	1969	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0,00	0.00	0.26	0,21	0.39	0.25	0.41	0.69	0.03	0,44	0.51	0.63	0.68	0.13	0.77	0.76	0.82	0.14	0.69	0.58	0.47	0.11	0.06	0.00	0.04	0.00	0.00	0.00	0.00
10,	1970	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.17	0.00	0,21	0.59	0.08	0.00	0.45	0.40	-0,41	0.25	0.01	0.72	0.78	0.89	0.92	0.82	0.57	0,73	0.62	0.27	0.01	0.00	0.02	0.01	0.00	0.00	0.03	0.00
[ n.	1971	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.24	0.25	0.53	0.45	0.65	0,00	0,21	0.44	0.59	0.38	0.70	0.56	0.73	0.88	0.82	10.81	0.32	0.62	0.45	0.00	0.00	0.02	0.02	0,00	0.00	0.00	0.00
12.	1972	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.24	0.00	0.00	0.05	0.63	0.53	0.06	0.44	0.59	0.69	0.14	0.65	0.92	88.0	0.10	0.43	0.22	0.07	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.03	0.03
13.	1973	0.00	0,00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.26	0.21	0.41	0.57	0.61	0.69	0.20	0.32	0.51	0.30	0.64	0.78	0.71	0.94	0.19	0.83	0.75	0.62	0.47	0.11	0.06	0.02	0.04	0.04	0.03	0.03	0.03
14.	1974	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.25	0,00	0.41	0.35	0.37	0.31	0.30	0,24	0.57	0.57	0.76	0.76	0.92	0.94	0.81	0.59	0.73	0,44	0.05	0.10	0.00	0.00	0.04	0.00	0.03	0.00	0,00
15.	1975		0.03	0.00	0.04	0.00	0.03	0.03	0.13	0.00	0.24	0,45	0.59	0.47	0.21	0.69	0.28	0.11	0.00	0.42	0.54	0.62	0.65	0.92	0.82	0.77	0.59	0.60	0.33	0,00	0.00	0.02	0.00	0.00	0.03	0.00	0.03
16.	1976	0.03	0.03	0.00	0.00	0.00	0.14	0.00	0,00	0.10	0.26	0.20	0.45	0.63	0.08	0.05	0.01	0.28	0,49	0.30	0.74	0.09	0.23	0.84	0.48	0.59	0.71	0.64	0.47	0.00	0.00	0.02	0.04	0.04	0.03	0.03	0.03
í 17.	1977	0.03	. 0.00	0.00	0.00	0.00	0.14	0.14	0.00	0.22	0.26	0.45	0.41	0.02	0.20	0,42	0.19	0.02	0.07	0.03	0.70	0.02	0.04	0.84	0.02	0.32	0.09	0,54	0.47	0.07	0.00	0.00	0.00	0.00	0.00	0.00 0.00	0.03
18.	1978	0.03	0.00	0.00	10.00	0.02	0.03	0.14	0.09	0.08	0.00	0.10	0.37	0.15	0.47	0.00	0.37	0.44	0,39	0.09	0.74	0.71	0.71	0.20	0.02	0.25	0.24	0.50	0.45	0.10	0.00	0.02	0.04	0.00	0.00	0.00	0.00
19.	1979	F		0.00	10.00	0.01	0,14	0.13	0.00	0.21	0.00	0.20	0,33	0.07	0.10	0.27	0.40	0.44	0.55	0.05	0.70	0.50	0.92	0.40	0.10	0.33	0.73	0.02	0.35	0.00	0.00	0.02	0.00	0.00	0.05	0.00	0.00
20.	<u>1980</u> 1981	0.03	0.03	0.04	0.05	0,08	0.14	0.02	0.00	0.10	0.29	0.37	0.23	0.00	0.00	0.53	0.40	0.35	0.39	0.60	0.74	0.70	0.92	0.01	0.62	0.35	0.59	0.60	0.45	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
21. 22.	1981	0.03	0.00	0.00	10.00	0,08	0.00	0.00	0.00	0.25	0.20	0.00	0.05	0.05	0.75	0.20	0.22	0.30	0.59	0.47	0.77	0.05	0.02	0.36	0.50	0.55	0.40	0.58	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00
22.	1982	0.00	0.03	0.04	0.05	0.03	0.00	0.05	0.00	0.10	0.00	0.00	0.00	0.67	0.05	0.00	0.07	0.00	0.04	0.14	0.70	0.76	0.87	0.88	0.70	0.27	0.65	0.48	0.47	0.11	0.00	0.00	0.04	0.00	0.00	0.00	0.00
24.	1983	0.05	0.00	0.00	0.02	0.04	0.10	0.00	0.20	0.12	0.00	0.10	0.47	0.55	0.67	0.00	0.32	0.29	0.59	0.69	0.76	0.65	0.81	0.70	0.64	0.83	0.67	0.22	0.37	0.11	0.06	0.02	0.00	0.00	0.03	0.03	0.00
25.	1985	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.15	0.25	0.47	0.30	0.45	0.07	0 40	0.44	0.55	0.69	0.76	0.78	0.81	0.94	0.79	0.79	0.69	0.62	0.47	0.11	0.00	0.00	0.00	0.00	0.03	0.02	0.02
26.	1986	0.00	0.00	0.00	0.05	0.00	0.14	0.00	0.03	0.16	0.31	0.45	0.50	0.00	0.49	0.45	0.09	0.22	0.42	0.40	0.76	0.78	0.73	0.76	0.82	0.83	0.73	0.28	0.47	0.11	0.00	0.00	0.04	0.00	0.00	0.00	0.00
27.	1987	1	0.00	0.00	0.05	0.00	0.00	0.00	0.03	0.00	0.00	0.15	0.53	0.43	0.61	0.36	0.40	0.39	0.00	0.69	0.76	0.78	0.79	0.76	0.81	0.81	0.73	0.52	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.03
28.	1988	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.05	0.18	0.25	0.49	0.21	0.67	0.49	0.15	0.28	0.29	0.57	0.69	0.76	0.47	0.92	0.92	0.82	0.83	0.73	0.56	0.15	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00
29,	1989	0.03	0.03	0.04	0.05	0.04	0.12	0.04	0.19	0.05	0.31	0.03	0.31	0.37	0.73	0.24	0.04	0.06	0.39	0.34	0.52	0.36	0.92	0.80	0.82	0.83	0.73	0.62	0.00	0.00	0.06	0.00	0.02	0.00	0.00	0.03	0.00
30.	1990	10.03	0.03	0.04	0.05	0.00	0.12	0.14	0.20	0.23	10.18	0.00	0.31	0.59	0.67	0.24	0.40	0.38	0.42	0.69	0.60	0.67	0.73	0.94	0.33	0.81	0.51	0.62	0.37	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.02
31.	1991	10.03	0.00	0.03	0.00	0.00	0.00	0.03	0.00	0.08	0,18	0.20	0.00	0.59	0.15	0.38	0.18	0.44	0.59	0.09	0.02	0.58	0.92	0.42	0.82	0.75	0.73	0.00	0.47	0.06	0,00	0.00	0.00	0.00	0.03	0.03	0.00
32.	1992	0.03	0.03	0.00	0.05	0.08	0.14	0.14	0.20	0.06	0.00	0.00	0.51	0.67	0.15	0.20	0.37	0.11	0.00	0.57	0.38	0.65	0.92	0.94	0.81	0.83	0.73	0.28	0.00	0.00	0.05	0.02	0.00	0.04	0.00	0.00	0.02
33.	1993	0.00	0.03	0.01	0.05	0.05	0.00	0.00	0.20	0.06	0.15	0.47	0.59	0.00	0.65	0.27	0.08	0.26	0.55	0.69	0,76	0.78	0.87	0.94	0,82	0.73	0.73	0.58	0.06	0.11	0.00	0.00	0.00	0.00	0.03	0.02	0.00
34.	1994	0.00	0.00	0.04	0.00	0.00	0.00	0.09	0.20	0.02	0.00	0.51	0.11	0.16	0.69	0.69	0.40	0.38	0.59	0.40	0,70	0.74	0.87	0.94	0.61	0.83	0,40	0,62	0.02	0.07	0.00	0.00	0.00	0.04	0.03	0.00	0.00
35.	1995	0.00	0.00	0.00	0.05	0.01	0.14	0.00	0.08	0.00	0.30	0.47	0.37	0.13	0.73	0.14	0.31	0.39	0.59	0.00	0,50	0.74	0.59	0.72	0.66	0.25	0.63	0.03	0.47	0.11	0.06	0.00	0.00	0.00	0.00	0.00	0.00
36.	1996	0.00	0.03	0.00	0,00	0.00	0.00	0.14	0.00	0.00	0.00	0.29	0.59	0.04	0.59	0.29	0.38	0.44	0.59	0.69	0.70	0.00	0.92	0.94	0.48	0.49	0,16	0.00	0.33	0.01	0.05	0.02	0.00	0.00	0.00	0.02	0.00
		0.01	0.01	0.01	1000	0.00	0.04	0.01	0.07	0.10	0.10	0.14	0.22	0.27	0.42	0.74	0.25	0.20	0.41	0.40	0.62	0.61	0.74	0.74	0.65	0.67	0.57	0.46	0.20	0.06	0.02	0.01	0.01	0.00	0.01	0.01	0.01
L	Average	0.01	0.01	0.01	1 0.02	0.02	0.06	0.04	0.07	0.10	0.18	0.24	0.37	0.37	0.43	0.34	<u>_ 0.25</u>	0.30	0.41	0.48	0.02	0.01	0.70	0.70	0.00	1 0.03	0.57	0.40	0.29	0.00	0.02	1 0.01	0.01	0.00	0.01	0.01	0.01

	Code No.	g Condition) No.		Total	Annual Water Demand
No.	(by Basin)	(Node No.)	Node Name	Service	on 36 Years Average
	(-)	(Diagram)		Area (ha)	(1,000 m3/year)
					1 010
1.	B1-1	A1-1	Melca	391	1,912
	B1-1	A1-2	Gostivarsko pole	6,656	32,393
	B1-1	A1-3	Stenche	896	4,368
	B1-1	A1-4	Mazdracha	1,180	5,748
	B1-1	A1-5	Radiovce-Bistrica	13,381	74,722
	B1-2	A1-6	Bardovci-Zlokukjani	390	3,356
	B1-3	A1-7	Kamnik	1,540	13,245
	B1-3	A1-8	Mladost (Otovica)	1,200	10,307
	B1-4	A1-9	Topolka	852	7,329
	B1-4	A1-10	Boshavica	1,935	16,644
	B1-4	A1-11	Pepelishko pole	1,300	11,196
	B1-5	A1-12	Udovo-Valandovo	3,988	32,194
	B1-5	A1-13	Bogdanci I and II	4,804	38,771
			Total	38,513	252,186
2.	B2-1	A2-1	Kichevosko pole	2,080	16,406
3.	B3-2	A3-1	Slavishki pole	250	1,226
ָס.	B3-2 B3-2	A3-1 A3-2	Studerna bara-Vakuf	852	7,329
	B3-1	A3-3	Dragomanci	136	1,166
	B3-3	A3-4	Lipkovo	10,924	93,940
		· · · · ·	Total	12,162	103,661

 Table I.4
 Water Demand at Irrigation Intake Node (1/2)

## Table I.4 Water Demand at Irrigation Intake Node (2/2)

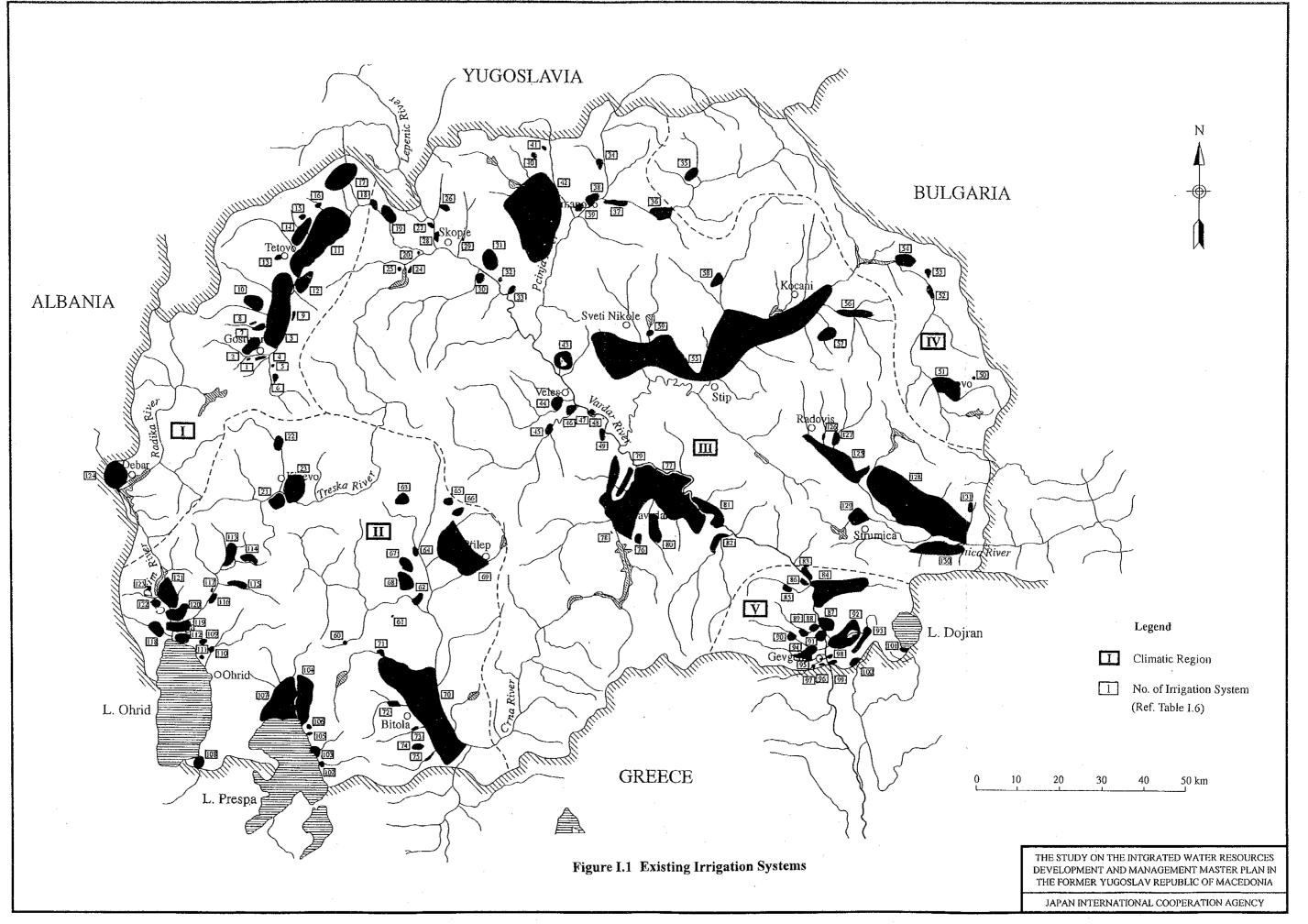
Basin	Code No.	No.		Total	Annual Water Demand
No.	(by Basin)	(Node No.)	Node Name	Service	on 36 Years Average
		(Diagram)		Area (ha)	(1,000 m3/year)
4.	B4-1	A4-1	Crn dol (Pehchevo)	80	377
••	B4-1	A4-2	Maleshevsko pole	917	4,453
	B4-1	A4-3	Milkovo (Delchevo)	909	4,411
	B4-2	A4-4	Bregalnica	28,890	310,304
	B4-2	A4-5	Blatec	915	7,867
	B4-3	A4-6	Belashnica-Zletovo	200	1,709
	B4-4	A4-7	Mantovo	5,581	47,977
	B4-4	A4-8	Mavrovica	136	1,166
			Total	37,628	378,264
	DC 1	A.E. 1	D		
5.	B5-1 B5-1	A5-1 A5-2	Desovo Prilep	2,067 6,200	16,305 48,931
	<i></i>			0,200	
	B5-2	A5-3	Strezhevo	20,525	161,959
	B5-3	A5-4	Tikvesh	19,425	167,028
	B5-3	A5-5	Trstenik-Gradsko	988	8,500
			Total	49,205	402,723
6.	B6-1	A6-1	Podaresh	317	2,727
	B6-2	A6-2	Turija	10,250	88,161
	B6-3	A6-3	Vodocha	4,000	34,410
	B6-3	A6-4	Podlbelasichki	1,400	12,039
		·····	Total	15,967	137,336
7.		A7-1	Asamati	5,955	46,996
		A7-2	Ljubanishte	142	1,123
		A7-3	Leskoec	210	1,663
		A7-4	Izdeglavje	2,240	17,667
	B7-2	A7-5	Strushko pole	2,810	22,175
	B7-2	A7-6	Debarsko pole	1,080	5,248
			Total	12,437	94,872
			Grand Total	167,992	1,385,448

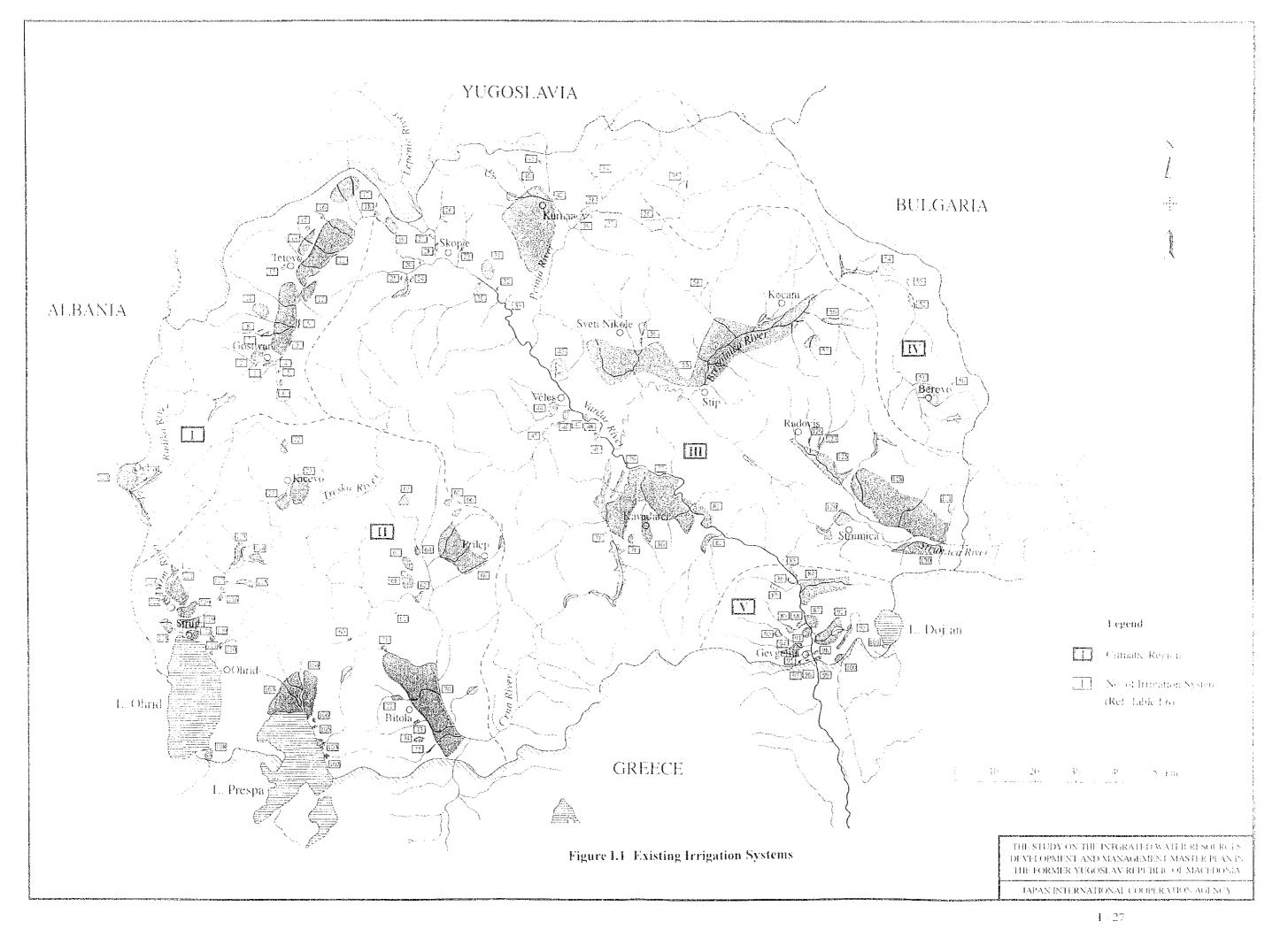
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## Table I.5 Livestock Water Requirement

				1994
Unit Water Requirement:	Cattle	95	lit/day/head	281,336 heads
•	Horse	60	lit/day/head	61,797
	Pig	25	lit/day/head	171,571
	Sheep	11	lit/day/head	2,466,099
	Poultry	t	lit/day/head	4,685,021
	•			7,665,824
1994				

	1994													r•	T-4-1
Ja	Code No.	No		cipality (old) oncerned	Catt		Hors	~	Kind of L Pig		Sheep	<u> </u>	Poultr	y	Total Water Demand
			No.	Namé	heads	m3/s	heads	m3/s	heads		heads		heads	m3/s	<u>m3/s</u>
asin	1-1: Vardai	River !	Basin						÷						
1.	B1-1	1 2	02 03	Gostival Tetovo	24,439 47,511	0.027	4,249 7,770	0.003	865 11,043	0.000	113,810 135,492	0.014 0.017	156,484 435,327	0.002 0.005	0,046 0.083
2.	B1-2	3	01	Skopje	21,968	0.024	5,742	0.004	14,057	0.004	151,810	0.019	416,299	0.005	0.056
3.	B1-3	4	09	Veles	6,923	0.008	1,331	0.001	1,963	0.001	150,474	0.019	156,619	0.002	0.030
4.	B1-4	5	22	Negotino	1,498	0,002	702	0.000	2,800	0.001	24,388	0.003	69,803	0.001	0,007
5.	B1-5	6 7	23 24	Valandovo Gevgelija	2 674 5 165	0.003 0.006	480 1,449	0.000 0.001	2,422 3,095	0.001 0.001	11,858 40,085	0.002 0.005	47,775 91,116	0.001 0.001	0.006 0.014
Basin	n-2: Treski	River l	Basin												
6.	B2-1	8	04	Kichevo	15,722	0.017	1,945	0.001	1,884	0.001	69,707	0,009	141,719	0.002	0.030
7.	B2-2		-	-											
8.	B2-3	9	05	Brod	5,087	0.006	\$\$5	0.000	1,559	0.000	23,854	0.003	46,547	0,001	0.010
Basi	n-3: Pchin										100 714	0.000	372,990	0,004	0,053
9.	B3-1	10	06	Kumanovo	15,849	0.017	3,047	0.002	20,329 7,954	0.006	183,734	0.023 0.007	109,874	0,001	0.022
10.	<u>B3-2</u>	11 12	08 07	Kriva Palanka Kratovo	9,586 3,263	0.011 0.004	475	0.000	3,608	0.001	39,095	0.005	54,142	0,001	0.011
11.	B3-3		•	-											
12.				-										:	
Вазі	in-4: Pcbin	ja River	Basin												
13.	<b>B4-1</b>	- 13 14	16 15	Berovo Delchevo	5,682 7,978	0.006 0.009	2,039 684	0.001 0.000	5,010 10,338	0.001 0.003	130,175 76,603	0.017 0,010	61,845 109,439	0.001 0.001	0.026
14.	B4-2	15 16	14 13	Vinicha Kochani	1,996 6,447	0.002 0,007	333 1,459	0.000 0.001	3,899 14,052	0.001 0.004	48,626 62,648	0.006 0.008	74,507 191,613	0.001 0.002	0.011 0.022
15.	B4-3	17 18	11 12	Shtip Probishtip	2,907 2,422	0.003	428 185	0,000 0.000	2,841 4,190	0.001 0.001	\$1,886 47,144	0.010 0.006	83,796 71,803	0.001 0.001	0.016 0.011
16.	B4-4	19	10	Sveti Nikole	1,920	0.002	500	0,000	3,890	0,001	81,665	0.010	92,810	0,001	0.015
Bas	în-5: Crua	River B	lasin												
17	85-1	20	17	Demir Hisar	4,158	0.005	1,421	0.001	2,637	0.001	29,513	0.004	82,107	0.001	0.011
•••	201	21 22	18 20	Krusevo Prilep	4,104 16,026	0,005 0.018	1,234 3,834	0.001 0.003	708 6,526	0.000 0.002	35,850 257,246	0.005 0.033	29,607 279,957	0.000 0.003	0.010 0.058
18.	B5-2	23	19	Bitola	16,455	810.0	1,931	0.001	7,498	0,002	220,761	0.028	378,968	0.004	0.054
19.	B5-3	24	21	Kavadarci	988	0.001	1,119	0.001	2,891	0.001	39,864	0.005	72,854	0.001	0,009
Bas	sin-6: Stru	nica Riv	ver Bas	in											
20.	<b>B6-1</b>	25	29	Radovish	4,379	0.005	3,014	0.002	4,894	0.001	75,546	0.010	161,576	0,002	0.020
21	B6-2	26	30	Strumica	14,466	0.016	11,243	0,008	15,448	0.003	107,198	0.014	380,662	0.004	0.045
22	. <b>B6-</b> 3		-	-											
	. <b>B6-4</b>		-	•											
Ba	sia-7: Crn	Drim R	iver Ba	sin									1		11
24	B7-1	27	21	Debar	2,849	0.003	1,049	0.001	0	0.000	52,891	0.007	18,308	0.000	0.011
25	5. <b>B</b> 7-2	28 29	21		6,501 7,342	0.007 0.008	77 727	0.000 0.001	1,659 8,389	0.000 0,002	20,249 51,195	0,003 0,007	101,477 168,891	0.001 0.002	0,011 0.019
26	5. <b>B</b> 7-3	30	2	6 Struga	15,031	0.017	1,282	0.001	5,122	0.001	49,269	0.006	226,106	0.003	0.028
					281,336	0.309	61,797	0.043	171,571	0.048	2,466,099	0,314	4,685,021	0.054	0.768





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1996				4-1			1		Cropping		Cropp	ng Area							Сторра	ng Period						Скоррі	ng Duration
Suppling Code No.		trigation.	Traination Fronteen	Irrigation Service	No.	Climatic Region	No.	Crop	Code	jai C	) rop	2nd Crop	(summer)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct	Nov. 3 2 2 3	Dec.		
Pattern (Solo-Basin) No. (Diagram)	(hode)	System Max	Irrigation System	Ares (ha)	<b>I</b> NO.	Clankov Region			No.	Area (ha)	Ratio	Aren (ha)	Ratio	123	123	123	123	123	123	123	12	312	312	3 1 2 3	123	months	Decades
81-1 81+1 81-1 81-1 81-1	Al-i Al-2 Al-2 Al-2 Al-2 Al-3 Al-3 Al-3 Al-3 Al-5(1/2) A	14. 15. 16,	Lakavica Meica Shkoza Zdunje I & II Gosti varsko pole Banjica Vrapcišska reka Balin dol Stenche Mazdracha Radiovce-Bistrica Miletino-Chelopek Rechica Rates Djepishte Neproshteno Stari Debarsko pole	161 230 142 2,200 3,914 400 280 116 500 1,180 8,187 856 114 1,00 160 114 2,500 1,080	2. 3, 4.	Tetovo - Gostivar Bitola - Prilep Shitip - Skopje Beravo - Kriva P. Gevgelija	2. 3. 4. 5. 6. 7. 8. 9. 10. 13. 12. 13.	Cabbage Tomatoes Peppers Other Vegetables Apples Plums S. Chemics	i1 21 31 41 52 61 71 81 91 101 111 121 131 141 Total	20,857 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.90	0 \$,111 0 0 0 0 1,159 1,159 10,428 0 0 0 2,317 23,174	0.35 0.05 0.05 0.45 0.00 0.00 0.10										-			7 4 4 4 12	2 1 1 1 1
2. B2-1 B2-1 B2-1 B5-1 B5-1 B5-1 B5-1 B5-1 B5-1 B5-1 B5	A2-1 A2-1 A5-1 A5-1 A5-1 A5-1 A5-1 A5-1 A5-1 A5	21, 22, 23, 60, 61, 62, 66, 67, 68, 69, 70, 71, 72, 73, 103, 104, 105, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 117, 117, 117, 117, 117, 117	Total Bigor-Dolenci Zacc-Greshnica Kichevosko pole Obednichki Demir hisar Buchin Debreshte Cma upper reach Brailovo Desovo Krushevo Borino (Lazhani) Pnilep Strezhevo Borino (Lazhani) Pnilep Strezhevo Bistrica Velushka river Graeshnica Ljubojno Krani Asamai Pretor Kursinovo Sithan Ljubanishta Trebenishta Leskocc Velgoshte Ovoshtamik Izdeglavje Slatino Boton Boton Shun-Vishni Lozhani Stari Starishko pole Banjiste	23,174 590 450 1,040 30 120 251 250 240 220 666 6,200 20,2	2. 3. 4.	Tetovo - Gostivar Bitola - Prilep Shitip - Skopie Berovo - Kriva P. Gevgelija	3 4 5 6 7 8 9 10 11 12 13	Wheat Maize Rice Tobaco Sunflower Cabbage Tomatoes Peopers Other Vogetables Apples Plums S. Cherries Other Orchards Grapes	12 22 32 42 52 62 72 82 92 102 112 122 132 142 Total	33,784 0 0 0 0 0 0 0 0 0 0 0 0 42,229	0.80	0 12,670 0 0 2,111 2,111 6,334 6,334 6,334 2,111 0 0 0 42,229	0.30 0.25 0.05 0.15 0.15 0.05 0.05 0.00 1.00													7 4 4 4 12 12	

(13)

Figure I.2 Cropping Pattern (1/3)

996					_						Croppin	- 4		1.					<b>g</b> niqqonD	Period						Cropping	Durau
_	Conic His.	Node No.	Inigation		Invigation	and and and a local	1	Crop	Cropping _	tət Çi		2nd Crop (#	ummer)	Jan.	Feb.	Mar.	Apr.	26.00	200	h-1	Aug.	Sep.	Oct.	Nov.	Dec.		Dar
	7.4-2	(Insider)	System.	Irrigation System	Service	No. Climetic Region	No.	Crop	No.	Antes (ha)	Ratio	Arca (ha)	Retic	123	123	123	123	23	2 3	1 2 3	123	123	121	123	123	months	108.10
o	(0	(Duntaria)	¥6.	······································	Area (ha)	······	+																			7	2
			18,	Radusha	71	1. Tetovo - Gostivar	1. V	Wheat	13	37,651	0.60	0	0.30			-			RI H	<b>DAMAR I</b>	URAN PEN	<b>HEAD</b>	的数据册			4	1
31.		A1-5(2/2) A1-5(2/2)		Rashche	325	2. Bitola - Prilep	2. N		23	0		18,824	0.50					[	110010					i l	ł	I .	
		AI-5(2/2)		Sarai	14	3. Shitip - Skopje		Rice	33 43	0		3,138	0.05			Į	- 1		1	1				1	1	4	1
	BI-2	A1-6	24.	Shishevo	56	4. Berovo - Kriva P.		Tobacco Sunflower	53	ß		6,275	0,10											1	. i	4	
	BI-2	A1-6	25.	Glumove	14	5. Gevgeläja		Cabbage	63	ŏ		0				Į.								i 1			•
	91-2	A1-6		Vuchidol-Orman	85			l'omatocs	73	ō		3,138	0.05	1			ł							1		1	
	B1-2	A1-6	27.	Novo selo	68 140			Peppers	83	0		3,138	0,05	1 ·									S 1 14	1		1	
	B1-2	A1-6		Bardovci-Zlokukjani	27			Other Vegetables	93	0		3,138	0.05			4			· =	1				1		1	
	B1-2	A1-6	29.	Radishani	110			Apples	103	0		0		ł.	1	1			ł	. [				1 1		{	
	B1-3	A1-7	30.	Drachevo-Batinei Kamnik	1,300		] H, F	Plums	113	0		0		-	l				الحرب و					1.1	200 C	12	(
	B1-3	A1-7	31. 32.	Petrovec	100			S. Chemics	123	1,255	0.02	1,255	0.02 0.03	1.1.1										يؤرست		12	C
	B)-3	A1-7 A1-7	33.	Shamak	30			Other Orchards	133	1,883	0.03 0.35	),883 21,962	0.35													12	C
	B1-3 B1-3	A1-8	43.	Miadost (Otovica)	1,200		114.	Grapes	143	21,962	1.00	62,751	1.00	-		. 1										)	
	B1-4	A1-9	44.	Topolka	400		1		Total	62,751	1,00	02,771	1.00	1		1		· .				}					
	B1-4	A1-9	45.	Vitanci	98		1									1			1	1		ł					
	B1-4	A1-9	46,	Babuna	100											-		1				[	· ·				
	B)-4	A1-9	47.	Kochilari	80									1	1				1				1				
	B1-4	A1-9	48.	Zgropulci	24 150		1.							1	1 1				i			1					
	B1-4	A1-9	49.	Vinichani	1,935												1	1	ļ					1		Ì	
	B1-4	A1-10	\$0.	Boshavica Receively and	1,000		1								1			·	· 1				1	1	ļÎ	ł	
	B1-4	A1-11	81.	Pepelishko pole	300											1		ļ						1		1	
	81-4	AI-11 A3-3	82. 34.	Demir kapija Dragomanci	136		1							1				1	1				i	1		1	
	83-1 B3-2	A3-3 A3-2	36.	Studema bara-Vakuf	290									1	1								1	1			
	B3-2 B3-2	A3-2	37.	Davezence-Jachince-Klechovce	175									i i	+ ·						ł	1		1	1		
	83-2	A3-2 A3-2	38.	Klechovec	265									1	1.							1					
	B3-2	A3-2	39.	Shupli kamen-Zubovce	22									1	1	Į –					1	Í	1				
	B3-3	A3-4	40,	Rechica	60		1							1	1								1		1 1		
	B3-3	A3-4	41.	Izvor Jovica	44		1							1.	1 .							1	ļ	1	ŀ I		
	93-3	A3-4	42.	Lipkovo	10,820									1	-						1.	1		1			
	B4-2	A4-5	56.	Osojnica	415															ł	ł	1	1	ł	Í	[]	
	B4-2	A4-5	57.	Blatec	\$00 200										1	1 ·				1	Į	1			1		
	B4-3	A4-6	58.	Belashnica-Zietovo	5,583		1							ļ	1	1					1		1	1		11	
	B4-4	A4-7	125.	Mantovo	136		1							1			ł			1	1	1	ł	1		ļį	
	84-4	A4-8	59.	Mavrovica Dabnichka reka	200										I		1			i i		1		1			
	85-3 85-3	A5-4 A5-4	76. 77.	Tikyesh	19,225											1	1 ·				1				{	11	
	B5-3 B5-3	A5-5	78.	Vozarci	28	•	1							1	E		1					-	1		1		
	B5-3	A5-5	79,	Testenik-Gradsko	960									1	1 .					ŧ	1	1			1		
	B6-1	A6-1	126.		67												1		÷ .	ł			}	1	ł		
	B6-1	A6-1	127.		250										1	1		ŧ.		[	1		1		1		
	B6-2	A6-2	128.	Turija	10,050		1 ·							1			1	1		1	ļ				1		
	B6-2	A6-2	131.		200		1							1	1	1	1	1	l	ł			Į	1		{ }	
	B6-3	A6-3	129.		4,000 1,400										1		Į.	[		[		1	1		1	11	
1.1	B6-3	A6-4	130,		62,751		1									-	1	<b> </b>			+			+	+		
	_			Total		·····	-					. 0			<u></u>	1	1	1			1		1.			7	
3b.	B4-2	A4-4	55.	Bregalnica	28,890	1. Tetovo - Gostivar		Wheat	13 23	14,445 0	0,50	4,333	0.15			T	T			IS E				£		4	
	<b>D</b> +2					2. Bitola - Prilep		Maize	33	ă		4,333	0,15		1	1										5	
						J. Shitip Skopje		Rice Tobacco	43	ň		1,445	0,05			1	1	<b>_</b>			1	1	-	_		1 4	
						4. Berovo - Kriva P.		Sunflower	53	0		2,888	0.10			1	1	1							ţ	11 *	
						5. Gevgelija		Cabbage	63	ō		0		1		1	1	1	1	1.50	6.5.54	$\mathcal{F}_{(2)}$		<i>4</i>	1	ļ,	
								Tomatocs	73	ō		1,445	0.05	1	1	1		1 · ·						2	1		
								Peppers	83	Ó		1,445	0.05		1	1	1	E							1	1 4	
							9	Other Vegetables	93	0		2,889	0.10		1	1	1		•				1	-	1	11	
								Apples	103	. 0		0			1		1	1			1		1	1	1		
							1.11	Plums	113	0		0			1	1	1	1	I			1		and so and so all so		12	
				·			12.	S. Chemies	123	1,445	0.05	1,445	0.05													12	
							12. 13.	S. Chemies Other Orchards	133	2,889	0,10	2,889	0,10	1.1												12 12	
							12. 13.	S. Chemies			0.05 0.10 0.20 0.85							 1		· · · · ·						12	

Figure I.2 Cropping Pattern (2/3)

199	6																				Cmpoi	ng Períod						Croppin	p Durstion
Crossing	Code 14	No. 14	lode X4.	Inigation		Intention			1	<b>e</b>	Cropping Code	1st C	Сторрі	2nd Crop (	(and the set	Jan.	Feb.	Mar.	ADE.	May	Jun.	Jol.	Aug.	Sep.	Oct.	Nov.	Dec.		
-	(Jub-Ber	) (شب	(make)	System.	Irrigation System	Service Area (ha)	No.	Climatic Region	No.	Стор	No.	Anca (Na)	Ratio	Arca (ha)	Ratio	123	123	123	123	123	123	123	123	123	123	123	123	months	Decades
- <u>Ha.</u> 4.	(Diagonal (B3-2) (B4-1) (B4-1) (B4-1) (B4-1) (B4-1) (B4-1) (B4-1)	-2 /	A3-1 A4-1 A4-2 A4-3 A4-3 A4-3	50, 51, 52, 53,	Slavishko pole Cm dol (Pehchevo) Maleshevsko pole Sandanški (Delchevo) Jugotutua (Delcevo)	250 80 917 250 164	2. 1 3. 5 4. 1	Fetovo - Gostivar Bitola - Prilep Shitip - Skopje Berovo - Kriva P. Gevgelija	2. 3. 4.	Wheat Maize Rice Tobacco Sunflower Cabbage	14 24 34 44 54 64	216 0 0 0 0	0.10	0 108 0 0 0	0.05						KI		XIMINIS	HUDWINH	HKRAINI			7 4	2 1
	<b>B4-</b> 1	-1 /	<b>A4-3</b>	<b>54</b> .	Milkovo (Deichevo) Total	495 2,156	-		7. 8. 9. 10. 11.	Tomatoes Peppers Other Vegetables Apples Plums S. Cherries Other Orchards	74 84 94 104 114 124 124 134 144 Total	0 0 0 1,509 431 0 2,156	0,70 0.20 1.00	43 0 65 0 1,509 431 0 0 2,156	0.02 0,03 0.70 0.20													4 4 12 12	1 1 0 0
5.	B1- B1- B1- B1- B1- B1- B1- B1- B1- B1-		A1-12 A1-12 A1-12 A1-13 A1-13 A1-13 A1-13 A1-13 A1-13 A1-13 A1-13 A1-13	83. 84. 85. 87. 88. 89. 90. 91. 92. 93. 94.	Gradec Udovo-Valandovo Miravci Petrushka river Grehishte I and II Smokvice I and II Prdejci Kovanska, Sermeninska rivers Vinciya Gjavoto Paljurei Konska reka	264 3,624 100 423 i10 200 200 i50 1,340 800 571	2. 3. 4.	Tetovo - Gostivar Bitola - Prilep Shlöp - Skopje Berovo - Kriva P. Gevgelija	2. 3. 4. 5. 6. 7. 8. 9. 10. 11, 12.	Wheal Maize Rice Tobacco Sunflower Cabbage TomMoes Peppers Other Vegetables Apples Piums S. Cherries	15 25 35 45 55 65 75 85 95 105 125 125 135	2,198 0 0 2,638 0 0 0 0 0	0,25	0 2,198 0 0 0 879 440 1,319 0 0 0	0.25 0.10 0.05 0.15													7 4 6 4 4	2 I I I I I
	B1- B1- B1- B1- B1- B1-	I-5 / I-5 / I-5 /	A1-13 A1-13 A1-13 A1-13 A1-13 A1-13	95. 96. 97. 98. 99. 100.	Schovo Granica Pod anot Avlakjot Keramadnica Selemij Total	200 120 120 40 80 350 8,792			14.	Other Orchards Grapes	145 Total	3,956 8,792	0.45	3,956 8,792	0.45													12	0
					Grand Total	167,992	2. 3. 4.	Tetovo - Gostivar Bitola - Prilep Shitip - Skopje Berovo - Kriva P. Gevgelija	2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13.	Wheat Maize Rice Tobacco Sunflower Cabbage Tomatoes Peppers Other Vegelables Apples Plums S. Cherries Other Orchards Graper	10 20 30 40 50 60 70 80 90 100 110 120 130 140 Totał	109,151 0 0 2,638 0 0 6,334 3,620 3,131 7,089 31,696 163,659	0.97	46,244 4,333 15,141 9,163 0 8,775 8,293 24,173 6,334 3,620 3,131 7,089 31,696 167,992	1.00														

Figure I.2 Cropping Pattern (3/3)



