

CHAPTER 9

***RECOMMENDATION FOR FUTURE PROMOTION
OF THE MASTER PLAN***



CHAPTER 9 RECOMMENDATIONS FOR FUTURE PROMOTION OF THE MASTER PLAN

9.1 Recommendations on Action Plan

9.1.1 General

In promotion of the action plan such as the Project Implementation Plan, it is recommended to formulate a concrete scheme in order to maintain the function of the development projects and bring out the best of the project effects with implementation of sustainable development and thorough management as well as with full understanding of the close relationship between the water resources development and water resources management plan.

9.1.2 Project Implementation Plan

Figure 9.1 shows the proposed implementation schedule of the development projects included in the water resources development plan in the Master Plan by region, by water use purpose, and by PHASE, with the project costs. The total project costs required in the period from 1999 to 2025 is estimated at 1.965 billion US\$ including those for the water resources management plan (price level: January 1999).

The following 12 projects are proposed for PHASE I (from 1999 to 2005):

Projects Proposed in PHASE I

| River Basin | Project Name (No.) | Purpose | Project Cost (10 ⁶ US\$) |
|------------------------------|--|---------|-------------------------------------|
| 1. Vardar River Upper Reach | 1) Water Supply Project for Tetovo - River Pena Intake (1) | M&I | 3.2 |
| | 2) Kichevsko Pole Area Irrigation Rehabilitation Project (2) | RI | 2.9 |
| | 3) Patishka Reka Water Supply Project (3) | M | 3.2 |
| | 4) Slupchanka Dam Project (4) | M | 7.3 |
| | 5) Treska River Upper Reach Rural Water Supply Project (34) | RS | 19.3 |
| | 6) Skopje Circle Rural Water Supply Project (35) | RS | 21.3 |
| | 7) Kriva Palanka/Kumanovo Circle Rural Water Supply Project (36) | RS | 29.3 |
| 2. Vardar River Middle Reach | 1) Zletovica Multipurpose Dam Project (5) | M&I | 68.2*1) |
| 3. Vardar River Lower Reach | 1) Valandovo Area Irrigation Rehabilitation Project (6) | RI | 7.3 |
| | 2) Pelagonia Circle Rural Area Water Supply Project (37) | RS | 35.4 |
| 4. Crn Drim River | 1) Irrigation System Betterment Project in Resen (7) | RI | 7.0 |
| 5. Strumica River | 1) Oraovica Dam Project (8) | M&E | 21.7 |
| Total | | | 226.1 |

(*1: the remaining investment, 14.7 million US\$ was already invested as of March 31, 1998)

M : Municipal Water, I : Industrial Water, RI : Existing Irrigation Rehabilitation Project, RS : Rural Water Supply, E : Environmental Water.

The order of implementing these projects is proposed as follows (See Figure 9.2):

(1) Projects in the First Group

The projects to be implemented as the first group are below:

- One municipal water supply project, whose project cost is relatively small with rather large beneficial population suffering from seasonal water shortage;
- One multipurpose dam project, whose documentation has been promoted for its urgent requirement with relatively large investment cost;
- One betterment project for an existing irrigation system suffering from little water due to loss in the deterioration of the facilities.

The following three projects are proposed to be commenced in 2000 with a feasibility study (F/S) or design review (the figures in the parenthesis show the project number):

- a) Slupchanka Dam Project (No.4)
- b) Zletovica Multipurpose Dam Project (No.5)
- c) Irrigation System Betterment Project in Resen (No.7)

For the Slupchanka Dam Project, it is proposed to carry out further study on F/S level and to estimate the internal rates of return for next stage as soon as possible.

F/S and detailed design (D/D) of the Zletovica Multipurpose Dam Project (5) was finished in 1996, and the works started partly. Some review and up-dating of D/D completed by 1996 will be required.

F/S and/or basic design (B/D) for the Irrigation System Betterment Project in Resen were finished except for estimation of internal rates of return showing the economic and financial viability. Since some time has passed after such study and design, it is proposed to review and update them, and to estimate the internal rates of return for the next stage as soon as possible.

(2) Projects in the Second Group

The projects to be implemented as the second group are as below:

- One water supply project to deal with seasonal drinking water, whose planning needs further investigation and study;
- One municipal water supply project for the east/east-south parts of the Metropolitan, whose project cost is relatively small with rather large beneficial population suffering from seasonal water shortage due to overpopulation as well as pollution of water source;
- One project to supply water to meet the ecological minimum as well as municipal water supply;
- Two rural water supply projects, whose beneficiary population are relatively small.

The following five projects are proposed to be commenced in 2001 with F/S or design review (the figures in the parenthesis show the project number):

- a) Water Supply Project for Tetovo – River Pena Intake (No.1)
- b) Patishka Reka Water Supply Project (No.3)
- c) Oraovica Dam Project (No.8)
- d) Skopje Circle Rural Water Supply Project (No.35) (including Regional Water Supply “Petrovec”)
- e) Kriva Palanka/Kumanovo Circle Rural Water Supply Project (No.36)

Review of the Water Supply Project for Tetovo – River Pena Intake shall include F/S combining it with the Studena Voda Groundwater Development Project (No.9 in Figure 9.1), as an alternative.

F/S and/or B/D for the Patishka Reka Water Supply Project were finished except for estimation of internal rates of return showing the economic and financial viability. Since some time has passed after such study and design, and revision of the planning is required, it is proposed to review and update them, and to estimate the internal rates of return for the next stage as soon as possible.

For the Oraovica Dam Project and two rural water supply projects, it is proposed to carry out further study on F/S level, and to estimate the internal rates of return for next stage as soon as possible.

(3) Projects in the Third Group

The projects to be implemented as the third group are as follows:

- Two irrigation rehabilitation projects, which are expected to produce relatively high project effects with rather small investment;
- Two rural water supply projects, whose beneficiary population is relatively small.

The following four projects are proposed to be commenced in the years after 2002 and to be completed before 2005 with F/S or design review (the figures in the parenthesis show the project number):

- a) Kichevsko Pole Area Irrigation Rehabilitation Project (No.2)
- b) Valandovo Area Irrigation Rehabilitation Project (No.6)
- c) Treska River Upper Reach Rural Water Supply Project (No.34)
- d) Pelagonia Circle Rural Water Supply Project (No.37) (including Regional Water Supply System “Medzitlija”)

For these four projects, it is proposed to further study their feasibility and to estimate the internal rates of return for next stage as soon as possible.

9.1.3 Study on Possible Fund Raising Plan

(1) Investment Plan in PHASE I

The allocation of the project cost of the 12 projects proposed in PHASE I is planned in the following table. Expected start year is when construction of each project will be started. Before the start of the construction, around one to one and half years will be required for a feasibility study (F/S) or design review of the projects as described above.

Investment Plan in PHASE I

| Year | Expected Start of Projects (Name and No.) | Investment (10 ⁶ x US\$) | Expected Completion of Projects (Name and No.) |
|------|---|--|--|
| 1999 | — | 0 | — |
| 2000 | — | 0 | — |
| 2001 | • Slupchanka (No.4) • Zletovica (No.5) • Resen (No.7) | 20.8 | — |
| 2002 | • Tetovo (No.1) • Patishka Reka (No.3) • Skopje (No.35) • Kriva Palanka/ Kumanovo (No.36) | 50.2 | • Slupchanka (No.4) • Resen (No.7) |
| 2003 | • Kichevsko (No.2) • Valandovo (No.6) • Oraovica (No.8) • Pelagonia (No.37) | 68.0 | • Tetovo (No.1) • Patishka Reka (No.3) • Skopje (No.35) |
| 2004 | • Treska (No.34) | 57.6 | • Kichevsko (No.2) • Zletovica (No.5) • Kriva Palanka/ Kumanovo (No.36) |
| 2005 | — | 29.5 | • Valandovo (No.6) • Oraovica (No.8) • Treska (No.34) • Pelagonia (No.37) |
| | Total | 226.1 | |

(2) Project Situation in PIP

The following table shows whether each of the proposed projects has been already listed in the PIP (1998 – 2000) of the Government of Macedonia (GOM) or not, and the budgetary situation shown in the PIP when listed:

Project Situation in PIP (1998 – 2000)

| Project Name (No.) | Project /Budgetary Situation |
|--|--|
| 1) Water Supply Project for Tetovo – River Pena Intake (1) | 1) not listed |
| 2) Kichevsko Pole Area Irrigation Rehabilitation Project (2) | 2) not listed |
| 3) Patishka Reka Water Supply Project (3) | 3) listed without budget allocation |
| 4) Slupchanka Dam Project (4) | 4) not listed |
| 5) Treska River Upper Reach Rural Water Supply Project (34) | 5) listed *1) |
| 6) Skopje Circle Rural Water Supply Project (35) | 6) same as 5) |
| 7) Kriva Palanka/Kumanovo Circle Rural Water Supply Project (36) | 7) same as 5) |
| 8) Zleovica Multipurpose Dam Project (5) | 8) listed up without budget allocation |
| 9) Valandovo Area Irrigation Rehabilitation Project (6) | 9) not listed |
| 10) Pelagonia Circle Rural Area Water Supply Project (37) | 10) same as 5) |
| 11) Irrigation System Betterment Project in Resen (7) | 11) not listed |
| 12) Oraovica Dam Project (8) | 12) not listed |

*1) : Budget allocation for "Water-supply of villages in economically underdeveloped regions"

The PIP has proposed to allocate 15.72 million US\$ to the rural water supply projects in the Economically Underdeveloped Areas (Region) for three years from 1998 to 2000. The budget of approximately 5 million US\$ is estimated, therefore, to be allocated per annum.

(3) Aid by Donors

ACU provides the following figures on the trends of donors to provide financial aid for water supply and environmental conservation projects:

Amount of Grant Aid Projects by Donors

(unit : 1,000 US\$)

| Year | Belgium | FAO | Germany | Japan | Netherlands | Swiss | PHARE | IBRD | Total |
|--------------|--------------|------------|---------------|------------|---------------|--------------|--------------|----------|---------------|
| 1993 | — | — | 3,022 | — | — | — | — | — | 3,022 |
| 1994 | — | — | 899 | — | — | — | — | — | 899 |
| 1995 | — | — | — | — | — | 2,000 | — | — | 2,000 |
| 1996 | — | 228 | 7,418 | 596 | — | — | — | — | 8,242 |
| 1997 | — | — | — | — | — | — | 3,888 | — | 3,888 |
| 1998 | 1,000 | — | — | — | 12,000 | — | — | — | 12,000 |
| Total | 1,000 | 228 | 11,339 | 596 | 12,000 | 2,000 | 3,888 | 0 | 30,051 |

Amount of Loan Aid Projects by Donors

(unit : 1,000 US\$)

| Year | Belgium | FAO | Germany | Japan | Netherlands | Swiss | PHARE | IBRD | Total |
|--------------|----------|----------|---------------|----------|-------------|----------|----------|---------------|---------------|
| 1993 | — | — | — | — | — | — | — | — | — |
| 1994 | — | — | — | — | — | — | — | — | — |
| 1995 | — | — | — | — | — | — | — | — | — |
| 1996 | — | — | — | — | — | — | — | — | — |
| 1997 | — | — | 10,989 | — | — | — | — | 56,700 | 67,689 |
| 1998 | — | — | — | — | — | — | — | — | — |
| Total | — | — | 10,989 | — | — | — | — | 56,700 | 67,689 |

From 1993 to 1998, the donors' assistance amounted to 98,740 thousand US\$ consisting of the grant aid of 30,051 thousand US\$ and the loan aid of 67,689 thousand US\$. About 16,500 thousand US\$ was provided annually on average; 30% of which is from the grant aid and 70% from the loan aid.

(4) Financial and Economic Indicator

The project cost, and the economic and financial efficiency of each project by economical internal rate of return (EIRR) and financial internal rate of return (FIRR) are shown in the following table:

Economic and Financial Indicator of Each Project

| Project Name (No.) | Project Cost (10 ⁶ x US&Dollars) | EIRR | FIRR |
|--|--|-------|-------|
| 1) Water Supply Project for Tetovo – River Pena Intake (1) | 3.2 | 17.0% | 15.0% |
| 2) Kichevsko Pole Area Irrigation Rehabilitation Project (2) | 2.9 | 16.4% | 15.5% |
| 3) Patishka Reka Water Supply Project (3) | 3.2 | 16.5% | 13.8% |
| 4) Slupchanka Dam Project (4) | 7.3 | 16.0% | 13.1% |
| 5) Treska River Upper Reach Rural Water Supply Project (34) | 19.3 | 1.6% | - |
| 6) Skopje Circle Rural Water Supply Project (35) | 21.3 | 7.0% | - |
| 7) Kriva Palanka/Kumanovo Rural Water Supply Project (36) | 29.3 | 5.4% | - |
| 8) Zletovica Multipurpose Dam Project (5) | 68.2 | 8.3% | 8.1% |
| 9) Valandovo Area Irrigation Rehabilitation Project (6) | 7.3 | 20.1% | 18.4% |
| 10) Pelagonia Circle Rural Area Water Supply Project (37) | 35.4 | - | - |
| 11) Irrigation System Betterment Project in Resen (7) | 7.0 | 20.4% | 19.6% |
| 12) Oraovica Dam Project (8) | 21.7 | 8.2% | 7.9% |
| Total | 226.1 | | |

The project cost, EIRR and FIRR in the Master Plan have been just estimated based on general figures, reference, and data obtained through formulation of the Master Plan.

The investment cost required for PHASE I is estimated at 226.1 million US\$ (averaged at 45 (=226.1/5) million US\$ per a year), summing up the annual investment costs of 5 years from 2001 (20.8 million US\$) to 2005 (29.5 million US\$). In the meanwhile, the public investment cost relating to the water supply and irrigation sector was about 20 million US\$ among the national budget of 750 million US\$ in 1996, and about 16.5 million US\$ was provided annually on an average according to a report of ACU, resulting in 36.5 (=20+16.5) million US\$ per a year combing those for the public investment cost for the water supply and irrigation sector. That means further 8.5 (=45-36.5) million US\$ per a year will be required, being compared with the current annual investment, in case implementation of the projects as proposed in PHASE I.

To deal with this, it is strongly recommended in the early time to carry out further investigation and study on the F/S level and to estimate the project cost, EIRR and FIRR of each project with a certain accuracy so as to formulate a fund raising plan

incorporating the fund sources for the projects like foreign currency (foreign aids), local currency (government budget), and others (BOT/PFI, etc.).

9.2 Recommendations on General Issues in Water Resources Development

(1) Consideration to the Issue of International Rivers

Coordination about the international rivers with the neighboring countries for the implementation of some of the development and management projects needs to be managed by the Government of Macedonia.

(2) Coordination among Donors

Currently, the irrigation system rehabilitation projects are being implemented with the World Bank cooperation and the nationwide master plan formulation study on the treatment of wastewater and solid waste under the PHARE program. The cooperation between the Master Plan and these on-going projects contributes to the efficient implementation of the Master Plan.

(3) Early establishment of the Water Economy Base Plan

It is desirable to formulate the Water Economy Base Plan, which is expected to be completed by PWME, as a concrete and practical action plan in the water resources management as soon as possible based on the output of the Master Plan. For the preparation, institutional strengthening for operation and management and enhancement of the legal system should be carefully considered in addition to the facility construction.

9.3 Recommendations on General Issues about Development Plan

(1) Review and Upgrade of the National Development Strategy 1997

The National Development Plan should be developed through review and upgrade of the National Development Strategy 1997. The National Development Plan needs to provide a comprehensive image of improvement in the population's living conditions, the development of the agricultural, industrial, and commercial sectors, the regional development, and environmental conservation. The plan is also expected to show the concrete directions of the "development goals and targets", "development strategy", "action plan", etc.

(2) Formulation of Regional and Sectoral Development Plans

According to the National Development Plan, which is proposed in the previous paragraph, the development plans by regions and by economic sectors including agricultural, industrial, trading etc. are required. The regional development plans will show the concrete action plans based on the direction of development for

each region, which is given in the National Development Plan. The sectoral development plan needs to provide the new direction of the development toward the market-oriented economy through the preparation of the nationwide inventory of the existing production activities, facilities, etc. In addition to development of the agricultural and industrial sectors, the improvement of the marketing and distribution system is also important.

(3) Strengthening of Project Planning and Implementation System through Participatory Development Method

The participatory development method, such as the PCM method, etc. is desirable to be introduced in each of the steps of the project cycle including project formulation, project selection and appraisal, planning, implementation, and monitoring and evaluation. This will improve the ownership and sustainability of the development projects. Especially in the sectors related to the water resources, where the understanding and cooperation of the community members are essential, the promotion of the community participation will greatly contribute to the effective development and management.

| | Project Name | Purpose | Project Cost (US\$mil.) | | | PHASE I | | | | | PHASE II | | | | | PHASE III | | | | | | | | | | | | | | | | |
|--|--|-------------|-------------------------|----------|-----------|---------|------|----|----|----|----------|----|----|----|----|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | PHASE I | PHASE II | PHASE III | 1999 | 2000 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1. Water Supply Project for Tetovo - River Pena Intake | M & I | 3.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2. Kichevsko Pole Area Irrigation Rehabilitation Project | RI | 2.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3. Patishka Reka Water Supply Project | M | 3.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4. Slupchanka Dam Project | M | 7.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5. Zletovica Multipurpose Dam Project (Phase I) | M & I | 68.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6. Valandovo Area Irrigation Rehabilitation Project | RI | 7.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7. Irrigation System Betterment Project in Resen | RI | 7.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8. Oraovica Dam Project | M & E | 21.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 34. Treska River Upper Reach Rural Water Supply Project | RS | 19.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 35. Skopje Circle Rural Water Supply Project | RS | 21.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 36. Kriva Palanka/Kumanovo Circle Rural Water Supply Project | RS | 29.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 37. Pelagonija Circle Rural Water Supply Project | RS | 35.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 9. Studena Voda Groundwater Development Project | M | | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10. Paligrad Multipurpose Dam Project | M & I, A, P | | 48.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 11. Lipkovo-Glaznja Area Irrigation Rehabilitation Project | RI | | 21.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 12. Kiselichka Dam Project | M & I, A | | 46.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 13. Vakuf Multipurpose Dam Project | M & I, A, P | | 164.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14. Razlovci Dam Project | M & I, A | | 42.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 15. Rechani Multipurpose Dam Project | M & I, P | | 50.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16. Construction of Irrigation Sub-system "Shtipsko Pole", left side | A | | 13.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 17. Studencica Supplemental Water Supply Project | M & I | | 2.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 18. Kovanska Dam Project | A | | 31.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 19. Konsko Dam Project | M & I, A | | 66.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 20. Ohrid Area Irrigation Rehabilitation Project | RI | | 8.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 21. Mantovo Area Irrigation Rehabilitation Project | RI | | 11.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 22. Strumica Area Irrigation Rehabilitation Project | RI | | 24.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 38. Vardar River Upper Reach Rural Water Supply Project | RS | | 15.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 39. Bregalnica River Basin Rural Water Supply Project | RS | | 29.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 40. Vardar River Lower Reach/Strumica River Basin Rural Water Supply Project | RS | | 21.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 41. Southwest Mountains Area Rural Water Supply Project | RS | | 7.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 23. Construction of Bypass Channel Raven- Rechica | A | | | 44.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 24. Pelince Dam Project | A | | | 57.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25. Blatec Dam Project | M & I, A | | | 37.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 26. Krapa Dam Project | M & I, A | | | 54.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 27. Zhvan Dam Project | A | | | 127.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 28. Obednik Dam Project | A | | | 44.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 29. Kochishte Dam Project | A | | | 66.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 30. Zhurche Dam Project | A | | | 21.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 31. Konjarka Dam Project | A | | | 24.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 32. Petrushka Dam Project | A | | | 65.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 33. Podares Dam Project | M & I, A | | | 66.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 42. Nationwide Rural Water Supply Extension/Improvement Project | RS | | | 53.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Subtotal by PHASE | | 226.1 | 606.5 | 662.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Subtotal of Water Resources Development Plan | | | | 1,495.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Water Quality Conservation Plan by River Basin | | | | 217.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Watershed Conservation Plan by River Basin | | | | 190.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Surface Water and Groundwater Monitoring System Improvement Plan | | | | 61.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Water-related Facilities Operation and Maintenance Improvement Plan | | | | 2.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Institutions and Legal System Strengthening Plan | | | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Human Resources Development Plan | | | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | New Water Economy Base Plan to be prepared by GOM | | | | - | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Subtotal of Water Resources Management Plan | | | | 470.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Grand total | | | | 1,965.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

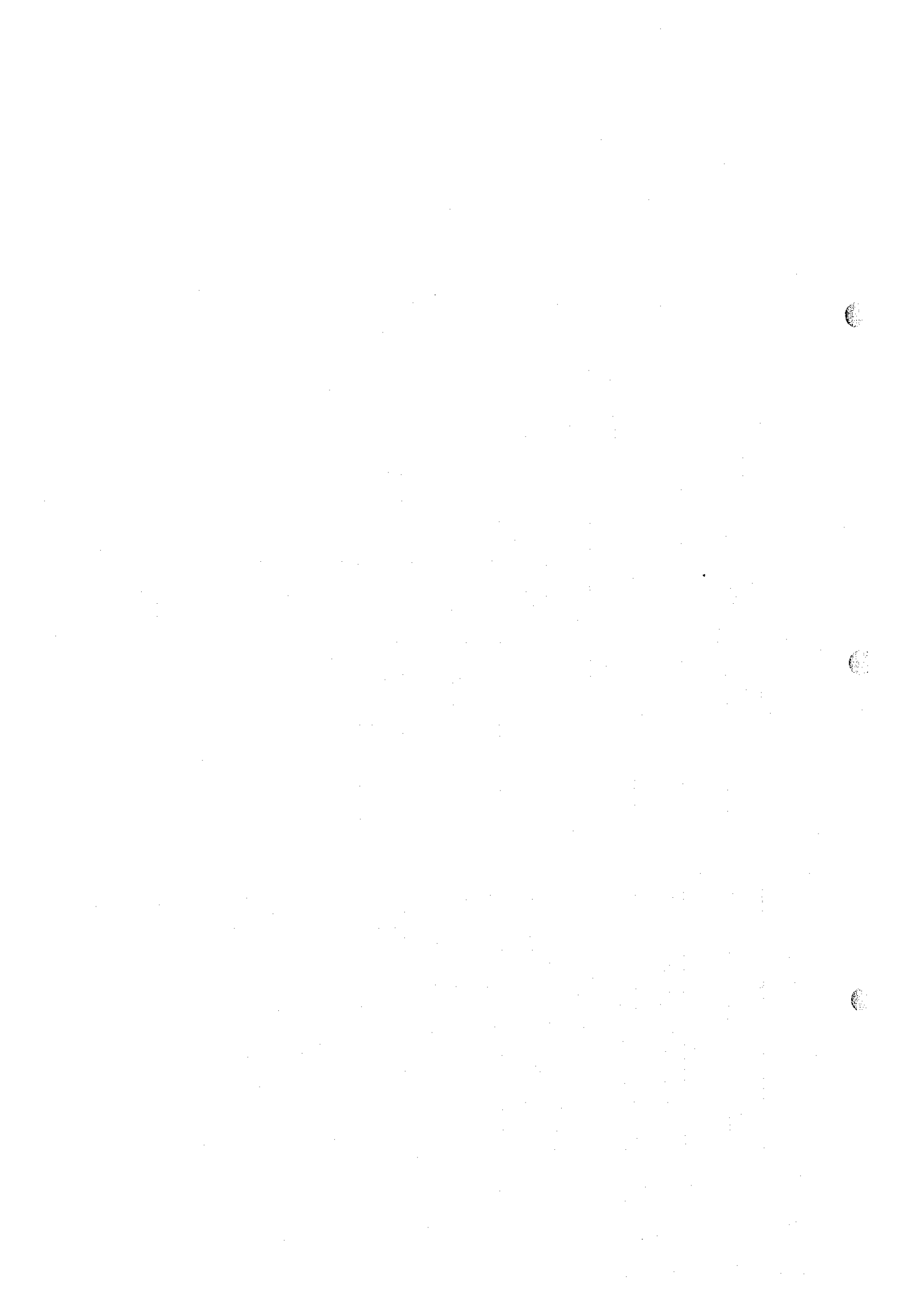
Remarks, M: Municipal, I: Industrial, A: Agricultural, P: Power, E: Environmental, RI: Irrigation Rehabilitation, RS: Rural Water Supply

Figure 9.1 Overall Implementation Plan

| No. | Project Name | Purpose | Project cost (US\$ mil.) | PHASE I | | | | | | | | |
|-----|--|----------|-----------------------------|---------|------|------|------|------|------|------|--|--|
| | | | | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | | |
| 1 | Water Supply Project for Tetovo - River Pena Intake | M & I | 3.2 | | | RE | | | | | | |
| | | | | | | | 1.6 | 1.6 | | | | |
| 2 | Kichevsko Pole Area Irrigation Rehabilitation Project | RI | 2.9 | | | | NP | | | | | |
| | | | | | | | | 1.4 | 1.5 | | | |
| 3 | Patishka Reka Water Supply Project | M | 3.2 | | | RE | | | | | | |
| | | | | | | | 1.6 | 1.6 | | | | |
| 4 | Slupchanka Dam Project | M | 7.3 | | | RE | | | | | | |
| | | | | | | | 3.7 | 3.6 | | | | |
| 5 | Zletovica Multipurpose Dam Project | M & I | 68.2 | | | RE | | | | | | |
| | | | | | | | 13.6 | 20.5 | 20.5 | 13.6 | | |
| 6 | Valandovo Area Irrigation Rehabilitation Project | RI | 7.3 | | | | NP | | | | | |
| | | | | | | | | 2.3 | 2.7 | 2.3 | | |
| 7 | Irrigation System Betterment Project in Resen | RI | 7.0 | | | RE | | | | | | |
| | | | | | | | 3.5 | 3.5 | | | | |
| 8 | Oraovica Dam Project | M & E | 21.7 | | | | NP | | | | | |
| | | | | | | | | 6.5 | 8.7 | 6.5 | | |
| | | Subtotal | 120.8 | 0.0 | 0.0 | 20.8 | 30.8 | 33.9 | 26.5 | 8.8 | | |
| 34 | Treska River Upper Reach Rural Water Supply Project | RS | 19.3 | | | | | NP | | | | |
| | | | | | | | | | 9.6 | 9.7 | | |
| 35 | Skopje Circle Rural Water Supply Project | RS | 21.3 | | | NP | | | | | | |
| | | | | | | | 10.6 | 10.7 | | | | |
| 36 | Kriva Palanka/Kumanovo Circle Rural Water Supply Project | RS | 29.3 | | | NP | | | | | | |
| | | | | | | | 8.8 | 11.7 | 8.8 | | | |
| 37 | Pelagonija Circle Rural Water Supply Project | RS | 35.4 | | | | NP | | | | | |
| | | | | | | | | 11.7 | 12.7 | 11.0 | | |
| | | Subtotal | 105.3 | 0.0 | 0.0 | 0.0 | 19.4 | 34.1 | 31.1 | 20.7 | | |
| | | Total | 226.1 | 0.0 | 0.0 | 20.8 | 50.2 | 68.0 | 57.6 | 29.5 | | |

Remarks: • For purpose of project; M: Municipal, I: Industrial, E: Environmental, RI: Irrigation Rehabilitation, RS: Rural Water Supply
• For works before implementation of Projects; RE: Review of existing plan/design, NP: New planning, study and survey

Figure 9.2 Implementation Program of PHASE I Projects







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