Chapter 11 Project Implementation Program

11.1 Implementation Program

The project implementation program delineates time frame of various project activities starting from financial negotiation with foreign lending institutions, up to the operation and maintenance stage through land acquisition and construction work of sewerage facilities.

Phase 1 implementation as priority project is expected to be completed by the end of 2000, while Phase 2 as the overall completion of the proposed project is considered to be achieved by the end of 2010.

Phase 1	(1998 to 2001)	- Priority Project
	1998	Preparation of project
	1999	Detailed design, bidding
	2000	Construction & procurement of equipment
	2001	Construction
	2002	Commencement of operation
Phase 2	(2007 to 2010)	
	2007	Preparation of project
	2008	Detailed design, bidding
	2009	Construction & procurement of equipment
	2010	Construction
	2011	Commencement of operation

The project implementation and disbursement schedule with estimated annual disbursement of project cost is presented in Figure 11.1.1. The required project activities are described below.

11.2 Activities of Project Implementation

11.2.1 Preparation of Project

Preparatory work for the project implementation includes:

- Budgetary arrangement within the Albanian Government for land acquisition and institutional development,
- Negotiation of grant/loan with foreign lending institution/s, and
- Selection of consultants in accordance with the agreement executed between the foreign lending institution and the executing agency of the Albanian government.

This preparatory work shall be commenced by the middle of 1998 and completed by the end of the same year.

It shall be noted that the institutional development of the executing agency and staffing as required for project implementation are prerequisite not only to insure successful achievement of the project objectives, but also to secure the firm commitment of financial assistance from the foreign lending institution/s. Appraisal mission of such institution will pay due attention on the preparedness and maturity of the proposed project as well as implementing capability of the executing agency both financially and institutionally.

11.2.2 Pre-construction Stage

Majority of the project activities will be undertaken by the consultants hired by the executing agency. Those which to be carried out by the consultants include, but not limited to, detailed field investigations, detailed engineering design, and preparation of tender documents for bidding. These activities will be carried out from early time of 1998 to the middle of the same year.

After preparation of the tender documents, bidding for procurement of maintenance equipment and for construction work of proposed project will be executed by the end of 1999.

In parallel to the above project activities, the executing agency shall, in accordance with the detailed design, negotiate with respective land owners for land acquisition. Other important subjects, such as tariff system of sewerage service for cost recovery, shall be carried out by the executing agency as recommended in the preceding chapter of this Study.

Figure 11.1 Project Implementation and Disbursement Schedule

Phase		Phase 1				Phase 2			
Item \ Year		1998	1999	2000	2001	2007	2008	2009	2010
Implementation Schedule									
1. Preparation of Project									
2. Pre-Construction Stage									
2.1 Detailed Design									
2.2 Bidding									
3. Construction									
3.1 Collection System									
- Interceptor									
- Trunk Main									
3.2 Sewage Treatment Plant									
- Civil Work									
- Mechanical/Electrical Work									
4. Procurement of Equipment									
Disbursement Schedule	**Total Cost (Million US$)**								
1. Land Acquisition	**4,700**		2,600				2,100		
2. Administration	**600**		100	100	100		100	100	100
3. Construction Work	**39,796**			10,803	10,803			9,095	9,095
4. Procurement of Equipment	**1,233**			1,078				155	
5. Engineering Service	**3,300**		1,000	400	400		700	400	400
6. Contingency	**7,442**		1,365	1,370	1,370		1,113	1,112	1,112
Total of Annual Disbursement	**57,071**		**5,065**	**13,751**	**12,673**		**4,013**	**10,862**	**10,707**

11.2.3 Construction

Major scope of construction work are as follows:

(1) Collection System

- Trunk main
- Interceptor (repair and replacement)
- Storm overflow chamber and storm discharge outlet
- Storm water inlet

(2) Sewage treatment plan

- Civil work
- Mechanical/electrical work

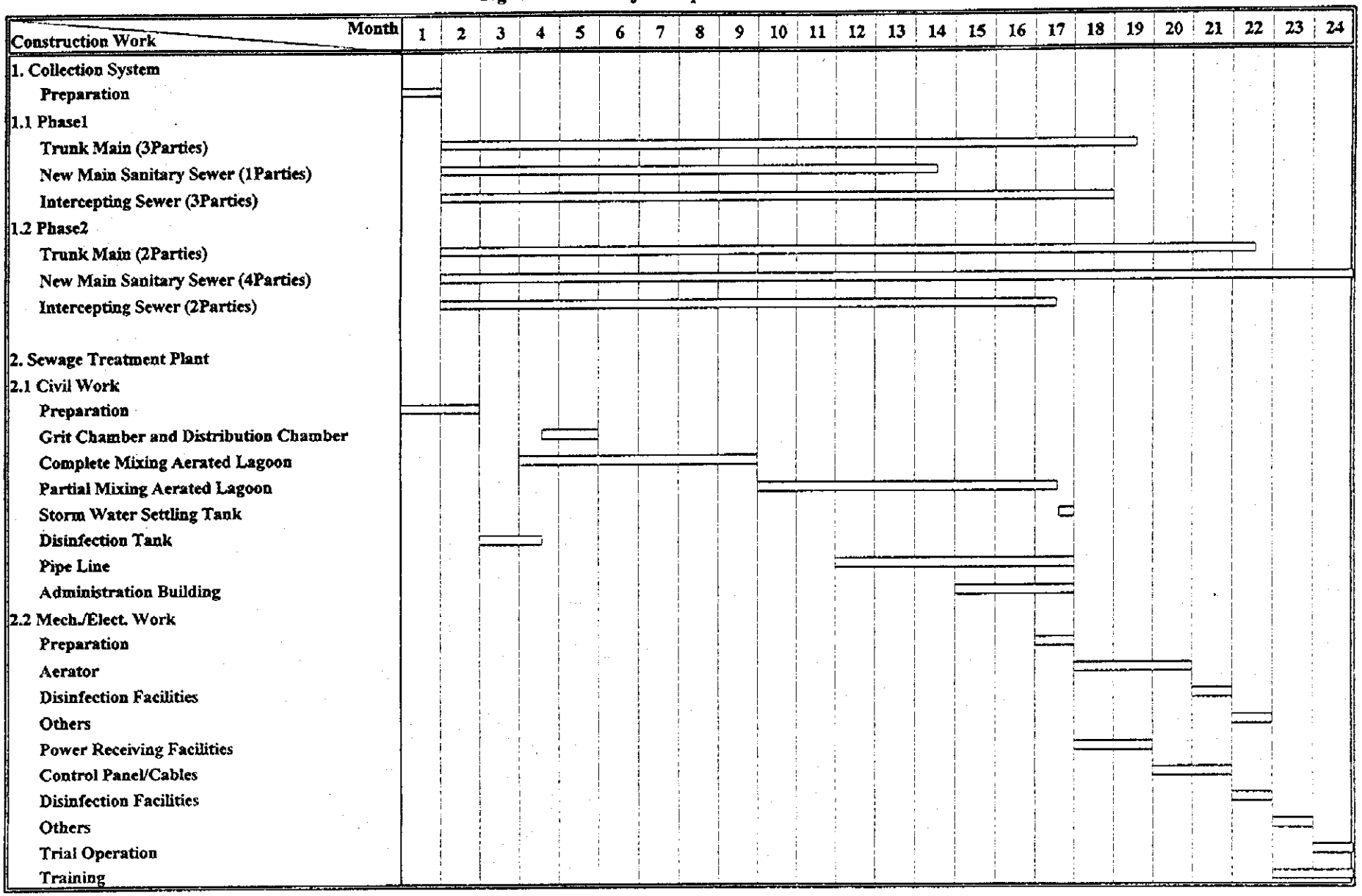
Construction periods for major works are estimated as follows:

(1) Collection System	Phase 1	Phase 2
- Momilization	1.0	1.0
- Trunk main	17.5	20.5
- New main sanitary sewer	12.5	23.0
- Interceptor (replacement)	17.0	15.5
- Interceptor (replacement)	17.0	15.5
- Storm overflow chamber/outlet	3.0	0.0
- Storm water inlet	3.0	0.0
Total	24.0 months	24.0 months

(2) Sewage treatment plan	
- Momilization	2.0
- Civil work	15.0
- Mechanical/electrical work	6.0
- Trial Operation	1.0
- Training	2.0
Total	24.0 months

Detailed construction periods for each major works are shown in Figure 11.2.

Figure 11.2.1 Project Implementation Schedule



11.2.4 Procurement of Maintenance Equipment

Preparation of maintenance equipment, such as jet-cleaners, vacuum trucks, dump trucks, etc. will be prepared by the consultant during detailed design of sewerage facilities and procured within 2000 by international bidding.

Chapter 12 Legislative and Institutional Arrangements Relative to Sewerage Service and Urban Sanitation

12.1 Legislative and Institutional Arrangements for Public Sewerage Service

12.1.1 Legislative Arrangements

While environmental regulations and other laws have been put into effect as a whole, the current system of laws in effect remains incomplete and insufficient. Specifically, those directly concerned with the sewer system , i.e., laws requiring factories discharging pollutant waste to install treatment facilities etc., have yet to be instituted While it is not possible to put all blame on the legal system, this lack of regulation has allowed for the discharge of waste water into the Lana River, a clean river originally fit for consumption, as well as the abandoning of waste material. In sum, the legal system, as it is at present, has done little to preserve the environment.

In the following, we have presented an outline of the legal framework which will be necessary for sewer system development and maintenance. At the same time, it will also be necessary to institute a system of financing and one of legal enforcement, and to establish the wastewater quality standards. As a part of this, a system of penalties will be established to punish legal offenders, such as factory shutdowns, fines and forced withdrawal from the sector as a whole. As the making and enforcement of such a legal system will entail a high degree of expertise and is in general a complicated process, we recommend the establishment of a task force incorporating members from all the related institutions.

(1) **Waste water quality and quantity standards and discharging points**: On wastewater quality and quantity standards, On permission to discharge
(2) **Land usage**: On rights on the usage of private land and on ownership by public institutions
(3) **Sewer system construction requirements**: On sewer system construction duties for urban, industrial park, and residential planning, On installing treatment facilities
(4) **Sewer system usage requirements**: On restrictions on the usage of sewer facilities, On discharging pipe connections to sewer pipe networks in areas with sewer services, On protection of sewer facilities, On waste water intake
(5) **Construction of sewer facilities**: On construction standards for sewers and treatment facilities, On license systems for construction firms, engineers and technicians
(6) **Sewer tariffs and subsidy of funds**: On sewer tariffs and other service charges, On tax

benefits for those who invest in waste treatment facilities, On funding for discharging pipe connection and sewerage facility constructions

(7) **Owners of sewer facilities, development and maintenance**: On ownership structure for publicly-owned sewer facilities, On setting an executive body for planning, maintenance and operation

(8) **Arbitration**: On arbitration of disputes regarding usage and construction of facilities

12.1.2 Institutional Arrangements

Looking at the present system of arrangements for sewer system provisions and maintenance, it can be said that a tiered operational framework is generally in place. This is composed of the following: 1) enactment of national policy by the Ministry of Public Works, Territory Adjustment and Tourism (MOPWT); 2) enforcement of this policy at the district level by the Municipality; and 3) actual operations on the local level by Enterprise Maintenance of Road and Sewerage Systems (EMRS), which is supervised by the Municipality. However, this division of responsibilities between the national and local governments is not actually being observed. One reason is that although the national government provides funding, the MOPWT concurrently conducts evaluations of the validity of each construction project, and is thus directly involved in operations originally intended to be at the local level. Moreover, the MOPWT has yet to establish a firm policy on the provisions of sewer services, or one on standards and regulations.

The sewer sector has a large impact on a local level, and the regional authorities are responsible for the actual provision and upkeep of the system. Consequently, regional authorities should also have the authority to make such policies. Making a clear distinction between those policies to be decided at the national level and those at the regional level would have a positive effect on the sewer system as a whole, especially from an operational point of view. The following is an outline which categorizes those items to be conducted at the national level, the local level, and those to be done by the EMRS.

The following items are to be the MOPWT's responsibility :

(1) The setting of a firm policy for sewer systems for Albania as a whole

(2) The creation of construction standards for sewer facilities

(3) The setting of proper credentials of construction firms and engineers for the construction of sewer facilities

(4) The enactment of a system of regulations for sewer facilities, to be set at the national level
(5) The distribution of subsidies to local governments

The following items are to be the Tirana Municipality's responsibility:

(1) The formulation of a plan for the development of the sewer system, as well as the administration of the actual execution
(2) The setting of rules and regulations regarding sewer systems at the city level
(3) The setting of tariffs (charges) for sewer service and means of collection
(4) The monitoring of the sewer system's operations

The following are to be EMRS's responsibility, on the assumption that the current method of operations is preserved:

(1) The monitoring of sewer facility construction
(2) The maintenance of facilities
(3) The operation of waste water treatment facilities built at a later date
(4) A customer service center where customers can request the connection of discharge pipes and can make comments on sewer system services
(4) The monitoring of water quality of the water in the sewer network and of discharges from treatment plants

12.2 Legislative and Institutional Arrangements for Improvement of Relevant Urban Environmental Sanitation

The overall improvement and uplift of urban environment requires not only the provision of public sewerage system and its institutional/legislative arrangements, but also the appropriate arrangements and community participation to relevant sanitation measures.

Among others, appropriate measure for on-site treatment of domestic sewage is indispensable as intermediate measure for sanitation not only for suburban area in the outside of sewerage service area, but also households being unserved by the public sewerage system. Those which identified subjects are, but not limited to, the following:

(1) Area classification for application of on-site treatment/disposal
(2) Building permission
(3) Financial assistance for installation of on-site treatment/disposal facility
(4) Removal and treatment of septage

Next subject is solid waste management. Although two private companies have awarded the contract from Tirana City to collect and dump municipal garbage, considerable amount of garbage are still uncollected and disposed into rivers, open channels and vacant lots. When appropriate measures are not taken up to prevent such illegal dumping of solid waste, the improvement of aquatic environment in the Lana River will not be achieved.

12.3 Public Education on Health and Hygiene Aspect

Not only for the smooth implementation of the proposed project, but also for maximization of environmental improvement expected to the proposed project, thorough understanding of the objectives of the project and active community participation are indispensable.

Those which to be taken up in public education on health and hygiene aspect as well as the promulgation of the proposed project are identified, but not limited to, as follows:

(1) Relationship between unsanitary practices and water borne/related/vector diseases
(2) Role and objective of public sewerage system
(3) Role and objective of on-site treatment/disposal of domestic sewage
(4) Importance of recovery and recycling of resource materials from garbage through separate collection
(5) Role and objective of community participation, such as sharing of community activities for cleaning of garbage deposit site.

To enhance the effect of community participation, the respective local government authority and executing agency of public sewerage system shall take following measures:

(1) Preparation of campaign materials and public announcement
(2) Campaign to the public through TV, radio and other available mass-communication measures,
(3) Periodical meeting with local residents and community leaders.

Chapter 13 Financial Analysis

Several financial issues must be considered during the course of project work: (1) ensuring that there are sufficient funds to carry the project through to completion; (2) recovering an appropriate portion of the costs from the users so as to ease the burden on the state and local governments, especially when considering the Albanian state government's current financial deficit; and (3) the impact of investments on the financial state of the Sector and the overall financial viability and soundness of the Sector itself.

13.1 Introduction

In the case of financial planning for on going enterprises, a financial forecast is normally prepared based upon past accounting information, as such data represents the actual costs of operation and thus usually provides a reliable basis for analysis of cost activity for the future. However, past accounting data has not been effectively used in the financial planning of the sewerage sector and/or EMRS, due to the lack of reliability of EMRS's past financial statements and the magnitude of new investments compared to the existing total assets. Financial analysis in this report is dependent on assumptions based on various external data because of the limited internal accounting information mentioned above. Thus, there is a possibility that the fluctuation of external conditions surrounding the enterprise will have an enormous effect towards the financial feasibility of the project in the future.

Subject of Financial Analysis

As for sewerage development in Albania, financial aid by the State government to local governments and/or executing organizations are made in the form of investments, where local government and/or executing organizations are not obliged to repay the principal or make payment of interest to the upper government. This also holds true in the case of financial aid from abroad. Thus, for the purpose of project evaluation, we performed a financial analysis of the Tirana sewerage sector as a whole, being responsible for bearing the capital cost of any project, rather than focusing upon only EMRS. A financial analysis of EMRS has been attached only for reference purposes.

Financial Sources Assumed

Given the huge amount of investment required, it is unrealistic to assume that all investments will be financed using internal funds. Rather, it might be appropriate to assume financial aid from foreign governments or from international aid agencies will be extended. The following analysis is made on the assumption that the investment will be financed by Grants, Loans and a combination of these international aids. The matrix of alternative financial sources is illustrated as follows;

Table 13.1 Alternative Application of Assumed Financial Sources

Case	Phase 1	Phase 2
Case 1	Loan	Loan
Case 2	Grant	Loan
Case 3	Grant	Grant

Effects of Inflation

The effects of inflation were not considered in this financial analysis owing to limited information of its prediction.

Effect of Fluctuation of Foreign Exchange Rate

In general, predictions of fluctuations in the foreign exchange rate are difficult to make, and currently, the Albanian Lek fluctuates widely within a short period. Thus, effects of fluctuation of the foreign exchange rate was also excluded from this financial analysis.

Project Period

Project period begins with 1998 and ends with 2040, sum up to 43 years in total.

Project period is composed of two phases, phase 1 from 1998 to 2030 and phase 2 from 2007 to 2040, both of which correspond to the beginning of detail design and the final repayment in Loan scheme, respectively.

13.2 Assumptions

Cash Receipt

1. Commencement of sewerage tariff charge: Tariff is assumed to be levied from January 1, 2000.

2. Design of tariff structure: Flat rate is assumed.
3. Collection method: The sewerage sector pays a flat rate of 3% of the amount collected as a collection fee.
4. Monthly tariff rate and willingness-to-pay: For the purposes of sewerage cost recovery trials in succeeding sections, upper limit of their willingness-to-pay, 100 Lek per month is used. For the purposes of sensitivity analysis, monthly sewerage tariff per household is varied by ten degree, from Lek 80 to 260, in FIRR projections.
5. Collection ratio / price elasticity: The current collection ratio of the water supply tariffs is about 90%. For the purposes of sewerage cost recovery trials in succeeding sections, collection ratio of sewerage tariffs is assumed to be about 80% , considering the negative effect of additional burden to customers after commencment of sewerage charges. For the purposes of sensitivity analysis, collection elasticity of tariff rate is varied by five degree, from 50% to 90%, in FIRR projections.
6. Users liable to tariff: Tariff in phase 1 is assumed to be charged to non-beneficiaries who receive present outdated sewerage service in addition to beneficiaries living in targeted area for construction in phase 1.
7. Increase in consumers

   Population who is living in the area equipped with sewerage system at 2001 and 2010 is estimated as much as 359,300 and 525,200, respectively. For detail refer the Table 7.2.1. Population subsequent to 2010 is assumed as constant, except for zone USAID-1 and 2. As for the zone USAID-1 and 2, population density will increase from 200 per ha in 2010 to 300 per ha in 2025.

Cash Disbursements

1. Interest payment: 2.1 % of Loan balance per annum
2. Repayment of principal: Grace period of 10 years. Repayment will be made over the following 20 years.
3. Depreciation expenses: Fixed assets depreciation is assumed using the straight line method over useful lives as estimated below. For simplicity sake, we have assumed that there is no remaining amount.
   - Buildings and pipes: 50 years
   - Machinery and equipment: 15 years
   - Automobiles, machinery for cleaning: 6 years
4. Corporate income taxes: Corporate income taxes are not considered because of the plausible loss situation of EMRS and its status as a public enterprise.
5. Contingency allowance: Contingency allowance is not taken into account due to uncer-

tainty of its occurrence.

6. Possible enhancement of operational efficiency through organizational reform: Possible effects of management organizational reform, which is discussed in Chapter 14, to cash disbursement is not considered in the following projection.

13.3 Funding the Project

For successful execution of the project, one must prepare a financial plan to ensure that there are sufficient funds not only for construction of the facility but also for its maintenance and replacement after depreciation. In addition, in case the loan is utilized, funds for repayment of the principal and interest payment should also be provided by the sewerage sector.

Table below gives a rough estimation of the total funds necessary for the project throughout the projection period, divided into the construction phase, replacement phase, operating phase, and repayment of principal and interest payment.

Table 13.2 Total Funding for the Project

Unit: millions of Lek

Funding Item	Loan Only			Grant & Loan			Grant Only		
	External	Internal	Total	External	Internal	Total	External	Internal	Total
Construction	4,062	901	4,963	4,254	708	4,963	4,420	543	4,963
Replacement		1,929	1,929		1,929	1,929		1,929	1,929
Operating & Maintenance		3,587	3,587		3,587	3,587		3,587	3,587
Sub-total	4,062	6,417	10,479	4,254	6,224	10,479	4,420	6,058	10,479
Repayment of Principal	-4,062	4,062	0	-1,819	1,819	0	0	0	0
Payment of Interest	-1,747	1,747	0	-803	803	0	0	0	0
Grand Total	-1,747	12,226	10,479	1,633	8,846	10,479	4,420	6,058	10,479

Note: 'External' refers to funds provided by the international aid agencies.
'Internal' refers to funds provided by the Albanian government.

Total funds necessary for construction and operation is estimated at approximately Lek 10,479 million in all the three cases. Components of the external and internal funds differ slightly between the these cases as the scope of aid by Loan differs from that of Grant Aid.

However, after consideration of the possible financial burden of repayment of the principal and interest payment, a significant difference is noticed. In Case 1, financed only by Loans, the sewerage sector has to bear approximately Lek 12,226 million. In Case 2, financed by the Grant and Loan, the sewerage sector has to bear approximately Lek 8,846 million. In Case 3, financed only by Grant, the sewerage sector has to bear approximately Lek 6,058 million.

13.4 Cost Recovery

Table 13.4 below illustrates an analysis of how the necessary costs, analyzed in the preceding section, are recovered by collection of sewerage tariffs. As explained in 13.2, monthly sewerage tariff is assumed at Lek 100 per household and collection ratio is 80%. Future raise in sewerage tariff is not considered in the trial below

Table 13.3 Cost Recovery by Sewerage Tariff

Unit: millions of Lek

Year	Receipt	Sector Basis						Executive Organization	
		Loan Only		Grant + Loan		Grant Only		Stand-alone Basis	
		Disburse.	+/-	Disburse.	+/-	Disburse.	+/-	Disburse.	+/-
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1998	0	0	0	0	0	0	0	0	0
1999	0	-311	-311	-283	-283	-283	-283	0	0
2000	70	-146	-76	-21	49	-21	49	-11	59
2001	71	-161	-90	-72	-1	-72	-1	-62	9
2002	72	-109	-37	-62	10	-62	10	-62	10
2003	72	-109	-36	-62	11	-62	11	-62	11
2004	73	-109	-36	-62	11	-62	11	-62	11
2005	74	-109	-35	-62	12	-62	12	-62	12
2006	74	-226	-152	-179	-105	-179	-105	-71	3
2007	75	-109	-34	-62	13	-62	13	-62	13
2008	76	-360	-285	-313	-238	-282	-206	-62	14
2009	76	-219	-143	-172	-95	-72	5	-62	15
2010	96	-195	-99	-147	-51	-74	22	-64	32
2011	107	-301	-193	-142	-35	-104	3	-104	3
2012	108	-396	-289	-241	-133	-202	-95	-95	13
2013	108	-286	-178	-133	-25	-95	14	-95	14
2014	109	-284	-175	-133	-24	-95	14	-95	14
2015	109	-305	-196	-157	-48	-119	-10	-103	6
2016	109	-610	-501	-464	-355	-426	-316	-104	5
2017	110	-277	-167	-133	-23	-95	15	-95	15
2018	110	-382	-272	-241	-131	-202	-92	-95	15
2019	110	-272	-162	-133	-22	-95	16	-95	16
2020	111	-278	-167	-141	-30	-103	8	-103	8
2021	111	-382	-271	-248	-137	-120	-9	-104	7
2022	112	-353	-242	-221	-109	-95	17	-95	17
2023	112	-349	-237	-219	-107	-95	17	-95	17
2024	112	-452	-340	-325	-213	-202	-90	-95	18
2025	113	-629	-517	-504	-391	-384	-271	-103	10
2026	113	-346	-233	-223	-110	-104	8	-104	8
2027	113	-347	-235	-227	-114	-110	3	-95	18
2028	113	-327	-215	-209	-97	-95	18	-95	18
2029	113	-323	-211	-208	-95	-95	18	-95	18
2030	113	-435	-322	-322	-209	-211	-98	-103	10
2031	113	-535	-422	-535	-422	-426	-313	-104	8
2032	113	-202	-89	-202	-89	-95	18	-95	18
2033	113	-215	-103	-215	-103	-110	3	-95	18
2034	113	-198	-85	-198	-85	-95	18	-95	18
2035	113	-204	-92	-204	-92	-103	10	-103	10
2036	113	-312	-199	-312	-199	-212	-99	-104	8
2037	113	-192	-80	-192	-80	-95	18	-95	18
2038	113	-190	-78	-190	-78	-95	18	-95	18
2039	113	-204	-91	-204	-91	-110	3	-95	18
2040	113	-476	-363	-476	-363	-384	-271	-103	10
Total	4,170	-12,226	-8,056	-8,846	-4,675	-6,058	-1,888	-3,587	583

On the Sector basis, total cost exceeds total tariff receipts in all three cases. Full recovery of

necessary costs is impossible even in the Case 3, grant finance for Phase 1 and 2. However, the total operating and maintenance cost will be able to be fully recovered by only sewerage tariffs on a stand-alone basis, in which an executing agency does not bear repayment of the principal and interest payment of loan, and cost for investments in replacement which will occur subsequent to the completion of the construction.

13.5 Financial Performance

Financial internal rate of return (FIRR), is used as an indicator of the overall financial performance of the project, was calculated and its sensitivity analysis is shown below.

Note:

- In the FIRR calculation, assumptions used are common to those employed at Section 13.2. In addition to the assumptions above, terminal value at the end of the project is estimated as acquisition cost for land and net book value for depreciable properties. With regard to principal payment of loan, the payment is excluded from calculation bases of FIRR.
- Sensitivity analysis with varying tariff rates from 80 to 260 Lek per month, and changing collection rate from 50% to 90% are performed.

Table 13.4 FIRR and Sensitivity Analysis

Unit: Lek

Case A:

Collection Ratio	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Monthly tariff rate	80	100	120	140	160	180	200	220	240	260
FIRR: Loan only	-5.63%	-4.73%	-3.86%	-3.02%	-2.21%	-1.41%	-0.64%	0.11%	0.86%	1.59%
FIRR: Grant + Loan	-5.15%	-4.20%	-3.28%	-2.39%	-1.53%	-0.69%	0.13%	0.93%	1.73%	2.51%
FIRR: Grant only	-4.41%	-3.46%	-2.55%	-1.67%	-0.82%	0.01%	0.82%	1.61%	2.39%	3.17%

Case B:

Collection Ratio	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Monthly tariff rate	80	100	120	140	160	180	200	220	240	260
FIRR: Loan only	-6.04%	-5.23%	-4.44%	-3.67%	-2.93%	-2.21%	-1.50%	-0.81%	-0.14%	0.53%
FIRR: Grant + Loan	-5.58%	-4.72%	-3.89%	-3.08%	-2.29%	-1.53%	-0.78%	-0.05%	0.67%	1.37%
FIRR: Grant only	-4.85%	-3.99%	-3.16%	-2.35%	-1.57%	-0.82%	-0.08%	0.64%	1.35%	2.05%

Case C:

Collection Ratio	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Monthly tariff rate	80	100	120	140	160	180	200	220	240	260
FIRR: Loan only	-6.46%	-5.73%	-5.03%	-4.34%	-3.67%	-3.02%	-2.38%	-1.76%	-1.15%	-0.56%
FIRR: Grant + Loan	-6.02%	-5.26%	-4.51%	-3.79%	-3.08%	-2.39%	-1.72%	-1.06%	-0.42%	0.22%
FIRR: Grant only	-5.29%	-4.52%	-3.78%	-3.05%	-2.35%	-1.67%	-1.00%	-0.35%	0.28%	0.91%

Case D:

Collection Ratio	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
Monthly tariff rate	80	100	120	140	160	180	200	220	240	260
FIRR: Loan only	-6.89%	-6.25%	-5.63%	-5.03%	-4.44%	-3.86%	-3.30%	-2.74%	-2.21%	-1.68%
FIRR: Grant + Loan	-6.47%	-5.80%	-5.15%	-4.51%	-3.89%	-3.28%	-2.68%	-2.10%	-1.53%	-0.97%
FIRR: Grant only	-5.74%	-5.07%	-4.41%	-3.78%	-3.16%	-2.55%	-1.96%	-1.38%	-0.82%	-0.26%

Case E:

Collection Ratio	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Monthly tariff rate	80	100	120	140	160	180	200	220	240	260
FIRR: Loan only	-7.32%	-6.78%	-6.25%	-5.73%	-5.23%	-4.73%	-4.24%	-3.76%	-3.30%	-2.84%
FIRR: Grant + Loan	-6.93%	-6.36%	-5.80%	-5.26%	-4.72%	-4.20%	-3.68%	-3.18%	-2.68%	-2.20%
FIRR: Grant only	-6.20%	-5.62%	-5.07%	-4.52%	-3.99%	-3.46%	-2.95%	-2.45%	-1.96%	-1.48%

FIRR results are negative in almost cases. Positive FIRR results can only be obtained if calculations are made using an increasing monthly sewerage tariff of almost twice as that of the upper limit of publics willingness-to-pay of 100 Lek per month.

As per the sensitivity trial to recover all cost of this project only by tariff revenue, it is necessary to levy sewerage tariffs to each household of almost Lek 200 per month. This amount is far beyond the current willingness-to-pay of the general public which ranges from Lek 50 through 100 per month. Considering the current economic situation of the sewerage sector, it can be concluded that financial planning which aims to collect all costs via sewerage tariffs without increase in price is unrealistic. As a result, such plans should be replaced by more realistic alternatives.

13.6 Improvement of Financial Difficulties

To keep this sewerage project financially sustainable on the long run, it is important to secure stable and long-term financial resources to recover all disbursements made for operating and maintenance, replacement of fully depreciated assets, and initial investments.

For example, if the sewerage sector fails to secure financial resources for operating and maintenance disbursements, certain service cannot be provided satisfactorily, or in the worst case, the entire sewerage system will cease to function. As for the shortage of replacement disbursements, the sewerage sector will face difficulties as certain machinery has been left in an out-of-use condition. As for the shortage in financial disbursements, the situation might not have such a serious impact on users as in preceding cases. However, as in the case of the Loan, the sewerage sector can not make repayment of principals and interest payment as scheduled. In the case of the grant, the sewerage sector will not be able to reinvest in any succeeding project at the end of this project period, since the sewerage sector has failed to reserve sufficient money through capital accumulation by means of depreciation.

Financial resources for the sewerage sector include the sewerage tariff and government financial subsidies. As for use of government subsidies, attention should be paid to its possible negative effect to equality. Failure to recoup costs from the users creates a privileged class of beneficiaries, who in effect receive a subsidy or income transfer from the rest of the society, while it deprives the project entity of resources that could be used to extend the service to additional users. As a result, government subsidies should be used as a compliment to the sewerage tariff. An increase in tariff revenue should be treated as a primary financial resource to resolve the financial difficulties.

The table below illustrates the possible effects on the FIRR for tariff rate changes, proportional to the economic growth (per capita GDP). When economic growth is positive, the rate of change on tariffs is an equal (positive) increase and vice versa.

Table 13.5 FIRR and Sensitivity Analysis after Increase or Decrease of Tariff Rate

Unit: Lek

Loan Only

	80	100	120	140	160	180	200	220	240	260
4.00%	-1.00%	0.28%	1.41%	2.43%	3.36%	4.24%	5.06%	5.85%	6.60%	7.34%
3.00%	-2.43%	-1.21%	-0.12%	0.87%	1.79%	2.65%	3.47%	4.25%	5.00%	5.72%
2.00%	-3.78%	-2.66%	-1.64%	-0.69%	0.19%	1.03%	1.83%	2.59%	3.33%	4.04%
1.00%	-5.00%	-4.02%	-3.10%	-2.23%	-1.40%	-0.61%	0.15%	0.89%	1.60%	2.30%
0.00%	-6.05%	-5.23%	-4.44%	-3.67%	-2.93%	-2.21%	-1.51%	-0.82%	-0.15%	0.52%
-1.00%	-6.90%	-6.25%	-5.60%	-4.96%	-4.33%	-3.70%	-3.08%	-2.47%	-1.86%	-1.25%
-2.00%	-7.57%	-7.06%	-6.55%	-6.04%	-5.53%	-5.01%	-4.50%	-3.98%	-3.46%	-2.93%
-3.00%	-8.09%	-7.70%	-7.30%	-6.91%	-6.50%	-6.10%	-5.69%	-5.27%	-4.84%	-4.41%

Grant plus Loan

	80	100	120	140	160	180	200	220	240	260
4.00%	-0.45%	0.86%	2.02%	3.07%	4.03%	4.93%	5.78%	6.60%	7.38%	8.15%
3.00%	-1.89%	-0.63%	0.49%	1.52%	2.47%	3.36%	4.20%	5.01%	5.79%	6.55%
2.00%	-3.26%	-2.10%	-1.04%	-0.05%	0.87%	1.74%	2.57%	3.36%	4.14%	4.89%
1.00%	-4.51%	-3.48%	-2.52%	-1.61%	-0.74%	0.09%	0.89%	1.66%	2.42%	3.15%
0.00%	-5.58%	-4.72%	-3.89%	-3.09%	-2.30%	-1.54%	-0.79%	-0.06%	0.65%	1.36%
-1.00%	-6.47%	-5.78%	-5.09%	-4.41%	-3.74%	-3.07%	-2.41%	-1.75%	-1.10%	-0.44%
-2.00%	-7.17%	-6.63%	-6.09%	-5.54%	-4.99%	-4.44%	-3.88%	-3.32%	-2.75%	-2.18%
-3.00%	-7.71%	-7.29%	-6.87%	-6.45%	-6.02%	-5.58%	-5.13%	-4.68%	-4.21%	-3.74%

Grant only

	80	100	120	140	160	180	200	220	240	260
4.00%	0.07%	1.34%	2.47%	3.50%	4.44%	5.32%	6.16%	6.96%	7.74%	8.49%
3.00%	-1.30%	-0.08%	1.02%	2.02%	2.95%	3.82%	4.65%	5.44%	6.21%	6.96%
2.00%	-2.61%	-1.47%	-0.44%	0.53%	1.43%	2.28%	3.09%	3.87%	4.63%	5.37%
1.00%	-3.80%	-2.80%	-1.85%	-0.95%	-0.10%	0.72%	1.50%	2.26%	3.00%	3.72%
0.00%	-4.85%	-3.99%	-3.16%	-2.36%	-1.58%	-0.83%	-0.09%	0.63%	1.34%	2.03%
-1.00%	-5.72%	-5.02%	-4.32%	-3.64%	-2.96%	-2.29%	-1.63%	-0.97%	-0.32%	0.33%
-2.00%	-6.41%	-5.86%	-5.30%	-4.74%	-4.18%	-3.62%	-3.05%	-2.48%	-1.90%	-1.32%
-3.00%	-6.95%	-6.52%	-6.08%	-5.64%	-5.19%	-4.74%	-4.28%	-3.80%	-3.32%	-2.83%

Per the analysis above, if the sewerage sector continues to raise tariffs every year through to the end of the project period, the initial monthly tariff rate in almost all cases would have to be set higher than the upper limit of the general public's willingness-to-pay to keep the FIRR positive. For example, in Case 1 (Loans only), if the sewerage sector succeeds in raising tariffs by 2 % per annum, the initial monthly rate levied would have to be approximately 160 Lek.

As a result, if the sewerage sector charges a monthly tariff of 100 Lek, which represents the upper limit of the general public's willingness-to-pay, in almost cases it will suffer financially without assistance from government financial subsidies. The table below summarizes possible financial subsidies required if the sewerage sector charges a monthly tariff of 100 Lek, with a collection rate of 80 % and continues to raise this monthly from 0% through 4% per annum.

Table 13.6 Relation between increased tariff rate and necessary government financial subsidies

(millions of Lek)

Tariff Raise	Tariff Revenue	Case 1 : Loan		Case 2 : Grant & Loan		Case 3 : Grant	
		Subsidy	Disbursement	Subsidy	Disbursement	Subsidy	Disbursement
4%	10,682	1,557	12,239	-1,823	8,859	-4,610	6,072
3%	8,330	3,909	12,239	529	8,859	-2,258	6,072
2%	6,552	5,687	12,239	2,307	8,859	-480	6,072
1%	5,201	7,038	12,239	3,658	8,859	871	6,072
0%	4,170	8,069	12,239	4,689	8,859	1,902	6,072

13.7 Financial analysis of Phase 1, stand-alone basis

This section describes stand-alone based financial evaluation of project phase 1. The project period subject to the evaluation is from 1998 to 2030. The assumption taken in this analysis is also the same as the assumption taken in the previous section.

Table 13.7 Phase 1, Summary of Financial Analysis (millions of Lek)

Fund	Disbursement	Sewerage Sector		EMRS
		Case 1	Case 3	
External fund	Construction	-2,243	-2,463	
Internal fund	Construction	-495	-303	
	Replace	-861	-861	
	O&M	-2,024	-2,024	-2,024
	Financial	-3,188		
	Total disbursement	-6,568	-3,188	-2,024
	Tariff collection	2,347	2,347	2,347
	Net cost recovery	-4,221	-841	323
	FIRR	-5.26%	-3.78%	N/A

Table 13.8 Phase 1, Relation between future increased tariff and necessary governmental financial subsidies

(millions of Lek)

Tariff Raise	Tariff Revenue	Case 1 : Loan		Case 3 : Grant	
		Subsidy	Disbursement	Subsidy	Disbursement
4%	4,520	2,048	6,568	-1,332	3,188
3%	3,804	2,764	6,568	-616	3,188
2%	3,219	3,349	6,568	-31	3,188
1%	2,740	3,828	6,568	448	3,188
0%	2,347	4,221	6,568	841	3,188

13.8 Recommendations

1. Commencement of collection of sewerage tariffs
2. Continuing increase of sewerage tariffs
3. Re-viewing a tariff structure
4. Continuing improvement of collection of sewerage tariffs.
5. Continuing improvement of production
6. Transforming the executing agency from a budgetary organization to a self-supporting organization
7. Project financing
8. Exemption from corporate taxes
9. Computerization

Chapter 14 Management Form of Future Sewerage Systems

14.1 Future Management Form of EMRS

As the sewerage sector is a primary example of the countries social infrastructure and requires a large investment with low profitability, it is appropriate for a public enterprise to provide these services. Regardless of it being part of the public works system, services should be provided efficiently and effectively as all costs will eventually be paid by the service users. It therefore seems an adequately feasible option to form a management scheme where the Tirana Municipality and EMRS take sole responsibility in managing the sewerage system development, and supervising maintenance and operation works, while outsourcing executing (manual) work to the private sector. This concept is based on the fact that the private sector will perform such executing work more efficiently under competitive circumstances.

However, as there are no entities operating wastewater treatment plants and performing the cleaning of sewer pipes with sufficiently advanced machinery in Albania, it seems once again feasible and an appropriately gradual system to incorporate and acquire the required know-how and experience in sewerage systems through the proposed project should EMRS take up these works itself.

Should EMRS choose to utilize the private sector in sewerage system operations, it is recommended that they employ option 1 first, and after ascertaining the private sector's abilities in executing the respective sewerage system works required, it should proceed to option 2. At this point when all the executing work is outsourced to the private sector, only engineering section, supervising for entrusted works to the private sector and planing and design, and general business section will remain as responsibilities for EMRS to perform and is therefore ideal for it to be absorbed into the Municipality.

Option 1

1) Segregation of the Road Maintenance Section
2) Construction outsourcing
3) Septic tank cleaning concessions

EMRS will be responsible for the following work :

1) Controlling and supervising overall sewerage system construction, maintenance and operation
2) Cleaning sewer pipes

3) Operation and maintenance of sewerage treatment

4) Monitoring treatment plants and wastewater quality of sewer pipes

Option 2

1) Segregation of the Road Maintenance Section

2) Construction outsourcing

3) Septic tank cleaning concessions

4) Cleaning sewer pipes

5) Operation and maintenance of sewerage treatment

6) Monitoring wastewater quality of sewer pipes and treatment plant

EMRS will be responsible for the following work

1) Planing and design of sewerage facilities

2) Controlling and supervising overall sewerage system construction, maintenance and operation

Segregation of the Road Maintenance Section

To concentrate on its sewerage system development, maintenance and operation and moreover to make clear the cost of investment and operation in achieving a certain degree in the engineering and technical level of sewerage systems, it is recommended to separate the road maintenance section from EMRS for more efficient and effective operation of the sewerage system as a whole.

Construction Outsourcing

Private construction companies, in general, will carry out such construction more efficiently being business oriented and profit driven in nature. Taking these conditions into consideration, sewerage facilities construction should be contracted out (outsourcing) to the private sector.

Septic Tank Cleaning

If a private company were to do the cleaning, it would not be limited to servicing areas within Tirana city, but may expand services to beyond the city borders, enabling them to procure more septic tank cleaning orders. This would result in, efficient use of cleaning facilities and workers, and also make cleaning work profitable. EMRS is presently charging households for septic tank cleaning. Two private companies have presently undertaken garbage collection in Tirana city, making the possibility of septic tank cleaning by private companies seem high.

Revising EMRS' organizational structure

Assuming the operations which EMRS handles are kept the same as the Study Team propose, the number of personnel necessary for other functions by the year 2001, which we used as a halfway point on the assumption that operation reform was to be completed by the year 2010, is estimated at 68 people. This number was derived on the assumption that present operations, including outsourcing, were maintained, and that the waste water treatment plant was operating at half-capacity. Were the plant to be operating at full capacity, the figure derived is 82.

Table 14.1 Institutional Options for Provision of Sewerage System

Area of Responsibility	Responsible Entity				
	EMRS	Municipality	Government	Private Sector	Others
Sewerage system general development policy			①② MOPWT		
Ownership of public sewerage facilities		①②			
Sewerage system development long and short term planning		①②			
Engineering and technical study on sewerage facilities					①②S-Inst.
Sewage treatment plant construction planning		①②			
Sewage treatment plant construction executive management	①	②			
Sewage treatment plant construction				①②	
Sewage treatment plant operation and maintenance	①			②	
Setting construction standards			①② MOPWT		
Licensing constructors and engineers			①② MOPWT		
Training sewerage system engineers and workers	①	②	①② MOPWT support		①②S-Inst. support
Sewer pipe network construction planning and management	①	②			
Sewer pipe network construction and maintenance				①②	
Sewer network pipe cleaning	①			②	
Road maintenance					①② Other Enterprise
Septic tank cleaning				①②	
Treatment of septic waste	①②Treatment plant				
House connections				①②	
Giving permission for house connections	①	②			
Maintaining users ledger and sewerage facility (including sewer network) drawings	①	②			
Setting sewerage tariffs		①②			
Sewerage tariff collection					① ② W-Enterprise
Providing funds for sewerage system development, O & M		①②	①		
Providing soft-loans for low income families to connect discharge pipes, and Providing loans for on-site treatment plant construction		①②	①		
Inspection of water quality at sewage treatment plants and waste water discharged into sewerage system	①			②	
Inspection of wastewater quality			① ② MOH, etc.		
Imposing penalties in the case broken laws and regulations		①②	①②		
Education and information on sewerage systems	①	①②	① ② MOH, MOE		
Establishing laws and/or regulations regarding sewerage		①②	①②		

Note: Key : ① Assumed for Option 1, ② Assumed for Option 2
MOH : Ministry of Health and Environmental Protection MOE : Ministry of Education
W-Enterprise : Water Supply Enterprise; S-Inst.: Study Institutes

14.2 Uncertainties in Management Setup

Segregation of the Road Maintenance Section

The Study Team recommended the segregation of the road maintenance section. Such a drastic change in terms of organizational structure (separation of the road maintenance section from EMRS) would require the establishment of a new enterprise for road maintenance or absorbing it into another enterprise such as the Enterprise of Cleaning and Greenness. This would make it necessary to further discuss the issue with the road maintenance section and to consider their views on how to separate the road maintenance section from EMRS .

(Appropriate) Number of Employees in EMRS

EMRS anticipates to operate with a proposed (appropriate) number of employees, however this will require a reduction in the present number of people already being employed. Taking the present economic condition of Albania though, it seems difficult for those laid off to find new jobs individually, even in other pubic agencies, institutes or companies. It would thus be necessary to lay off employees in stages to the proposed number, providing them with compensatory measures, such as skill-up programs required for new workplaces, finding of suitable new employment, financial compensation, etc.

Contracting Out of Small Construction Work to the Private Sector

EMRS is at present already outsourcing rather large scale construction projects to the private sector, therefore making it likely that the same be done in the case of small construction projects. Yet it is uncertain if sufficiently willing and reliable private construction companies, capable of undertaking such projects exist.

Concession of Septic Tank Cleaning

Two private companies are presently undertaking garbage collection in Tirana city. The Study Team thus assumes that there could be some private companies willing to raise a hand to undertake septic tank cleaning as a business. However, it is uncertain as to whether or not such companies will come out, as presently there are no such companies providing these services. If no reliable private companies appear to willingly undertake septic tank cleaning, EMRS should continue cleaning operations itself by increasing its septic tank cleaning capacity (procuring an additional 3 or 4 vacuum cars).

Contracting Out of Sewer Pipe Cleaning and Treatment Plant Operation

Since becoming a market economy, several private companies have indulged in a variety of

businesses. The Study Team assumes there must be private companies willing to undertake sewer pipe cleaning and treatment plant operations. However, as there are no private companies presently in the field, it is uncertain as to whether there are any private companies having the capacity to undertake such work. If no private companies sufficiently eligible exist, EMRS should continue both sewer pipe cleaning and treatment plant operations itself until such companies are found.

14.3 Possible Options of Privatization for EMRS

Switching of both Sewerage Enterprises and the Water Supply Enterprises to the private sector was made possible in March of 1996 with the enactment of "On Privatization of Water Supply, Sewerage Systems and the Waste Water Sector". However, given the low anticipated profitability of EMRS, as evidenced by calculated depreciation and rises in capital costs as well as the inability of the public to pay, we believe that it would be unfeasible to completely switch EMRS to the private sector via selling off its assets. Although there is some possibility that this could have been done through merging EMRS with the Water Supply Enterprise, given that the latter is currently pursuing privatization independently, this has been ruled out as an option.

However, even if complete privatization is impossible, the introduction of a tariff system will be a necessity in relieving the financial burden on the national government and the Municipality. Moreover, it will also be necessary to utilize the strengths of the private sector as much as possible for coming sewerage system development and maintenance, as well as to improved cleaning of septic tanks for those areas without sewerage service. Given that each operation to be outsourced has its own unique characteristics in both scale and content, and that they also have a direct effect on management, we recommend using the private sector in the following fashion.

(1) Using a BOT contract for the development and operation of waste water treatment plants
(2) Using a BOT contract for developing the sewer network within certain areas of urban development
(3) Outsourcing all sewer network construction projects, including maintenance and rehabilitation
(4) Outsourcing of all sewer pipe cleaning operations and/or waste treatment plant operations
(5) Concession of septic tank cleaning to the private sector (using a service contract)

Outsourcing of sewer network constructions, sewer pipe cleaning work, and concession of septic tank cleaning work are anticipated to be pragmatic solutions for EMRS. If private sector participation in all the areas described above comes to fruition, EMRS should become one of the divisions of the Municipality.

14.4 Human Resource Development (Institution of Training Programs)

The sewerage sector does resemble industry in some ways in that efficiency can be raised. This may be pursued through the use of proper technology and ascertaining all employees of the Enterprise possess a high level of know-how, allowing the sector to jump leaps in efficiency with limited number of personnel. Moreover, this would also enable the Enterprise to respond more precisely to the needs of the residents of Tirana. Judging from the Enterprise's current state of operations, it appears necessary to pursue human resource development and an effective method of doing this would be to institute a training and education program. The following is an outline of our proposal for such a program.

Education and training areas:

- Operation and maintenance of the sewage treatment facility
- Taking waste water samples and analyzing water quality
- Laying of sewer pipes and their maintenance
- Planning and designing of sewer pipes
- Use of the machinery used in cleaning of sewer pipes
- Ability to evaluate the materials used in laying of pipes and other facilities
- Business operation, organizational and operational management
- Financial accounting and management accounting
- Computers

Human resource development should be performed as two programs. One being the strengthening of skill and capacity of the management, including persons in charge of daily work control, while the other being capacity and skill training of engineers in sewerage systems. Strengthening of management capacity and skill would be more practically performed through re-establishment of the management system and job procedure streamlining undertaken by eligible foreign consultants. As for engineering and technical skill training, engineers and technicians may be acquired through the implementation of projects proposed by the Study Team. During the course of implementation, engineers and technicians will be able to obtain advanced technology and better their technical skills on sewerage systems through participation and direct learning from engineers engaged in the proposed project. Such costs for engineering and technical education may be absorbed in the total project cost, leaving only cost for management capacity and skill training as is reflected below.

The estimated cost for the project listed below were prepared for planning purposes only. The figures were determined largely on professional judgment and may vary drastically depending on the scope of work required by foreign consultants. More accurate costs can then be estimated based on proposals by bidders after public bidding.

Estimated Cost of Management and Administration
Education and Training Program

Description	M/M	Amount in ths. Lek
Foreign consultant(s)	3	7,200
Expenses of foreign consultant		1,100
Local consultant(s)	3	3,600
Payment to other institutes		500
Miscellaneous		100
Sub-total		12,500
Contingency(10%)		1,250
Total		13,750

M/M : Men per month

Chapter 15 Project Evaluation

15.1 General

The proposed project for the improvement of existing sewerage systems in Metropolitan Tirana was evaluated from the view points of expected benefits and appropriateness/feasibility. Composition of the evaluation items adopted included the technical aspect, environmental aspect, financial aspect, and social and economic aspects.

Since the sewerage system is one of the major urban infrastructures, associated legislative and institutional arrangements including community participation for improvement and maintaining of the urban environment are indispensable to maximize the overall benefits of the project. In this respect, comments and recommendations relevant to the sewerage system and urban sanitation are also identified and incorporated.

15.2 Benefits and Justification of the Project

The principal objectives of the sewerage system development and its operation are (1) to smoothly drain sewage/wastewater discharged in the sewerage service area and (2) to treat them at the sewage treatment plant to mitigate water pollution in the receiving water body of treated effluent.

The existing sewerage system of Tirana City was initially introduced in 1938 and was completed sometime in the 1960s. Since the existing system was designed only to drain sewage and some part of stormwater from urban centers to nearby rivers and brooks, there is no sewage treatment plant. Resultant from this, serious deterioration of aquatic environment in the public water body has been caused due to the absence a of sewage treatment plant.

In unserved areas and unconnected households of the existing sewerage system, domestic sewage is, on the other hand, mostly disposed into on-site treatment facilities. Effluent from these facilities and some raw domestic sewage are discharged into rivers and brooks, but some of this is discharged into street gutters resulting in unhygienic conditions.

Leakage of sewage from sewer pipes is another problem of the existing sewerage system. This leakage associated with a deteriorated water supply system has triggered epidemic of water

borne/related/vector diseases in Tirana City.

Since 1991, with the drastic change in the political and economic set-up of Albania, Tirana city and its suburban areas have been encountering rapid development of commercial establishments and urbanization associated with population increase. Especially, urbanization in the outskirts of Tirana City, which are not served by the existing sewerage system, is expected to be continued along with further deterioration of the living environment.

The proposed sewerage project is formulated to improve the current situation of the urban environment and expand public sewerage services to newly urbanizing areas. It also includes treatment of collected sewage at treatment plant to reduce pollution load of effluent to Tirana City, the receiving water body.

The Government of Albania has prepared and promulgated the Public Investment Program 1996-1998 aiming at management of natural resources, such as agriculture, water and environment and development of urban and rural infrastructures to facilitate reconstruction of the Albanian economy.

In consonance to the current government's policy as mentioned above, the effectiveness and necessity as well as importance of implementation of the proposed sewerage project is hereby justified as it is expected to greatly contribute to the betterment of public hygiene and environmental sanitation in Metropolitan Tirana.

15.3 Project Evaluation

15.3.1 Technical Evaluation

Project evaluation from a technical view point was carried out as described below.

(1) The discharged sewage will be collected and conveyed via interceptor mains to the sewage treatment plant, preventing the direct discharge of untreated sewage into rivers and brooks. In this regard, water quality in the Lana River and the Tirana River, where raw sewage is currently being discharged, will considerably improved.

(2) The sewage treatment method adopted in the proposed sewerage project has been selected with due consideration of the required level of technical expertise for operation and main-

tenance, construction costs including land acquisition costs, operation and maintenance costs, and final disposal cost of accumulated sewerage sludge, to attain the most economical way to achieve the objectives of the project.

(3) The effluent quality from sewage treatment plants will meet the legislated water quality standards of European Union which will is most likely to be adopted by the Government of Albania, so that any further provision of treatment facilities will not be required.

(4) The improvement of existing interceptor mains and installation of stormwater inlets is included in the proposed project as an indispensable means to mitigate inundation/submergence of roads and residential areas.

When the priority project and the entire project are implemented in accordance with the proposed implementation program, the water quality (BOD) in the Lana River will steadily be improved based on the water quality simulation as shown in Table 15.1.

Table 15.1 Water Quality Improvement Expected from the Proposed Project

Unit: BOD mg/l

Target Year		2001			2010		
Reference Point of Water Quality		Upstream	Middle	Down-stream	Upstream	Middle	Down-stream
Estimated Present Water Quality (Dry Season)		5.7	122	120	5.7	122	120
Estimated Future Water Quality	Without Project	-	87	87	-	102	106
	After Implementation	-	20	19	-	17	15

Upon implementation of the project, approximately 80 % of the pollution load will be reduced by 2001, and about 85 % in 2010, respectively.

For furtherance of environmental improvement in the Lana River, the following measures are deemed inevitable for those households (approximately 24,000 persons) being located within the drainage basin of the Lana River:

1) Appropriate maintenance of septic tanks
2) Introduction of advanced biological treatment units for individual houses

3) Implementation of small community sewerage systems

15.3.2 Environmental Consideration

Environmental Impact Assessment (EIA) of the proposed project was carried out during the course of the Study. Results of this EIA study has raised a certain possibility of environmental impacts by implementation of the project. Preventive measures and relevant legislative arrangements are thereby considered to mitigate the anticipated environmental impacts.

As a whole, the proposed project including the said preventive measures is determined to have minimal and tolerable impacts on the environment and considered a great contribution to improve the current environmental problems and conserve the aquatic environment.

Among others, the following preventive measures are included in the scope of the proposed project:

(1) Sewerage sludge will not be disposed into the Tirana River and will be treated by sanitary landfill together with other municipal garbage.

(2) Possible emission of offensive odor and growth of undesirable insects will be minimized by appropriate landscaping, concrete banking on the slope of lagoons, and provision of a green belt with trees along the perimeter fence of the treatment plant.

15.3.3 Financial Evaluation

To keep the sewerage project financially sustainable on the long run, it is important to secure stable, long-term financial resources to recover all disbursements made for operating and maintenance, replacement and initial investments. In cases of financial shortage for operations, certain services cannot be provided satisfactorily, and shortage of replacement within the sector will cause inefficient operations. This might also give rise to a negative impact on the long term cash flow resulting in closing of sewerage operations in the future.

The result of the financial analysis is summarized as in Table 15.3.3 below;

Table 15.2 Summary of Financial Analysis (in Lek 1 million, except for FIRR)

		Sewerage Sector			EMRS
		Case 1	Case 2	Case 3	
External fund	Construction	-4,062	-4,254	-4,420	
Internal fund	Construction	-901	-708	-543	
	Replace	-1,929	-1,929	-1,929	
	O & M	-3,587	-3,587	-3,587	-3,587
	Financial	-5,809	-2,622		
	Total disbursement	-12,226	-8,846	-6,059	-3,587
	Tariff collection	4,170	4,170	4,170	4,170
	Net cost recovery	-8,056	-4,676	-1,889	583
FIRR		-5.23%	-4.72%	-3.99%	N/A

Note:

1. Case 1: All external portions are financed by Loan;
   Case 2: Phase 1 external portion is financed by Grant and Phase 2 external portion is financed by Loan;
   Case 3: All external portions are financed by Grant.
2. Tariff collection and FIRR: Tariff rate is assumed as 100 Lek per month and collection rate is 80 %.
3. FIRR: Other situations are analyzed by sensitivity analysis, for details refer to13.5.2.

(1) Total cost evaluation

Significant differences in the Albanian government's ultimate financial burden have resulted from this type of financial aid scheme. As for construction disbursements, a slight difference was identified due to the scope difference of aid provided by loan and grant aids. Most of the difference comes from financial disbursements.

(2) Net cost recovery evaluation

If the executing organization is released from its financial responsibility as well as replacement disbursements, it will be able to fully cover annual operating and maintenance costs by

annual tariff revenue and keep its cash flow position positive. On the other hand, the sewerage sector is responsible for all its disbursements and suffers big cash shortages in its projection. Even in Case 3, it will result in a negative cash position, due to additional investment replacements amounting to 1,929 million Lek throughout the project period.

(3) Financial evaluation

Financial resources for the sewerage sector include sewerage tariffs and government financial subsidies. As for usage of government subsidies, recouping costs from subsidies creates income transfer from non beneficiaries. As a result, government subsidies should only be used as a compliment to sewerage tariffs.

The sensitivity analysis revealed that to recover all costs only by tariff revenue, would necessitate a monthly tariff of no less than 200 Lek per household. This amount far exceeds the current willingness-to-pay of 50 to 100 Lek per month, implying full cost recovery by tariffs is unrealistic and should be replaced by more realistic alternatives.

The project period is rather long, and tariffs are expected to be raised in proportion to future economic growth. Initially, total costs including finance will be covered by tariffs and government subsidies. With time and economic progress , the sewerage sector will be able to raise sewerage tariffs gradually so as to recover larger portions of the cost in proportion to an increase of use of disposable income. The table below summarizes possibly necessary financial subsidies when the sewerage sector charge monthly tariff 100 Lek with collection rate 80 % and continues to raise monthly tariff through 0% to 4% per annum.

Table 15.3 Relation between future increased tariffs and necessary governmental financial subsidies

(in millions of Lek)

Tariff Raise	Tariff Revenue	Case 1 : Loan		Case 2 : Grant & Loan		Case 3 : Grant	
		Subsidy	Disbursement	Subsidy	Disbursement	Subsidy	Disbursement
4%	10,682	1,557	12,239	-1,823	8,859	-4,610	6,072
3%	8,330	3,909	12,239	529	8,859	-2,258	6,072
2%	6,552	5,687	12,239	2,307	8,859	-480	6,072
1%	5,201	7,038	12,239	3,658	8,859	871	6,072
0%	4,170	8,069	12,239	4,689	8,859	1,902	6,072

As for Grant scheme, no financial burden exists. The sewerage sector has only to accumulate capital internally by the end of the project period. As for Loan scheme, the sector is entitled to a 10-year grace period during which total disbursements will be covered by tariffs and subsidies. Soon after commencement of repayment, the sector might only make financial disbursement by government subsidies. However, time and economic progress, will allow for the raise of tariffs gradually in order to fully make financial disbursements using

sewerage tariffs alone.

A final comparison of the aid scheme made showed in each case, that the sewerage sector should secure a stable, long-term financial resource. Grant aid appears to be the most effective means of funding the sector development for the following reasons (1) No interest payment, (2) No foreign exchange risk, (3) Easy tariff control.

15.3.4 Economic and Social Evaluation

Positive effects of advanced sewer systems can be broken down into two categories. The first of these is direct effects, i.e., the direct contributions that sewer projects make to those individuals who discharge waste into the sewer system. The other of these is indirect effects, i.e., the indirect contributions a sewage system makes to those individuals who are not connected to the system, as well as those contributions the system makes to future generations. In economic terms, such indirect benefits are called external economies, in which production or consumption yields positive benefits to even those who are not paying for said service directly. The following is a series of examples of such benefits.

(1) Improved public health: contributes to reduce social cost for hygiene
(2) Infrastructure as a basis for economic development
(3) Construction's short-term favorable effects on the local economy
(4) Construction's long-term effects on the local economy
(5) Using construction to acquire technology

Economic benefits of building a sewage system are not limited to individual users, but rather are spread over society as a whole, as well as over multiple generations. Some of the public health benefits, such as the avoidance of epidemics, are external to the individual user and so not necessarily included in the price of service. Since the benefits of a sewage system are reaped over many generations, in theory, the financial burden could be spread out over many generations as well. However, in actuality it is quite difficult to spread the costs of such projects over the various indirect beneficiaries of the completed project. As a result, the portion of public expenditures which are not attributable to the individual user are not always fairly charged to other possible beneficiaries. However, when also calculating the broad social benefits which are indirectly created by the project, and which are not included within standard FIRR procedures, one discovers that the negative financial results derived via accounting procedures (FIRR) may not be an appropriate index for gauging the overall economic meaning of a

sewage project.

15.4 Risks and Uncertainties

A number of potential risks and uncertainties do remain, the bulk of which the government is aware of, but need to be reemphasized so as to allow for more efficient discussion and implementation of any resolutions reached, as shown below.

(1) Future urban development and adoption to change in managerial environment
(2) Influence of future economic development upon willingness-to-pay
(3) Financial deficits; its negative effect to source of fund and annual subsidies
(4) Shifts in foreign exchange rates and inflation
(5) Hidden costs for household connection construction and private processing for industrial wastewater
(6) Costs of flood control measures

Chapter 16 Conclusions and Recommendations

16.1 Conclusions

The current intermittent water supply service in Tirana City and its suburban area will be remarkably improved upon completion of the on-going Bovilla water supply project by the end of 1998.

The increased water consumption will, on the other hand, further accelerate deterioration of urban environment and water pollution in rivers and brooks. Among others, inundation area will be increased during the rainy season since the existing sewer pipes may not able to accommodate the increased sewage flow.

The proposed sewerage system improvement/expansion project for Metropolitan Tirana is prepared to mitigate the above mentioned existing and foreseeable problems by the target year of 2010. It shall be noted that the proposed sewerage project clearly meets with the national policy for infrastructure development stipulated in the Public Investment Program 1996-1998 adopted by the Government of Albania.

Likewise, the necessity and appropriateness as well as urgency of the proposed project is substantially acknowledged and justified for betterment of public hygiene and environmental conservation in Metropolitan Tirana.

As per the financial analysis on FIRR, in order to recover all costs of this project entirely by sewerage tariffs, it will be necessary to levy a tariff of almost 200 Lek per month to each household. This amount represent as much as twice the upper limit of the general public's willingness-to-pay, which ranges from 50 to 100 Lek per month. As a result, the intention to collect all costs only by sewerage tariffs is unrealistic. The sewerage sector's finance should be complemented by an appropriate government financial subsidy.
However, the project period is rather long and it might be necessary to raise tariffs, in real terms, in proportion to the future increase of users' disposable income, supported by future economic growth. In addition, positive external benefits are widely expected from these investments.

Overall conclusion

Based on this study, it may be concluded that the scope and scale of investment of the project appear appropriate, and the effects of the investment seem satisfactory. Management systems necessary for project operation, even at the lowest level, should be implemented in due course. However, it is difficult to fully recover cost of the investment without substantial financial assistance by government financial subsidies. As a result, special consideration should be made, especially for a financial scheme to fully fund the project.

16.2 Recommendations

The following recommendations have been stemmed from the foregoing project evaluation and presented hereunder in accordance with their importance and priority:

(1) Establishment of measures to secure project fund.

(2) Implementation of following measures to increase financial feasibility of proposed project:
   - Early establishment of legislative set-up for sewerage service, and
   - Introduction of sewerage tariff system.

(3) Early commencement of negotiation with land owners for site acquisition.

(4) The proposed project is designed to improve flow capacity of interceptor mains, to install a main pipe for the proposed expansion area and to construct sewage treatment plant. In this connection, the executing agency is required to implement lateral sewers in the proposed sewerage service area in parallel with the progress of the proposed project.

(5) The basic plan of sewer system for stormwater disposal shall be developed and implemented carefully taking into account;
   - Trend of urbanization in the Metropolitan Tirana, and
   - Target area, timing and improvement method of stormwater disposal.