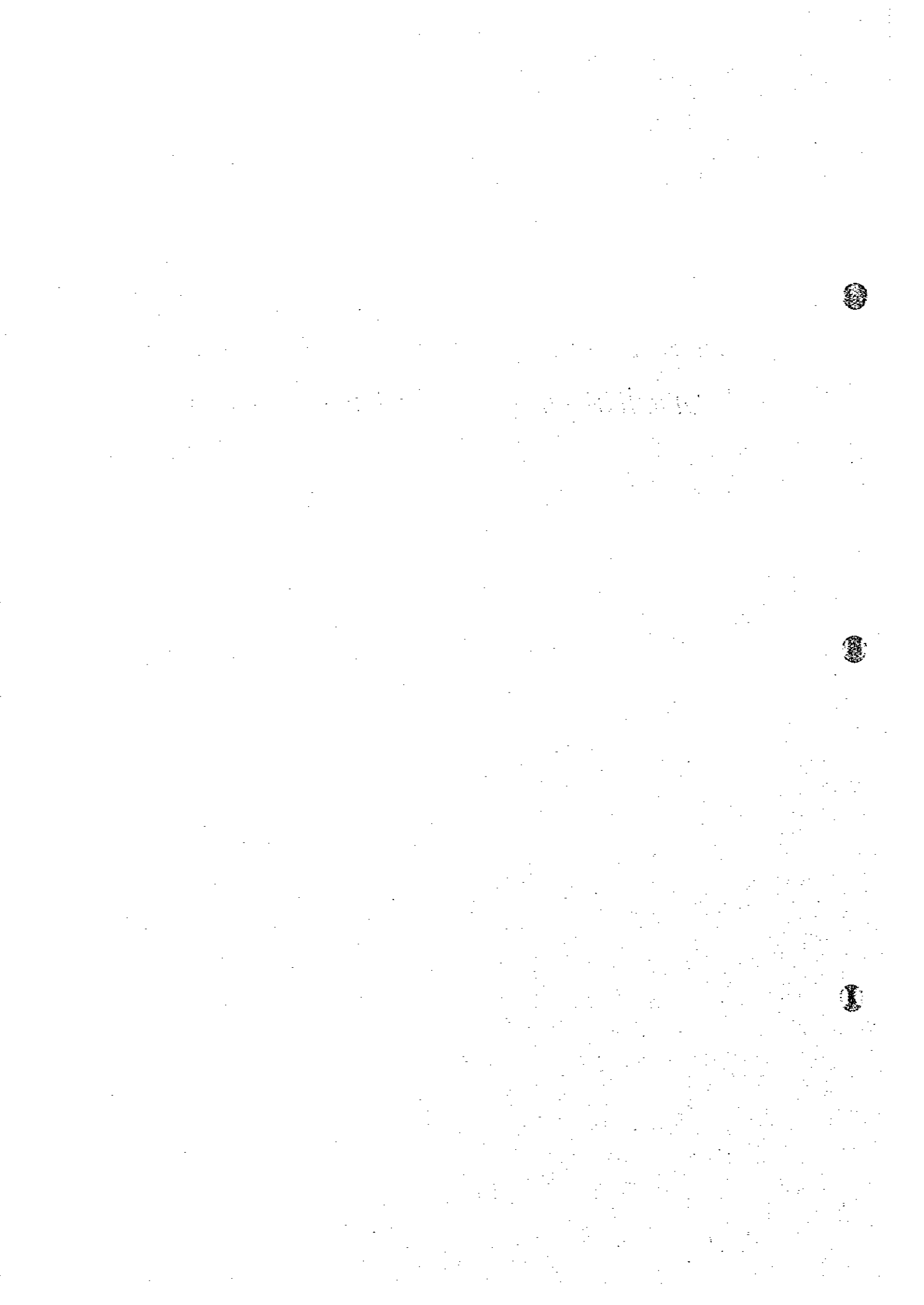


Chapter 9

Conclusions and Recommendations



9 Conclusions and Recommendations

9.1 Conclusion

a. Amount of municipal solid waste generated and the waste stream

As of 1996, the amount of municipal solid waste generated is estimated to be 1,772 tons/day. According to the data collected by utilising the weighbridge installed at the Vingunguti disposal site for this Study (the only disposal site in Dar es Salaam city) only 143 tons, i.e. 8.1%, of the daily waste generated is collected and disposed of. The rest of the waste is either illegally dumped (47.8 %, 847 tons/day), self disposed (36.9%, 654 tons/day), or recycled (7.3%, 130 tons/day).

The present waste generation amount is estimated to increase twofold to 3,464 tons/day in correlation to the forecast population increase of 3.97 million in 2005 from 2.03 million in 1996. These waste problems are predicted to worsen by 2005 if no countermeasures are taken. Therefore, an appropriate municipal solid waste management system has to be established urgently.

b. The importance of SWM in urban environment sanitation

Financial and human resources in Dar es Salaam City is extremely limited. Considering the need to provide maximum administrative services with such limited resources, apportioning more resources solely for the improvement of the solid waste management services is not justifiable from the administrative and citizens' viewpoint. Therefore, the current urban environment sanitation was examined in this study in order to assess the significance of solid waste management services in the urban environment sanitation sector. The results indicate that water supply improvement should take precedence over SWM. The improvement of SWM is strongly demanded by the public according to the POS results in which SWM is ranked second in order of priority for improvement. However, considering that only 22% of households have taps in their houses and only 5% are connected to the sewerage system, it is necessary to make plans which will bring about maximum improvement but is cost effective, as the fund allocated for the improvement of solid waste management project will be limited.

c. Technical System

The present technical system of the solid waste management in Dar es Salaam city is very weak in every aspect. As a result, most of the waste generated (more than 85%) is not properly treated. In addition, the city also lacks the financial support indispensable for the establishment of a technical system. The following are the main conclusions formed through this survey regarding the technical system.

- Judging from the conditions of urban infrastructure (especially roads) in Dar es Salaam city, except for the UA, it would be difficult to provide refuse collection services to all districts using the curb side collection system which requires access roads for the collection vehicles.
- Therefore, the point collection system, which obliges beneficiaries to bring their waste to points accessible to collection vehicles, should be adopted for some of SUPA, and the majority of SUUA and RA.

- The pilot project confirmed the residents' willingness to cooperate in primary collection (i.e. taking their wastes to the collection sites) as long as waste collection service is sufficiently provided.
- Judging from the results of compost market survey, it is not feasible to establish compost facilities (off-site) utilising waste as raw materials. On the premise that cost for facility construction and product transport does not have to be shouldered, the production and utilisation of composts (on-site) at the waste generation sources should be promoted.
- The present rate of waste recycled to the total waste generated 7.3%, is a highly creditable attempt, considering only 12% of the total waste generated is recyclable.
- The establishment of a new disposal site is an urgent issue as the Vingunguti disposal site, the only waste disposal site in the city, is creating adverse impacts to the surrounding environment and its remaining economic life is a few more years.
- With regard to the improvement of the technical system, first priority should be given to the establishment of basic refuse collection and final disposal systems. Therefore, volume reduction and resource recovery (i.e., recycling, recyclable waste collection), which requires cost sharing by public institutions, should be promoted after a fundamental technical system is established.

d. Institutional System

The solid waste management institutional system is also very weak and encompasses various problems. The important conclusions formed through this study regarding the institutional system are as follows.

- At present, the Cleansing Unit of the Health Department, which is mainly in charge of solid waste management is weak in all aspects and lacks the ability to assume its responsibilities. Moreover, one of the main reasons for the organisational system's weakness is attributed to the fact that jurisdiction over solid waste management services is shared by three Departments.
- Opportunity to receive training in order to do the job well is not provided to the people engaged in solid waste management (from administrators to labourers). It is, therefore, of vital importance to conduct human development programmes to develop human resources that would ensure a sustainable solid waste management system.
- Dar es Salaam City is constantly lacking in funds and its total budget in 1995 was only Tsh.5.91 billion (US\$9.89 million), which is Tsh.2,610 (US\$4.37) per year per person. Furthermore, the budget for cleansing services in the same year was Tsh.362 million (US\$605 thousand), only Tsh.160 (US\$0.27) per year per person, which is extremely low compared with other developing countries. Therefore, unless this chronic defect is solved by countermeasures such as increasing revenue from city taxes, a proper solid waste management system cannot be established.

- The expansion of refuse collection services by a concession system, due to DCC's financial weakness, is unrealistic. Therefore, to establish the solid waste management system of Dar es Salaam City, DCC's ability to conduct the services should be reinforced first. Accordingly, the enhancement of the agency's operational (acquisition of equipment and necessary personnel) and financial capabilities should be given top priority (increase city taxes revenues and RCC collection amount).
- Since the private sector cannot directly collect RCC which it needs to provide the service, a system in which an incentive should be established to effectively collect RCC.
- Laws relevant to solid waste management which are contained in various legislation, should be rearranged and unified.
- The establishment of a function for the supervision and control of the cleansing services offered by DCC and private contractors is necessary.

c. Priority project

As a result of the discussion with DCC based on the basic plan formulated, the following projects were selected as priority projects to be completed by 2002 and their feasibility study (F/S) was carried out.

Table 9-1: Priority Projects and Project Cost (Investment)

Category	Contents of Projects	Type	unit: million Tsh 1999-2003	
			Required Investment	Required Grant of Total Investment
Improvement of Waste Collection, Transport and Disposal System	Improvement of Waste Collection and Transport <i>Procurement of refuse collection vehicles and skips, etc.</i>	Equip.	6,719	3,644
	Development of the New Kunduchi Disposal Site <i>Construction of a disposal site, procurement of sanitary landfill equipment</i>	Facil.	1,841	831
		Equip.	750	600
	Improvement of Street Sweeping <i>Procurement of equipment to collect street sweeping waste, etc.</i>	Equip.	69	23
	Improvement of the Nyerere Workshop <i>Procurement of machinery for repair of refuse collection vehicles and sanitary landfill equipment</i>	Facil.	42	42
Equip.		297	297	
Improvement of Administrative System <i>Renovation of office facilities, procurement of educational equipment, etc.</i>	Facil.	29	29	
	Equip.	165	123	
Improvement of Night Soil Collection and Transport System	Improvement of Night Soil Collection and Transport <i>Procurement of cesspit empty trucks, etc.</i>	Equip.	786	655
Detailed Design and Supervision			1,070	624
Total			11,768	6,868

Note:

* The amount of required grant covers the investment required in 1999 which will play a role in a take-off project.

f. Evaluation of First Priority Projects

The first priority projects were divided into the following two components and evaluated.

- i. Improvement project of refuse collection, transport and disposal system.
- ii. Improvement project of night soil collection and transport system.

f.1 Improvement project of refuse collection, transport and disposal system

Project evaluation for the improvement project of refuse collection, transport and disposal system was conducted in terms of technical, social, environmental, financial, and economic perspectives.

The financial evaluation, FIRR (financial internal rate of return) for the 18 cases were calculated. As a result if:

- all investment cost for 1999 is granted.
 - the most probable scenario of increase of tax revenue is taken.
 - RCC is collected by either DAWASA included in the water charges or the DCC directly.
- 1) In the case where RCC is collected by DAWASA with water charges, the project would be financially feasible because the FIRR is 24.70 %, exceeding the cut off rate of 11.6 %.
 - 2) In the case where special RCC is collected by DCC, the FIRR is 10.24 %. Although this value is slightly lower than the cut off rate of 11.6 %, it can be made financially feasible by DCC making additional efforts such as collecting more taxes, increase collection rate of special RCC, etc.

As a result the EIRR is calculated at 19.56 % which is close to the cut off rate of 11.6 %. Therefore the implementation of the master plan will contribute to the national economy.

As an overall conclusion, the execution of the refuse collection and transportation system improvement project and the development project of the New Kunduchi disposal site is essential to enable a sustainable technical, social, environmental, financial and economic development.

f.2 Improvement project of night soil collection and transport system

The results indicate that the project would be unrealisable if the overall cost is subsidised by a loan, as it would incur a negative FIRR rate. However, the project would be financially feasible if the 1999 vehicle procurement cost is subsidised by a grant and if a collection fee of 10,500 Tsh/trip is imposed.

However, this was prepared in a very short period under limited conditions, and therefore the following issues should be reminded for implementation.

- The examination on the disposal capacity of night soil because it has not been investigated in this Study.

- Whether the proposed night soil collection charge is accepted has to be examined because it has not been done in this Study. However, it is expected that the magnitude of willingness to pay for night soil collection charge is larger than that for RCC because night soil is too difficult to be collected and dumped by themselves and the negative impacts created when it is not collected is much larger than refuse.

g. Conclusion of the EIA

Based on the results of the IEE, surveys were conducted regarding the following environmental items in order to do the EIA for the Kunduchi new disposal site construction project.

- | | |
|----------------------------------|--------------------------|
| 1) Economic activities | 9) Flora and fauna |
| 2) Traffic and public facilities | 10) Landscape/aesthetics |
| 3) Public health | 11) Air pollution |
| 4) Waste | 12) Water pollution |
| 5) Hazards/Risks | 13) Soil contamination |
| 6) Topography and geology | 14) Noise and vibration |
| 7) Groundwater | 15) Offensive odour |
| 8) Hydrological situation | 16) Litter |

The Environmental Impact Assessment matrix shows that the project will have various positive and negative impacts, although the latter will only be minor, except those regarding traffic (traffic jams, increase in traffic accidents and exhaust gas emissions). These negative impacts can be minimised through appropriate mitigation measures such as expanding the traffic lane in congested areas, strengthening traffic regulations, and improving collection vehicles. The result of the EIA showed that all adverse impacts can be kept within the permissible level by adopting mitigation measures.

9.2 Recommendation

a. Implementation of the Master Plan

The basic goal of this master plan is "to establish a proper solid waste management system in Dar es Salaam City by 2005". The establishment of this management system shall attract foreign investment and consequently promote national economic development as well as preserve the urban environment and public health, and a sustainable development of the city.

The master plan is evaluated as feasible from a technical, social, environmental, financial, and economic viewpoints. Therefore, DCC should implement this master plan based on the strategies proposed in this study with the cooperation of the central government.

b. Improvement of Technical System

In order to realise the master plan, the technical system needs to be improved as follows.

- The most suitable collection system shall be adopted according to the characteristics of the areas. The collection system shall be either of the following

depending on the accessibility to the collection points: (1) without primary collection: curb side collection by tipper trucks. (2) with primary collection: point collection by skip trucks.

- DCC needs to conduct the refuse collection services with as much cooperation from the private sector as possible, as its collection vehicles are very limited in number. Collection services should be extended to the following areas in their order of urbanisation starting from UA, SUPA, SUUA, and finally RA.
- Regarding maintenance of vehicles and any kind of heavy equipment necessary for solid waste management, Nyerere Workshop needs to be remodelled and at least the tools necessary to do preventive maintenance needs to be secured.
- To conduct recycling activities with construction and operation of associated facilities by public institutions, generally require additional funding. Therefore, although composting at waste generation sources shall be recommended, collective processing and recycling facilities shall neither be built nor operated. Construction and operation of these facilities shall be entrusted to the private sector. Reduction and resource recovery by 2005 shall be achieved by administratively (in a way which lessens financial burden) promoting recycling activities by dischargers and private companies including the informal sector.
- Taking into account the high unemployment rate and poor road surface conditions, street sweeping services should be done manually.
- The new Kunduchi disposal site should be developed and sanitary landfill operations should start by 2000 when Vingunguti disposal site becomes obsolete. Furthermore, disposal sites in both Ilala and Temeke districts shall be prepared and waste collected in these districts shall be disposed of at their respective disposal sites by sanitary landfilling.
- For the disposal site selection in both Ilala and Temeke districts, it is necessary to select disposal sites where construction and operation costs can be minimised as much as possible, adopting a method used by the study team to select the new Kunduchi disposal site.
- This study provided data regarding the quantity and composition of waste and the waste stream, which are the bases for proper solid waste management and waste stream. For the future re-examination of this plan, waste composition and quantity shall be surveyed regularly to accumulate basic data such as daily and seasonal fluctuation.
- By using the weighbridge installed at the Vingunguti disposal site, data on waste collection and disposal can be collected and analysed for the development of a more effective and sound collection and disposal system. This experience should be disseminated to the municipalities throughout Tanzania.

c. Improvement of Institutional System

The establishment of a strong and sound institutional system is most important to realise the master plan, making its technical system sustainable. Therefore, DCC needs to improve the institutional system by conducting the following to implement the priority projects (take-off projects) of the master plan.

- Integrate functions dispersed through the three departments (Health, Works and Planning) and establish an independent Waste Management Authority within DCC to assume all solid waste management responsibilities, including night soil collection. The Waste Management Authority shall be given the authority to independently conduct the administrative, operative and financial aspects of the services.
- Establish a Supervision and Monitoring Committee, an independent organisation to supervise and control the cleansing services provided by DCC and private contractors.
- Improve the city's tax collection capability and use city taxes as the main financial source for cleansing services by allocating a special fund for solid waste management.
- In order to establish the "beneficiary-pay-principle" in the future, the RCC system needs to be continued. However, the expenses of this system should not exceed the amount collected. Therefore, the joint billing of RCC with the water charge by DAWASA shall be considered. In case the adoption of this system is not possible due to some hindrance, DCC shall directly collect special RCCs.
- The type of contract shall be shifted from a concession contract system where collection services and RCC collection are consigned to private collectors, to the contracting out system in which DCC pays the contractor a service fee. To make the most of the private company's capabilities, clear policies and guidelines for the consignment of private companies for waste collection by the contracting out system should be formulated.
- Improve legislation relevant to solid waste management and incorporate them into the Sanitary Code.
- In view of the poor financial capabilities of DCC (service provider of cleansing) and the residents (beneficiaries), resident participation is very important for an efficient solid waste management system. DCC should, therefore, actively conduct promotional campaigns and educational programmes in order to gain their cooperation. Books and educational videos produced and used in the pilot project of this Study should be utilised effectively.
- Provide training for the people engaged in solid waste management and formulate a human resource development plan to improve their basic skills.

d. Financial Source

The funding for solid waste management shall mainly come from the special fund allocated from the city's taxes and the RCC. However, the financial analysis of the overall solid waste management project clearly states that even in the case of an optimistic revenue in which the income of the city and RCC are at its maximum (A-1-a), the project would still be infeasible, as the FIRR reaches only 2.32% when investment fund is all on loan.

According to the results of the financial analysis, the funding for implementing the priority projects, the take-off projects of the master plan, scheduled for 1999 should be subsidised either by the central government or by bilateral or multilateral grant aid.

Other than these priority projects, projects (i.e. vehicles and equipment replacement and facility expansion) necessary to realise the Master Plan shall be subsidised by the internal reserves from the special fund mentioned previously, RCC, tipping fees, etc.

The establishment of a sound financial system would firstly rely on accurate cost calculation for efficiently conducting operation, and secondly, restricting the use of collected RCC for reinvestments into solid waste management and its operation cost.

Table 9-2 shows the financial requirements to make the implementation of M/P and F/S projects feasible.

Table 9-2: Financial Requirements for Master Plan

Category 1	Category 2	Requirements
City taxes	Revenue	<ul style="list-style-type: none"> • Service levy, petrol levy: to retain at least 50 % of annual growth rate based on performance in 1996. • Development levy, property tax, hotel levy: to retain at least 40 % of annual growth rate based on performance in 1996. • Business license, market levy, others: to retain at least 20 % of annual growth rate based on performance in 1996.
	Budget allocation to SWM works	<ul style="list-style-type: none"> • To retain the SWM budget allocation rate at 5.0 % until 2005.
RCC	Joint billing	<ul style="list-style-type: none"> • Household waste: the collection rate shall exceed 30 %. • Waste other than household waste: the collection rate shall exceed 70 %. • The actual revenue from RCC excluding cost and commission shall be less than 30 % of RCC.
	Special RCC	<ul style="list-style-type: none"> • Charge all wastes other than household and informal wastes
	Amount of RCC	<ul style="list-style-type: none"> • Household: 1,250 Tsh/household/month • Other than household waste: 20,000 Tsh/ton
Institution		<ul style="list-style-type: none"> • Establishment of the Waste Management Authority. • Establishment of the Supervision and Monitoring Committee. • To allocate a budget for the special fund for solid waste management. • To introduce RCC by joint billing with water charges by DAWASA or special RCC collected directly by DCC. • To change the contract method from a concession to contracting out. • Improve legislation relevant to solid waste management and incorporate them into the Sanitary Code. • To conduct promotional campaigns and educational programmes. • Provide training for the people engaged in solid waste management and formulate a human resource development plan.

Appendix A

*Financial Analysis for
Night Soil Collection*

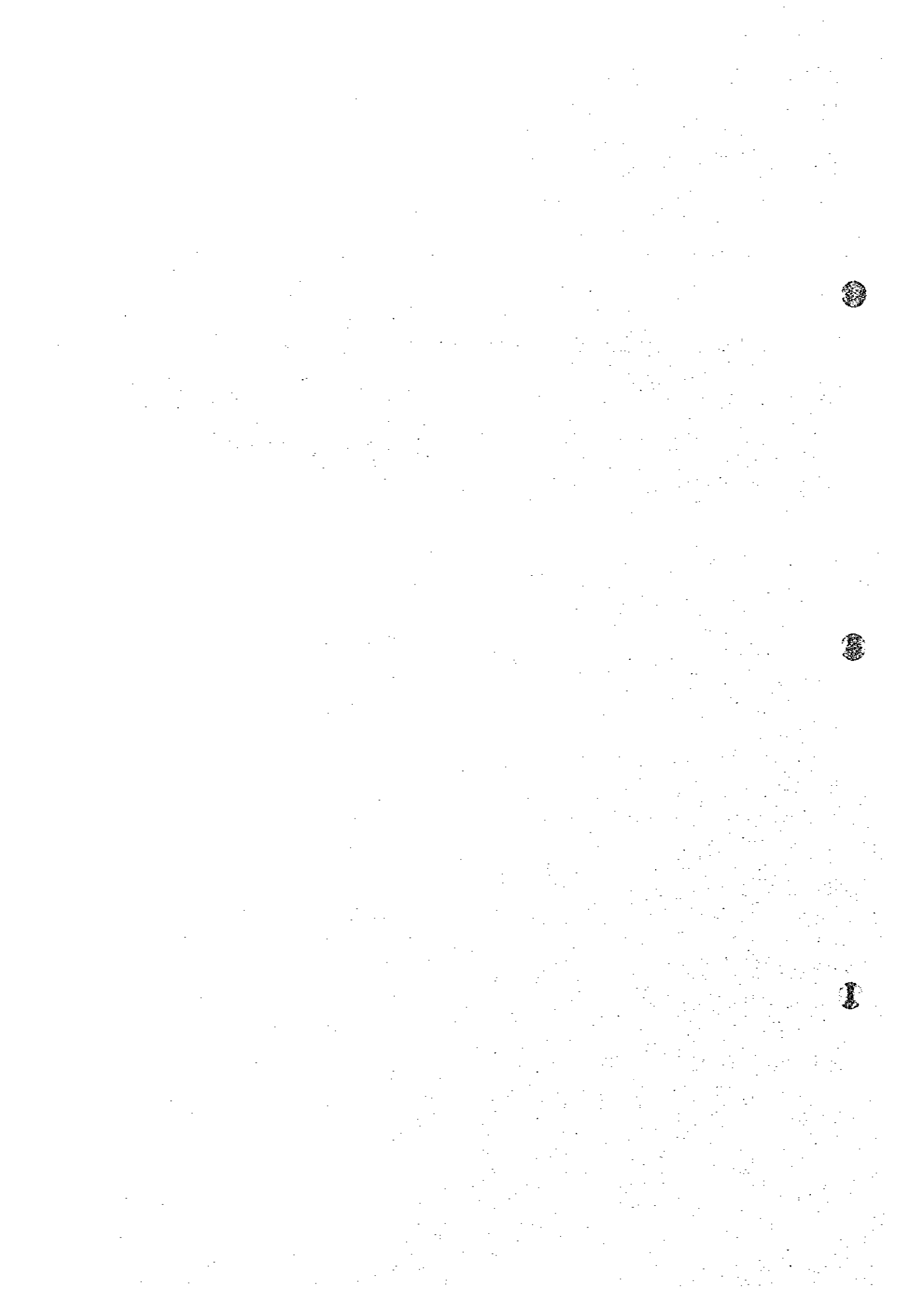


Table A-1 Financial Planning for Night Soil Collection (Case A-1)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment	million Tsh.	655	328	311	279	279	279	279	0
1.1.1 Collection and Transportation	million Tsh.	655	87	44	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	241	267	279	279	279	279	0
1.2.1 Labour	million Tsh.	0	32	35	37	37	37	37	0
1.2.2 Material	million Tsh.	0	54	60	62	62	62	62	0
1.2.3 Repair	million Tsh.	0	66	73	77	77	77	77	0
1.2.4 Dumping Fee	million Tsh.	0	89	99	103	103	103	103	0
2. Revenues									
2.1 Collection Fee	million Tsh.	0	104	115	120	120	120	120	137
2.1.1 Tariff	Tsh. per Trip	0	5000	5000	5000	5000	5000	5000	0
2.1.2 Number of Trips	Trip	0	20805	22995	24090	24090	24090	24090	0
2.2 Scrap Value	million Tsh.	0	0	0	0	0	0	0	137
3. Balance	million Tsh.	-655	-224	-196	-159	-159	-159	-159	137

Table A-2 Financial Planning for Night Soil Collection (Case A-2)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment	million Tsh.	655	328	311	279	279	279	279	0
1.1.1 Collection and Transportation	million Tsh.	655	87	44	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	241	267	279	279	279	279	0
1.2.1 Labour	million Tsh.	0	32	35	37	37	37	37	0
1.2.2 Material	million Tsh.	0	54	60	62	62	62	62	0
1.2.3 Repair	million Tsh.	0	66	73	77	77	77	77	0
1.2.4 Dumping Fee	million Tsh.	0	89	99	103	103	103	103	0
2. Revenues									
2.1 Collection Fee	million Tsh.	0	187	207	217	217	217	217	137
2.1.1 Tariff	Tsh. per Trip	0	9000	9000	9000	9000	9000	9000	0
2.1.2 Number of Trips	Trip	0	20805	22995	24090	24090	24090	24090	0
2.2 Scrap Value	million Tsh.	0	0	0	0	0	0	0	137
3. Balance	million Tsh.	-655	-141	-104	-62	-62	-62	-62	137

Table A-3 Financial Planning for Night Soil Collection (Case A-3)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment	million Tsh.	655	328	311	279	279	279	279	0
1.1.1 Collection and Transportation	million Tsh.	655	87	44	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	241	267	279	279	279	279	0
1.2.1 Labour	million Tsh.	0	32	35	37	37	37	37	0
1.2.2 Material	million Tsh.	0	54	60	62	62	62	62	62
1.2.3 Repair	million Tsh.	0	66	73	77	77	77	77	0
1.2.4 Dumping Fee	million Tsh.	0	89	99	103	103	103	103	0
2. Revenues									
2.1 Collection Fee	million Tsh.	0	270	299	313	313	313	313	137
2.1.1 Tariff	Tsh. per Trip	0	13000	13000	13000	13000	13000	13000	0
2.1.2 Number of Trips	Trip	0	20805	22995	24090	24090	24090	24090	0
2.2 Scrap Value	million Tsh.	0	0	0	0	0	0	0	137
3. Balance	million Tsh.	-655	-58	-12	34	34	34	34	137

Table A-4 Financial Planning for Night Soil Collection (Case B-1)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment	million Tsh.	0	328	311	279	279	279	279	0
1.1.1 Collection and Transportation	million Tsh.	0	37	44	0	0	0	0	0
1.1.1.1 Collection and Transportation	million Tsh.	0	87	44	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	241	267	279	279	279	279	0
1.2.1 Labour	million Tsh.	0	32	35	37	37	37	37	0
1.2.2 Material	million Tsh.	0	54	60	62	62	62	62	62
1.2.3 Repair	million Tsh.	0	66	73	77	77	77	77	0
1.2.4 Dumping Fee	million Tsh.	0	89	99	103	103	103	103	0
2. Revenues									
2.1 Collection Fee	million Tsh.	0	104	115	120	120	120	120	137
2.1.1 Tariff	Tsh. per Trip	0	5000	5000	5000	5000	5000	5000	0
2.1.2 Number of Trips	Trip	0	20805	22995	24090	24090	24090	24090	0
2.2 Scrap Value	million Tsh.	0	0	0	0	0	0	0	137
3. Balance	million Tsh.	0	-224	-196	-159	-159	-159	-159	137

Table A-5 Financial Planning for Night Soil Collection (Case B-2)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment	million Tsh.	0	328	311	279	279	279	279	0
1.1.1 Collection and Transportation	million Tsh.	0	87	44	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	241	267	279	279	279	279	0
1.2.1 Labour	million Tsh.	0	32	35	37	37	37	37	0
1.2.2 Material	million Tsh.	0	54	60	62	62	62	62	
1.2.3 Repair	million Tsh.	0	66	73	77	77	77	77	0
1.2.4 Dumping Fee	million Tsh.	0	89	99	103	103	103	103	0
2. Revenues									
2.1 Collection Fee	million Tsh.	0	187	207	217	217	217	217	137
2.1.1 Tariff	Tsh. per Trip	0	9000	9000	9000	9000	9000	9000	0
2.1.2 Number of Trips	Trip	0	20805	22995	24090	24090	24090	24090	0
2.2 Scrap Value	million Tsh.	0	0	0	0	0	0	0	137
3. Balance	million Tsh.	0	-141	-104	-62	-62	-62	-62	137

Table A-6 Financial Planning for Night Soil Collection (Case B-3)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment	million Tsh.	0	328	311	279	279	279	279	0
1.1.1 Collection and Transportation	million Tsh.	0	87	44	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	241	267	279	279	279	279	0
1.2.1 Labour	million Tsh.	0	32	35	37	37	37	37	0
1.2.2 Material	million Tsh.	0	54	60	62	62	62	62	
1.2.3 Repair	million Tsh.	0	66	73	77	77	77	77	0
1.2.4 Dumping Fee	million Tsh.	0	89	99	103	103	103	103	0
2. Revenues									
2.1 Collection Fee	million Tsh.	0	270	299	313	313	313	313	137
2.1.1 Tariff	Tsh. per Trip	0	13000	13000	13000	13000	13000	13000	0
2.1.2 Number of Trips	Trip	0	20805	22995	24090	24090	24090	24090	0
2.2 Scrap Value	million Tsh.	0	0	0	0	0	0	0	137
3. Balance	million Tsh.	0	-58	-12	34	34	34	34	137

Table A-7 FIRR (Case A-1)

FIRR = -54.18%

Project Year	Financial Year				Benefit	Net Benefit	Cumulative Net Benefit
		Investment	O & M	Cost			
1	1999	655	0	655	0	-655	-655
2	2000	87	241	328	104	-224	-879
3	2001	44	267	311	115	-196	-1,075
4	2002	0	279	279	120	-159	-1,234
5	2003	0	279	279	120	-159	-1,392
6	2004	0	279	279	120	-159	-1,551
7	2005	0	279	279	120	-159	-1,709
8	2006	0	0	0	137	137	-1,572

Table A-8 FIRR (Case A-2)

FIRR = -36.61%

Project Year	Financial Year				Benefit	Net Benefit	Cumulative Net Benefit
		Investment	O & M	Cost			
1	1999	655	0	655	0	-655	-655
2	2000	87	241	328	187	-141	-796
3	2001	44	267	311	207	-104	-900
4	2002	0	279	279	217	-62	-962
5	2003	0	279	279	217	-62	-1,024
6	2004	0	279	279	217	-62	-1,086
7	2005	0	279	279	217	-62	-1,149
8	2006	0	0	0	137	137	-1,012

Table A-9 FIRR (Case A-3)

FIRR = -15.46%

Project Year	Financial Year				Benefit	Net Benefit	Cumulative Net Benefit
		Investment	O & M	Cost			
1	1999	655	0	655	0	-655	-655
2	2000	87	241	328	270	-58	-713
3	2001	44	267	311	299	-12	-725
4	2002	0	279	279	313	34	-690
5	2003	0	279	279	313	34	-656
6	2004	0	279	279	313	34	-622
7	2005	0	279	279	313	34	-588
8	2006	0	0	0	137	137	-451

Table A-10 FIRR (Case B-1)

FIRR = -53.66%

Project Year	Financial Year				Benefit	Net Benefit	Cumulative Net Benefit
		Investment	O & M	Cost			
1	1999	0	0	0	0	0	0
2	2000	87	241	328	104	-224	-224
3	2001	44	267	311	115	-196	-420
4	2002	0	279	279	120	-159	-579
5	2003	0	279	279	120	-159	-737
6	2004	0	279	279	120	-159	-896
7	2005	0	279	279	120	-159	-1,054
8	2006	0	0	0	137	137	-917

Table A-11 FIRR (Case B-2)

FIRR = -31.27%

Project Year	Financial Year				Benefit	Net Benefit	Cumulative Net Benefit
		Investment	O & M	Cost			
1	1999	0	0	0	0	0	0
2	2000	87	241	328	187	-141	-141
3	2001	44	267	311	207	-104	-245
4	2002	0	279	279	217	-62	-307
5	2003	0	279	279	217	-62	-369
6	2004	0	279	279	217	-62	-431
7	2005	0	279	279	217	-62	-494
8	2006	0	0	0	137	137	-357

Table A-12 FIRR (Case B-3)

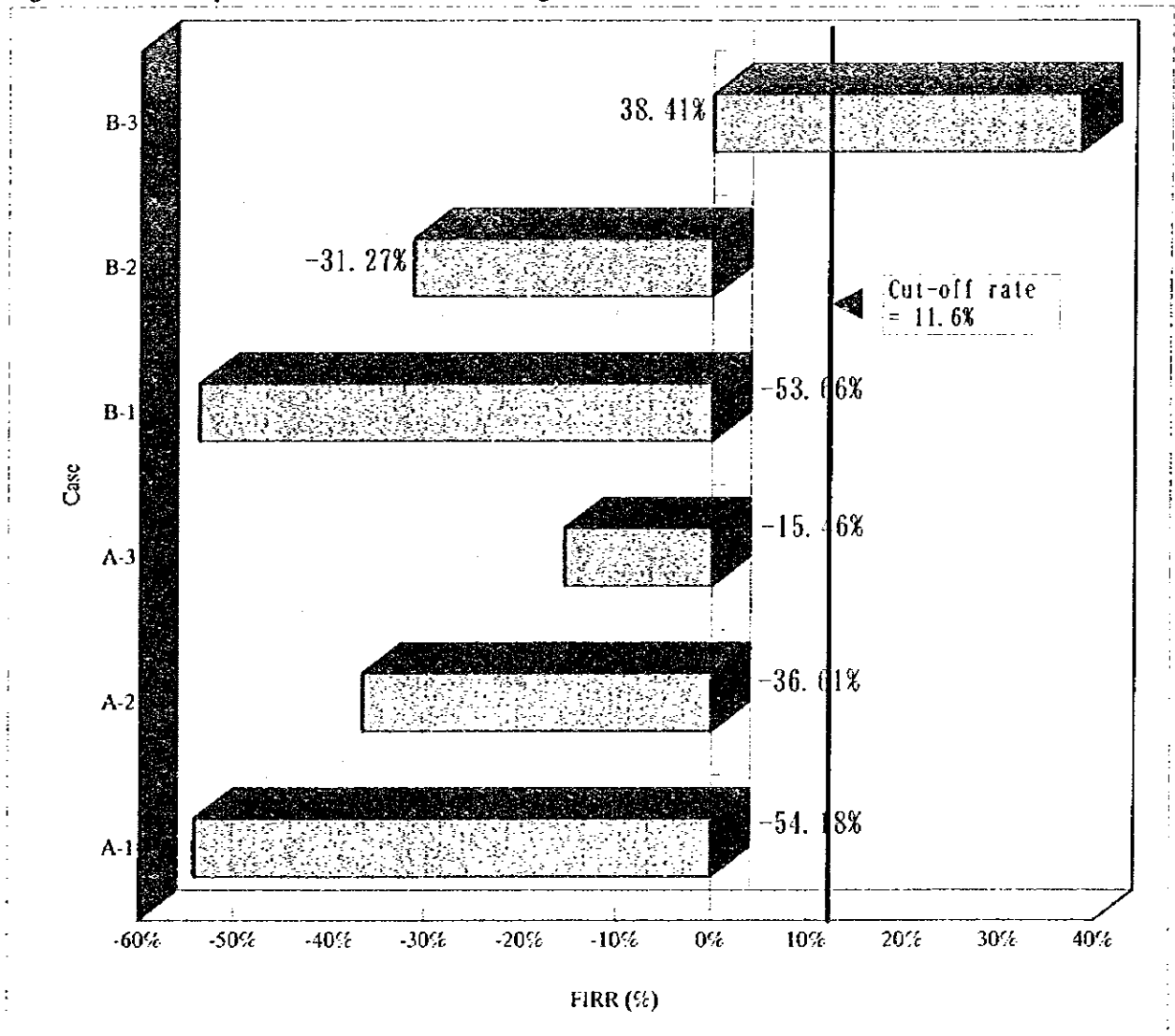
FIRR = 38.41%

Project Year	Financial Year				Benefit	Net Benefit	Cumulative Net Benefit
		Investment	O & M	Cost			
1	1999	0	0	0	0	0	0
2	2000	87	241	328	270	-58	-58
3	2001	44	267	311	299	-12	-70
4	2002	0	279	279	313	34	-35
5	2003	0	279	279	313	34	-1
6	2004	0	279	279	313	34	33
7	2005	0	279	279	313	34	67
8	2006	0	0	0	137	137	204

Table A-13 Summary of Financial Evaluation for Night Soil Collection

Case	Cost	Tariff	FIRR
A-1	All Loan	Tsh. 5000 per Trip	-54.18%
A-2	All Loan	Tsh. 9000 per Trip	-36.61%
A-3	All Loan	Tsh. 13000 per Trip	-15.46%
B-1	Grant for 1st Year	Tsh. 5000 per Trip	-53.66%
B-2	Grant for 1st Year	Tsh. 9000 per Trip	-31.27%
B-3	Grant for 1st Year	Tsh. 13000 per Trip	38.41%
Cut-off Rate	Grant for 1st Year	Tsh. 10500 per Trip	11.60% = Cut-off Rate

Figure A-1 Summary of Financial Evaluation for Night Soil Collection



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Appendix B

Revenue Forecast

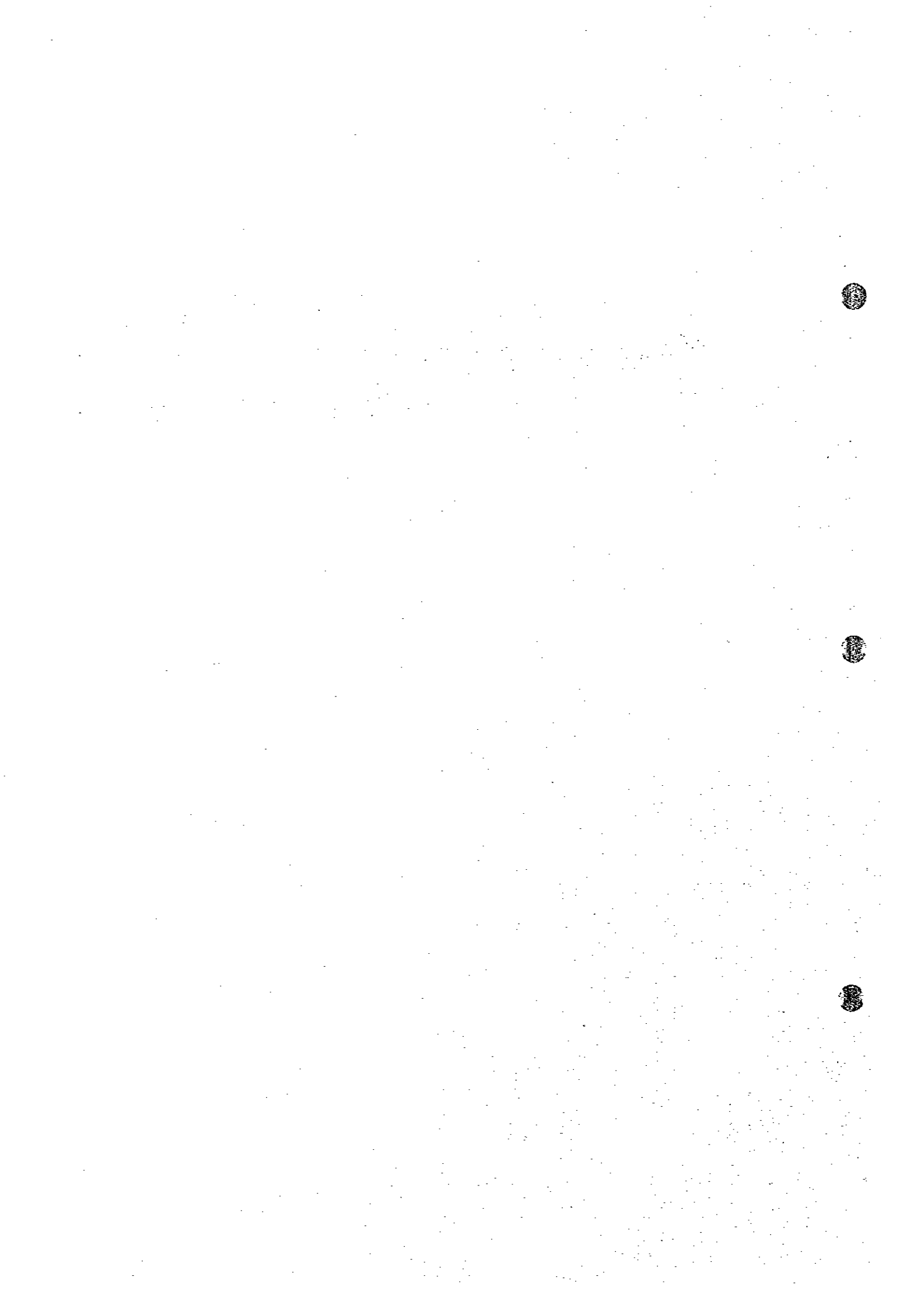


Table B-1 Financial Planning (Case A-1-a : Cost = All Loan, Revenue Source = Joint Billing + Tax, Revenue Forecast = Optimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	5634	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	5098	1407	1864	430	580	0	0	0
1.1.1.1 Collection and Transportation	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.1.2 Final Disposal	million Tsh.	1431	0	150	430	580	0	0	0
1.1.1.3 Road Sweeping	million Tsh.	23	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	304	1948	2564	3156	3156	3155	3156	2358
2.2 Joint Billing (Household)	million Tsh.	304	1160	1481	1729	1729	1729	1729	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.2.4 RCC Collection Rate	%	0.0	20.0	20.0	20.0	20.0	20.0	20.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	410	552	725	725	725	725	0
2.3.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.3.2 Waste Collection Amount	ton/year	0	41019	55170	72542	72542	72542	72542	0
2.3.3 RCC Collection Rate	%	0.0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	0	0	0	0	0	0	0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	0
3. Balance	million Tsh.	-4830	-571	-696	981	820	1386	1351	2358

Table B-2 Financial Planning (Case A-1-b : Cost = All Loan, Revenue Source = Joint Billing + Tax, Revenue Forecast = Moderate)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	5624	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	5098	1407	1864	430	580	0	0	0
1.1.1.1 Collection	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.2 Final Disposal	million Tsh.	1431	0	150	430	580	0	0	0
1.1.3 Road Sweeping	million Tsh.	23	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	548	1480	1975	2591	2591	2591	2591	2358
2.2 Joint Billing (Household)	million Tsh.	548	693	893	1165	1165	1165	1165	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.2.4 RCC Collection Rate	%	0.0	20.0	20.0	20.0	20.0	20.0	20.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	410	552	725	725	725	725	0
2.3.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.3.2 Waste Collection Amount	ton/year	0	41019	55170	72542	72542	72542	72542	0
2.3.3 RCC Collection Rate	%	0.0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	0	0	0	0	0	0	0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	0
3. Balance	million Tsh.	-5086	-1039	-1295	416	255	822	786	2358

Table B-3 Financial Planning (Case A-1-c : Cost = All Loan, Revenue Source = Joint Billing + Tax, Revenue Forecast = Pessimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	5634	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	5098	1407	1864	430	580	0	0	0
1.1.1.1 Collection and Transportation	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.1.2 Final Disposal	million Tsh.	1431	0	150	430	580	0	0	0
1.1.1.3 Road Sweeping	million Tsh.	23	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	369	1185	1512	1894	1893	1893	1893	2358
2.2 Joint Billing (Household)	million Tsh.	369	398	430	467	467	467	467	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0.0	607771	655162	708474	768942	837490	916628	0
2.2.4 RCC Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.3 Joint Billing (Others)	million Tsh.	0	20.0	20.0	20.0	20.0	20.0	20.0	0.0
2.3.1 Tariff	Tsh./ton	0	410	562	725	725	725	725	0
2.3.2 Waste Collection Amount	ton/year	0	20000	20000	20000	20000	20000	20000	0
2.3.3 RCC Collection Rate	%	0.0	41019	55170	72542	72542	72542	72542	0
2.4 Special RCC with Business License	million Tsh.	0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	0
3. Balance	million Tsh.	-5265	-1334	-1748	-281	-443	124	88	2358

Table B-4 Financial Planning (Case A-2-a : Cost = All Loan, Revenue Source = Special RCC + Tax, Revenue Forecast = Optimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	5634	2519	3260	2175	2336	1769	1905	0
1.1.1 Collection and Transportation	million Tsh.	5098	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	1431	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	23	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	0	406	526	684	684	684	684	0
1.3.1 Workshop	million Tsh.	536	142	164	172	183	196	232	0
1.3.2 Motor Pool	million Tsh.	342	54	64	80	91	104	119	0
1.3.3 Administration	million Tsh.	0	7	7	7	7	7	7	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	804	1817	2364	2890	2890	2890	2890	2358
2.2 Joint Billing (Household)	million Tsh.	804	1160	1481	1729	1729	1729	1729	0
2.2.1 Tariff	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.2 Number of Households	households	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-4830	-702	-896	715	554	1121	1085	2358

Table B-5 Financial Planning (Case A-2-b FCost = All Loan, Revenue Source = Special RCC + Tax, Revenue Forecast = Moderate)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	5634	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	5098	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	1431	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	23	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	548	1349	1776	2325	2325	2325	2325	2358
2.2 Joint Billing (Household)	million Tsh.	548	693	893	1165	1165	1165	1165	0
2.2.1 Tariff	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.2 Number of Households	households	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-5086	-1170	-1484	150	-11	556	520	2358

Table B-6 Financial Planning (Case A-2-c : Cost = All Loan, Revenue Source = Special RCC + Tax, Revenue Forecast = Pessimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	5634	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	5098	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	1431	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	23	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	0	406	526	684	684	684	684	0
1.3.1 Workshop	million Tsh.	536	142	164	172	183	196	232	0
1.3.2 Motor Pool	million Tsh.	342	54	64	80	91	104	119	0
1.3.3 Administration	million Tsh.	0	7	7	7	7	7	7	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	369	1054	1313	1627	1627	1627	1627	2358
2.2 Joint Billing (Household)	million Tsh.	369	398	430	467	467	467	467	0
2.2.1 Tariff	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.2 Number of Households	households	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-5265	-1465	-1947	-548	-709	-142	-178	2358

Table B-7 Financial Planning (Case B-1-a : Cost = Partial Loan, Revenue Source = Joint Billing + Tax, Revenue Forecast = Optimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	4203	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	3667	1407	1864	430	580	0	0	0
1.1.1.1 Final Disposal	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.1.2 Final Disposal	million Tsh.	0	0	150	430	580	0	0	0
1.1.3 Road Sweeping	million Tsh.	23	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	804	1948	2564	3156	3156	3155	3156	2358
2.2 Joint Billing (Household)	million Tsh.	804	1160	1481	1729	1729	1729	1729	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0.0	607771	655162	708474	768942	837490	916628	0
2.2.4 RCC Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.3 Joint Billing (Others)	million Tsh.	0	410	552	725	725	725	725	0
2.3.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.3.2 Waste Collection Amount	ton/year	0	41019	55170	72542	72542	72542	72542	0
2.3.3 RCC Collection Rate	%	0.0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	0	0	0	0	0	0	0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-3399	-571	-696	981	820	1386	1351	2358

Table B-8 Financial Planning (Case B-1-b : Cost = Partial Loan, Revenue Source = Joint Billing + Tax, Revenue Forecast = Moderate)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	4203	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	3667	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	0	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	23	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	536	406	526	684	684	684	684	0
1.3.1 Workshop	million Tsh.	342	142	164	172	183	196	232	0
1.3.2 Motor Pool	million Tsh.	0	54	64	80	91	104	119	0
1.3.3 Administration	million Tsh.	194	7	7	7	7	7	7	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	548	1480	1975	2591	2591	2591	2591	2358
2.2 Joint Billing (Household)	million Tsh.	548	693	893	1165	1165	1165	1165	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.2.4 RCC Collection Rate	%	0.0	20.0	20.0	20.0	20.0	20.0	20.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	410	552	725	725	725	725	0
2.3.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.3.2 Waste Collection Amount	ton/year	0	41019	55170	72542	72542	72542	72542	0
2.3.3 RCC Collection Rate	%	0.0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	0	0	0	0	0	0	0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-3655	-1039	-1285	416	255	822	786	2358

Table B-9 Financial Planning (Case B-1-c : Cost = Partial Loan, Revenue Source = Joint Billing + Tax, Revenue Forecast = Pessimistic)

	Year	Unit	Revenue Forecast = Pessimistic																	
			1999	2000	2001	2002	2003	2004	2005	2006										
1. Costs																				
1.1 Investment Cost		million Tsh.	4203	2519	3260	2175	2336	1769	1805	0										
1.1.1 Collection and Transportation		million Tsh.	3667	1407	1864	430	580	0	0	0										
1.1.2 Final Disposal		million Tsh.	3644	1384	1691	0	0	0	0	0										
1.1.3 Road Sweeping		million Tsh.	0	0	150	430	590	0	0	0										
1.2 Operation and Maintenance		million Tsh.	23	23	23	0	0	0	0	0										
1.2.1 Labour		million Tsh.	0	970	1232	1573	1573	1573	1573	1573										
1.2.2 Fuel and Materials		million Tsh.	0	240	285	335	335	335	335	335										
1.2.3 Repair		million Tsh.	0	324	421	554	554	554	554	554										
1.3 Indirect Cost		million Tsh.	536	142	526	694	684	694	684	684										
1.3.1 Workshop		million Tsh.	342	54	64	172	183	196	232	232										
1.3.2 Motor Pool		million Tsh.	0	7	7	80	91	104	119	119										
1.3.3 Administration		million Tsh.	194	81	93	85	85	85	106	106										
2. Revenues																				
2.1 Special Account from DCC Tax		million Tsh.	369	1185	1512	1894	1893	1993	1893	1893										
2.2 Joint Billing (Household)		million Tsh.	369	398	430	467	467	467	467	467										
2.2.1 Tariff		million Tsh.	0	377	531	701	701	701	701	701										
2.2.2 Number of Households		Tsh./household/month	0	1250	1250	1250	1250	1250	1250	1250										
2.2.3 Waste Collection Rate		households	0	607771	655162	708474	768942	837490	916628	916628										
2.2.4 RCC Collection Rate		%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	25.5										
2.3 Joint Billing (Others)		%	0.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0										
2.3.1 Tariff		million Tsh.	0	410	552	725	725	725	725	725										
2.3.2 Waste Collection Amount		Tsh./ton	0	20000	20000	20000	20000	20000	20000	20000										
2.3.3 RCC Collection Rate		ton/year	0	41019	55170	72542	72542	72542	72542	72542										
2.4 Special RCC with Business License		%	0.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0										
2.4.1 Tariff		million Tsh.	0	0	0	0	0	0	0	0										
2.4.2 Waste Collection Amount		Tsh./ton	0	0	0	0	0	0	0	0										
2.4.3 RCC Collection Rate		ton/day	0	0	0	0	0	0	0	0										
2.5 Scrap Value		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0										
3. Balance		million Tsh.	-3834	-1334	-1748	-281	-443	124	88	2358										
		million Tsh.																		

Table B-10 Financial Planning (Case B-2-a : Cost = Partial Loan, Revenue Source = Special RCC + Tax, Revenue Forecast = Optimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	4203	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	3667	1407	1864	430	580	0	0	0
1.1.1.1 Collection and Transportation	million Tsh.	3644	1384	1691	0	0	0	0	0
1.1.2 Final Disposal	million Tsh.	0	0	150	430	580	0	0	0
1.1.3 Road Sweeping	million Tsh.	23	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1282	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	804	1817	2364	2890	2890	2890	2890	2358
2.2 Joint Billing (Household)	million Tsh.	0	0	0	0	0	0	0	0
2.2.1 Tariff	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.2 Number of Households	households	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-8399	-702	-896	715	554	1121	1085	2358

Table B-11 Financial Planning (Case B-2-b : Cost = Partial Loan, Revenue Source = Special RCC + Tax, Revenue Forecast = Moderate)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	4203	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	3667	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	3644	1884	1691	0	0	0	0	0
1.1.2.1 Final Disposal	million Tsh.	0	0	150	430	580	0	0	0
1.1.3 Road Sweeping	million Tsh.	23	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1282	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	548	1343	1776	2325	2325	2325	2325	2358
2.2 Joint Billing (Household)	million Tsh.	548	693	893	1165	1165	1165	1165	0
2.2.1 Tariff	million Tsh.	0	0	0	0	0	0	0	0
2.2.2 Number of Households	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	households	0	0	0	0	0	0	0	0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3.1 Tariff	million Tsh.	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	Tsh./ton	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	ton/year	0	0	0	0	0	0	0	0
2.4 Special RCC with Business License	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4.1 Tariff	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.2 Waste Collection Amount	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.3 RCC Collection Rate	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-3655	-1170	-1484	150	-11	556	520	2358

Table B-12 Financial Planning (Case B-2-c : Cost = Partial Loan, Revenue Source = Special RCC + Tax, Revenue Forecast = Pessimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	4203	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	3667	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	3644	0	150	430	580	0	0	0
1.1.3 Road Sweeping	million Tsh.	23	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	536	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	342	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	369	1054	1313	1627	1627	1627	1627	2358
2.2 Joint Billing (Household)	million Tsh.	369	398	430	467	467	467	467	0
2.2.1 Tariff	million Tsh.	0	0	0	0	0	0	0	0
2.2.2 Number of Households	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	-3834	-1465	-1947	-548	-709	-142	-178	2358

Table B-13 Financial Planning (Case C-1-a : Cost = All Grant, Revenue Source = Joint Billing + Tax, Revenue Forecast = Optimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	194	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	0	1407	1864	430	580	0	0	0
1.1.1.1 Final Disposal	million Tsh.	0	1384	1691	0	0	0	0	0
1.1.1.2 Final Disposal	million Tsh.	0	0	150	430	580	0	0	0
1.1.1.3 Road Sweeping	million Tsh.	0	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	194	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	0	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	804	1948	2564	3156	3156	3155	3156	2358
2.2 Joint Billing (Household)	million Tsh.	804	1160	1481	1729	1729	1729	1729	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0.0	607771	655162	708474	768942	837490	916628	0
2.2.4 RCC Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.3 Joint Billing (Others)	million Tsh.	0	20.0	20.0	20.0	20.0	20.0	20.0	0.0
2.3.1 Tariff	Tsh./ton	0	410	552	725	725	725	725	0
2.3.2 Waste Collection Amount	ton/year	0	20000	20000	20000	20000	20000	20000	0
2.3.3 RCC Collection Rate	%	0.0	41019	55170	72542	72542	72542	72542	0
2.4 Special RCC with Business License	million Tsh.	0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	610	-571	-696	981	820	1386	1351	2358

Table B-14 Financial Planning (Case C-1-b : Cost = All Grant, Revenue Source = Joint Billing + Tax, Revenue Forecast = Moderate)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	194	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	0	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	0	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	0	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	0	406	526	684	684	684	684	0
1.3.1 Workshop	million Tsh.	194	142	164	172	183	196	232	0
1.3.2 Motor Pool	million Tsh.	0	54	64	80	91	104	119	0
1.3.3 Administration	million Tsh.	0	7	7	7	7	7	7	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	548	1480	1975	2591	2591	2591	2591	2358
2.2 Joint Billing (Household)	million Tsh.	548	693	893	1165	1165	1165	1165	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.2.4 RCC Collection Rate	%	0.0	20.0	20.0	20.0	20.0	20.0	20.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	410	552	725	725	725	725	0
2.3.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.3.2 Waste Collection Amount	ton/year	0	41019	55170	72542	72542	72542	72542	0
2.3.3 RCC Collection Rate	%	0.0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	0	0	0	0	0	0	0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	354	-1039	-1285	416	255	822	796	2358

Table B-15 Financial Planning (Case C-1-c : Cost = All Grant, Revenue Source = Joint Billing + Tax, Revenue Forecast = Pessimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	194	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	0	1407	1864	430	580	0	0	0
1.1.1.1 Collection and Transportation	million Tsh.	0	1384	1691	0	0	0	0	0
1.1.2 Final Disposal	million Tsh.	0	0	150	430	580	0	0	0
1.1.3 Road Sweeping	million Tsh.	0	23	23	0	0	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.1 Labour	million Tsh.	0	240	285	335	335	335	335	0
1.2.2 Fuel and Materials	million Tsh.	0	324	421	554	554	554	554	0
1.2.3 Repair	million Tsh.	0	406	526	684	684	684	684	0
1.3 Indirect Cost	million Tsh.	194	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	0	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	369	1185	1512	1894	1893	1893	1893	2358
2.2 Joint Billing (Household)	million Tsh.	369	398	430	467	467	467	467	0
2.2.1 Tariff	Tsh./household/month	0	377	531	701	701	701	701	0
2.2.2 Number of Households	households	0	1250	1250	1250	1250	1250	1250	0
2.2.3 Waste Collection Rate	%	0	607771	655162	708474	768942	837490	916628	0
2.2.4 RCC Collection Rate	%	0.0	20.7	27.0	33.0	30.4	27.9	25.5	0.0
2.3 Joint Billing (Others)	million Tsh.	0.0	20.0	20.0	20.0	20.0	20.0	20.0	0.0
2.3.1 Tariff	Tsh./ton	0	410	562	725	725	725	725	0
2.3.2 Waste Collection Amount	ton/year	0	20000	20000	20000	20000	20000	20000	0
2.3.3 RCC Collection Rate	%	0	41019	55170	72542	72542	72542	72542	0
2.4 Special RCC with Business License	million Tsh.	0.0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
2.4.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.4.2 Waste Collection Amount	ton/day	0	0	0	0	0	0	0	0
2.4.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	175	-1334	-1748	-281	-443	124	88	2358

Table B-16 Financial Planning (Case C-2-a : Cost = All Grant, Revenue Source = Special RCC + Tax, Revenue Forecast = Optimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	194	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	0	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	0	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	0	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	194	406	526	684	684	684	684	0
1.3.1 Workshop	million Tsh.	0	142	164	172	183	196	232	0
1.3.2 Motor Pool	million Tsh.	0	54	64	80	91	104	119	0
1.3.3 Administration	million Tsh.	0	7	7	7	7	7	7	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	804	1817	2364	2890	2890	2890	2890	2358
2.2 Joint Billing (Household)	million Tsh.	804	1160	1481	1729	1729	1729	1729	0
2.2.1 Tariff	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.2 Number of Households	households	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	610	-702	-896	715	554	1121	1085	2358

Table B-17 Financial Planning (Case C-2-b : Cost = All Grants, Revenue Source = Special RCC + Tax, Revenue Forecast = Moderate)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	194	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	0	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	0	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	0	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	194	142	164	172	183	196	232	0
1.3.1 Workshop	million Tsh.	0	54	64	80	91	104	119	0
1.3.2 Motor Pool	million Tsh.	0	7	7	7	7	7	7	0
1.3.3 Administration	million Tsh.	194	81	93	85	85	85	106	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	548	1349	1776	2325	2325	2325	2325	2358
2.2 Joint Billing (Household)	million Tsh.	548	693	893	1165	1165	1165	1165	0
2.2.1 Tariff	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.2 Number of Households	households	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	354	-1170	-1484	150	-11	556	520	2358

Table B-18 Financial Planning (Case C-2-c : Cost = All Grant, Revenue Source = Special RCC + Tax, Revenue Forecast = Pessimistic)

Year	Unit	1999	2000	2001	2002	2003	2004	2005	2006
1. Costs									
1.1 Investment Cost	million Tsh.	194	2519	3260	2175	2336	1769	1805	0
1.1.1 Collection and Transportation	million Tsh.	0	1407	1864	430	580	0	0	0
1.1.2 Final Disposal	million Tsh.	0	1384	1691	0	0	0	0	0
1.1.3 Road Sweeping	million Tsh.	0	0	150	430	580	0	0	0
1.2 Operation and Maintenance	million Tsh.	0	23	23	0	0	0	0	0
1.2.1 Labour	million Tsh.	0	970	1232	1573	1573	1573	1573	0
1.2.2 Fuel and Materials	million Tsh.	0	240	285	335	335	335	335	0
1.2.3 Repair	million Tsh.	0	324	421	554	554	554	554	0
1.3 Indirect Cost	million Tsh.	0	406	526	684	684	684	684	0
1.3.1 Workshop	million Tsh.	194	142	164	172	183	196	232	0
1.3.2 Motor Pool	million Tsh.	0	54	64	80	91	104	119	0
1.3.3 Administration	million Tsh.	0	7	7	7	7	7	7	0
2. Revenues									
2.1 Special Account from DCC Tax	million Tsh.	369	1054	1313	1627	1627	1627	1627	2358
2.2 Joint Billing (Household)	million Tsh.	369	398	430	467	467	467	467	0
2.2.1 Tariff	Tsh./household/month	0	0	0	0	0	0	0	0
2.2.2 Number of Households	households	0	0	0	0	0	0	0	0
2.2.3 Waste Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2.4 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3 Joint Billing (Others)	million Tsh.	0	0	0	0	0	0	0	0
2.3.1 Tariff	Tsh./ton	0	0	0	0	0	0	0	0
2.3.2 Waste Collection Amount	ton/year	0	0	0	0	0	0	0	0
2.3.3 RCC Collection Rate	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4 Special RCC with Business License	million Tsh.	0	656	883	1161	1161	1161	1161	0
2.4.1 Tariff	Tsh./ton	0	20000	20000	20000	20000	20000	20000	0
2.4.2 Waste Collection Amount	ton/day	0	41019	55170	72542	72542	72542	72542	0
2.4.3 RCC Collection Rate	%	0.0	80.0	80.0	80.0	80.0	80.0	80.0	0.0
2.5 Scrap Value	million Tsh.	0	0	0	0	0	0	0	2358
3. Balance	million Tsh.	175	-1465	-1947	-548	-709	-142	-178	2358

Table B-19 Statistical Summary for Willingness to Pay

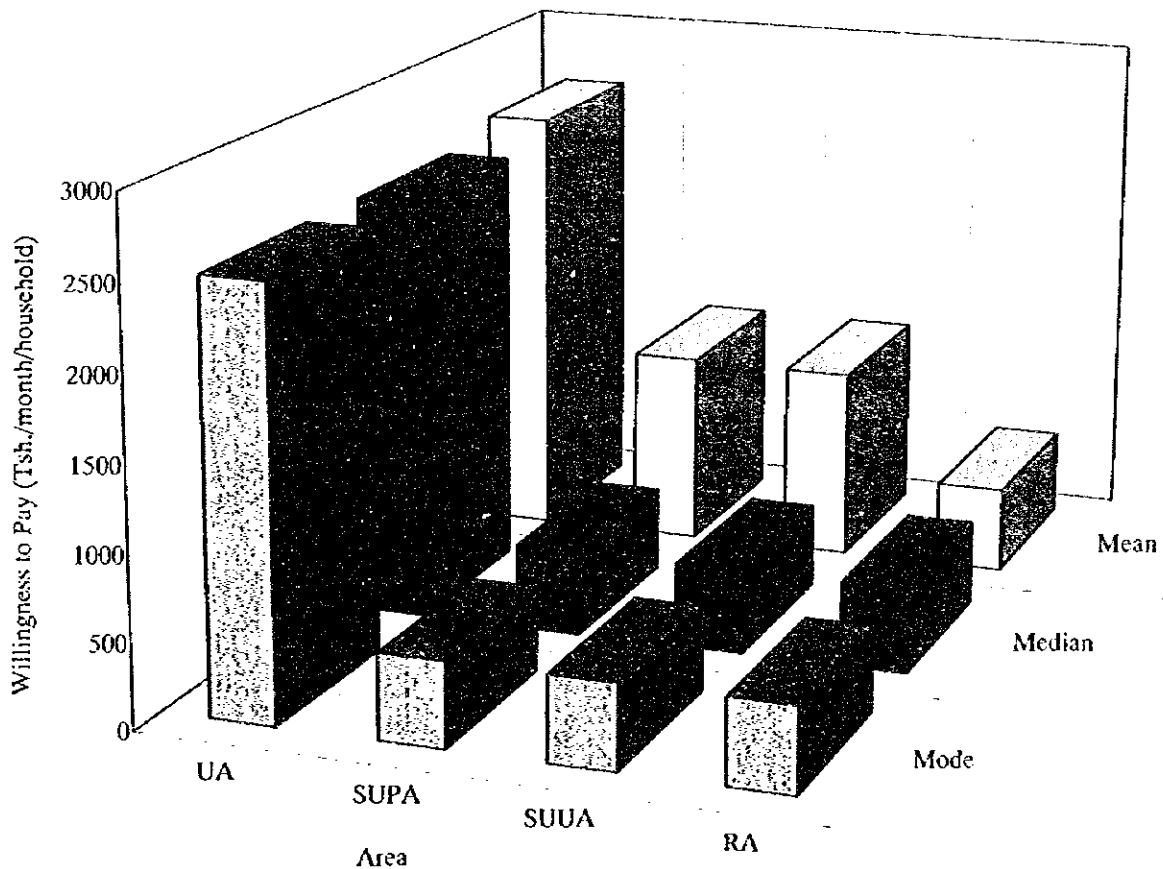
(Unit: Tsh. per month per household)

Basic Statistical Value	Total	Urban	Semi-urban Planned	Semi-urban Unplanned	Rural	Area A	Area B
Mean	1230.4	2610.0	1154.5	1145.2	509.9	1445.6	1016.1
Standard Error	84.3	306.5	118.1	146.8	75.2	118.2	119.0
Median	500	2500	550	500	500	1000	500
Mode	500	2500	500	500	500	500	500
Standard Deviation	1887.3	2167.2	1669.6	2075.8	537.0	1868.8	1885.0
Range	15000	10000	15000	10000	2500	15000	10000
Minimum	0	0	0	0	0	0	0
Maximum	15000	10000	15000	10000	2500	15000	10000
Sum	616443	130500	230900	229040	26003	361400	255043
Number of Samples	501	50	200	200	51	250	251
Confidence Interval	165.7	615.9	232.8	289.4	151.0	232.8	234.3

Source: Public Opinion Survey Conducted by the Study Team in 1996

Note: The above confidence intervals are based on 95%.

Figure B-1 Mean, Median and Mode of Willingness to Pay by Area



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