national treasury
Department:
National Treasury
REPUBLIC OF SOUTH AFRICA

Capital Planning Guidelines

Contents

1. INTRODUCTION

In support of the National Development Plan and the New Growth Path objective of continual improvement in service delivery, the National Treasury provides guidance on how infrastructure programmes and project proposals should be planned, appraised and evaluated before significant funds are committed. The acquisition of new infrastructure or rehabilitation and refurbishment including maintenance requires comprehensive assessment and planning that takes into consideration the full life cycle cost of the asset. These guidelines will enable decision makers to evaluate and make decisions on whether capital investments are in the best public interest.

1.1 Alignment with other legislation

The guidance encourages a life-cycle evaluation process that ensures alignment not only between departmental planning processes but also consistency with the requirements of the following legislations:

- Government Immovable Asset Management Act (GIAMA).
  GIAMA provides guidelines and minimum standards for immovable asset management. This ensures that assets are adequately managed and maintained during their lifetime.
- The Infrastructure Development Act (IDA).
  The Infrastructure Development Act facilitates the coordination of public infrastructure development projects so that there is better planning, evaluation and implementation of Strategic Infrastructure Projects (SIPs) as they move through the project life-cycle.
- The Standard for Infrastructure and Delivery Management (SIPDM).
  This Standard ensures that value for money is achieved in the planning, design and procurement of infrastructure projects. It provides a range of contracting strategies and approaches to the delivery and execution of projects in order to improve project outcomes as well as making provision for innovative methods to respond to current maintenance challenges.

2. CAPITAL PROJECTS EVALUATION PROCESS

The guidance provides advice to departments on how to appraise capital projects and proposals that will be submitted to the National Treasury for evaluation and funding consideration. It provides at a minimum, the capital appraisal techniques that are expected to be closely followed so that there is adequate information to inform decision makers before the budget process commits funds to a project.

Valuation of proposals submitted to the National Treasury will involve detailed analysis of whether the planned project meets its objectives, is the most suitable option available and whether the best procurement mechanism to deliver the project has been selected. In this process it is necessary to test the assumptions/estimations in the proposal and to test the reliability and accuracy of information provided. It is important that government understands the risks, costs and benefits associated with a project and is in a position to make a sound investment decision when it decides to fund a particular project.

3. APPRAISAL PROCESS UNDERTAKEN BY DEPARTMENTS

The Capital Planning Guidelines below outline for departments and entities (hereafter institutions) project appraisal techniques and an explanation of the kind of information that needs to be submitted to the National Treasury when an infrastructure capital project is being planned and a bid is being submitted. The guidelines are designed to ensure thorough planning of capital projects and the prioritisation of projects that offer maximum economic and social benefits to society.

The planning, appraisal and evaluation of capital projects is a continuous process which takes place throughout the year. An infrastructure bid submitted to the National Treasury should be closely linked to other planning processes in the institution. The institution's Infrastructure Plan or User Asset Management Plan is a rolling plan and it is expected that each year this plan will be updated and re-prioritised on the basis of:

- Targets and priorities set out in the strategic plan;
- The anticipated MTEF budget; Priorities set out in the SIP and
- The progress of the current projects being implemented.

The Medium Term Expenditure Framework (MTEF) infrastructure bid proposals may contain on-going and new capital projects which may include refurbishments, upgrades or maintenance projects.

Each department should have in place project planning and appraisal processes that are aligned to their strategic planning, infrastructure planning and budget planning processes.

3.1 Extension of Existing Infrastructure Projects

All submissions for existing capital projects should be based on the need to complete or extend the project. If the completion/extension was contemplated in the original planning documentation, a reference to these documents is sufficient.

However, if the additional bid is due to cost overruns or an increase in the scope of the project which was not part of the original planning documentation, a clear explanation and motivation is necessary as part of the submission.

3.2 New Capital Projects

All new capital projects are required to undergo a systematic and rigorous appraisal as described in these Guidelines. The type and depth of information required will depend on the size and the nature of the project. Resources spent on appraising capital project proposals should be proportional to the project cost, keeping in mind its nature and complexity.

The appraisal activities may be outsourced, depending upon the capacity resident in an institution. ***Institutions must provide for project planning within their current MTEF budget baselines, including, as necessary, funding for outsourced capital project appraisals.*** Multiple small projects with the same outputs can be grouped and motivated as a single infrastructure programme requiring funding.

All projects go through a series of distinct stages from the initial project idea to the time the project is completed and handed over. It is important for institutions to understand these project stages and the analysis to be carried out at each stage. The analysis is an integral part to a logical approach to project planning that will assist in the appraisal of the project. The analysis will also provide the rationale or justification for government funding for the project. A clear need must be articulated which is in the national interest.

3.3 Maintenance costs for on-going projects

Direct maintenance costs will include the costs over the full project cycle of maintaining the assets in the condition required to deliver the specified outputs, and may include the costs of raw materials, tools and equipment, and labour associated with maintenance. The level of maintenance assumed must be

consistent with the capital costs and the operating cost forecasts. It is important to ensure that maintenance costs are budgeted for and not diverted to other funding pressures during the year, to ensure that there is no depletion to the current stock of assets.

4. MINIMUM INFORMATION REQUIRED

The following information must be submitted for each capital project. While every project must address all the elements, the detail and rigor applied at a particular stage will be dependent upon the size and complexity of the project.

1.	Preparatory Work
1.1.	Needs and demand analysis with specified outputs of the project
1.2.	Options Analysis
•	Demand Analysis
•	Technical Engineering Analysis
•	Environmental Analysis
•	Socio-economic Analysis
•	Legal and Regulatory Due Diligence
2.	Viability Evaluation
2.1.	Financial analysis
2.2.	Economic analysis
3.	Risk Assessment and Sensitivity Analysis
4.	The Preferred Option
5.	Implementation Readiness
5.1.	Institutional capacity
5.2.	Procurement plan
6.	Project Concept Note

5. PREPARATORY WORK

5.1 Needs Analysis

The needs analysis identifies and evaluates a clear need that is in the public interest. The analysis should demonstrate alignment with the institution's mandate and strategic objectives. The purpose of this analysis is to enable the institution to clearly identify an infrastructure need, specify outputs of the project and ascertain the extent of current and future demand for the service.

The analysis should describe:

- The problem that has given rise to the need for additional infrastructure, including an analysis of the existing asset capacity;
- The extent and urgency of the need;
- The extent of the need this request is intended to meet;
- Output specifications that describe the service the institution needs to deliver, the required minimum standards of the service output as well as the specific key indicators to measure performance;
- The data, surveys or service-delivery indicators demonstrating the current demand and estimating the future demand growth. The demand analysis cannot simply assume a continuation of a historic trend, but must demonstrate what long-term factors are driving demand, and how those trends may be shifting ;
- The consequences if the services infrastructure need is not addressed;
- The institutions budget capacity in line with the prioritised need;
- How the proposed capital solution to the problem fits into the institution's long term infrastructure delivery programme.

The output from this stage is a statement of the services infrastructure need, a specification of the output requirements and a sound demand analysis.

5.2 Options Analysis

The purpose of an options analysis is to undertake an analysis of all feasible options that can achieve the identified output specifications. This will assist in identifying the preferred solution.

The following principles should guide the options analysis:

- All feasible options should be evaluated;
- The preferred option should achieve value for money[1];
- The preferred option should be affordable;
- The analysis should consider those options crucial to a project's success; and
- A scenario which sets out the base case (the 'do nothing' scenario) where the current situation is sustained with minimal operating and maintenance investments and basic efficiency improvements.

A first high-level analysis of these options should include a qualitative listing of the advantages and disadvantages as well as preliminary quantification of the costs and benefits of each option relative to the objectives of the project. This comparison should allow for the development of a shortlist of 1 to 2 preferred options which will be assessed in detail.

Each of the shortlisted options will be separately assessed by the processes described in the stages below. The information below needs to be assembled first to enable the undertaking of the Financial and Economic analysis.

[1] Value for money can be defined as a measure of economic efficiencies that achieves the best mix of quality and effectiveness at least cost.

5.2.1 Demand Analysis

The first step is to confirm that there is demand for the goods and services that will be produced by the project. This is important because levels of current and forecasted demand should be sufficient to contribute to the viability of the project. Any factors that constraint demand need to be identified and factored into the demand forecasts.

The outcome of this analysis will give confidence to the following:

- Forecast quantities of demand (product/service) over the life of the project;
- Constraints such as government regulations (administered prices, price ceilings, quotas including arrangements for making future adjustments to prices); and
- Other variables that affect the volume of demand such as technological developments impacting on the product life cycle and subsidies.

5.2.2 Technical Engineering Analysis

This is an important step that determines the scale, the design, location and technology that will be adopted by the proposed project. The input parameters necessary for the construction, operation and maintenance of the project are identified, quantified and the cost approximated over the life of the project. To be able to do this it is necessary to come up with an implementation schedule that sets the output levels. The most cost effective procurement procedures are also considered at this stage. The outcomes of the analysis include:

- The technology choice for the project including designs and prototypes;
- Project size and location;
- Construction schedule and output targets;
- Input parameters and their prices including labour for the construction and operation and maintenance of the project; and
- Procurement procedures.

For larger and technically more challenging projects, however, the technical assessment is crucial and needs to be accomplished accurately and thoroughly. The technical feasibility will then inform the financial analysis, by providing detailed clarification on the costs of construction, operation and maintenance of the project and identifying potential risks. Different technology choices for the project, including designs and the need for prototyping should be assessed to determine whether they will be viable for delivering the desired project outputs. In addition, potential locations for the project should be assessed to determine their viability, including ownership, geological and heritage aspects.

5.2.3 Environmental Analysis

Every project involving new construction or substantial rehabilitation of an existing structure will involve undertaking an Environmental Impact Assessment (EIA). In those instances where the institution is going to procure, by conventional means, the construction of a facility of its own design, the institution must undertake the EIA and obtain all necessary environmental, zoning and town planning consents. The cost of so doing is one of the costs that must be identified early on and quantified when determining the feasibility of a particular project.

Outcomes from this analysis include:

- The costs of, and time to obtain an Environmental Impact Analysis (EIA) report;
- Anticipated mitigation or displacement costs; and
- Other necessary approvals and permits.

Identified costs and risks must be taken into account in the viability analysis. Institutions should note that an EIA can be very costly and can extend over a protracted period of time hence the need for an EIA should be recognised early so that adequate budgetary provision can be made for such costs.

5.2.4 Socio-economic Analysis

Many services infrastructure projects provide potential economic benefits to Broad Based Black Economic Empowerment (BBBEE) and Small Medium and Micro-sized Enterprises (SMME) development as well as the community in general. The implementation of a project can result in an increase in land values or in an increase in demand for affordable housing. The use of local labour and materials in a major infrastructure project also provides significant benefits to communities affected by the infrastructure project. There may also be costs not easily realisable such as congestion in the city caused by the implementation of the project. All these will need to be translated into economic costs and benefits.

Outcomes from this analysis include:

- BBBEE participation including Women Empowerment
- SMME developmental impact
- Local Preferential Procurement
- Community Development
- Job Creation

5.2.5 Legal and Regulatory Due Diligence

A legal and regulatory due diligence study should confirm that the project will be able to comply with all regulatory requirements, identify any risks and obligations that could increase costs of or decrease benefits. The cost of compliance must be included in the financial and economic analysis.

Typically the analysis will include an assessment of the following:

- Sector legislation, policies and regulations;
- Tax legislation;
- Labour legislation;
- Environmental legislation;
- Heritage legislation;
- BBBEE legislation and Codes of Good Practice;
- Local procurement requirements;
- Imported goods requirements;

- Foreign exchange requirements;
- Zoning and town planning requirements;
- Building codes;
- License requirements; and
- Site ownership and/or access approvals.

6. VIABILITY EVALUATION

6.1 Financial Analysis

6.1.1. *Financial cash flow analysis*

The objective of this analysis is to establish the financial viability of the option. The analysis is carried out in accordance with the discounted cash flow method. A financial model projecting the cash flows for the costs and any revenue generated from the project over its lifetime is developed. This is done through a discounted cash flow method. The analysis needs to be undertaken for each of the preferred options identified. The options should be weighed against each other to demonstrate the rationale used in arriving at the best chosen solution. If the institution lacks the capacity for developing such financial models, outsourcing this expertise should be considered. However, institutions are required to budget for such expenditure from the own baseline. Table 1 in Annexure A illustrates how a project financial cash flow is worked out.

The financial model must be informed by all the life-cycle costs to deliver the identified outputs. The cash flow profile identifies all the receipts and expenditure over the life of the project. This is based on the operating costs (including working capital requirements) and revenues; investment costs and residual value (in last year of project) and sources of financing (their characteristics and implications). All revenues generated over the lifetime of the project must be projected, bearing in mind, where applicable, the requirements of the Public Finance Management Act (PFMA) requiring such revenues to be deposited into the appropriate national or provincial revenue fund (sections 13 and 22). The result of this analysis is a timeline on which all cash flows over the project's lifetime, both positive (i.e. revenues) and negative (i.e. expenditures) are demonstrated.

By calculating the balances, discounted at an appropriate rate, it is possible to define a financial net present value for the option that will determine its financial viability. The discount rate used in the calculations is within the discretion of the institution but it needs to be justified. However, it's advisable to use the government bond yield as the discount rate over a comparable period as it reflects the actual cost to government of raising funds at any given time.

The financial analysis must also determine the minimum net cash flow requirement over the life of project. This must include life-cycle capital or construction costs as well as the annual operating and maintenance costs. This will demonstrate that the option is financially sustainable and will not require supplementary funding. If the proposed option is not financially viable, it is important to check whether it is viable from an economic and social point of view. If it is, consideration is given to other sources of additional funding.

Since capital projects are long-term in nature, there is uncertainty with regards to some of the assumptions used in the calculation of costs and revenues. Costs should be readjusted to reflect different scenarios based upon variations in key assumptions – e.g. what is the effect of a 10% increase in costs, or what is the effect on the cost of imported inputs if there is 5% devaluation in the exchange rate? This is an essential part of the capital bid as it will assist the project planners to be aware of how costs vary with changes in the underlying assumptions.

6.2 Economic Analysis

An economic analysis is different from a financial analysis in that it analyses the viability of a project based upon economic and social welfare improvements, and not financial bankability. An economic analysis thus takes non-monetary welfare impacts into account, such as improved health, reduced accident risks, congestion and pollution.

All mega projects with a total project cost of R1 billion or more will need to undertake either a cost-benefit analysis or a cost-effectiveness analysis for each of the preferred options. Generally, the cost-benefit analysis is more appropriate for economic infrastructure projects, e.g. transport, water, energy and communications sector projects, whereas a cost-effectiveness analysis will be more appropriate for social infrastructure projects, e.g. health, and education.

6.2.1 Cost Benefit Analysis

Different methodologies are available for analysing the economic viability of a project; the most common one is the Cost Benefit Analysis (CBA). A CBA seeks to establish whether a particular investment is the most efficient use of society's resources. It does this by identifying and monetising the costs and the benefits to society to enable comparison.

Unlike in the financial analysis, the market prices of the project inputs and outputs do not necessarily reflect the values of economic costs and benefits when there are distortions in the market place. In reality, many distortions prevail in the economy of South Africa, including taxes and subsidies. Therefore, they should be properly assessed and incorporated in the economic appraisal. The CBA translates all financial transactions (i.e., receipts and expenditures) into benefits and costs in order to reflect the true benefits and costs to the society as a whole.

A conversion factor can be created as the ratio of the economic value of an item to its corresponding financial price. Once these are estimated then the financial receipts or costs of each item can be converted into their economic values by multiplying them by corresponding conversion factors. These values are then discounted back to their present values using a social discount rate[2].

The result of a CBA is best reported in the form of an Economic Net Present Value (ENPV). If the economic net present value of the project is greater than zero, the project is worthwhile to implement because the project would generate more net economic benefits than if the resources had been used elsewhere in the economy. On the other hand, if the net present value is less than zero, the project

[2] Social discount rate refers to the economic opportunity cost of capital and is the rate used to estimate the economic NPV of capital projects, financed by government funds.

should be rejected on the ground that the resources invested could be put to better use in the next best alternative use.

Every preferred option will be subject to this approach. The result will then be a comparison of every option with the base case "do-nothing" scenario and a ranking of the different options in accordance to their net welfare benefit to society. Table 2 in Annexure A illustrates how a project economic analysis is carried out.

6.2.2 Cost Effectiveness Analysis

Cost-effectiveness studies are appropriate where project options must be compared but assigning a monetary value to the desired outcome would not be appropriate. This usually applies to projects that do not represent an economic activity, such as social, health or human rights projects, and where a needs analysis has been informed by a defined social requirement.

Decision-making in these cases is focused on finding the solution that is the most efficient in realising the desired project outputsThe cost-effectiveness analysis examines the costs of a project in exactly the same manner as a CBA. However, the benefits are described in a very specific non-monetised way such as 'number of HIV tests conducted' or 'number of lives saved per year' or 'number of children vaccinated'. The results are then presented as the cost per 'unit' of benefit (1 HIV test, 1 life saved, or 1 child vaccinated). The project with the best ratio is the one with the optimal scale that uses the resources the most efficiently. In certain occasions however, there is a particular threshold (minimum of 10.000 vaccinations) that needs to be reached before comparing projects on the efficiency ratio.

The cost-effectiveness analysis allows institutions to assess projects without having to monetise social benefits.

6.2.3 Economic Impact Assessment

Once the viability of one or more project options has been demonstrated through cost-benefit analysis or cost-effectiveness analysis, it may be necessary to do further analysis to identify the macro-economic growth effects, spill-over effects, or distributional impacts.

If the proposed project is so large, capital intensive or import reliant that it might influence national or sectorial GDP, the balance of payments or the exchange rate, a macro-economic impact assessment is required.

If the project has the potential to affect a particular social group, a region or a sector, a micro-economic impact assessment is required. The assessment allows for the identification of the losers and the winners from the project and the judgement of whether these distributional impacts are aligned with government priorities. If the potential losers are identified as an already vulnerable group, this might require mitigation actions to be undertaken. The project's scope and financial structure must be aligned towards the findings in the impact assessment.

The results of these impact assessments can assist in prioritising viable projects on the basis of other developmental goals such as impact on rural or regional development, industrial expansion, potential for job creation or losses, or reduction in inequality; or for large projects, and their impact on exchange rates, balance of payments, inflation, and GDP growth.

6.3 Risk assessment and sensitivity analysis

The outcomes of both the financial and economic analysis are based on certain modelling assumptions and risk predictions. These assumptions need to be scrutinised and tested to ensure that the project remains viable even in an environment which differs significantly from that assumed in the various analyses conducted.

Large projects with significant technical, financial and economic risk are required to undergo a qualitative as well as quantitative risk assessment. Government does not usually take full account of risk but it is important to know and understand the full impact and cost of each risk variable. Smaller projects with limited technical or contextual risk, must attempt to draw up a risk matrix (see table 3 in Annexure A) where all the potential risks are listed and the likelihood and impact of the identified risk on the project is qualitatively described and controls or mitigating actions identified.

A sensitivity analysis tests the impact of changes in various modelling assumptions on the viability of the project. After the financial model has been finalised, sensitivity analyses need to be undertaken in order to determine the resilience of the cash flows to changes in assumptions over the project's life-cycle. Adjusting each variable individually by a given percentage and then stress-testing project viability will highlight which assumptions are the most vulnerable. The impact of changes in these assumptions on the FNPV and ENPV should be determined. See table 3 and table 4 in Annexure B for examples of a sensitivity analysis on FNPV and ENPV.

7. THE PREFERRED OPTION

Having identified and thoroughly evaluated the options that may provide a solution to the identified need, it is important to now quantify the cost of the shortlisted options that will most nearly provide a complete solution, in order to select a preferred option for funding. The aim is to identify the best solution that will meet the criteria given any constraints the institution may be facing. The result is a clear reasoning as to why and how the preferred option was chosen. The preferred option is the option that meets the project objectives most economically.

Each option should be weighed against each other to arrive at the most economical option that meets the project's objectives. The preferred option will serve as a benchmark during procurement and assist the institution to benchmark the cost of the project and serve as an evaluation tool for potential bidders. It is therefore vital for the institution to ensure that the preferred solution complies with all relevant norms and standards set in that particular sector to enable fair comparison with bidders' proposal. The preferred solution will also assist the institution in setting an affordability limit.

8. IMPLEMENTATION READINESS

8.1 Institutional Capacity

Sufficient capacity to deliver the project on time, on budget and to specifications should be demonstrated clearly. An institutional arrangement that is conducive to effective delivery is critical. Analysis to ensure that the institutions responsible for implementation, including project management, and operational responsibility will be appropriate to the task, should demonstrate that:

- Institutions have suitable skills and capacity in line with the requirements of the project;
- Suitable incentives or penalties are in place to ensure delivery;

- Accountability, transparency and appropriate risk allocation mechanisms are put in place;
- There are no governance issues that may affect implementation; and

If necessary, a plan for institutional capacity building should be included in this analysis. This includes sufficient planning, procurement and skills transfer of the required technical expertise. Options for enhancing implementation potential include in-house training as well as various forms of partnering with the private sector.

8.2 Procurement Plan

A procurement plan must be submitted. The plan needs to demonstrate that the proposed procurement method is the most cost effective and appropriate for the project and will result in achievement of the targeted outcomes. This includes indicating the procurement methodology that will be employed and how it will be managed.

The plan will include a description of the bidding and bid evaluation process, a high-level project plan, key milestones and timelines as well as the envisaged institutional and financial arrangements.

(Refer to Standard for Infrastructure Procurement and Delivery and Management (SIPDM) http://ntintranet/legislation/pfma/TreasuryInstruction/default.aspx)

9. PROJECT CONCEPT NOTE

All institutions submitting bids should complete the Project Concept Note below. The completed Note, which provides a summary of the bid, should serve as the front cover for the submission.

PROJECT CONCEPT NOTE

Name of department/public entity	

Project proposal name	
Name and contact details of the official responsible for proposal	

Project objective

Brief discussion of the institution's mandate and options considered when drawing up the proposal

Implementing/contracting agent and brief discussion of the institution's capacity to deliver on time and on budget, including if feasibility study has been undertaken

Brief discussion on how the project demonstrates achieve value for money

Describe the project's sources of funding

Is the project a Strategic Infrastructure Project or related?

Describe the project's main cost drivers

Details of advanced planning and demonstration that due diligence issues have been addressed

Expected socio-economic and environmental benefits

NPV – Cost Benefit analysis

CER – Cost Effective Analysis

10. Annexure A

Table 1 is a practical example of how to conduct a viability analysis. The example is based on a water project. The variables considered in a viability analysis will differ across sectors and projects. Table 1 shows an example of a financial cash flow; Table 2 an example of how to carry out an economic analysis; Table 3 a risk matric and Table 4 and 5 show an example of how to conduct a sensitivity analysis.

Table 1: Example of a project financial cash flow in nominal terms

R million	2011	2012	2013	2014	2015	2016	2017	2018	2019
INFLOWS									
Revenue from Drinking Water			1	4	7	10	12	13	14
Revenues from Washing Water			21	79	139	183	223	251	268
Revenues	0	0	22	83	147	193	235	264	282
Change in accounts receivable	0	0	-6	-16	-17	-14	-14	-12	-10
TOTAL INFLOWS	0	0	39	151	276	371	455	516	555
OUTFLOWS									
Investments									
Civil works	0	94	203	197	44	37	34	23	15
Equipment and materials	0	117	242	243	59	45	41	29	18
Consulting services	2	1	1	0	0	0	0	0	0
Land	28	0	0	0	0	0	0	0	0
In-house engeneering services	36	18	18	14	5	0	0	0	0
Operating and maintenance									
Wages	0	0	8	28	47	59	70	80	87
Chemicals	0	0	1	5	8	10	12	13	14
Power	0	0	2	6	10	13	15	17	18
Supplies & other expenses	0	0	1	4	7	9	10	11	12
Income tax	0	0	0	0	0	0	0	0	0
Change in accounts payable	0	0	-1	-3	-2	-2	-2	-2	-1
Change in cash balance	0	0	1	2	2	2	2	2	1
TOTAL OUTFLOWS	66	230	476	498	180	172	181	173	164
NET BENEFIT FLOWS	-66	-230	-437	-347	96	199	274	343	391
DISCOUNT RATE	11%								
NPV	-219								

Table 2: Example of a project economic analysis in nominal terms

R million		2011	2012	2013	2014	2015	2016	2017	2018	2019
ECONOMIC BENEFITS										
Resources Saved from reduced Vendors supply		0	0	5	20	34	45	55	62	66
Value of increased consumption		0	0	1	5	8	11	13	15	16
Benefits to paying users from washing water		0	0	35	130	229	301	366	412	441
Toal Resources saves from paying users		0	0	41	154	272	357	435	489	523
Change in account receivable from drinking water		0	0	-2	-4	-5	-3	-3	-2	-1
Change in accounts receivable from washing water		0	0	-9	-24	-25	-18	-16	-11	-7
Change in accounts receivable		0	0	-10	-28	-29	-21	-19	-13	-9
Benefits to Non-Paying users of Drinking Water		0	0	3	10	15	17	18	21	22
Benefits to Non-Paying users of Washing Water		0	0	12	38	56	63	67	75	81
Resources saves from non-paying users		0	0	15	48	72	80	85	96	103
GROSS ECONOMIC BENEFITS		0	0	91	348	629	832	1 002	1 143	1 235
ECONOMIC COSTS										
Investments	CF*									
Civil works	0.98	0	92	199	193	43	36	33	23	15
Equipment and materials	1.246	0	145	301	303	74	56	51	36	23
Office buildings	1.02	0	4	4	0	0	0	0	0	0
Consulting services	1	2	1	1	0	0	0	0	0	0
Land	1	28	0	0	0	0	0	0	0	0
In-house eng. services	0.7	26	13	13	10	3	0	0	0	0
Taxes and duties	0	0	0	0	0	0	0	0	0	0
Operating and maintenance		0	0	0	0	0	0	0	0	0
Wages	1	0	0	8	28	47	59	70	80	87
Chemicals	0.96	0	0	1	5	8	10	11	12	13
Power	1.07	0	0	2	7	11	14	16	18	19
Supplies & other exp.	0.96	0	0	1	4	7	8	10	11	12
Income tax	0	0	0	0	0	0	0	0	0	0
Change in accts. payable	1	0	0	-1	-3	-2	-2	-2	-2	-1
Change in cash balance	1	0	0	1	2	2	2	2	2	1
GROSS ECONOMIC COSTS		55	256	530	549	193	183	190	179	169
NET ECONOMIC BENEFITS		-55	-256	-438	-202	436	649	811	963	1 066
DISCOUNT RATE	9%									
ENPV	1 462									

* Conversion Factors

Table 3: An example of a risk matrix

CATEGORIES	DESCRIPTION	MITIGATION	RISK VALUE (R MILLION)
Completion risks	The possibility that the completion of the Works required for a project may be (i) delayed so that the delivery of the Services cannot commence at the Scheduled Service Commencement Date	Appointment of an Independent Certifier to certify the completion of the Works.	200
Cost over-run risk	The possibility that during the design and construction phase, the actual Project costs will exceed projected Project costs.	Fixed price construction contracts. Contingency provisions.	100
Environmental risk	The possibility of liability for losses caused by environmental damage arising (i) from construction or operating activities.	Thorough due diligence by the bidders of the Project Site conditions. Independent surveys of the Project Site commissioned by the Institution at its cost. Independent monitoring of remediation works.	50
Exchange rate risk	The possibility that exchange rate fluctuations will impact on the envisaged costs of imported inputs required for the construction or operations phase of the Project.	Hedging instruments (e.g. swaps).	75
Inflation risk	The possibility that the actual inflation rate will exceed the projected inflation rate. This risk is more apparent during the operations phase of the Project.	Index-linked adjustment to financial model or user charges.	35

Table 4: Example of sensitivity analysis on ENPV

Variation in Financial Tariff of Water	ENPV (R million)
base	R 1 244
2.50	1474.68
3.00	1453.58
3.50	1419.96
4.00	1373.83
4.50	1315.17
5.00	1244.00
5.50	1160.31
6.00	1064.10
6.50	955.37
7.00	834.12
7.50	700.35
8.00	554.07
8.50	395.26
9.00	223.94

Table 5: Example of sensitivity analysis on FNPV

Cost -Over runs	FNPV (R million)
base	-R 219.0
-7%	49.54
-6%	11.18
-5%	(27.19)
-4%	(65.55)
-3%	(103.91)
-2%	(142.27)
-1%	(180.64)
0%	(219.00)
5%	(410.81)
10%	(602.63)