

TOWN DEVELOPMENT FUND

Project Financial Appraisal Manual with Software Application

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**Bishnu Pd. Sharma (PhD)
Kathmandu, Nepal**

TDF Project Appraisal Manual

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CHAPTER 1: INTRODUCTION

1.1 Background

The Town Development Fund (TDF) is an autonomous financial intermediary institution that was created to support municipalities, urbanizing Village Development Committees (VDCs) and other governmental & non-governmental institutions related to urban sector for the development of urban infrastructure. It is the only organization in public sector for financing urban infrastructure development through loans and grants.

The objective of TDF is to serve as a sustainable financial institution by mobilizing financial resources from Development Partners (DP) and Government of Nepal (GoN). In the long run, it also aims to raise private debt from domestic capital market for high priority urban infrastructure investments, contributing directly to improved living standards of urban population. For this purpose TDF has the policy of funding viable urban infrastructure projects, provide efficient technical assistance including improved financial management of its clients, facilitating the participation of private sector in infrastructure development (TDF, 2011).

To achieve its objectives, TDF should follow scientific, efficient and transparent project appraisal procedures to ensure that TDF loans and grants are fully utilized. This contributes to make borrowing institutions financially sustainable and capable of paying back its loan. This also helps TDF to remain financially sustainable.

1.2 Objectives of the Manual

The main objective of this manual is to provide a user friendly, systemic and methodological tool for TDF staffs to conduct financial analysis of the proposals submitted by its clients mainly by various municipalities of Nepal requesting loans for constructing urban infrastructures/facilities (solid waste management, bus parks, sewerage/drainage, drinking water, buildings etc). Appraisal models are integral component of this appraisal manual, which will be useful for data entry, analysis and decision making.

This manual presents a set of working rules which will lead to more consistency and rigour in financial analysis of projects for TDF. This will enhance better informed decision making in TDF funding. This manual facilitates responsible TDF staffs to undertake financial analysis internally. This manual helps to carry-out assessment of the viability, stability and profitability of a project by using the cash flow, creditworthiness and borrowing capacity analysis of municipal projects and make decisions regarding lending capital. It also helps to make an informed selection on various alternatives within the project.

1.3. Scope of the Manual

The manual is focused principally on financial appraisals only. This manual is an internal document of TDF but it follows internationally accepted standard financial appraisal procedures. The main purpose of the manual is to enhance the capacity of TDF staff for financial appraisal of municipal projects. Accordingly, this manual focuses on the financial appraisal needs of TDF. For this purpose, it follows financial appraisal criteria approved by TDF. The manual mainly focuses on the kinds of municipal projects that approach for funding. The manual however leaves space for diverse kinds of funding projects of TDF in the future.

The computer software application for financial analysis of municipal projects submitted for TDF loans will also be guided by TDF internal requirements, criteria and assumptions. The programming contains interactive feature that allows TDF staffs to examine TDF loan request with different options. The manual provides stepwise instructions to operate the computer programming.

CHAPTER 2: PROJECT EVALUATION PRINCIPLES

This section discusses briefly the theoretical aspects of project evaluation, economic and financial analysis and their scope. It identifies the major differences between economic and financial analysis and the rationale for undertaking financial analysis. It also presents a few issues to be considered while undertaking project analysis.

Appraisal of public sector projects can be undertaken from two perspectives- from the perspective of the whole society or from the perspective of the undertaking entity only. Examining the profitability or viability of the project from the society's perspective is considered economic analysis. Economic analysis considers the direct benefits and cost of the project to the implementing entity as well as the indirect benefits and cost to the society at large. Economic analysis is larger in scope with extensive data requirement of both direct and indirect costs and benefits. This escalates cost of analysis significantly. Social cost benefit analysis that estimates the net present value of public sector projects is the most widely used tool of economic analysis.

An evaluation of the World Bank's practice in undertaking cost benefit analysis by the Independent Evaluation Group-World Bank indicated that the trend of cost benefit analysis has been declining in the World Bank projects. The basic reasons identified were the problem in the measurement of benefits and lack of reliable data (World Bank, 2010). In case of public sector projects whose indirect benefits are obvious, there is a need for assessing the direct costs and benefits in relation to resource availability. Financial analysis provides a better alternative in such cases.

Financial analysis, which is closely related to, but distinct from economic analysis, asks 'what is the net benefit to the entity that undertakes the project?' rather than 'what is the net benefit to the society as a whole?' It examines the financial viability of the project in terms of market interest rate (a discount rate equivalent in social cost benefit analysis) of cash flow (revenue and costs) during the project period. Only cash flows in and out of the entity are considered: cash flows involving other players are excluded, as generally are costs and benefits that are un-priced. Projects are considered financially viable if the financial net present value is positive or the financial internal rate of return is greater than rate or return on capital. Financial analyses are appropriate for revenue generating public projects that generate direct benefits to user rather than externalities that cannot be captured by market mechanism. One of the several merits of financial analysis is that it ensures the sustainability of the investment decision. A project may be economically viable but may not ensure financial sustainability. Financial sustainability ensures that the project generates revenue enough to make the project functional throughout its expected life.

A number of tools are available for financial analysis of public sector projects. The most reliable and widely used indicators are the financial cost benefit analysis, financial internal rate of return complemented by the borrower creditworthiness analysis (ADB; 1997; ADB; 2005; EU, 2008; Gittinger, 1982; World Bank, n.d.). The financial net benefit provides information on whether the entity will be able to generate profits or at least necessary resources each year to make the project functional for the designed/planned period. The financial rate of return estimate provides whether the project will be able to manage sufficient funds to generate returns to its capital invested and debt servicing for the loans borrowed at assumed market interest rates.

The credit worthiness analysis of the entity that aims to develop a public sector project provides information on its general capacity to provide necessary capital and its debt servicing cost to meet the fixed cost and regular costs of the project. The creditworthiness analysis is based on the revenue and expenditure data of the entity for a number of years, generally 5 to 10 years. The excess of income over potential expenditure to finance for the project ensure that the entity will be able to financially sustain the project and also ensures that the entity is in good financial health that includes financial transparency and discipline. A major problem of public sector

entities is that they lack properly maintained and audited financial records of revenue and expenditure. Thus the creditworthiness analysis is a bottom-line for TDF lending. The process of financial analysis starts with entity credit creditworthiness analysis based on the entity providing reliable account of its income and expenditure, followed by financial net present value and/or the financial internal rate of return.

CHAPTER 3: A COMPREHENSIVE MODEL FOR FINANCIAL APPRAISAL

3.1 TDF Loan Procedure and Financial Appraisal Requirement

As per the Lending and Grant Policy approved by TDF's Board in 2011, the applicant borrowers should go through three steps as mentioned below to get loan from TDF (enter into a Financial Agreement between the TDF and borrower):

- Registration: Formal Request for Loan along with their financial statements (Financial Operations Plan, FOP) and a comprehensive Feasibility Study Report (FSR).
- Initial Loan Appraisal: The TDF undertakes initial appraisal and prepare the Initial Loan Appraisal Report (ILAR) to check eligibility of the borrower and the project based on the feasibility study report.
- Final Loan Appraisal: In this stage, the applicant borrower shall make borrowing request to TDF for the proposed loan amount with Detail Project Report (DPR) i.e. details engineering report. After receiving the DPR, TDF needs to undertake seven different appraisals to approve the loan listed as follows:
 - technical,
 - financial,
 - economic,
 - organizational,
 - legal,
 - social and
 - environmental appraisals

Among the requirements, the financial appraisal is one of the most important requirements. The financial appraisal helps to evaluate whether the borrower will be able to pay back the principal and interest of a loan from TDF for a proposed project. Before starting the financial appraisal, there must be completion of Feasibility Studies and Detail Project Report preparation.

Under Financial Appraisal, three types of analyses are important as mentioned below:

- Financial cost benefit analysis to check the financial viability of a project
- Cash flow analysis to check financial sustainability of a project
- Borrowing capacity analysis to check creditworthiness of a borrower

Based on the results of the analyses, decision about the application on loan should be made.

3.2 Financial Cost Benefit Analysis (CBA)

3.2.1 Meaning and importance of the parameters for CBA

Any project that involves delivering a service to the users against a tariff or user charges is necessary to go through cost benefit analysis to check commercial viability of the project. The analysis helps to aggregate net benefits and draw conclusions on whether the project is desirable and worth implementing. Usually, it is evaluated on an incremental basis, by considering the difference between the project scenario and an alternative scenario without the project. They are estimated in constant prices for a selected year, typically using the official exchange rate at the time of appraisal. The revenues of the project comprise entirely of user charges, that is, no government subsidies are included.

For TDF fund, evidence should be provided that the contribution of TDF is necessary for the project to be financially viable. The cost benefit analysis should particularly aim to:

- Evaluate the financial profitability of the investment from different perspectives (TDF perspective, borrower's perspective and overall project perspective)
- Check the financial sustainability of the project

Assessing financial viability is a crucial step as it highlights important financial parameters as follows:

- **Financial Net Present Value (FNPV):** This is obtained by subtracting the discounted costs and negative effects from the discounted benefits. A negative NPV suggests that the project should be rejected because entity/society would be worse off.
- **Financial Benefit-cost ratio:** This is derived by dividing the discounted costs by the discounted benefits. A value greater than 1 would indicate a useful project.
- **Financial Internal rate of return (IRR):** The average rate of return on investment costs over the life of the project. It should be equal to or greater than the financial opportunity cost of capital (interest rate of loan).

There is need to evaluate the financial profitability of the investment from different perspectives as following:

- **TDF perspective:** To check financial viability of loan component only. Just concerned about whether revenue is enough to payback loan or not.
- **Borrower's perspective:** To check financial viability of loan and equity investment portion only.
- **Project perspective:** The Government and donor want to see financial viability of the project from overall project investment perspective.

3.2.2 Steps and Components/indicators of Financial Cost Benefit analysis

Main steps of financial cost benefit analysis include as following:

- i. Formulate baseline assumptions and parameters
- ii. Determine total investment costs (capital cost)
- iii. Estimate Source of Financing
- iv. Determine annual total operating costs (recurrent cost)
- v. Determine recurring revenues
- vi. Calculate annual net cash flow (iv – iii – ii).
- vii. Perform discounting of cost and benefit flows
- viii. Calculate Benefit Cost Ration (BCR)
- ix. Calculate the financial net present value (FNPV);
- x. Calculate the financial internal rate of return (FIRR);
- xi. Carry-out risk and sensitivity analysis
- xii. Interpretation of results and decisions

Step 1: Formulate baseline assumptions and parameters

Step 1.1 Determine life of the project: The key to deciding on a time frame is assessing the useful life of the program. This term comes from infrastructure projects, such as roads, bridges or buildings, that need replacement or substantial maintenance after some typical length of time. The time horizon must be consistent with the economic life of the main assets.

Step 1.2: Determine the appropriate discount rate: Discount rate reflects the opportunity cost of capital, defined as 'the expected return forgone by bypassing other potential investment activities for a given capital. In case of social project funded by Government, lower discount rate (social discount rate) is used. In case of TDF funded project, it is suggested to use TDF determined interest rate as the discount rate. The TDF's interest rate depends on cost of funds, operating cost, anticipated default (loan loss), and return on equity of a financing program.

Step 2: Determining total investment costs (capital cost): Capital costs are one-time expenses incurred for creating a new asset or for substantial modernisation or renovation of an

existing asset. It includes cost of civil works, machinery, equipment, installation and commissioning expenses. Any substantial expenditure that needs to be incurred during the life of the project to maintain the useful life of the asset is also taken as a capital expenditure. In case of renovation, modernisation and improvement projects, it is necessary to consider incremental costs and benefits only. It is obtained from the detail project report.

Step 3: Estimate sources of financing: The sources of financing for capital cost investment could be as following:

- Grant from Government of Nepal (GoN) and other development agency:
- Municipality investment
- Town Development Fund (TDF) Loan

Step 4: Calculate recurring costs: Recurring costs are periodic costs which are incurred periodically for operating the asset. These include cost of labour, energy/ fuel costs, periodic maintenance and other operating expenses such as cost of tools, consumable, etc.

Step 5: Calculate recurring revenues: This include any user charges or fees that will be collected from users, revenue from other non-tax resources such as advertising arising out of the project, any special tax or levy that could be charged from the project users or general public, etc. This is a measure the extent to which the project can bear the capital expenditure on the project. The project revenues should be measured over a period of time that matches the life of the asset. For estimating revenue of a project following steps and data are required:

- Step 5.1: Calculate expected number of users or customers
- Step 5.2: Estimate average volume of consumption per consumer of the services provided by a project
- Step 5.3: Calculate tariff rate: Tariff rate is calculated as following:
 - If available, the fees currently charged for such services in the nearby areas
 - Based on willingness to pay of customers and their monthly income
 - Enough to cover capital cost and annual recurrent cost.

Step 6: Calculate annual net cash flow: Net cash flow refers to the difference between a project’s cash inflows (revenue) and outflows (costs) on annual basis. It is the actual amount of cash being paid out with respect to cash received by the project. This is calculated for each year of the assumed project life horizon.

Step 7: Perform discounting of cost and benefit flows: Costs and benefits occurring at different times have different value in real terms so must be discounted. The future values of project cost and benefit should be adjusted to present values using a discount rate as following:

$$\text{Discounted Benefit flow} = B_1 \frac{1}{(1+r)^1} + B_2 \frac{1}{(1+r)^2} + B_3 \frac{1}{(1+r)^3} \dots \dots \dots + B_n \frac{1}{(1+r)^n}$$

For instance, B0, B1, B2.....Bn are the benefit flows in period 1 to n. The r is the discount rate.

Step 8: Calculate Benefit Cost Ratio (BCR): The BCR is derived by dividing the discounted costs by the discounted benefits. A value of BCR greater than 1 would indicate a useful project. The BCR is calculated as following:

$$BCR = \frac{\sum_{t=1}^n \frac{B_t}{(1+r)^t}}{\sum_{t=1}^n \frac{C_t}{(1+r)^t}}$$

Step 9: Calculate the financial net present value (FNPV): The financial net present value is the sum that results when the expected investment and operating costs of the project (suitably discounted) are deducted from the discounted value of the expected revenues. Following formula is used to calculate NPV:

$$NPV = \sum_{t=1}^T \frac{(Benefit_t - Cost_t)}{(1+r)^t}$$

The net present value should be positive (greater than zero) for the project to be acceptable.

Step 10: Calculate the financial internal rate of return (FIRR): It is defined as the discount rate that produces a zero FNPV as following:

$$PV(Benefits) - PV(Costs) = 0$$

The calculation of the financial return on investment measures the capacity of the net revenues to remunerate the investment cost.

Step 11: Carry-out sensitivity analysis: It is necessary to carry-out sensitivity analysis to test the resilience of the base case financial models against changes to assumptions costs and revenues. This is done by letting the project variables vary according to a given percentage change and observing the subsequent variations in financial performance indicators. Variables should be varied one at a time, while keeping the other parameters constant. It evaluates the effects of uncertainty on a project’s financial viability in case of changes in key input assumptions. It helps to make adjustment for possible risks, if necessary. For TDF projects, it is suggested to carryout sensitivity analysis as following:

- 10 percent increase in capital cost
- 10 percent decrease in revenue
- Increase in capital cost and decrease in revenue both by 10 percent

Step 12: Interpretations of Results and Decisions: After of calculation of NPV, BCR and IRR for each of the options, the value should be presented in summary table and interpreted in detail. The result of sensitivity analysis and borrowing capacity analysis should also be presented in different tables and interpreted adequately.

The FNPV, FIRR and B/C ratio show the financial profitability of the investment on project. The decision should be made on the basis of financial viability of the project as following:

- The FNPV should have positive value. The negative FNPV suggests that the project should be rejected because society would be worse off.
- The B/C ration should greater than one to be financially viable
- The FIRR equal to or greater than the financial opportunity cost of capital, the project is considered financially viable. In case of TDF funded project IRR should be higher than the cost of debt which is around 5 percent.

Box 1: Financial cost benefit analysis from different perspectives

The financial cost benefit analysis needs to performed from three different perspective as following:

i) Project perspective: To check viability of overall investment (grant, loan and equity investment).

ii) Borrower’s perspective: To check viability of just loan and equity component. Revenue generating project should

iii) TDF loan perspective: To check viability of just loan component only. The utility project should

be viable from this perspective.

3.3 Cash Flow Analysis

The financial sustainability of the project should be assessed by checking that the cumulated (undiscounted) net cash flows are positive over the entire reference period considered. The net cash flow is net revenue after deducting operating expenses and annual debt service payment (annuity). The residual value is not taken into account here unless the asset is actually liquidated in the last year of analysis considered. Following steps should be followed to check financial sustainability of a project:

Step 3.1: Net operating income calculation: Net operating income is calculated from deducting annual operating expenses of the project from revenue.

Step 3.2 Calculate debt service payment (annuity). To calculate annuity (an equalized stream of cash flows i.e. principal and interest payment) following information are required:

- Total amount of loan
- Grace period
- Loan repayment period
- Interest rate

After having the information, using following formula annuity can be calculated:

$$P = \frac{r(PV)}{1 - (1 + r)^{-n}}$$

The TDF provides loan for maximum 20 years repayment periods with up to 5 years grace period.

Step 3.3 Calculate net cash flow: It is net revenue after deducting annual debt service payment (annuity) from net operating income. To be financially sustainable the project should not have any years of negative cash flow on a cumulative basis over the life of the project.

3.4 Borrowing Capacity Analysis

TDF financing on municipal infrastructure is largely entity financing rather than project financing. For TDF financing the municipal project shall pass through the borrowing capacities assessment. The financial situation of a municipality is crucial for its creditworthiness, as it determines the ability to meet current obligations and debt service. Borrowing capacity assessment report indicates the **Solvency** of municipality i.e. municipal ability to pay its obligation to creditors (TDF) and other third parties in the long-term. Factors that have an impact on the financial position of municipality include:

(i) Income:

- Municipality revenue: taxes; rentals; licenses fees; fees for services like parking fee, etc; fees and fines; local development fee; other income
- Government revenue-sharing and capital subsidies.: Government recurrent and capital grant; DDC Revenue Sharing

(ii) Expenditure: Personal emoluments, Materials and Services; Materials and Services; Interest payments, dividends & bonus; Grants, subsidies, contributions; Pensions and retirement benefits;

Other operating expenditures (Traveling expenses; Repairs and maintenance; Transportation and communication)

(iii) Net operating savings: i.e., the excess of regular, recurring revenues over recurring expenditures.

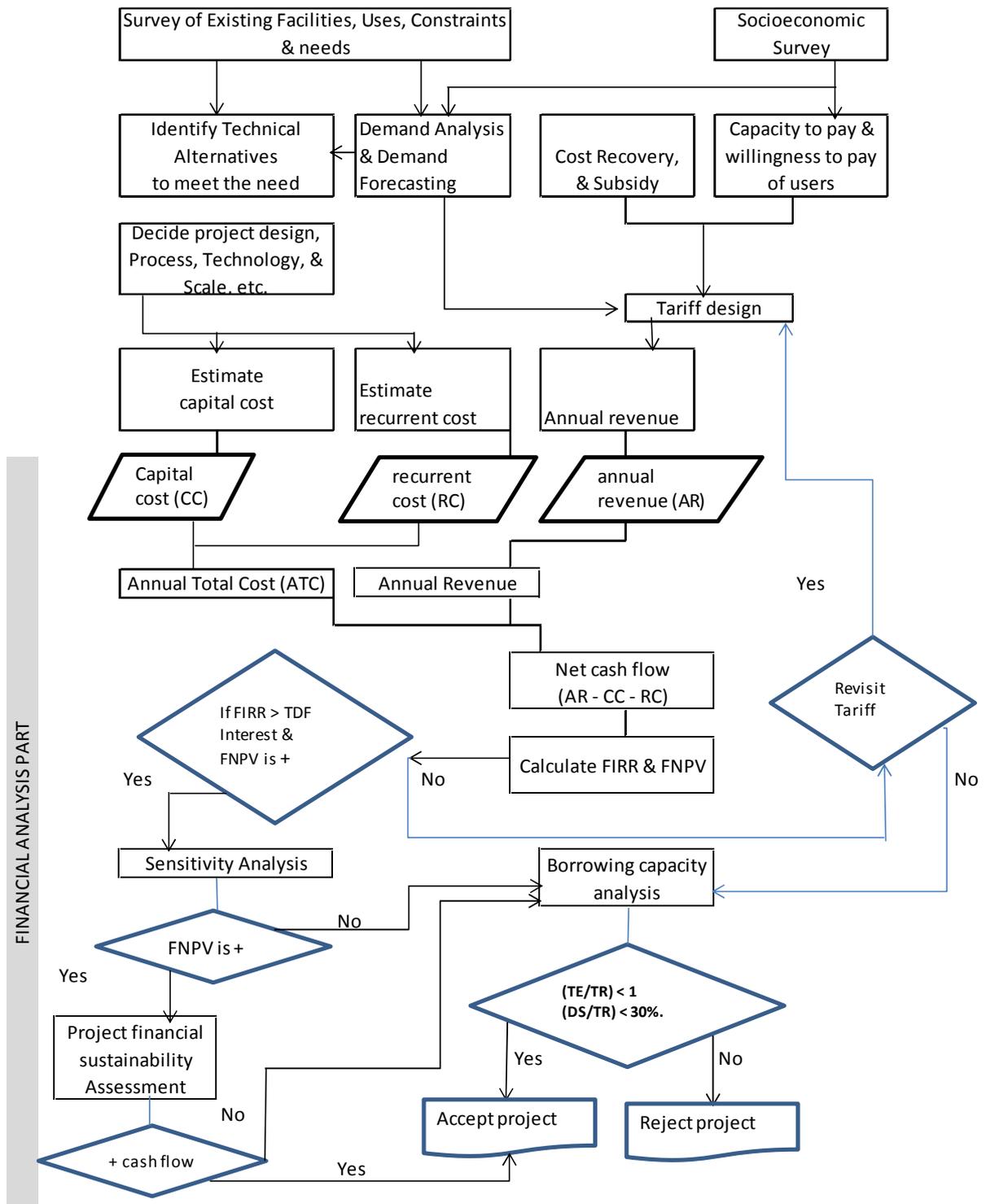
The last five years financial data (revenues and expenditures) of the municipality are organized and analyzed. Based on the last 5 year data, prospects of the entity throughout the loan repayment period is worked out using the commonly used extrapolation statistical tools. This exercise is needed especially for entity based financing, which determines the financial resources available in advance for debt servicing. Municipalities usually repay debt (principal plus interest) from the operating surplus, which is the difference between operating revenues and expenditures. Maximum borrowing capacity of a municipality can be estimated as the present value of its future net operating surpluses (operating surplus minus debt service on outstanding debt).

Municipalities should be able to demonstrate that they are able to generate persistent positive net operating results in the future, as a precondition for borrowing. If a municipality has a temporary structural deficit (negative net operating result) in the future, it can still take on new debt, provided that the financing agreement foresees a grace period at the time the deficit is recorded. Alternatively it can use capital revenues to finance the operating deficit. However, if a municipality runs on persistent structural deficits, serious efforts must be made to rationalize operating expenditures and increase revenues before borrowing should even be considered.

The ratio of expected net operating result to expected debt service is probably one of the most important indicators of local governments' debt carrying capacity. If the ratio is close to one, then any major fluctuation in a municipality's operating revenues or expenditures could result in serious problems in meeting the debt service obligation. A ratio significantly higher than one indicates that the municipality has a comfortable financial position relative to its debt obligations. The minimum determinants of eligibility are specified in TDF's Loan and Grant Policy the borrower's creditworthiness as following:

- Total Expenditure/Total Income (TE/TR)<1. Expenses should be less than that (<100%). Total expenses (operation + interest expenses) should not exceed total revenues (own sources + assigned sources). If expenses exceed 100%, it means that the municipality is running a deficit. The TE/TR should be estimated for the last 5 years.
- The average debt service coverage ratio (DSCR) should be greater than one. The DSCR ratio is used to determine the amount of debt that can be supported by the operating surplus of the borrower municipality. In other words it is net income of municipality divided by the new loan payment. It helps to ensure about minimum debt coverage requirements.
- Debt-Service/Total Revenue (DS/TR)<30%. This ratio provides information on the capacity to repay the debt incurred for the project from average amount of total revenue for past 5 years data. If necessary, it can be assessed as per past year average growth of total revenue with estimated debt service of previous year projects and new projects according to loan amount. It is advisable that debt service (including debt service on the proposed TDF loan) not go beyond 30% of the total revenue. If it goes beyond 30%, it will mean that the municipality is left with insufficient amount to meet other expenditures.

Fig. 1: General Financial Appraisal Steps



Note: It is just a generic financial appraisal model.

CHAPTER 4: FINANCIAL APPRAISAL OF SECTOR SPECIFIC DEVELOPMENT PROJECTS

4.1 Categorization of Municipal Projects

TDF Lending and Grant Policy (2011) categorizes the municipality projects into three categories (Table 4.1). The categorization is based on Local Self-governance Act (LSGA) 1999 and ETP Criteria

Table 4.1: Sector Categorization of Municipality Project

Social Infrastructure	Utilities	Revenue Generating
<ul style="list-style-type: none"> • Drainage (Bridges/culverts if part of drainage) • Public toilets • Slum are improvement (water, road, drainage, solid waste and access roads to hamlets of the poor communities) • Sanitation Programmes, • Pre-primary schools, • Libraries/Reading Halls (book bank for poor children), • Health Centres/Health Posts, • Fire Station, • Aged Rest-Houses/Orphanages, • Water Pollution (including Sewerage, Waste Water Treatment Plants etc.), • Social Housing, School buildings (hostels for girls and physically challenged), • Green Zones/Parks/ Play Grounds, • Municipal Hospitals, Aurvedic Hospitals 	<ul style="list-style-type: none"> • Roads and Bridges, • Drinking Water, • Preservation of Natural/Cultural/ Archaeological/Heritage Sites, • Slaughter House, • Street Lightings, • Municipal Buildings, • Community Buildings and Rest Houses, • Sports/Stadium, Recreational Area, Crematoriums, Museums, • Protection of Natural resources including Controlling Air and noise pollution, Public Land Protection Works, River • Cuttings/Floods/Soil Erosion Control, Preservation of • Rivers/Streams/Ponds/Deep Water Wells/Lakes/Stone Spouts; and Plantation on Road sides etc. • SWM (Collection, Transportation and Disposal including equipment), 	<ul style="list-style-type: none"> • Bus Parks and Parking Spaces for Rikshwas/Horse Carts/Trucks etc., • Cottage/Medium/Small Industries, • Tourism Projects, • Haat Bazar/Market Fair Centres/Exhibition Centres, • Land Pooling, • Communication Facilities, • Generation/Distribution of Electricity etc.

4.2 Selection of Financial Analysis Tools

The revenue generating infrastructure projects are expected to generate adequate income to bear operation, maintenance and recover the capital investment. Whereas, the basic/utility infrastructure projects are expected to generate revenue adequate for operation and maintenance of the system and also recover certain percent of capital cost (at least the loan component). For none revenue generating social projects, cost-benefit analysis and cash flow analysis have no meaning but borrowing capacity analysis is must as mentioned in table below.

Table 4.2: Suggested Financial Analysis Tools for different types of Municipal Projects

Categories of the projects	Suggested financial appraisal tools	Remarks
• Revenue generating	• Cost-benefit analysis	Project should be viable

infrastructure projects	<ul style="list-style-type: none"> • Cash flow analysis • Borrowing capacity analysis 	from borrower's perspective
<ul style="list-style-type: none"> • Basic/Utility Infrastructure Projects 	<ul style="list-style-type: none"> • Cost-benefit analysis • Cash flow analysis • Borrowing capacity analysis 	Project should be viable from TDF loan perspective.
<ul style="list-style-type: none"> • Social projects 	<ul style="list-style-type: none"> • Borrowing capacity analysis 	The borrower must have sound borrowing capacity

Depending upon size of the project and available budget, it is recommended to do economic analysis of the municipality projects to ensure that the project is beneficial to the whole of society instead of just the owners of the infrastructure.

4.3 Sector Specific Grant: Loan Mix

The TDF Lending and Grant Policy (2011) has proposed different level of Loan:Grant mix for different types of municipality projects as mentioned in Table 4.3 below.

Table 4.3: TDF Loan:Grant Mix for Municipality Projects

Types of project	Grant	Loan	Own source
Social infrastructure	80%	10%	10%
Basic urban utilities	60%	30%	10%
Revenue generating projects	30%	60%	10%

TDF has developed a coherent loan:grant policy which has since been approved by the TDF Board and the Government. The Government and donors have agreed that the grants in donor projects will be administered through TDF, presenting a single window for the towns, for both loans and grants. But TDF's lending policies and terms are volatile and subject to changing definitions of loan and grant eligibility, with differential interest rates across programs, either fixed or linked to fluctuating GoN bond rates. Likewise, TDF also competes internally with different loan grant blends, so the Loan:Grant mix in above table are subject to change. TDF loan contributions can be allocated up to 90% of total project cost. Correspondingly, the matching funds allocated by the borrower should be at least 5%.

4.4 Case Studies

Depending on nature of the projects, the data requirements for financial appraisal are different as outlined below:

Case Study 1: Water Supply Project (Utility Project)

As water supply scheme is utility project, we need to carryout following financial analyses:

- Financial cost benefit analysis
- Cash flow analysis
- Borrowing capacity analysis

Basic data requirement

To perform financial appraisal of a water supply project, there is need of data as outlined in table 4.4 below:

Table 4.4: Basic data requirement for CBA of Water Supply project

Key variables	Details	Source of information
Capital cost	i) Civil works (intake, reservoir, building, house connection, pipe laying and joining, fixing and fitting, valve chambers, pipe crossing, earth work excavation & filling etc.); ii) Materials and equipment; iii) Land acquisition; iv) Legal fees; Construction period and draw down schedule	Detailed project report
Means of finance	% of loan, grant and equity	TDF lending and grant policy
Recurrent cost	i) Tap connection cost; ii) meter replacement cost; iii) Electricity; iv) Spare parts; v) personnel cost; vi) Services; vii) chemicals; viii) Maintenance; etc. and its growth rate	Detailed project report
Tariff rate	Need calculation based on willingness to pay & capacity to pay of users, minimum tariff required for financial sustainability of project, tariff in nearby municipalities, existing tariff etc.	Social survey
Connection charge	Calculation based on estimated cost and existing connection charge in nearby municipalities	Detailed project report
Annual revenue	Revenue from connection (connection fee multiplied by number of connection that year) Revenue from water tariff (tariff multiplied by number of users and their water consumption)	Calculation
Population	Number of households, family size & growth rate	Social survey
Life of the project	Based on life of past projects, , baseline year	Detailed project report
Discount rate	TDF proposed interest rate	TDF interest rate

As water supply project is a utility project, it must be viable from TDF loan perspective i.e. the revenue should be adequate to payback loan, interest and cover recurrent cost. Detail example with numerical example has been presented in Supplementary Software Operating Manual.

Case Study 2: Bus Park Project

As a bus park project is revenue generating project, we need to carryout following financial analyses:

- Financial cost benefit analysis
- Cash flow analysis
- Borrowing capacity analysis

Basic data requirement

To perform financial appraisal of a bus park project, there is need of data as outlined in table 4.5 below:

Table 4.5: Basic data requirement for CBA of Bus Park Project

Key variables	Details	Source of information
Capital cost	i) land and land development; ii) building and civil works; iii) plants & equipment; iv) furniture fixtures; v) vehicles; vi) pre-operating expenses; viii) contingencies & VAT Construction period and draw down schedule	Detailed project report

Means of finance	% of loan, grant and equity	TDF lending and grant policy
Recurrent cost	i) Charges for water, electricity, cleaning and sweeping, building maintenance & other Utilities; ii) salaries and wages; iii) electricity & water; iii) insurance of properties; & iv) office overheads	Detailed project report
Service utilization factors	Annual service use factors	Detailed project report
Service charge rate	Existing service fee and fee required for sustainability of the project	Detailed project report
Annual revenue	Number of vehicles, route of the vehicles, service charge rate	Calculation
Life of the project	Based on life of past projects, baseline year	Detailed project report
Discount rate	TDF proposed interest rate	TDF interest rate

It is a revenue generating project, so it must be viable from the project (Government) perspective i.e. the revenue should recover whole project investment and meet recurrent cost. Detail example with numerical example has been presented in Supplementary Software Operating Manual.

Case Study 3: Sewerage Project

As a sewerage project is a utility project, we need to carryout following financial analyses:

- Financial cost benefit analysis
- Cash flow analysis
- Borrowing capacity analysis

Basic data requirement

To perform financial appraisal of a bus park project, there is need of data as outlined in table 4.5 below:

Table 4.6: Basic data requirement for CBA of Sewerage Project

Key variables	Details	Source of information
Capital cost	i) Infrastructures (Collection system; Pumping station, Treatment Plant, House service connection, Storm Drain, Road etc.); ii) Equipment; iii) Sewerage Treatment Plant and sewer lines Construction period and draw down schedule	Detailed project report
Means of finance	% of loan, grant and equity	TDF lending and grant policy
Recurrent cost	i) Personnel; ii) Chemical and Tools etc; iii) Minor Servicing; iv) Seasonal Labour; v) Electricity and fuel for Generator, vi) Telephone & vii) Transportation	Detailed project report
Revenue	Sewerage connection charge, monthly sewer tariff and sale of sludge.	Detailed project report
Life of the project	Based on life of past projects, baseline year	Detailed project report
Discount rate	TDF proposed interest rate	TDF interest rate

It is a utility project, so it must be viable from the borrower's perspective i.e. the revenue should be adequate to payback loan annuity and meet recurrent cost. Detail example with numerical example has been presented in Supplementary Software Operating Manual.

CHAPTER 5: SOFTWARE FOR FINANCIAL ANALYSIS

A MS-Excel (spreadsheet) based interactive and flexible software has been developed to facilitate performing financial analysis of public projects. The software is helpful to accomplish following tasks:

- Check financial viability of the project at different tariff rates
- Check financial viability of the project at different level of subsidy, loan and equity mix
- Calculate minimum tariff rate to make the project financially viable
- Perform sensitivity analysis and calculate minimum tariff rate to make the project financially viable in different possible contexts (increase in capital cost, decrease in revenue, both etc.)
- Carryout borrowing capacity analysis

The results generated from above mentioned analysis are helpful for decision makers for:

- Make decision on acceptance of a project for loan approval
- Fixing appropriate tariff rate
- Calculate maximum loan amount the municipality can afford and fix appropriate subsidy rate for a municipality

Considering needs of the TDF, different four sector specific financial appraisal Microsoft Excel spreadsheets have been developed as following:

- drinking water
- bus parks,
- sewerage/drainage,
- Solid waste management

The spreadsheets are very helpful to determine appropriate tariff rate and fix grant:loan mix. The MS Excel spreadsheet has different sheets as mentioned in following sections:

5.1 Data Entry Sheet.

The data entry sheet allows to enter the basic information required to carry-out financial appraisal. To generate results the software needs basic data of a project as outlined below:

- capital cost
- means of financing
- loan terms and draw schedule
- basic information and assumptions
- asset life and rehabilitation requirement
- tariff rate and expected revenue
- recurrent cost (personnel, energy, spare parts, maintenance etc)
- annual growth in recurrent cost
- borrowing capacity (revenue, grant, recurrent expenditure, annuity payment etc.)

5.2 Data Analysis Sheets

As per the requirement various data analysis sheets have been created and kept hidden.

5.3 Summary Result Sheet

The summary result sheet present summary of financial cost benefit analysis from different perspective as following:

- TDF perspective (viability of loan investment)
- Borrower's perspective (viability of loan and equity investment)
- Project perspective (viability of total project investment – grant, loan and equity)

Likewise, the summary result sheets present sensitivity analysis result and CBA result with different tariff rates. Additionally, the summary sheets present result of cash flow analysis which is helpful to check financial sustainability of the project.

5.4 Results of Borrowing Capacity Analysis

Result of borrowing capacity analysis is summarized in this sheet.

CHAPTER 6: ADDITIONAL CONSIDERATIONS

In addition, financial appraisal it is necessary to undertake other analyses like economic appraisal, environmental impact assessment (EIA) and ex-post evaluation of a project depending upon size of the project and available budget. Importance of the other analyses is outlined below:

6.1 Reappraisal/ Audit of Financial Analysis

There is practice of doing ex-post evaluation (post implementation review) of financial appraisal after the project came in operation. The evaluation involves:

- re-examination of the benefits and costs to assess whether the anticipated benefits and costs were achieved;
- assessment of the effectiveness in meeting the project priorities and objectives;
- reconsideration of alternative options (if still applicable); and
- examination of the project design and implementation process to investigate scopes for improvement

6.2 Additional Financing Analysis

In exceptional cases, there might be need of additional financing to complete the project or expand service coverage area. When a borrower requests Additional Financing, it is necessary to carry-out financial appraisal of the Additional Financing. In such cases it is recommended to follow the following steps:

- Bring all already spent amount and realized benefits to current price using market inflation rate
- Add the costs and revenue
- Do all necessary steps as outlined in Chapter-4 to carry-out financial appraisal of a project

6.3 Economic Analysis

Public investment should go through economic analysis to ensure that the project is beneficial to the whole of society instead of just the owners of the infrastructure. The economic analysis appraises the project's contribution to the economic welfare of the country. In economic analysis, most of things are similar financial analysis besides following mentioned points;

- Inclusion of additional indirect effects. Consideration of non-market costs and benefits also.
- Monetization of non-market impacts
- use of accounting shadow prices, based on the social opportunity cost, instead of observed distorted prices
- Social discounting
- Calculation of economic performance indicators

6.4 Cost-effectiveness analysis

Cost-effectiveness analysis (CEA) is useful tools to evaluate those projects whose benefits are very difficult to evaluate, while costs can be estimated more confidently. It helps to make comparison of alternative projects with a unique common effect which may differ in costs. CEA helps to select the project, for a given output level, minimises the costs, or, alternatively, for a given cost, maximises the output level as mentioned below:

- If fixed level of benefits, it helps to select project with minimum costs among alternative projects
- If budget is fixed, it helps to select project having maximum benefit

This methodology is more useful to perform the economic evaluation of healthcare programmes, scientific researches, education and environmental projects.

6.5 Environmental analysis

For the public infrastructure projects, it is necessary to go through Environmental Impact Assessments (EIA) to assess environmental impact of the project on the local and global environment. Not taking into account environmental impacts will result in an over- or underestimation of the social benefits of the project and will lead to bad economic decisions. Typical environmental impacts are associated with local air quality, climate change, water quality, soil and groundwater quality, biodiversity and landscape degradation, technological and natural risks. A decrease or increase in the quality or the quantity of environmental goods and services will produce some changes, gains or losses in social benefits associated with their consumption (EC. 2008).

CHAPTER 7: A SUMMARY OF MAJOR EMPIRICAL STEPS IN FINANCIAL ANALYSIS OF THE MODEL

Based on nature (categories) of the projects, TDF has different requirements to approve loan as following:

Table 7.1 Requirements of Projects for TDF Loan Approval

Types of project	CBA analysis	Cash flow	Borrowing capacity
Revenue generating projects	From borrower's perspective: <ul style="list-style-type: none"> ○ NPV > 0 ○ FIRR > TDF interest ○ B/C > 1 	+ cumulative cash flow for whole project life	DS/TR < 30%
Basic/Utility Infrastructure projects	From TDF loan perspective: <ul style="list-style-type: none"> ○ NPV > 0 ○ FIRR > TDF interest ○ B/C > 1 	+ cumulative cash flow for whole project life	DS/TR < 30%
Non-revenue generating social projects	Not required	Not required	Must have DS/TR < 30%

The financial appraisal is a guideline or tools for project selection. It is very helpful to fix tariff and decide about grant:loan mix. But the recommendations generated by the financial appraisal are subject to verification with the macro, meso, and micro level plan objectives and targets.

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Annex 1: Format for Borrowing Capacity Assessment of Applicant Municipality

Borrowing Capacity (as Estimated Cash flow for 20 years) - NRs in million

.....Municipality

Particular	Actual (Past 5 years as per audited report)					Annual Growth Rate in Average	Projection for Next 10 years										Total for 10 years	Total for 20 years	Remarks	
	1	2	3	4	5		1	2	3	4										
Net Internal Revenue																		-	-	
Municipality Grant (Unconditional- Recurrent)																		-	-	
Local Dev Fee-Recurrent																		-	-	
Municipality Grant (Unconditional- Capital)																		-	-	
LDF (Unconditional-Capital)																		-	-	
DDC-Revenue Sharing																		-	-	
Total Recurrent Revenue																		-	-	
Less: Recurrent Expenditure																		-	-	
Less: Previous years annual annuity																		-	-	
Operating Surplus for Capital Investment under Municipal Jurisdiction																				
25% of fund for Debt Services																				
Borrowing Capacity Before sub project																		-	-	
**Annual Loan Repayment of RF/TDF (street lighting)																		-	-	
**Annual Loan Repayment of.....																		-	-	
Additional Borrowing Capacity																		-	-	

Note: (A) Net Internal Revenue = Internal Revenue - Sales of Fixed Cost - Revenue from resource mobilization of Pubic Private (PP). Despite this PP considered as internal revenue in LBFAR 2064, this amount has been deducted for the calculation of recurrent revenue for this purpose of borrowing capacity calculation.

(B) Recurrent Expenditure = Total Current Expenditure – Social Security Grant – Interest Payment (As per LBFAR 2064 items) – Project base Recurrent Expenditure

Assumptions:

(i) Internal Revenue and Recurrent Expenditure is estimated as per average of annual growth rate of historical data.

- (ii) Recurrent grant, Revenue Sharing and capital grant assumed to be increased by 10% annually.
- (iii) Recurrent Expenditure estimated as per average of annual growth rate of historical data.
- (iv) Debt Services ceiling has been assumed as 25% of Operating Surplus.
- (v) Surplus amount calculated for the first 10 years has been put the same for another next 10 years for calculating the 20 years borrowing capacity
- (vi) Regarding previous debt services of Vyas Municipality, the following annual annuity is taken as per TDF records to be assessed on July 2015 with balance principal and interest amount with its capitalization as follows:

Annex 2: Gap analysis: Review of Financial Analysis Manual of TDF (2011)

This review of the Financial Appraisal Manual of TDF Nepal (2011) aims to identify its strengths and weakness with a view of providing necessary ground work for updating and/or revising the financial appraisal manual of TDF. We review the manual by examining its overall structure, major component, applicability of the manual and major implications complemented by feedback from the TDF staffs.

3.1 Overall structure of the Manual:

The manual is structured into six sections: the Introduction section, Appraisal on General Criteria, Processes proceeding to Final Financial Appraisal, Financial and Economic Appraisal, Appraisal Recommendations, Loan Covenants and Credit Enhancement. The manual concludes with Appendices with schedules to guide the user conduct various components of the financial analysis such as conducting the financial analysis, annuity estimation, NPV and IRR estimation etc. A set of sample form and guideline is also included to provide information to the borrowing entities on the process along with the request to furnish data to TDF for preparing the financial operating plan of the borrowing entity.

The texts provide theoretical concepts and assumptions related to project appraisal along with explanations of the steps while boxes are used to guide the reader on estimating important technical calculations such as annuity payments or the debt service coverage ratio. Tables in the manual provide matrices to guide the reader by the kind of financial or economic analyses required in accordance with the nature of the entity, category of the project, the analytical tools, and data availability. The Appendices provide more detailed information on the various components of project analysis with instruction of the nature of data required. There are five appendices with sample tables for financial analysis, concepts and calculations of NPV and IRR, models of loan sanction letter, content of feasibility analysis relevant to technical appraisal, sample format for financial operating plan and guideline. The final appendix lists useful websites for further information.

3.2 Major Components of the Manual

Section 1 discusses the general objective of the manual and discusses how the manual has been structured into different sections. The manual begins by specifying several criteria before moving ahead for conducting any financial appraisal of proposals submitted. These are the project categorization criteria, eligibility criteria, entity criteria, borrow creditworthiness criteria, criteria by purpose of borrowing and initial requirements mentioned in section 2 and 3.

The manual provides information on the nature of the urban development projects and their categorization into social infrastructure project, basic/utility infrastructure projects, economic/revenue generating projects and commercial projects. Eligibility criteria requires that the proposed proposal for TDF funding must comply with the municipal or regional master plan, if it exists and the proposed project must be a priority requirement of the community and is linked to the development plans. The manual also specifies on who are the potential borrower entities. They may be he municipalities, , urbanizing Village Development Committee (VDCs), the District Development Committees (DDCs), Urban Local Bodies Joint Committees as per the LSGA regulations and Town Development Committees (TDC) or a public corporation board.

Borrower credit worthiness criteria have four financial indicators that has been discussed at some greater length throughout the manual. The purpose criteria indicate that TDF cannot provide financing on the cost of acquisition of land and working capital. The other two initial criteria are

that a complete feasibility study with the Detailed Project Report and, the provision of satisfactory compliance with environmental and social safeguard are at hand. Once these general and initial criteria are met, the manual emphasizes on two major components as criteria for project appraisal: (a) Financial viability of the project and (b) credit worthiness of the borrower.

Section 4 specifically dedicates itself on the financial and economic analysis. The manual discusses that financial and economic appraisals are the two complementary approaches to project appraisal. It recognizes that for commercial, public utility and economic projects to be undertaken by various kinds of entities, both economic and financial analysis are necessary while for purely social projects economic analysis is adequate. However, since TDF financing is basically an entity financing model, financial analysis is basic for its project appraisal with emphasis on two components: financial viability and borrower creditworthiness. It also discusses the differences between financial and economic analysis on the basis of the conceptual differences, data used and the kind of analysis performed. With these visions, the manual moves ahead towards steps for financial analysis.

3.2.1 Components of financial analysis

The financial analysis provided in section 4.1 is organized under several sub-sections: The sub-section 4.1.1 on Information and assumptions needed for financial appraisal elaborates on the project costs and project revenues and their underlying assumptions. This is followed by section 4.1.2 forecasting project cash inflows and outflows and; determining the financial viability of the project in section 4.1.3.

Project Costs

The project cost is broken down into capital costs (construction cost, replacement capital, working capital, residual value). These costs are critical components of financial analysis and the manual discusses the assumptions related to their estimation to enhance clarity. The next section discusses the draw-down of funds with the help of the reference schedule presented in the appendix describing how the drawdown from loan and grant sources are calculated. The operating and maintenance (O&M) costs sub-section discusses with the help of an annex table discusses how the O&M cost would be distributed throughout the project cycle. It specifically discusses the issue of technical and non-technical losses accruing to the project particularly due to the public utility nature of the project. The financing costs sub-section discusses the categorization by the sources of financing and the cost associated with loan, grant, user contribution or equity. The cost of financing is the opportunity cost of the loan or equity and is equal to the interest rate on the loan or dividend payment. The tenor of the loan, corporate tax or sales taxes, inflation and cost escalators are other considerations related to financial appraisals. The manual highlights that TDFs financial appraisal should be based on constant prices rather than current prices to ensure against weaknesses from current price estimation. This section also provides the tools for estimations of average annuity payments.

Project Revenue

The project revenue section provides guideline for estimation revenue from tariff and other sources. This section also discusses the methods of forecasting future cash flow on the basis of surplus generated by the project.

Financial Viability

The financial viability is calculated based on the project cost and revenue using the concept of financial present net value (FNPV) and financial internal rate of return (FIRR). As complement to the FNPV and FIRR, the manual suggest the estimated value of the debt service coverage ratio should be greater than one implying that the project generates surplus at least above the amount required to cover for the debt service. The section that follows provides some outline for conducting the economic analysis using the economic NPV and the economic IRR.

Section 4.2 of the manual discusses the Economic analysis by shedding light on estimation of economic cost, economic benefits and the main assumptions used in economic analysis. It discusses the application of the economic net present value (ENPV) and the economic internal rate of return (EIRR).

Sensitivity and Risk Analysis

Section 4.3 of the manual provides guidelines for conducting the sensitivity and risk analysis. It discusses how sensitivity analysis evaluates the projects financial sustainability with variation in one of the assumption on one of the key inputs. The manual illustrates how the changes in the financial appraisal indicators might change with changes in the component costs, price, demand, environmental factors or exchange rates with the base case as a reference and a higher and a lower case as a sensitivity analysis.

Borrowing Capacity Assessment

Section 4.4 discusses the borrowing capacity of the entity for TDF's financial decision making purpose. The manual mentions that it is conventional for municipalities to have their statements grouped under (i) General Administration, (ii) Health Service, (iii) Physical Planning, (iv) Public Utility Services, (v) Welfare Services, among others. Accordingly data on all revenues and expenditures are conventionally organized under these five service categories. The revenue heading of the borrowing municipalities comprises of assessment rates and taxes, rental incomes, licenses, fee for services, other income and revenue grants. All these revenue headings can be broadly grouped into own revenue and revenue grants for borrowing capacity assessment.

On the expenditure side, expenditure headings comprises of personal emoluments, travel expenses, supplies and requisites, repair and maintenance, transport and communications, interest payment, dividend and bonus; grants subsidies and contributions and pension and retirement benefits. All these can be broadly categorized into establishment expenditure, operations and maintenance expenditures; finance expenditures and debt service obligations for financial appraisal purposes.

Based on these revenue and expenditure headings the financial operation plan of the borrowing entity with the project budget factored in is prepared for a period of generally five years. Collection efficiency is estimated along with composition analysis, trend analysis, listing of assumptions, collection of loan data and a projection of individual heads of income and expenditures. The TDF has adopted two evidences as the criteria for borrowing capacity appraisal. They are: total expenditure does not exceed total income ($TE/TR < 1$) and the ratio: debt service (DS) /total revenue (TR) is less than 30 percent)

The Appraisal Recommendation section outlines the criteria for lending decision making. The borrower creditworthiness are decided on the basis of these three indicators: (a)The ratio of debt service to total revenue is less than 30 percent, or (b) The ratio of total expenditure to total revenue is less than 100 percent and (c) The annuity on the loan from TDF does not exceed the government's maximum capacity for debt service (recurrent revenues =recurrent costs over the five years of the FOP). Likewise, for financial viability, the conditions are: (a) The project NPV is positive (or IRR is above the opportunity cost of capital) under a wide range of scenario analysis (b) The project's cumulative, undiscounted cash flows are positive over the life of the project, and the project show sufficient positive cash inflows in its early years to cover any subsequent years of negative cash flows.

3.3 Applicability of the Manual

The manual is mainly designed as a conceptual and theoretical document rather than a practical user friendly document to undertake a project appraisal based on real field demand faced by TDF staffs. The manual states in its Introduction section that it is designed to provide an outline of

conceptual steps in the financial appraisal process. Thus it is not a user manual as such. The major problem with the manual is the lack of its direct applicability for project appraisal.

The manual provides the concepts and tools but they are not organized in a logical coherent and user friendly manner. There is a lack of a glossary that provides practical illustration of the terminologies and their calculation process that might appear to be complicated to the reader. As a result, the user does not feel comfortable and confident in using the manual. Due to the more theoretical and conceptual nature of the manual, the background academic and training requirements are high. The user needs to be at least a Master's degree holder in Economics, Management or Finance. There is lack of practical examples in most of the cases. There are a number of parameters such as the appropriate discount rates that need to be fed into the appraisal that do not come from the proposals. These are, in fact, based on national standard estimates and need regular updating. More importantly, what is necessary is the manual should be translated to some computerized application such as Microsoft-excel with special features. Such an application would make the financial analyst feed the data submitted by the borrowing entity in the standard format. The standard parameters are also fed into the program. The financial analyst just needs to check that the assumptions and the parameters used in the financial proposal are valid. Once the data from the financial proposal is fed in the system, the value of critical indicators is obtained and recommendations for loan approval can be made.

3.4 Major Implications

The critical review of the existing financial appraisal manual and the feedbacks from the interactions with the TDF staffs indicated that the existing financial appraisal manual has difficulty to understand properly to carry-out a financial appraisal. The manual is fine from the conceptual level. For instance the manual has highlighted two criteria for project appraisal. The first criteria is: financial viability measured in terms of the financial internal rate of return and the financial net present value. The second criteria the creditworthiness analysis based on the total expenditure total revenue ratio and the debt service total revenue ratio. The major problem is its lack of the user friendliness. Likewise, the steps are not in sequential order and given formats to collect data are complicated. So it has not been use. This has led to delay in the required financial decision making process and the undertaking of municipal development activities. Updating or replacing the manual with the provision of a computer based application would greatly enhance TDF staff's capacity to undertake financial appraisal in the future.