Framework for the Economic and Financial Appraisal of Urban Development Sector Projects

A Reference Guide for Bank Staff, Consultants and Executing Agencies

ASIAN DEVELOPMENT BANK
Economics and Development Resource Center
Infrastructure Department
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Preface

The Asian Development Bank’s Infrastructure Department recently identified the need for a broad framework of economic and financial appraisal criteria to be applied consistently to all subprojects under urban development sector projects. In response, this Framework for the Economic and Financial Appraisal of Urban Development Sector Projects was prepared jointly by staff of the Infrastructure Department and the Economics and Development Resource Center. The Framework is based on operational experiences emerging from a review of the Bank’s appraisal reports and a survey of staff experiences in processing and implementing Bank-assisted urban development sector loans.

The Framework focuses on urban development sector loans. The Framework is consistent with the Bank’s existing Guidelines for Economic and Financial Analysis of Projects, but refines these guidelines in several ways. The Framework introduces an operational definition of urban subprojects and suggests a structured approach towards the economic appraisal of the numerous subsectoral components within urban development sector projects.

The Framework is intended for use by Bank staff, consultants and staff of executing agencies. The Framework contains a set of operational guidelines that should facilitate the preparation and appraisal of subsectoral components in urban development sector loans. Under the sector loan format, primary responsibility for the appraisal of subsectoral components before and during project implementation rests with executing agencies.

The suggested appraisal criteria for subsectoral components generally apply as well to integrated urban development project, which do not follow the sector approach. With some modifications, the structured approach suggested in this Framework and the financial considerations are also applicable to water supply and sanitation sector projects. The structured approach and the criteria for justifying sector project loans may not be applicable to urban development projects that do not employ the sector approach.

This Framework is based largely on operational experiences. Lessons that Bank staff and DMC executing agencies will learn from application of the Framework in future Bank-assisted urban development sector projects will be incorporated in revisions of the Framework, in an effort to continuously update the methodology involved.

The preparation of this Framework was coordinated by Dr. Etienne Van De Walle. Dr. Asad Ali Shah, Dr. Bong Koo Lee and Mr. M.G. McDonald made important contributions in the development of concepts and appraisal methodology.

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Table of Contents

List of Abbreviations

I. Introduction ........................................................................... 1

II. Criteria for Justifying Sector Loans and Selection of Subprojects .................................. 2
   A. Sector Plan, Investment Plan and Sector Institutions ........................................... 2
   B. Interlinkage Between Sector Loan Criteria ..................................................... 2
   C. Consistency with the Bank's Operational Strategy in DMCs .............................. 3
   D. Urban Development Sector Projects: Definition of Subprojects ...................... 3
   E. Broad Subproject Area Selection Criteria ....................................................... 5
   F. Economic vs. Financial Appraisal Criteria ...................................................... 5
   G. Role of Economic and Financial Internal Rate of Return Analysis in Project Appraisal Work .............................................................. 6
   H. Preparation and Appraisal of Sample Subprojects as Discrete Units of Investment ................................................................. 7

III. General Framework for Economic Appraisal ................................................. 9
   A. Introduction ......................................................................................... 9
   B. A Structured Approach Towards Economic Appraisal ................................... 9
   C. Broad Economic Appraisal Criteria ......................................................... 10
   D. Integrated Approach Towards the Economic Evaluation of Subprojects ........ 11
   E. Identification of Beneficiaries and Economic Benefits ................................... 12
   F. Cost Benefit Analysis ............................................................................ 13
   G. Environmental Impact Assessment and Valuation ........................................ 14

IV. General Framework for Financial Appraisal ............................................... 15
   A. Objectives of Financial Analysis ............................................................... 15
   B. Applicability of FIRR Analysis ................................................................ 16
   C. Role of FIRR in Project Evaluation ........................................................... 17
   D. Magnitude of FIRR in Urban Development Sector Projects ....................... 19
   E. Subsidization and Cost Recovery in Socially Oriented Projects .................... 19
   F. Cost Recovery and Municipality Finance .................................................... 20
   G. Financial Affordability to the Government ................................................ 21
   H. Affordability to Households ....................................................................... 22

V. Community Participation and Beneficiary Preferences ...................................... 22
   A. Objectives of Social Analysis in Integrated Urban Development ................... 22
   B. Social Analysis and Project Justification ..................................................... 23

Appendix 1 - Appraisal Criteria for Subsectoral Components ........................... 27
Appendix 2 - Type of Subprojects: Description of Physical Works ..................... 35
List of Abbreviations

AR Appraisal Report
ATP Ability to Pay
DMC Developing Member Country
DUI Discrete Unit of Investment
EA Economic Analysis
EIA Economic Investment Appraisal
EIRR Economic Internal Rate of Return
EOCC Economic Opportunity Cost of Capital
FA Financial Analysis
FIRR Financial Internal Rate of Return
FOCC Financial Opportunity Cost of Capital (Cost of Finance)
IEE Initial Environmental Examination
IFD Infrastructure Department
IRC Incremental Recurrent Cost
IRR Internal Rate of Return
IUD Integrated Urban Development
KIP Kampung Improvement Program
MIIP Market Infrastructure Improvement Program
MIS Management Information System
O & M Operations and Maintenance
OM Operations Manual
SP Subproject
SWM Solid Waste Management
UD Urban Development
UDP Urban Development Project
UDSP Urban Development Sector Project
VOC Vehicle Operating Cost
WID Women in Development
WS Water Supply
WTP Willingness-to-Pay
I. Introduction

The overall objective of this Framework for the Economic and Financial Appraisal of Urban Development Sector Projects is to provide to Bank staff, consultants and staff of executing agencies a broad set of operational guidelines to be used in the preparation and appraisal of urban development (UD) sector projects. A second objective of the Framework is to provide guidelines to Bank staff for the presentation and discussion of sample subprojects and their economic and financial appraisal at loan fact-finding and appraisal stages.

Under the sector loan format, staff responsibilities include (i) disseminating the proposed framework to executing agencies, as early as the project preparatory technical assistance stage; (ii) familiarizing executing agencies with the concepts and methodologies to be applied by consultants at the feasibility study stage; and (iii) monitoring the implementation of the framework during the project implementation phase. Primary responsibility for the appraisal of subsectoral components and subprojects before and during the project implementation phase rests with the executing agency.

This Framework focuses on urban development sector projects. Such projects usually (i) cover a relatively large number of smaller urban areas; (ii) include a wide range of subsectoral components; (iii) contain a number of small individual investment components; and (iv) focus on the urban poor and social concerns related to urban poverty. The appraisal criteria for subsectoral components shown in this Framework in general also apply to integrated urban development projects that do not follow the sector approach (see Appendix 1). However, specific aspects of the appraisal framework such as the structured approach towards economic appraisal and criteria for justifying sector project loans may not be applicable to UD projects that do not employ the sector approach.

With some modification, the structured approach and financial considerations presented in this Framework are applicable to water supply and sanitation sector projects. Many aspects of the Framework are also applicable to integrated urban development projects and projects focusing on a specific urban subsector, such as water supply, sewerage and wastewater treatment and roads.
II. Criteria for Justifying Sector Loans and Selection of Subprojects

A. Sector Plan, Investment Plan and Sector Institutions

In the sector loan context, the criteria for justifying the sector approach must be assessed carefully. The first criterion to justify the sector approach is the existence of a well-conceived sector plan based on clear policy objectives and appropriate sector policies. Through sector study work and/or policy dialogue prior to or together with the provision of the sector loan, outstanding sector issues should be identified and solutions sought. The sector project itself may provide an opportunity to further improve the UD policy framework. The project components should reflect how the sector issues identified will be addressed by the project.

A well-conceived and appropriately formulated investment plan or program composed of clearly identified projects constitutes the second major sector loan criterion. The sector and investment plan may be translated into a policy action plan—a policy and institutional matrix—specifying the policy area or objective and the measures already taken and yet to be taken, with an indication of target date. The feasibility of the proposed urban sector reforms highlighted in the policy and institutional matrix should also be assessed carefully.

A third criterion for sector loans is the existence of strong sector institutions able to effectively implement subprojects and sustain operation and maintenance activities. While experienced central urban institutions may indeed have the capabilities necessary for implementing a sector plan, an investment program and specific projects, local urban authorities in a decentralized setting often may lack experience in urban project planning, project implementation and resource mobilization. In these circumstances, a sector project may need to provide institution building to strengthen the managerial, technical and financial capabilities necessary to identify, prioritize, formulate, appraise, approve and implement subprojects and subsectoral components.

B. Interlinkage Between Sector Loan Criteria

In the sector loan approach, the relationship between the sector plan, the investment plan or program, and the policy action plan also should be described briefly. Institution building measures should be assessed based on their expected contribution to effective planning and project implementation.
C. Consistency with the Bank's Operational Strategy in the DMCs

A proposed UD sector project should be consistent with the Bank's operational strategy in the country concerned. Full justification should be given as to how the proposed project will fit into this strategy and how it will contribute towards addressing Bank-wide concerns. Urban development sector projects can contribute to the achievement of the Bank’s strategic development objectives in various ways: economic growth, through infrastructure improvements and direct or indirect socioeconomic development effects; poverty reduction, through targeted interventions to raise the living standards of the poor, women and other disadvantaged groups; environmental protection and enhancement, through a variety of environmental sanitation subprojects such as sewerage, low-cost human waste disposal schemes, solid waste management and wastewater treatment that generate important health benefits and positive environmental externalities; and through urban subprojects that address environmental problems such as urban congestion, noise pollution and air pollution. Another important objective in UD sector projects is stimulating financial and technical self-reliance among local urban authorities through institutional strengthening.

D. Urban Development Sector Projects: Definition of Subprojects

Urban development sector projects generally consist of investment in a large number of geographically dispersed urban areas or secondary towns. These projects usually include a number of integrated subsectoral components providing a variety of urban services. In these circumstances, there is a need for a flexible definition of "subprojects" that would depend on the particular project viewpoint and the sector context.

From the viewpoint of implementation, the term "subproject" can be defined on an area basis (town, secondary city, urban area, or district) or on a subsectoral component basis. When defining subprojects from the implementation viewpoint, it would be necessary to consider the capabilities of the sector institutions concerned. For example, if local urban authorities or institutions are capable of formulating, designing and implementing integrated multisectoral investment programs, an area-based approach may be more appropriate, especially in the context of strengthening local institutions and decentralizing implementation. In these cases, the "subprojects" would cover the geographical area under the jurisdiction of a local government/urban authority.
From the viewpoint of municipality finance, there exists a strong rationale to treat local governments as the implementing agencies of the "subprojects." The municipality provides its citizens a variety of urban services, as well as financing overall expenditures (investment, operations and maintenance, and debt servicing) through direct user charges and indirect measures such as taxes and borrowing. On the other hand, where local authorities and institutions are not yet capable of implementing sector loans but where central agencies are responsible for formulating subsectoral policies and design of investments in a particular subsector, from the viewpoint of implementation, "subprojects" would be defined on a subsector basis (e.g., central water supply authority or central public works agency).

From the viewpoint of economic appraisal, subprojects should be defined as discrete units of investment (DUI) that generate benefits independently of other investments included in the sector project. A DUI can be in one or more interlinked subsectors in a given area. To obtain planned benefits, the DUI must be implemented as one activity. Thus, while an area-based definition of subproject is useful from the viewpoint of implementation, for the purpose of economic analysis there is a need for a further breakdown of the total investment package/program being implemented by the local government or subsector agency into independent investment "subprojects." For example, an urban development sector project may include a number of small road improvement works. If the roads are not linked together in a single system but service different areas within the municipality, each improvement work should be treated as a separate discrete unit of investment for the purpose of economic analysis.

On the other hand, since water supply and sewerage systems often are an integral part of a single system, scattered improvement works in a given area in these two subsectors might be treated as a single DUI. Similarly, while road segments included in a subproject may be spatially separated, often they can be viewed as an integral part of a single system. In this case the subprojects should be treated as a single DUI. Along the same lines, if an urban area has two independent drainage systems, for the purpose of economic analysis, investment in the drainage/flood protection subsector should be broken down in two separate DUIs.

As a general rule, a discrete unit of investment should generate benefits independently of other investments included in the sector project. Such investment should be treated as a logical unit for purposes of economic analysis. The important point is that benefits accruing from each subproject should be clearly identifiable and adequately divisible so that they can be separated from other subprojects. This will reduce the
computational burden and increase the efficiency of the appraisal process. The same definition of a subproject in terms of DUI is appropriate for urban development project loans as well. In water supply and sanitation sector projects, investment in a water supply and sewerage system/sanitation facilities in a given area, whether urban or rural, can be considered as one DUI.

E. Broad Subproject Area Selection Criteria

Partly because of technical, institutional and policy considerations and the limited size of the sector loan, criteria for selecting urban areas to be included in a sector project must be established. The preliminary selection of urban areas should take into account specific criteria such as (i) the role and potential role of an urban area as an economic growth center, including population size and population growth rates; (ii) the willingness of the local government/executing agency to participate in financing arrangements and to implement financial and institutional action plans; (iii) existing technical and institutional capabilities to prepare, process and implement subsectoral investment projects; (iv) the financial capability and the commitment of the government/executing agency to make necessary financial contributions in terms of equity, debt service and operation and maintenance budgets; (v) global infrastructure investment needs as compared with national/regional averages; and (vi) the integrated nature of several mutually interrelated components. The criteria for selecting urban areas to be included in a sector project should be determined in close consultation with authorities concerned and should be consistent with the Bank's operational strategy in the particular DMC.

F. Economic vs. Financial Appraisal Criteria

Financial internal rate of return (FIRR) calculations should be carried out for all revenue generating subprojects, such as water supply, environmental sanitation, low-income housing, land development¹ and market infrastructure improvements. For non-revenue subprojects, such as slum upgrading and squatter area improvement, flood protection and drainage, and urban roads improvement, FIRR calculations are not required, though economic analysis should be undertaken. Certain aspects of financial analysis such as planning and budgeting apply to both revenue generating

¹ Not all land development schemes are revenue generating, e.g., those cases in which land is neither purchased nor sold.
and non-revenue subprojects. For some subsectoral components, such as water supply and low-income housing, it is often feasible to carry out both economic and financial analysis.2

G. Role of Economic and Financial Internal Rate of Return Analysis in Project Appraisal Work

It is important to bring the relevance of economic and financial internal rate of return analyses into focus. In project appraisal work, economic and financial analyses clearly complement each other. Where feasible, both should be carried out.3 For example, if a given urban subproject such as in the water supply subsector does not earn a FIRR that ensures the sustainability of supplies, the EIRR will drop below the economic opportunity cost of capital (EOCC) and may even become negative. In a case with an FIRR below the financial opportunity cost of capital (FOCC), which may be the case with projects in socially oriented urban subsectors, but with an EIRR larger than the EOCC (after accounting for the economic cost of whatever subsidy would be required to equalize the FIRR with the FOCC), the project is considered acceptable from the economic viewpoint. As such, the EIRR is important not only in justifying the project but also in rationalizing the size of any subsidy needed to sustain the flow of project benefits.

Assuming that both EIRR and FIRR analysis can be carried out based on adequate data and assuming the availability of appropriate valuation methodology, the sequence of EIRR and FIRR analysis in project appraisal work generally would start with the EIRR analysis. As a second step, from the viewpoint of economic appraisal, the FIRR analysis is needed to determine the size of the subsidy, in case the FIRR is below the FOCC. The third step consists of the re-calculation of the EIRR, incorporating the economic cost of the subsidy, if any, and comparing of the EIRR with the EOCC.

Given the design standards for a given urban component, as determined by the social and economic analysis, EIRR analysis plays a primary role in justifying the standard of services that people want and for which they are prepared to pay. In an ideal situation, the EIRR would be calculated for each subproject/subsectoral component. As a next step, EIRRs for the various subsectoral components are compared and alterna-

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2 Currently this is a standard practice in World Bank appraisal reports.

3 As no subsector-specific guidelines for EIRR analysis for UD subsectoral investments are available, appraisal of Bank-assisted UD sector projects is often restricted to financial analysis only.
tive project mixes are considered to identify the most desirable balance between the UD subcomponents. The comparison of these subsectoral components in terms of their EIRRs is especially important for subcomponents, such as urban roads, which do not generate financial returns.

Compared with FIRR analysis, which is based on financial inflows and outflows, the EIRR analysis adds a broader perspective in project appraisal. The EIRR is based on the difference between the private costs of a household providing urban services and the price charged by a public utility for an improved service. The EIRR analysis further integrates market distortions and externalities.

To estimate the demand for each urban service to be provided under a UDP, it is necessary to determine the difference in user costs between the with-project and without-project situations. This means that socioeconomic surveys are needed to determine the willingness of people to pay for the improved or expanded urban service. In this regard, it is important to recognize the difference between affordability analysis, which determines the ability to pay (ATP) for a service, and analysis that indicates willingness to pay (WTP), which underlies the effective demand for that service. Empirical evidence suggests that in many small-town situations there is not a high degree of correlation between ATP and WTP, as alternatives to facilities provided under projects exist. It is often observed that people may have the ability to pay but not the willingness to pay. This distinction has important policy implications, such as subsidies for project supplies possibly being warranted in situations in which effective demand is limited by ATP. This would not be the case in a situation in which WTP, not ATP, is the constraining factor.

H. Preparation and Appraisal of Sample Subprojects as Discrete Units of Investment

While Bank guidelines do not strictly require preparation and appraisal of sample subprojects prior to loan approval, current Bank practice has been to prepare and appraise a limited number of representative sample subprojects at the appraisal stage. This has two major advantages. One is that Bank staff can review prepared sample subprojects at appraisal stage and discuss with less-experienced implementing

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4 In past appraisal work, the focus has been only on affordability in terms of ability to pay, based on analysis of household incomes and the share of the cost of services as a proportion of household income. However, future endeavors of the Bank in preparing subsector-specific guidelines for the economic analysis of subsectors (e.g., water supply) will have to be based on the WTP for the product/service concerned.
agencies how to further improve subproject design. The second is that if sample subprojects have been prepared well and appraised well, implementation of the sector project can start immediately after loan effectivity. It is therefore suggested that a range of representative sample subprojects for which appraisal should be presented in the appraisal report be selected and prepared.

No standard formula can be given to determine the number of sample subprojects to be prepared/appraised. One approach could be to prepare a very limited number of larger and more important subprojects that represent a proportionately larger share in the total investment cost. For this, the total investment package in a given urban area would need to be disaggregated into discrete units of investment for which economic and/or financial appraisal, as appropriate, could be carried out. The number of sample subprojects to be prepared/appraised depends on such factors as: (i) the total number of subprojects in the sector loan; (ii) their relative sizes in terms of investment costs; (iii) the homogeneity of the subprojects in terms of urban needs/characteristics; and (iv) the implementation capability of the local urban authority. The EIRRs or FIRRs of the appraised sample subprojects should be assessed and compared with their corresponding cut-off rates.

While the preparation and appraisal of sample subprojects will differ from project to project and is left to the judgement and discretion of the analyst, criteria for the selection, formulation, appraisal and approval of all subprojects included in the sector project must be agreed upon with the authorities concerned at appraisal.

While it is recognized that in secondary cities local urban and government agencies play a key role in the preparation/implementation of subsectoral investments, it should be pointed out that non-governmental organizations (NGOs) and even private sector agencies also can play an important role in the design and implementation of urban subprojects. Close cooperation with NGOs and their involvement in preparation of development projects is likely to strengthen the participatory approach to development and improve the delivery of services to target groups, especially the poor and the disadvantaged in urban areas. NGOs often are involved at the grass root level and are familiar with the specific needs of the poor and can lend their special expertise and thereby enhance the effectiveness of Bank-assisted UD sector projects. The sections that follow provide a general framework for the economic and financial appraisal of subprojects included in urban development sector projects.
III. General Framework for Economic Appraisal

A. Introduction

Economic appraisal should aim at assessing, in quantitative and/or qualitative terms, the contribution of a given UD sector project to the development of the country and should reflect both micro and macro aspects and effects. Therefore, in addition to undertaking cost-benefit analysis for non-revenue generating components, which takes into consideration the micro- or project-level aspects, economic appraisal should also study the project in its broader sectoral and country setting. The assessment of a government's UD sector plan, policies and investment programs should examine whether the possible effects of these plans, policies and programs are consistent with the statement of public policies and budgetary allocations. Furthermore, macro effects of a project should be assessed through economic appraisal.

B. A Structured Approach Towards Economic Appraisal

This Framework is based on the "structured" approach to economic analysis of subprojects ordinarily included in urban development sector projects. This approach is recommended, as urban development sector projects generally include a large number of investment subprojects in various urban areas and subsectors, with several possibly interlinked subsectoral components in each area. In these circumstances, it would be impractical and inefficient to expect full economic appraisal to be carried out on each subproject included in the sector project.

Following this approach, subprojects or DUls will need to be classified into separate categories, and acceptable criteria will need to be established with regard to the economic appraisal to be carried out for the subprojects falling into the different categories. The classification of subprojects could be based on financial considerations such as investment cost of subprojects, or in physical terms such as length of road in kilometers, treatment capacity of wastewater treatment plants, etc., or a combination of the two.

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5 The general guidelines spelled out in the Bank's Guidelines for Economic Analysis of Projects and Staff Guidelines on Institutional Development are also applicable to urban development projects. The present Framework provides an extension of these general guidelines to a sector-specific context.

6 Macroeconomic appraisal of projects is carried out by the Bank when country programs are formulated (see Guidelines for Economic Analysis of Projects).
It is suggested that subproject categories be classified as small, medium or large. The cut-off points in determining these categories will not be the same for every DMC or even for different sector projects in a given DMC. Cut-off points mainly will be based on criteria such as the total amount of the sector loan, and the type, number and size of the subsectoral components.

As a broad guideline for large sector projects (e.g., $250 million) in which investment cost of subprojects is used as the basis for classification, subprojects or DUIS costing less than $200,000 could be considered to be small, those between $200,000 to $1 million to be medium, and those costing more than $1 million to be large. In smaller sector loans (e.g., $35 million), subprojects costing less than $150,000 might be considered to be small, those costing between $150,000 to $500,000 to be medium, and those with investments costing more than $500,000 to be large. For certain vital subprojects such as those in the maintenance subsector, an investment of $150,000 to $200,000 could be considered to be medium or large.

The appraisal mission will need to consult with the implementing agency and then use its judgment in classifying subprojects according to size and in determining the basis for classification. Criteria might be size of subproject expressed in financial cost or physical size. The objective of classifying subprojects into small, medium and large categories is to enable a more structured and systematic approach to the economic appraisal of subprojects, as explained in the paragraphs below.

C. **Broad Economic Appraisal Criteria**

The small subprojects category ordinarily would consist of a large number of minor works and schemes or small rehabilitation programs. Subprojects in this category would frequently be of a repetitive nature, though scattered throughout the urban areas included under the sector loan. Because of the small size and repetitive nature of investments under these subprojects, it is recommended that economic appraisal in terms of EIRR analysis need not be demonstrated for these subprojects insofar as

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7 It is important to establish the extent of the interlinkages between investment components in identifying individual investment subprojects and the category into which the subprojects would fall. For example, minor drainage works might be analyzed in combination with new urban roads, road improvements, or Kampung Improvement Programs, as implementation and expected benefits from the minor drainage works often are closely linked to the latter three components. If such relationships are found to exist, the interlinked subcomponents should be considered as a single subproject and be classified accordingly. This aggregation may result in a small-sized investment component (minor drainage work) falling into the medium or even large subproject category.
they adhere to agreed design criteria that ensure cost-effectiveness, or if appraisal can be based on similar subprojects of proven viability.

Subprojects in the medium category would be more complex and would differ from area to area depending on local conditions. Accordingly, such subprojects should be subject to economic appraisal prior to investment, though it is recommended that the analysis required be simplified, keeping in mind the relatively large number of subprojects likely to fall into this category and the modest size of investment. The economic analysis might be limited to cost-effectiveness analysis, or in the case of a roads improvement subproject be based on a minimum daily vehicular count. If a reliable, low-cost estimation method can be used, such a simplified economic analysis could, though would not necessarily, result in an EIRR calculation.

For subprojects in the large category, a detailed EIRR analysis would have to be done and the detailed analysis should be subject to Bank review prior to final approval, on a case-by-case basis. As the indirect and largely intangible effects/externalities in subprojects become greater, the qualitative assessment of benefits, as a complement to the formal EIRR analysis, becomes more important as support for socioeconomic justification of urban subprojects. Needless to say, all subprojects should use appropriate technology and be cost-effective, which in general means that they should represent a least-cost solution. The thoroughness of this cost-effectiveness analysis depends on the size of the subproject.

D. Integrated Approach Towards the Economic Evaluation of Subprojects

Urban development projects frequently include an integrated approach to area development wherein two or more subsectoral investment components in a single area are closely interrelated. For example, resettlement schemes are often linked with road improvements and/or surface water drainage, resulting in joint economic benefits.

In such cases, an aggregate EIRR can be calculated based on a comparison of total costs of all of the components with the total economic benefits derived. In this way, it may be that components that show low economic returns when assessed independently (e.g., a road component)

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8 This implies an explicit identification of feasible, technologically appropriate alternatives for which detailed cost estimates are available.

9 Appropriate technology is defined as a technology which among several alternatives satisfies the identified demand and/or need in a manner that is acceptable from the technical, socioeconomic and cultural viewpoints and that is affordable for the targeted beneficiaries.
may be justified when assessed jointly with the benefits generated by another component (e.g., drainage).

It should be pointed out, however, that in order to avoid suboptimal solutions, the aggregate IRR approach should not be used to rationalize/justify poor project subcomponents. The economic appraisal in this case should provide detailed evidence as to the joint nature of the benefits resulting from the proposed specific project design. Moreover, technical design criteria and cost-effectiveness criteria should be adhered to for all subcomponents included in the aggregate EIRR analysis to avoid inefficient resource allocation. Furthermore, whenever feasible, EIRR analysis should be carried out for individual subsectoral components.

The above case is applicable to interlinked investment components that are implemented simultaneously. In the case of phased investment subprojects, it would be necessary to carry out a separate economic analysis. In this case, the previous investment should be considered as a sunk cost, with an incremental cost benefit analysis carried out for the new subproject. This analysis would be valid only if the total incremental benefits are fully attributable to the new subproject. However, if the subproject, through rehabilitation or system expansion, generates benefits for the entire system, incremental analysis becomes difficult if no acceptable method is available to estimate the proportion of overall system benefits than can be attributed solely to the subproject concerned.

To avoid double counting of subproject benefits, the economic analysis of integrated urban development projects requires a careful delineation of the boundaries for each individual investment project and a critical assessment of the underlying assumptions in the EIRR calculation.

E. Identification of Beneficiaries and Economic Benefits

In urban development sector projects it is important to identify the targeted beneficiaries. Beneficiaries may be individuals, commercial and industrial enterprises, institutions, or the local community at large. The number of beneficiaries should be estimated for each subsectoral component and the beneficiaries' financial and socioeconomic status indicated. This is especially important if urban services are targeted

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10 In a sector loan context, however, it may be difficult to accurately estimate the number of beneficiaries/losers prior to the appraisal of the subprojects concerned. Detailed information could be collected at the feasibility study stage or when the BME benchmark surveys and detailed engineering design are undertaken.
towards the urban poor. The accurate identification of all direct and indirect beneficiaries helps identify economic and other benefits.

The identification of beneficiaries targeted to gain from the provision of improved/expanded urban services should be part of the global analysis of the anticipated distributive effects of UD projects. Such analysis, which in some cases may also require social risk analysis, should also identify who is likely to lose, such as when resettlement of people is necessary. Such analysis/knowledge is important for assessing the efficiency/equity dimension of project justification. While EIRR analysis is based on projected cost flows and expected quantifiable benefits, it should be highlighted that many urban development subprojects also generate intangible benefits that are more difficult to express in monetary terms. In all subprojects, irrespective of size, it is necessary to identify all benefits that justify the investment. These benefits can be conveniently classified in the following groups: (i) economic benefits, such as productivity gains, secondary economic benefits, and developmental impact; (ii) health-related benefits, such as in environmental sanitation projects; (iii) social or equity benefits, such as gender, regional and income-related equity; (iv) institutional benefits, such as improved policy framework, institutional strengthening and improved local resource mobilization; and (v) environmental benefits. The expected flow of economic benefits to individuals should be distinguished from those benefits accruing to institutions and enterprises and to the community as a whole.

F. Cost Benefit Analysis

The economic analysis of urban subprojects should be conducted for a range of feasible technological options. To economize on time and cost, the appraisal could be limited to two or three feasible options. Whenever appropriate, financial costs and benefits should be converted to economic costs and benefits, with the latter to be used in the EIRR analysis for each feasible option. The estimated EIRRs are then assessed to choose the most appropriate option. This allows the decision maker to weigh possible trade-offs between minimizing cost and choosing the most appropriate technological option (in an engineering sense). If environmental impact costs can be quantified, they should be an integral part of the total project costs used in the benefit-cost comparison. In carrying out cost benefit analysis, the general guidelines for pricing inputs and outputs are applicable.11

11 See Guidelines for Economic Analysis of Projects.
Environmental Impact Assessment and Valuation

Urban development sector projects in secondary towns generally are designed to provide an appropriate mix and level of urban services. The subsectoral sanitation components in particular will contribute to an improved urban environment. Better urban services generally stimulate further urban development, with resultant urban economics of scale, reflected in decreased unit cost of urban services. While it is recognized that integrated urban development projects mostly have only minor adverse effects on the natural resources base, these projects generally still require an Initial Environmental Examination (IEE).

In some environmentally sensitive UD projects, such as where physical construction works or specific subsectoral components such as sewerage treatment plants are involved, anticipated adverse effects on the urban environment may be more pronounced, in which case a full-fledged environmental impact assessment (EIA) may be necessary as well. The IEE/EIA exercise is useful for the following reasons: (i) ensuring better project design by giving due attention to environmental considerations and minimizing to the maximum extent feasible the identified or anticipated negative environmental repercussions; and (ii) providing a concise or detailed impact assessment (quantification of environmental effects), a first necessary step in environmental valuation.

In quantifying urban environmental externalities it is convenient to distinguish between the three broad categories of environmental costs or foregone benefits: those arising from urban pollution; those arising from urban congestion; and those arising from degradation of the natural support system. Examples of major effects associated with the first category include health and safety (increased health-care costs, working days lost and higher mortality rates), durability of material assets (e.g., corrosion), and degradation of amenities (aesthetic losses, reduced visibility, etc.). Urban congestion, the second category, typically causes increased travel times, reduced access to amenities, and secondary health effects. In the third category, degradation of the natural support system may translate into effects such as increased cost of water supply, land subsidence from groundwater extraction, loss of recreational and cultural sites, and increased risk of natural hazards such as flooding.

As well-defined property rights and markets are often non-existent for environmental goods and services, expressing environmental impact directly in monetary terms is not easy. Indirect approaches towards valuation of environmental amenities include the broad categories of effects related to observed physical changes, and effects related to
behavioral changes. The former group includes aspects such as productivity losses, cost of illness, and replacement costs. The latter group comprises aspects such as changes in property values, valuation of travel costs, and contingency valuation approach.

It should be pointed out that methods under these approaches vary in degree of sophistication and degree of applicability in dealing with different types of urban components. While it is not always possible or necessary to apply either approach across the entire spectrum of urban environmental problems, a sound understanding of the underlying valuation principles can contribute to a better identification and valuation of environmental externalities and to a better appreciation of a project’s ultimate impact on the society’s welfare.

IV. General Framework for Financial Appraisal

A. Objectives of Financial Analysis

Market structure and product pricing in the UD sector is unique. The local government or local urban authority in many cases has a monopoly in the supply of urban goods and services and thus has a dominant role in determining prices for products or services. The general objective of financial analysis for UD sector projects is to examine how both a subproject’s viability and the project entity’s financial soundness can be achieved through the government’s pricing decisions for its urban services and other financial measures.

The financial analysis of an UD sector project normally will start with an analysis/assessment of the historical financial performance of the project entity (local government or urban authority). Furthermore, projections are needed for the financial performance for the project entity as a whole as well as for the subproject under consideration, taking into account the investment and financing plan, debt service requirements, and expected return to be earned on government equity investment in the project entity, if any. Financial appraisal of UD sector projects generally should be concerned with whether or not the project can recover investment and operating and maintenance costs from project beneficiaries. Financial analysis is also done to ensure that there will be a financing plan that will provide sufficient funds to cover the implementation cost of the project. In this regard, the Bank typically finances the foreign exchange
cost while the borrower or the government is expected to meet some or all of the local costs.

The financial appraisal of an UD sector project should also be concerned with financial viability and sustainability. Through projection of income and expenditures of local urban authorities, financial appraisal should examine whether local authorities will be able to meet their financial obligations, including debt service payments. Furthermore, through a careful review of the finances of local urban subsector authorities based on projection of income and review of cash flow statements and balance sheets, it should be ascertained whether these agencies will be able to generate sufficient funds from operations to provide working capital adequate to earn a reasonable return on fixed assets and to make a satisfactory contribution to future capital requirements.

Basic financial statements to be analyzed, including income statement, cash flow statement and balance sheets, should be prepared and expressed in nominal terms. With the objective of achieving financial soundness of project entity, the required product price or tariff in nominal and real terms for the projection period can be determined. If the projected price/tariff to cover all the costs is too high and not affordable, the Government can reduce the financing cost to the project entity through concessional loans, such that product price can be also reduced to an affordable level.

B. Applicability of FIRR Analysis

In a sector loan context, a FIRR analysis generally should be carried out for all subprojects in which a clear buyer-seller relationship exists and in which the user pays direct charges for the use of goods and services, i.e., when direct cost recovery from the beneficiaries concerned is feasible and when non-payment of user charges would exclude the user from the delivery of the services. FIRR analysis generally is required for water supply subprojects and environmental sanitation subprojects that have a potential for levying direct user charges. Generally, FIRR analysis is also feasible for MIIPs and industrial/housing site and land development schemes in which direct cost recovery is possible through increased market rental charges and sales value of serviced plots.

FIRR analysis is not required for subprojects in which cost recovery occurs through revenue-yielding measures such as general taxation, property taxes, and levies or fees that are not directly related to the usage of the project facilities. Examples where this generally is the case include transport subprojects (with the exception of toll roads), major drainage and flood protection works, slum and squatter area improvement/
Kampung Improvement Project (KIP), and other infrastructural services having the character of a public good. FIRR analysis would not be required for small subprojects in which the investment cost does not exceed a well-defined and justified lower cut-off investment size. FIRR analysis would not be required in situations in which the investment is a relatively small component of a larger system and would allow the larger system as a whole to function more efficiently, thereby generating substantial system benefits that are not entirely attributable to the incremental investment. In this case, FIRR-analysis for a single subsectoral component would be misleading. If the expected benefits are the joint product of the new and existing investment, it would not be valid, methodologically speaking, to apportion the enhanced system benefits between the existing equipment and the new project investment.

C. Role of FIRR in Project Evaluation

The calculation of the FIRR should be based on prices/tariffs for urban products and costs (capital, operation and maintenance costs) expressed in real terms. The FIRR should be arrived at based on the real prices/tariffs, which are determined taking into account all cost factors, including the cost of capital, which may comprise loans, equity and grants. Under these circumstances, the project’s FIRR would always be higher than its cost of capital pointing to the financial viability of the subproject. In such a context, determination of an appropriate level for interest rates on the loans and rate of return on equity for financing become more important than the FIRR calculation itself in the appraisal of financial viability.

In financial analysis, the FIRR should be compared with the cost of finance, i.e., the financial weighted average cost of capital. Both FIRR and cost of finance should be expressed in real terms. In contrast to the economic opportunity cost of capital, which is assumed to be fixed for a given country, the cost of finance may differ from one project to another and generally is dependent on the sources of finance and financial terms pertaining to a given project. It therefore is essential that an estimate of the cost of finance in each Bank-assisted project be presented and that the methodology used in case of divergence from the existing Bank’s guidelines on financial analysis be justified.

12 In this Framework, “cost of capital” and “cost of finance” are synonymous. The financial cost of capital is different from the capital cost embodied, for example, in physical infrastructure and facilities.

13 This Framework does not address the issue of deriving a practical methodology for estimating the cost of equity and grants. There is, however, a need for establishing such a methodology.
The comparison of the conventionally calculated FIRR with the cost of finance\(^4\) may lead to one of the five following situations.

- First, the FIRR is greater than the cost of finance. The project is financially viable such that all project costs—capital or depreciation cost, recurrent operation and maintenance costs, and financial costs—will be recovered. Moreover, a surplus will be generated, which will strengthen the viability of the financial entity concerned.

- Second, the FIRR is equal to the cost of finance. No surplus is generated but revenues will be just sufficient to recover all costs, including financial costs.

- Third, a positive FIRR is less than the cost of finance. The project allows basic cost recovery but financial costs are only partially recovered. Without subsidization from the central or local government in the long run, this may endanger the financial viability/performance of the financial entity.

- Fourth, the FIRR is equal to zero, assuming a positive cost of finance. The project generates revenues that are sufficient to fully recover the capital, operation and maintenance costs. As the cost of finance is not recovered in this case, the financial entity is viable only through subsidization measures.

- Fifth, the FIRR is less than zero, assuming a positive cost of finance. Basic cost recovery is not possible. If recurrent operation and maintenance costs are fully recovered, capital investment costs will only be partially recovered.

It should be pointed out that the last three cases would occur only if the prices/tariffs used in the FIRR calculation do not take into account all costs, including the real cost of capital. For example, if the price/tariff for an urban service is determined at a level lower than the total of recurrent OM cost and annual amortization of capital cost, the FIRR would become negative.

\(^4\) See also the FIRR and sensitivity analysis described in Section V, pages 18 to 20, of the Guidelines for Preparation and Presentation of Financial Analysis.
D. Magnitude of FIRR in Urban Development Sector Projects

The financial viability of a given revenue-yielding subproject is dependent on the level of charges, tariffs, plot values, and rental charges. These should be affordable to the intended beneficiaries with charges based on the beneficiaries' needs/preferences for urban services and willingness and financial capability to pay. If the target beneficiaries belong to middle-income groups—for example, those with incomes between the 40 to 70 percentile levels of income distribution—it may be reasonably expected that the beneficiaries will be willing and financially capable to pay the full cost of the services, including a premium to recover the cost of finance and generate a surplus. In this case, the FIRR should at least be equal to the cost of finance. However, as a general rule, Bank-assisted urban development sector projects are targeted towards the poorer, low-income groups of the urban population.

In these cases, the extent of financial viability will depend on the level of charges affordable to the beneficiaries and their expressed willingness to pay such charges. As the social/environmental impact and corresponding benefits of a given project become more important, it is likely that more situations in which the poor beneficiaries are not financially capable of paying the full project cost will be encountered. For such projects, FIRR lower than the cost of finance may be forthcoming. In environmental sanitation subprojects, such as sewerage and wastewater treatment, the potential for cost recovery may be very limited or non-existent, in which case low or even negative FIRR are likely to result. Financial analysis in poverty-oriented projects should be based on affordable user charges, and a reliable affordability analysis using appropriate survey methodology would be required to support the FIRR calculation. The magnitude of FIRR is closely related to the potential for cost recovery. This is discussed in Section E and Section F below.

E. Subsidization and Cost Recovery in Socially Oriented Projects

To the extent that urban development subprojects are socially oriented, aiming at, among other things, amelioration of urban poverty and improvement of the living environment of low-income groups, some subsidization and partial cost recovery from beneficiaries, as opposed to full or basic cost recovery, at least in the short-term, may be justified on social grounds. In such a case, detailed justification should be provided.

The text on subsidization/partial cost recovery in socially oriented projects has been kept general and no specific subsidization measures are suggested.
Subsidization could take the form of concessionary lending/relending or budgetary transfer (grants) from the central government to local governments or local urban authorities. Justification of less than full cost recovery should be based on considerations such as the economic and financial status of beneficiaries and appropriate construction standards; willingness of the beneficiaries to contribute to costs; reasonable attempt at cost recovery, utilizing cross-subsidies where possible; and the financial capabilities of the central government and the local government and executing agencies to provide subsidies during a limited period of time.

F. Cost Recovery and Municipal Finance

While basic cost recovery should be the long-term goal, cost recovery may not be possible in the short term. In such cases, a short-term or intermediate goal should be set, initially aiming at less than full cost recovery and a gradual increase in tariffs over time. For water supply subprojects, for example, the tariff level might initially be increased to reduce excessive consumption of the wealthier beneficiaries. The tariff structure should, however, be such that the poorest beneficiaries pay water charges that are affordable. Rationalization of water consumption through an affordable tariff structure adjustable over time should be a constant concern of water supply authorities. Through regular tariff adjustments it should be possible to approximate the tariff structure that maximizes cost recovery.

In UD sector projects it often is necessary to further strengthen the institutional and financial capabilities of local governments and urban authorities. In the short term, the central government may wish to continue to support smaller municipalities financially on social grounds. A phased approach towards improving their financial performances may then be more appropriate. While development of institutionally strong and financially viable municipalities should be the medium- or long-term goal, implying full cost recovery, partial cost recovery measures may be justified in the short run.

Over time, however, user charges should be increased gradually to recover the full operating expenses and capital cost and generate a surplus (financial earnings) that would cover financial costs as well. This would also allow replacement of the initial investment at the end of the project. In practice, however, replacement often is not possible entirely through internally generated funds. Borrowings and equity finance may be necessary to finance renewal and expansion of assets.
If local governments or urban authorities are responsible for the supply of a number of urban services, which often will be the case, the broader issue of strengthening the financial capabilities of the agency to provide all services on a continuous basis should receive greater focus than separate FIRR calculations carried out for individual subprojects. While improved cost recovery should be a constant concern in urban development sector projects, the fact that many public sector utilities in the Bank’s DMCs are inefficient and overstaffed should be remembered. Instead of passing on these inefficiencies by way of additional tariffs, financial action plans should be developed to provide for regular tariff reviews while at the same time looking into improving the efficiency and financial performance of public utilities over time. In the water supply sector, if one regional authority or enterprise is managing all water supply systems within its administrative area, the financial evaluation should cover all the systems in that area and not merely the systems to be rehabilitated and/or expanded in the selected subproject areas.

G. Financial Affordability to the Government

It is often observed in urban development sector projects that the central government is supporting local urban authorities financially for incremental administration and operation and maintenance cost during the project implementation period. Such financing of incremental recurrent cost (IRC) preferably would be done on a declining basis from year to year so that local urban authorities become increasingly self-reliant, such that they themselves would be able to meet future recurrent cost requirements.

The impact of government finance of IRC should be assessed by expressing the annual project IRC as a percentage of the estimated total recurrent expenditure of the government over the years of the plan period. Where a portion of the capital replacement cost and/or recurrent cost requirements beyond the implementation period would have to be met by the central government, this should be carefully assessed at appraisal.

In the case of costs for subsectoral components such as roads, drainage, and flood protection works, generally it is not possible to levy direct charges. Costs should be recovered indirectly through property and other taxes from the higher-income urban population. Similarly, for environmental sanitation projects, capital cost generally would be recovered through indirect means (taxes), while generally it is feasible to finance operation and maintenance costs through direct charges. It may be noted that sewerage charges normally are shown as surcharges on the water tariff. In the long run, user charges should cover all costs. Property
tax—taxes on incremental property values in particular—often could be the largest source of revenue for the indirect payment of those infrastructure services for which no direct user charges are feasible.

H. Affordability to Households

Financial and economic analysis should be supplemented with and supported by a detailed affordability analysis of the targeted beneficiaries. Such an analysis aims to assess beneficiaries’ specific needs for urban services and beneficiaries’ willingness and financial capability to pay for such services. It is necessary to include an analysis of affordability to households as an appraisal criterion in the appraisal of subsectoral components. This analysis should focus on the poorest segment of the population while also including an assessment of the desirable level of quality of services to be provided and their affordability to beneficiaries.

In poverty reduction-oriented urban development sector projects, subprojects and their components should be designed to avoid placing a heavy burden of charges on poor families, for example, those with average family income falling below the 40th percentile of income distribution. Generally this can be ensured through appropriate cross-subsidization measures.

In affordability analysis, it is useful to compare projected tariffs with estimated incomes of beneficiary household at given percentiles of the local income distribution. The selection of the percentiles relevant to the analysis would depend on the household income levels of the target beneficiaries. The analysis should demonstrate that the total cost of the services to the lower income groups is affordable from the standpoint of income level. Water supply and sanitation charges cover normally about 5 per cent of family income, though the latter percentage has only a broad indicative value and can be expected to change with gradual increases in user charges and income levels over time.

V. Community Participation and Beneficiary Preferences

A. Objectives of Social Analysis in Integrated Urban Development

While the main focus of this Framework is the economic and financial appraisal of urban development sector projects, some useful reference is
made to the framework for social analysis in such projects. Social analysis aims at obtaining critical information on the targeted communities and beneficiaries; assessing beneficiaries' needs, preferences and demand for the proposed urban services; ascertaining the beneficiaries' participation and involvement in the design and implementation of the subproject components, to the maximum extent feasible; and ascertaining beneficiaries' willingness and financial capability to contribute to the project cost and pay for the urban services provided. Social analysis further helps in optimizing project design by integrating target group preferences and priorities, developing appropriate means for subproject and subsectoral implementation, providing detailed social justification, and identifying major risks to project implementation.

B. Social Analysis and Project Justification

Adequate information on the preferences and priorities of targeted beneficiary groups and reliable estimates of potential levels of beneficiary participation are important in achieving more accurate determination of the demand for the project services and their financial viability. Information on preferences and priorities also helps determine the least-cost solution for subsectoral project design that satisfies the defined minimum needs of the target group. Furthermore, such analysis helps justify subsectoral components in terms of equity objectives as well as predicted recovery of investment, recurrent and financial costs from beneficiaries. The probability of cost recovery will be greatest when the analysis confirms that the subproject/subsectoral investment component takes fully into account preferences and priorities of target beneficiaries, and that the latter are willing to contribute to the project cost and pay for the services provided.

Urban development sector projects generally have a direct positive effect in terms of poverty reduction as well as a positive social effect. In some cases, urban subprojects may fail to meet cut-off IRRs but may still be fully justifiable because of their expected significant contribution to equity objectives. In order to provide full socioeconomic support for subprojects in such cases, in addition to formal cost-benefit analysis, it is important to present a qualitative assessment of clearly identified benefits that are difficult to express in monetary terms.

For example, if health and environmental benefits have been identified and found to be a significant contribution of a particular subproject, it would then be useful to describe in qualitative terms how these benefits will be generated as well as describe their importance in
terms of global benefits. As a complement to the formal economic analysis, it may also be possible to qualitatively describe their economic spin-offs, such as impact on health expenditures, likelihood of more recreational benefits, secondary economic benefits, and enhanced productivity. Moreover, for social projects in which no formal cost-benefit analysis has been presented, the qualitative analysis assessment of all benefit categories is essential in the socioeconomic justification of projects.
APPENDIX
APPENDIX I
Appraisal Criteria for Subsectoral Components

A. Roads Improvement

The economic justification for large road improvement components that are not interlinked with other subsectoral components, such as drainage works, will, in most cases, be based on cost savings that result from the improved transport infrastructure. However, cost savings can be used as a measure of economic benefits only for existing and future traffic flows, when these costs would have been otherwise incurred by the users. In addition to vehicle operation cost (VOC) savings and savings in road maintenance costs, it is also necessary to estimate travel time savings, which in urban areas often may represent a sizeable proportion of the total economic benefits.

To estimate VOC savings, traffic is classified as "normal," "diverted," and "generated" traffic. Normal and diverted traffic is the existing traffic using the road network that will be affected by the proposed improvement. Generated traffic is induced traffic due to reductions in VOCs arising from road improvement. VOC savings for normal and diverted traffic are calculated based on VOCs with and without the project. The estimation of VOC savings for generated traffic, however, is based on standard consumer surplus methodology, which assumes that for a price elasticity of demand of unity, the additional consumer surplus equals one half of the theoretical transport cost savings for the generated traffic.

The cost savings approach generally can be applied to important urban transport infrastructure improvements. While the standard EOCC is 10 to 12 per cent, it may be justified in some cases to impose a minimum EIRR greater than EOCC. The justification should be indicated. For access and local roads, economic benefits often are equated to the increase in land value or an equivalent in rentals of the sites opened up by the roads. In this case, care should be exercised in delineating the geographical area in which incremental land values are likely to be forthcoming. Incomplete or phased local roads construction would generate only partial or limited benefits. Funds for maintaining road pavements should be assured through some form of cost recovery if such costs are not covered by a local government budget. In case the road improvement is closely interrelated with, for example, the drainage component, it may be justified to estimate an EIRR for the joint road and drainage component using only the increment of land value enhancement achieved as a direct consequence of the combined road and drainage works. However, if the EIRR is below the cut-off point, it also may be necessary to estimate cost savings. No FIRR analysis is required for this non-revenue investment component as cost recovery is feasible only through indirect measures such as taxes.

B. Drainage and Flood Control

For major flood protection components, the EIRR analysis usually is based on avoided flood damage or the increase in land values plus the reduction in the
expected level of road and other infrastructure maintenance costs as a result of the drainage improvements. Where appropriate, flood protection benefits also could include avoided loss of incomes in commercial/industrial areas. If it can be clearly established that part of the increase in the sales value of private lands is independent of avoided flood damage to public infrastructure works such as bridges, then both criteria should be added in the analysis.

A simplified example may illustrate this. Suppose the accumulated flood damage in the without-project situation is estimated to be $1,000, while the economic value of the adjacent private and public lands is also $1,000. Assume further that the project works reduce the expected flood damage by 50 per cent and increase the value of the lands by 50 per cent. Then, the net incremental economic value of the drainage project is equal to $500 (avoided flood damage) plus $500 (increase in land value), or $1,000.

It must be pointed out that the impact of reduced flooding is not easy to assess and often is masked in ascertaining the benefits. The project analyst should make a reliable assessment of the scarcity value of the land properties and the real-term increases in land value, excluding any speculative price increases. One should be careful about considering and adding up different benefit categories, as double counting may occur. If the economic benefits due to avoided flood damage (or to increased land values) are large enough to justify the subsectoral investment, there is no need to include other benefit categories, as the cost of collecting necessary information would increase. Given an adequate data base, risk analysis should be incorporated in deriving the benefit streams.

In UD sector projects, local flood control may be the result of combined roads improvements and major urban drainage works. Important flood protection works that are of a regional, basin-wide nature should not be included in sector projects. The appraisal of such major works is complicated and the latter are to be implemented through individual flood control projects. For minor drainage works, benefits are better equated with increases in property value only. If implementation of these works (and therefore expected benefits) is linked to other subsectoral components such as urban roads, roads improvements or kampung improvement projects (KIP), minor drainage may be appraised with the latter components (integrated approach towards economic evaluation).

In low-lying urban areas such as swamps or where urbanization has taken place near a major river, impeding drainage discharges during flood seasons, there may be limited benefits in constructing minor drains or in desilting drainage channels. Under these circumstances property values are unlikely to increase in real terms. In those cases in which the drainage works are to be phased or are incomplete for some hydraulical reason, the full benefits will be forthcoming only when all the works are properly executed. The drainage cost may be prohibitively high in flat terrains, especially so in monsoon areas. Economic benefits can be sustained only if maintenance costs for local drains are assured.

Conventional cost-benefit analysis for minor and major drainage investments, based on quantifiable costs and benefits, does not capture all economic benefits. Such investments also contribute significantly to a reduction of health risks and
generate environmental enhancement benefits. As these intangible benefits are difficult to quantify, a qualitative assessment of these factors should be provided together with the quantitative cost-benefit analysis. In important drainage and flood protection works, there may be potential for carrying out FIRR analysis. The feasibility for direct recovery of the public investment cost through adjusted real estate taxes or similar taxes should be examined carefully.

C. Water Supply

In view of the difficulty in quantifying economic benefits and in the absence of operational guidelines for the economic analysis of water supply projects, current Bank practices should be used, meaning that financial analysis (FIRR) should be presented based on realistic tariff levels affordable to the beneficiaries. Although not yet done frequently in Bank appraisal reports, it also may be feasible to present an EIRR analysis based either on the beneficiaries' willingness-to-pay or on resource cost savings as reported in PPTA feasibility studies. If such analysis has been carried out, the EIRR should meet a minimum EOCC of 10 to 12 per cent as the cut-off rate. However, if the water supply system is targeted towards low-income beneficiaries, there may be significant, largely intangible social benefits (poverty reduction impact, gender-related impact) as well as sizeable non-quantifiable health benefits. This may justify a cut-off rate lower than the assumed EOCC for the country concerned. A qualitative assessment of intangible benefits at appraisal is necessary to justify the lower cut-off rate.

The financial justification should always be based upon an affordability analysis. Through socioeconomic surveys of priority needs and preferences, the willingness and capability of the beneficiaries to pay for the planned water services must be assessed. The analysis should clearly demonstrate that the proposed tariffs are within acceptable limits for the targeted low-income families, for example, those included in the 40th percentile group of income distribution. Affordability depends on the level of service provided; water supply through shallow wells and standpipes is obviously more affordable than a conventional piped water supply with individual house connections.

Differential pricing of water (cross-subsidization to beneficiaries according to level of water consumption) is often retained in the tariff structure to ensure affordability to the poorer segments of the population served and to achieve satisfactory financial performance of the water supply enterprise. The differential tariff structure is such that the poorer residential users of limited volumes of water are charged less than the more affluent who consume more and who will therefore be charged more.

D. Environmental Sanitation

The environmental sanitation component comprises human waste disposal schemes, solid waste management (collection and disposal) for households and the industrial/commercial sector, and sewerage and wastewater treatment
projects. The first component covers on-site, low-cost sanitation facilities and septic tanks and tankers used for sludge disposal. It should be noted that a combination of the on-site and off-site facilities often is feasible in the same town.

No detailed economic analysis (EIRR) is required for environmental sanitation since most of the net public and environmental benefits are largely intangible (non-quantifiable) and accrue to the local community as a whole, not only to the direct beneficiaries of these services. However, all projects should adhere to agreed planning and design criteria, implying the use of appropriate technology, and be cost-effective solutions to the problem of providing a basic level of service adapted to the local needs and traditions. For medium and large subprojects, a simplified economic analysis (no EIRR calculation) is required, based on cost-effectiveness criteria (choice of the least-cost solution) and expected achievement of the desired (positive) environmental impact. For sewerage and/or wastewater treatment investments, beneficiaries should be carefully identified (number, location) and a qualitative description/assessment of the environmental externalities, positive as well as negative, should be presented.

As sanitation projects usually have the potential for generating revenues, financial analysis (FIRR) is required. While generally it is not reasonable to insist upon full private cost recovery in the short term, because of the expected social impact and significant positive externalities (health and environmental benefits), house-to-house services for human waste disposal (provision of septic tanks and tankers for sludge removal) may be capable of recovering costs in full through an appropriate level of service charge. For solid waste disposal subprojects, feasible tariff structures should be aimed at maximizing the degree of cost recovery. In relation to the household sector, only partial cost recovery may be feasible, though full cost recovery should be sought for large-scale industrial and commercial users. The same rule should be applied to sewerage and wastewater treatment projects. Large industrial users should be required to pay full costs while initially only partial cost recovery may be feasible from low-income households. In the case of the construction of a high-cost, conventional sewerage system, full cost recovery should be always attempted. It may be appropriate in many cases to deal with sewerage in conjunction with water supply since the sewerage charge is generally a surcharge on the water charge. The tariff structure applied to environmental sanitation projects (and water supply) may accommodate cross-subsidization between different types of consumers (e.g., bulk commercial and industrial consumers may cross-subsidize domestic household consumers, between different kinds of urban services, and between wealthier and poorer beneficiaries).

Generally speaking, full cost recovery in the short term may not be possible in many environmental sanitation projects. However, at least operation and maintenance costs should be fully recovered. If charges are set initially at levels allowing partial recovery of capital costs as well, it has to be ensured that these charges are within affordable limits and willingness to pay of the users, as determined by socioeconomic surveys. Again, household affordability should match the desirable level of services to be provided. An action plan should be
implemented to increase sanitation charges gradually to achieve full cost recovery after a reasonable period of time.

It should be pointed out that a detailed FIRR analysis would be required only for large subsectoral components that have good potential for producing revenues and not for components such as small low-cost sanitation works directed primarily at the urban poor. Full cost recovery in this case would be contrary to the health, environmental and poverty reduction objectives of a typical urban development project. In this case, while no FIRR would have to be calculated, moderate financial conditions could be imposed in the medium term, for example, besides operation and maintenance costs, recovery of the original investment plus an interest rate of 1 per cent per annum.

E. Slum Upgrading and Squatter Area Improvement

For large investments in slum upgrading and squatter area improvement (including kampung improvement), an EIRR analysis should be presented. Economic benefits are generally based on incremental annual rental values or increases in capital value achieved as a direct improvement in urban services. This methodology assumes that there is no bias in the housing market and that rents reflect economic values. The plausibility of this assumption should be assessed in each case as rents in this market segment are frequently controlled. Alternatively, economic viability could also be demonstrated on the basis of earlier proven economic viability of similar subprojects in the country. In this case no EIRR analysis would be necessary.

In those slum upgrading or KIP subprojects in which the housing itself would also be improved, full direct recovery of the costs involved would be required and the potential to recover other costs for improved urban services should be considered as well. The EIRR analysis generally will not be able to capture all economic benefits, in view of the expected positive poverty and environmental effects resulting in intangible benefits to local communities as a whole. These benefits should at least be identified and a qualitative assessment added to the quantitative economic analysis.

F. Market Infrastructure Improvement Programs and Shop Development

As market infrastructure improvement and shop development projects generally result in moderate or significant intangible benefits such as improved sanitation, as well as secondary economic benefits, an EIRR analysis would not capture all economic benefits. An FIRR analysis should be presented instead. This analysis will be based on the consideration that full cost recovery generally should be sought through appropriate market rental charges, although on theoretical grounds, positive environmental externalities may justify less than full cost recovery. The latter consideration could justify a positive cut-off FIRR lower than the financial opportunity cost of capital (cost of finance).

In market infrastructure improvement projects (MIIPs), it is useful in some
cases to make a distinction between smaller and larger towns. A minimum FIRR equal to the financial cost of capital should be imposed in both cases. In larger towns, where the improvements are for daily markets, full cost recovery can be proposed even in the short run. However, for smaller towns without daily markets, a full cost recovering fee generally may not be possible in the short term because of social reasons and/or high risk of defaulted collections. In these cases, an action plan should be implemented with gradual increases in market rental charges sufficient to achieve full cost recovery over a reasonable period of time.

The quantitative FIRR analysis should be supplemented with a qualitative assessment of the improvement in hygienic conditions and related environmental factors. As is the case for slum upgrading and squatter area improvement schemes (including KIPs), it may be possible in some cases to demonstrate the economic viability of MIIPs on the basis of proven economic viability of similar subprojects implemented elsewhere in the country.

G. Low-income Housing and Land Development

1. Economic Analysis

Housing development schemes are of a social nature, and as many benefits are intangible and difficult to measure, their analysis in terms of economic viability is complex. The economic analysis is usually done only for physical components, excluding long-term economic benefits as a result of improvements in policy development and institutional strengthening.

Economic analysis is generally based on the assumption that economic benefits are represented by real property values after development. Current market property values can be used, provided the property market is relatively open. Conventional cost-benefit analysis is based on a comparison of total site costs (land acquisition cost plus cost of civil works, to be distributed over the implementation period) and economic benefits derived from the sale at market value of full serviced sites, which may be assumed to be sold in the year of their completion. In case low-cost houses are constructed on newly serviced sites, a separate economic analysis is required for this component. The costs in this case include site costs, construction costs, and maintenance costs of houses and local infrastructure (running costs). To calculate the running costs during the project period, it is convenient to assume that houses are built in the year of site purchase and that running costs are incurred subsequently. Benefit estimation is based on imputed rental values (at market rate) and the residual value of the house and lot at the end of the analysis period. It is reasonable to assume a residual value higher (e.g., 120 per cent) than the initial cost due to the provision of services in the housing areas.

A similar methodology can be followed in a case in which new houses are constructed on existing sites. The cut-off rate in the EIRR analysis should at least be equal to the prevailing economic opportunity cost of capital.

It should be pointed out that EIRR analysis based on only the increased
property values is not capturing all economic benefits generated by housing development schemes. Such schemes usually have spin-offs to the general economy. To the extent that project beneficiaries will belong to the bottom half of the urban income distribution, significant social benefits (poverty reduction impact, improved quality of life) may result. Investment in site development and house construction is expected to stimulate demand for local materials and increase local employment, and thus generate secondary economic benefits. Improved sanitation and water supply will result in significant health benefits with positive secondary effects on the labor force (higher productivity and earning potential) and school-age population (through decreased absenteeism).

2. Financial Justification and Cost Recovery

Housing sites and infrastructural services development and house construction on new or existing sites should be targeted towards the low-income groups. They should therefore be affordable to the intended beneficiaries, and project housing should be designed to satisfy the requirements of low-income households whose incomes fall in a specified percentile interval (e.g., between the 10th and 40th percentiles) of the income distribution. A detailed affordability analysis for the housing development component is required. This analysis should bring out clearly that the total cost of sites and services development and housing finance can be met by the incomes of the intended beneficiaries.

A detailed financial analysis is required for large subprojects and should demonstrate positive FIRRs at least equal to the cost of finance. Housing subprojects should recover all development and financial costs, including land acquisition, site development, provision of infrastructural services, overhead costs of the housing authority, and interest during construction. Positive FIRRs lower than the cut-off rate acceptable from the financial viewpoint could be justified if the qualitative assessment clearly demonstrates significant health, environmental and social benefits. This would be the case, for example, if housing services are targeted towards the poorest urban dwellers previously living in unhygienic conditions.

H. Small Industrial Site Development Schemes

The inclusion of industrial site development schemes in an urban sector project may be justified if only micro-entrepreneurial activities such as repair shops, handicraft shops, and very small non-polluting industries are targeted and if the relevant components would significantly enhance employment opportunities for the poorer urban dwellers. As the developmental impact (secondary economic benefits) of these schemes is difficult to quantify in monetary terms, no EIRR analysis is required. However, financial justification is required based on demand and affordability analysis of the prospective beneficiaries. The total site development costs generally should be recovered from the beneficiaries. In cases in which significant social and developmental impact can be demonstrated clearly, positive FIRRs lower than the financial cost of capital could be acceptable.
### SUMMARY TABLE

Economic and Financial Appraisal of Subsectoral Components in Urban Development Sector Projects

<table>
<thead>
<tr>
<th>Subsectoral Component</th>
<th>Potential for Revenue Generation</th>
<th>Economic Analysis&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Financial Analysis&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Quantifiable Benefits</td>
<td>Intangible Benefits&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Urban Roads Improvement (Transport)</td>
<td>I</td>
<td>VOC savings/road maintenance and time savings/economic value for new traffic</td>
<td>minor</td>
</tr>
<tr>
<td>Flood Protection (drainage)</td>
<td>I</td>
<td>Avoided flood damage/increased property values/reduced road maintenance costs</td>
<td>moderate/significant</td>
</tr>
<tr>
<td>Water Supply</td>
<td>D</td>
<td>resource cost savings WTP</td>
<td>moderate</td>
</tr>
<tr>
<td>Environmental Sanitation&lt;sup&gt;g&lt;/sup&gt;</td>
<td>D/I</td>
<td>Difficult</td>
<td>significant</td>
</tr>
<tr>
<td>Slum and squatter area improvement/KIP</td>
<td>I</td>
<td>Incremental rental values</td>
<td>significant</td>
</tr>
<tr>
<td>MIIPs and shop development</td>
<td>D</td>
<td>Difficult</td>
<td>moderate/significant</td>
</tr>
<tr>
<td>Small industrial site development</td>
<td>D</td>
<td>Difficult</td>
<td>moderate</td>
</tr>
<tr>
<td>Low-income housing</td>
<td>D</td>
<td>- market value of serviced plots - residual value</td>
<td>minor/moderate</td>
</tr>
</tbody>
</table>

<sup>a</sup> D = direct charges; I = indirect means (taxes, including property taxes).

<sup>b</sup> In poverty alleviation-oriented projects and/or when significant/environmental benefits occur, it may be justified to set the cut-off rates in economic and financial analysis at values below the prevailing EOCC or cost of finance. This justification must be given.

<sup>c</sup> Intangible benefits. This category may comprise either one or more of the following: health benefits, environmental benefits, social benefits, poverty alleviation impact.

<sup>d</sup> Secondary economic benefits (developmental impact) also fall in this category.

<sup>e</sup> EIRR is compared with the economic (opportunity) cost of capital (EOCC) (assumed to be 10 or 12 per cent).

<sup>f</sup> FIRR is compared with the financial (opportunity) cost of capital calculated as the weighted average cost of borrowed funds and equity finance.

<sup>g</sup> Not applicable.

<sup>h</sup> Comprises human waste disposal, solid waste management, sewerage and wastewater treatment.

<sup>i</sup> Sales value should cover all site development costs.
APPENDIX II
Type of Subprojects: Description of Physical Works

A. Roads, Bridges and Intersection Improvements

Rehabilitation and upgrading works; construction of new facilities, repaving, road widening, roadside drainage, footpaths, footbridges and pedestrian paths. In larger urban areas, the physical components of a comprehensive transport improvement program may comprise the following: (i) construction of primary arterial (national roads) roads to develop the major urban road network; (ii) construction, widening or reconstruction of secondary arterial local roads to develop the supporting arterial road network of a city; (iii) the reconstruction of major intersection to provide grade separations that alleviate traffic congestion; (iv) improved traffic management, comprising, for example, repaving, drainage, bus priority lanes, traffic signal equipment, pedestrian improvements, and road marking programs; (v) road rehabilitation and maintenance; and (vi) development roads, and extending the arterial road system, facilitating city growth and development.

B. Stormwater Drainage

Rehabilitation and restoring to full operational conditions existing channels, culverts and siphons. Construction of new drains, culverts, siphons, holding ponds. Construction of new channels to discharge water flows directly to existing outlets.

C. Urban Flood Protection and Major Drainage Schemes

This component may involve rehabilitation and improvement of storm drains, dredging and clearing of streams, widening of streams, repair of side walls and construction of new ones, and replacement of vehicular bridges. Improvements in urban drainage may include rehabilitation and/or construction of primary and secondary drains as well as works on culverts.

D. Solid Waste Management (Environmental Sanitation)

Development of land (final dumpsites) for solid waste disposal, including access roads to dumpsites; provision of solid waste collection equipment such as bins, garbage trucks, tractors, power tillers, trailers, and street sweeping equipment, and provision of collection containers, composting equipment and hospital incinerators. Upgrading of dump site operations through provision of additional equipment such as graders and bulldozers. Improved or new workshop facilities for maintenance of existing or new equipment.
E. Human Waste Disposal (Environmental Sanitation)

Construction of bathing-washing lavatory facilities, construction of communal septic tanks, on-site sanitation (private septic tanks), and provision of sludge pump trucks.

F. Water Supply

Improvement of existing water supply systems through intensification using existing sources: repair or rehabilitation of existing facilities, including pipelines, storage reservoirs, boreholes, pumps, treatment works, public standposts, house connections and ancillary equipment, and wells, particularly in low-income areas. The treatment works may include rehabilitation and improvement of existing water treatment plants; reduction of water losses through rehabilitation of distribution piping, water meters and other water service facilities; improvement of system reliability; extension programs directly related to existing sources may include: provision of additional public standpipes, extension of distribution networks, and increase in and development of production capacity and increase in the number of household connections. Works may enhance quantity and quality of the present services, including surveillance services and also provide additional or new services to new beneficiaries.

G. Sewerage

Construction of new sewerage and sewage disposal facilities, including house connection, collector and transmission mains, pumping stations, treatment facilities and outfall mains.

H. Slum and Squatter Area Improvement

Upgrading of services in low-income communities including ground preparation and site layout, stormwater drainage, access and circulation, water supply, sanitation and sullage removal, solid waste management (storage and collection services) and power supply and street lighting, where these services are insufficient or unsatisfactory. Non-physical elements of slum improvement programs include incentives for community participation, and health programs and education programs for children.

I. Low-income Housing and Land Development

Subcomponents under this subproject could comprise: (i) sites and services development; (ii) house construction on newly developed size; (iii) house construction on existing site; and (iv) rehabilitation of rental flats for subsequent sale. In a sector loan context in which low-income housing development is generally a minor subsectoral component in a given subproject (secondary town),
the development is usually limited to (i) above and possibly (ii) above. The sites and services development includes land acquisition, ground preparation, site layout and provision of infrastructure such as roads, water supply, sewerage and electricity. The second component only comprises the construction of low-cost houses affordable to low-income families.

J. Small Industrial Site Development

Land acquisition, ground preparation, site layout and provision of basic infrastructure such as roads, water supply, sewerage and electricity.

K. Kampung Improvements Program (KIP; Indonesia)

Kampungs are commonly characterized by narrow, unpaved, poorly drained streets often inaccessible to motor vehicles and lack of individual water points and individual facilities for disposal of human waste and sewage. Kampung improvement projects often provide sanitation infrastructure and services involves access roads, footpaths, drainage, culverts, public taps, public baths/toilets and solid waste management.

L. Guided Land Development (GLD; Indonesia)

In contrast to KIP undertaken for long-established densely populated areas, GLD programs while similar to KIP, apply to fast-growing peripheral areas of towns. The basic infrastructure is mainly provided/improved for low-income groups within planned conditions and a long-term framework. Physical components may consist of access roads, public hydrants, communal MCRs.

M. Market Infrastructure Improvement Program (MIIP)

Improvement of the service conditions of urban infrastructure within the marketing environment. Repair and reconstruction of the existing circulation network (footpaths) and existing drainage facilities within and surrounding the market; repair and extension of the bathing-washing-lavatory (MCRs) facilities area; provision of additional public standpipes and provision of additional solid waste collection facilities. These works are intended to upgrade existing markets. Market improvements may also involve the construction of new market areas, e.g., kitchen markets which will serve to provide sanitary market conditions for the sale of produce (fish, fresh vegetables and other perishable food items).