



Pre-Feasibility Study Guidelines

March 2011



CDIA

Cities Development Initiative for Asia

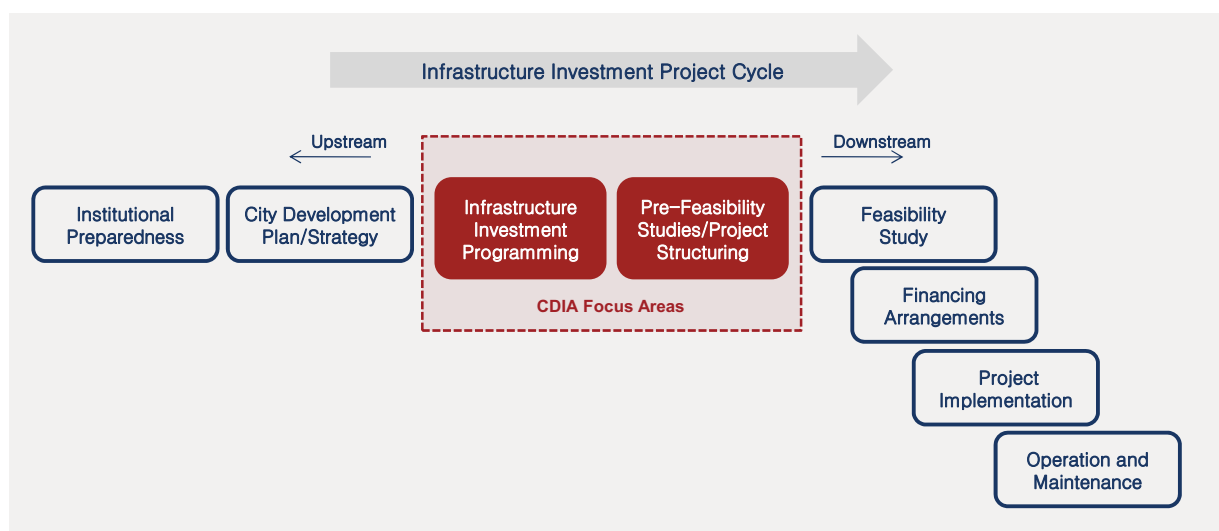
TABLE OF CONTENTS

1	INTRODUCTION.....	1
2	RATIONALE AND SCOPE	2
3	DEFINITION, PURPOSE, AND LEVEL OF DETAIL OF THE PRE-FEASIBILITY STUDY	3
4	SCOPE OF PRE-FEASIBILITY STUDIES	4
5	MANAGING THE PRE-FEASIBILITY STUDY PROCESS.....	5
5.1	Key Milestones in the Assignment.....	5
5.2	Quality Standards.....	7
6	SHAPING THE PRE-FEASIBILITY STUDY	8
6.1	Structuring the Pre-Feasibility Study Process	8
6.2	Pre-Feasibility Study Outcomes	10
6.3	Preparing for the Post Pre-Feasibility Study Phase.....	12
	APPENDIX 1. INDICATIVE PRE-FEASIBILITY STUDY REPORT STRUCTURE	13
	APPENDIX 2. SAMPLE DESIGN AND MONITORING FRAMEWORK.....	18
	APPENDIX 3-A. GUIDELINES FOR URBAN GOVERNANCE AND INSTITUTIONAL DEVELOPMENT	19
	APPENDIX 3-B. SECTOR GUIDELINES FOR PRE-FEASIBILITY STUDIES.....	26
	Urban Renewal.....	27
	Slum Upgrading.....	34
	Urban Transport.....	41
	Energy Efficiency.....	49
	Solid Waste Management.....	59
	Water Supply.....	68
	Wastewater Management.....	78
	Flood and Drainage Management.....	87

1 INTRODUCTION

The Cities Development Initiative of Asia (CDIA) is a regional initiative established in 2007 by the Asian Development Bank (ADB) and the Government of Germany, with additional support of the governments of Sweden, Spain, and Austria.¹ The initiative provides assistance to medium-sized cities to bridge the gap between their development plans and the implementation of their infrastructure investment projects. CDIA uses a demand-driven approach to identify and develop urban investment projects in the framework of existing city development plans that emphasize environmental sustainability, pro-poor development, good governance, and climate change.²

Figure 1: Cities Development Initiative of Asia Market Niche



These guidelines set out the objectives, processes, and techniques required for the second focus area shown in Figure 1—the Pre-Feasibility Study (PFS). CDIA projects emphasize one or more of the following impact areas:

- Improvement of the urban environment Mitigation of and adaptation to the effects of climate change
- Urban poverty reduction and gender equality
- Good urban governance

The overarching objective of a PFS is to formulate an integrated, inclusive, and sustainable project addressing institutional, technical, financial, economical, social, and environmental (e.g., climate change) concerns. The PFS process involves a tripartite partnership between the city government, PFS consultants, and the CDIA core management team (CMT), working together to identify, conceive, and structure prioritized urban development projects needed to improve living conditions in a city.

These guidelines will assist city governments and PFS consulting teams to deliver quality outputs within the specified time and budget to achieve the objectives outlined above. They clarify the PFS process, describe the content and outputs, and set minimum standards for performance by the city government, the PFS consultant team, and the CDIA CMT. The CDIA core management team in Manila, Philippines, prepared these guidelines with input from a range of stakeholders, including consultants, city officials, program partners, and technical experts.

¹ Austria joined the program in 2010.

² For more information about the CDIA program, see www.cdia.asia

2 RATIONALE AND SCOPE

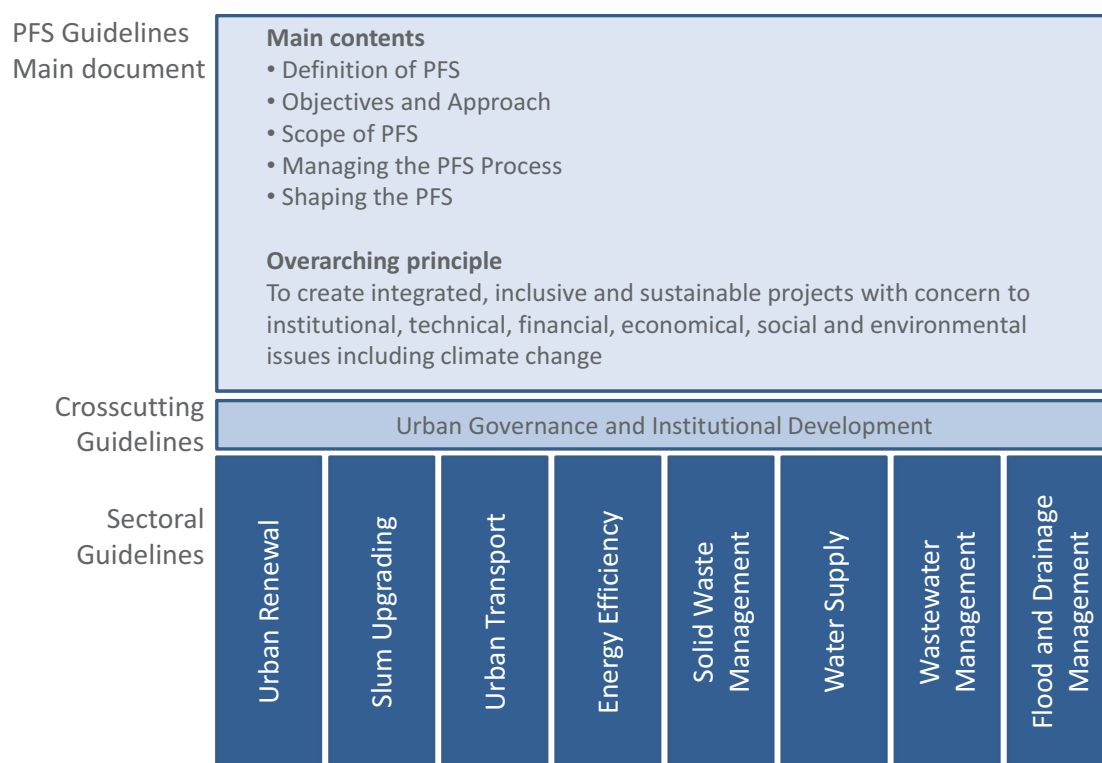
The guidelines aim to achieve a common understanding of the requirements for and the manner of cooperation during a pre-feasibility study (PFS), such that

- the client city government will be better positioned to work with the consultant team carrying out the PFS assignment;
- the PFS consulting team will have a better understanding of what is expected of them, and deliver a product of high quality; and
- CDIA improves its services in the targeted city and in other cities involved in the initiative.

The PFS guidelines contain three parts (Figure 2):

1. The overarching process guidelines (Appendix 1)
2. The crosscutting Guidelines for Urban Governance and Institutional Development (Appendix 3-A); and
3. The eight sector guidelines (Appendix 3–B).

Figure 2: Structure of the Pre-Feasibility Study Guidelines



PFS = Pre-Feasibility Study
Source: Cities Development Initiative for Asia

The main process guideline and the Guidelines for Urban Governance and Institutional Development apply to all sectors. Good governance is a prerequisite for success and sustainability, irrespective of the sector on which the PFS focuses.

The sector guidelines are tailored to the issues likely to be encountered in specific sectors (Figure 2).

3 DEFINITION, PURPOSE, AND LEVEL OF DETAIL OF THE PRE-FEASIBILITY STUDY

A pre-feasibility study (PFS) is broadly defined as preparatory studies enabling funders to undertake a successful feasibility study for a particular investment opportunity. Generally, the study will comprise sector investment options and priorities, initial scoping and costing of the identified investment project, and designing the governance and financing structures for implementation. Typical outputs provide the technical, financial, environmental, and social assessments of projects at a level of detail sufficient to write the terms of reference for a feasibility study.³

Ideally, a PFS should be preceded by a prioritization process of infrastructure investment projects leading to a Medium-Term Infrastructure Investment Program (MTIIP), which identifies a number of highly prioritized projects for further study and implementation.

The PFS process normally includes an assessment of one or two priority projects within the MTIIP framework. However, where a framework for such a medium-term (4–5 years) investment plan is not in place and the city master plan and sector plans are insufficiently detailed, it may be necessary to rework investment priorities, including sector reviews, in the early stages of the PFS. In any event, the MTIIP setting needs to be described for the specific investment sectors.

The PFS report may therefore include a component on infrastructure investment programming, detailing the output of this process (see Figure 1), and one or more components assessing priority projects. These guidelines focus on the development of the selected projects' PFS only. A separate set of guidelines and a tool kit discuss the infrastructure investment programming exercise.⁴

The purpose of the PFS is generally to prepare for the next phase of project development, i.e., a full-blown feasibility study or direct financing.

The PFS conceptualizes and structures an investment project at conceptual engineering design, a lower level of engineering design typically expected in a feasibility study being conducted for ADB and World Bank (preliminary engineering design). The accuracy margin to final costs in conceptual engineering design will generally be about 20%. Similarly, in the PFS, the level of policy, social, environmental, and institutional analysis is less detailed than at the feasibility study level. Financial and economic analyses in the PFS will contain internal rates of return, but again the expected accuracy margins will be higher (approximately plus or minus 20%, as compared to a feasibility study where a margin of 10% is expected based on preliminary engineering design).

Guiding Principles

To achieve sustainable urban development, the CDIA pre-feasibility study interventions will respond to the following guiding principles:

- 1. Urban environmental sustainability** <<cite consistently throughout—see page 1>>
Improve environmental and health conditions through careful selection and design of infrastructure projects and investments which are environmentally sustainable in the long term.
- 2. Mitigation of and adaptation to the effects of climate change** <<cite consistently throughout—see page 1>>
Focus on urban infrastructure investments that mitigate the effects of climate change and enhance local infrastructure to adapt to the impact of climate change.
- 3. Urban poverty reduction and gender equality**
Identify investments that positively contribute to social and economic development, and help women and the urban poor increase their access to services, resources, and decision-making

³ CDIA Operational Guidelines.

⁴ CDIA Medium-Term Infrastructure Investment Program (MTIIP) Guidelines and Toolkit.

power. With its clear focus on urban poverty reduction, the CDIA is designed to make a significant impact on all three of the above poverty dimensions by promoting investments in pro-poor and gender-sensitive urban infrastructure, and planning and implementing these investment programs in an inclusive and consultative manner.

4. Good urban governance

Develop more inclusive, transparent, and accountable project preparation processes and forms of civic engagement, working closely with stakeholders to identify the city's investment needs (see Guidelines for Local Governance and Institutional Development in Appendix 3-A).

The PFS will not be limited to flagging possible adverse impacts from an infrastructure investment, but actively deal with all crosscutting subjects in an integrated, holistic, and cross-sector infrastructure development approach, paying attention to crucial crosscutting social and governance issues, including participation, gender equality, poverty reduction, and environmental equity from an early stage in the PFS process. The initial assessment of the situation and needs of different groups in the city will form the basis for the infrastructure design and recommendations.

The PFS team will coordinate with and build on other urban development plans, technical assistance, and investments of government agencies, the private sector, and nongovernment organizations (NGO) and/or community based organizations CBO, and the informal sector. The proposed project must, as far as possible, integrate with and supplement other interventions, including those financed by development assistance agencies.

4 SCOPE OF PRE-FEASIBILITY STUDIES

The specific scope and tasks of a PFS will be described in the terms of reference (TOR). Generally, a PFS would include the following:

- Objectives, background, and purpose of the pre-feasibility study;
- Assessment of the current situation, gap analysis, and the urban development context, including the social, institutional and/or legal, environmental, technical, and financial issues;
- Discussion of sector options and priorities based on city development strategy and comprehensive land use plan, among others; development and description of sector Medium-Term Infrastructure Investment Programs (MTIIPs);
- Preliminary assessment of investment programs linkage to urban environmental improvement, urban poverty reduction, urban governance improvement, climate change and social and gender impacts, and if applicable, a preliminary assessment of possible environmental and social impacts, and ways to mitigate adverse impacts,⁵ flagging these issues for the anticipated feasibility study;
- Project identification, review of technical options and features of the potential project(s), conceptual and/or preliminary design, and identification of beneficiaries.

Each project assessment would describe the following in detail:

- Preliminary assessment of potential economic and social benefits;
- Preliminary estimates of project costs and financial sustainability;
- Assessment of the need for capacity building and recommendations to ensure the proposed projects' sustainability;

⁵ Safeguarding the environment, indigenous peoples, resettled people, i.e., to prevent, minimize, or mitigate harmful environmental impacts, social costs, marginalization of vulnerable groups that may result from development projects.

- Recommendation of likely implementation and operation arrangements for the potential project(s), including possible public–private partnerships (PPP);
- Development of financial and/or economic analysis based on available information, providing the basis for negotiation with potential financiers;
- Elaboration of needed downstream work, drafting of the TOR for a feasibility study, and flagging of issues to consider in detail;
- Risk assessment with focus on sustainability in downstream work (implementation and operation and/or maintenance); and
- Conclusions and recommendations.

The generic PFS report structure and/or outline in Appendix 1 provides more details.

5 MANAGING THE PRE-FEASIBILITY STUDY PROCESS

The PFS is designed to be an inclusive, open, and consultative process. Though implemented through CDIA-supported consulting teams, the study must be conducted in partnership between the consultants and recipient city government or corporation. Each plays a key role in implementing the process.

5.1 Key Milestones in the Assignment

The consultants’ terms of reference operationally guides the PFS assignment. However, to ensure that the process is clear and structured, and the delivered output is coherent, the following milestones are suggested (see Figure 3):

a) Mobilization Phase

International and national consultants are mobilized to the project and the city location where initial meetings are held. This is an opportunity for the consultant team, city government representatives, and the CDIA core management team to be introduced to each other. This signals the formal commencement of the assignment. It is essential that the team leader, the deputy team leader, and other team members (where possible) attend these first round of discussions to review TORs, counterpart responsibilities, logistical issues, and expectations from city officials. The CDIA experience shows that a good start sets the tone for the implementation of the assignment. It is also critical during this stage that cross cutting specialists and sector specialists are able to set the rules for collaborating with each other during the pre-feasibility study.

b) Inception Phase

An Inception Report is normally produced within 4 weeks of commencing the assignment. In consultation and partnership with the city government, the consulting team will have done the following:

- Conducted a situation and/or gap analysis of specific urban and related sector(s);
- Identified potential bottlenecks and/or challenges, highlighting locally available solutions; and
- Set the approach for the remaining stages of the study, having defined clear personnel and/or milestone schedules and study boundaries.

c) Midterm (Interim) Phase

A Midterm or Interim Report is normally submitted within 3–4 months of commencement. This report will document the situation and/or gap analysis across the key investment sectors and development themes (institutional, public finance, social, economic, environmental, political, and organizational) as required, and if not already described in existing documents, explain the process of identifying project options and sector priorities in consultation with a broad range of stakeholders.

The process of bringing priority projects to pre-feasibility table in terms of financial, economic, and social analysis should be well under way at this stage, and conducted in close consultation with the city government and other primary stakeholders. Experience shows this is to be crucial to broad ownership of investment ideas and projects. Training and institutional development activities conducted through stakeholder workshops or other similar activities may be undertaken during this phase.

d) Final Phase

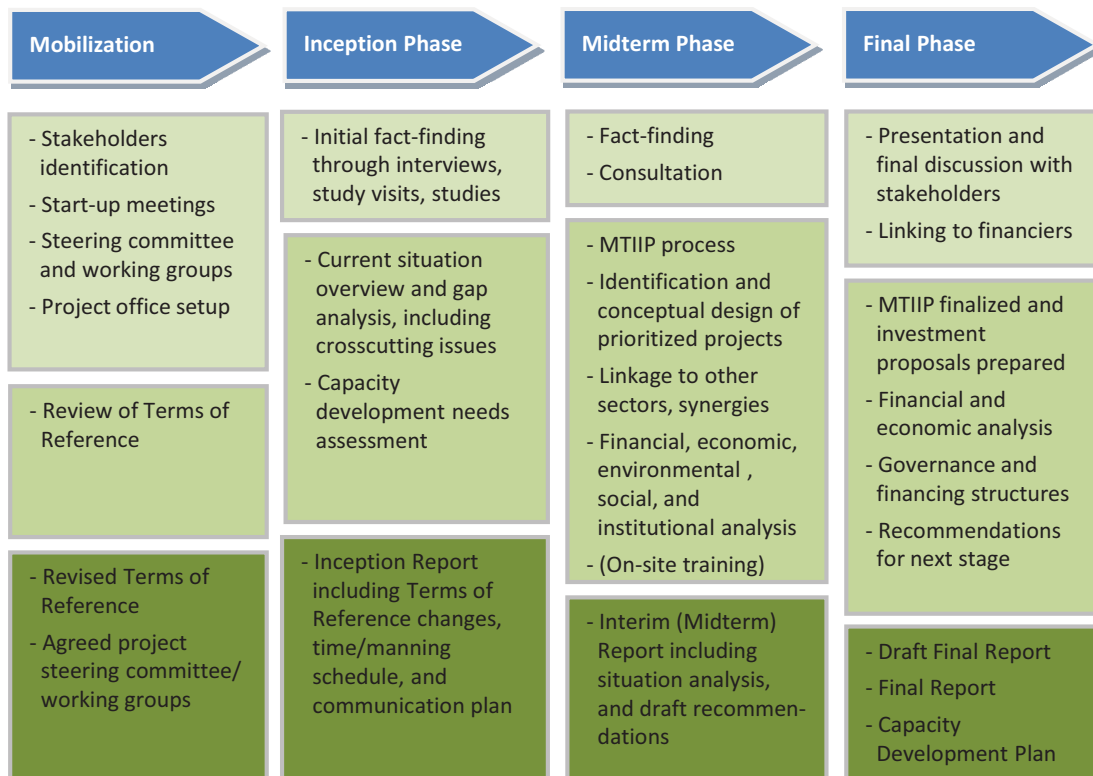
A draft final report should be submitted 1 month before the completion date of the assignment. At this point, the consultants' team and city government counterparts have already agreed on a set of priority projects, which have been subjected to pre-feasibility analysis and preparation. This includes concept (sketch) engineering design, financial analysis and internal rates of return (FIRR), economic analysis and internal rates of return (EIRR), social and poverty analysis, and environmental analysis.

The report will describe options and/or scenarios for project implementation. The report findings and proposed project investments will be discussed with stakeholders and submitted to CDIA once consensus between city representatives and other stakeholders is reached.

e) Final Report

Once CDIA and city representatives have given the consulting team their comments and feedback on the draft final report, the Final Report should be consolidated and submitted within 2–4 weeks prior to the completion date. The Final Report should include all relevant topics set out in Section 5.

Figure 3: Key Milestones in the Pre-Feasibility Study Preparation Process



MTIIP = Medium-Term Infrastructure Investment Program.

Source: Cities Development Initiative for Asia

5.2 Quality Standards

a) PFS Consulting Teams

CDIA expects the highest professional standards from its consulting teams, at least in line with international financial institution IFI requirements. This applies to outputs and inputs of national and international experts. Failure to meet these standards undermines the CDIA's credibility as an institution at the forefront of sustainable urban development in Asia.

The following minimum input standards apply:

1. All national and international experts must provide their inputs in the project location/site. Inputs to be made away from the project site must be clearly justified.
2. Consultant teams must provide inputs to and participate in steering committee meetings and periodic stakeholder consultations. Their participation ensures quality, anchors the pre-feasibility study findings, and represents important milestones in the PFS process. This applies especially to team and deputy team leaders.
3. The CDIA sees relationship management as a critical element in the PFS process. Team and deputy team leaders are expected to foster positive relations with their respective city counterparts. Failure to achieve this can undermine the credibility of the PFS process and products, and ultimately the CDIA. The CDIA core management team (CMT) will facilitate this process as may be required.
4. Consultant teams must work closely with their counterparts in local government and, where applicable, in CDIA national partner organizations, to integrate and institutionalize PFS processes and outcomes into the planning and development processes of the client city government.

5. In the unlikely event of conflict between the PFS team and the city government, or failure to deliver outputs to international standards, the CDIA will hold the lead firm responsible for discharging the assignment and the project director and/or team leader accountable for performance deficiencies.
6. The CDIA CMT must review the integration of crosscutting issues, including gender, in the consultants report.

b) City Governments

1. City governments that have agreed to work with CDIA must do so within the framework of a technical assistance agreement with CDIA. The agreement governs the relationship between CDIA, the city government, and the PFS consulting teams on the ground. To ensure a successful PFS outcome, CDIA expects that city governments will meet the commitments set out in the agreement and provide any other reasonable requests for assistance.
2. City governments are expected to deliver on their agreement to provide counterpart contributions and information stipulated in the technical assistance agreement in a timely manner, so as not to delay the implementation of the study. City governments are required to nominate officers from relevant departments to work with the consulting team during the study, and ensure they are available at reasonable notice.
3. City governments must constitute a project steering committee and facilitate its operation. The steering committee is the structural mechanism by which CDIA, the PFS consulting team, and the city government are able to assess progress, determine direction, and ensure that quality is maintained during the study. Timely guidance from the steering committee is crucial to a successful outcome of the PFS.

c) CDIA Core Management Team

1. The CDIA core management team will provide oversight and quality assurance to the PFS process and support from Manila where deemed necessary.
2. The team leader will maintain regular contact with the assigned CDIA CMT member and provide regular progress updates (frequency to be agreed).
3. The CDIA CMT will monitor progress against the agreed-upon terms of reference and deliverables. All payment invoices will be approved only upon delivery of agreed outputs to the satisfaction of CDIA and the city government.
4. The CDIA CMT will provide the PFS consulting teams with support, where necessary, to execute the assignment successfully.
5. At the end of the study, the CDIA CMT will evaluate the internal performance of the PFS consulting teams.

6 SHAPING THE PRE-FEASIBILITY STUDY

6.1 Structuring the Pre-Feasibility Study Process

a) Level of Detail

Consulting teams frequently ask questions pertaining to how much detail is required in the pre-feasibility study (PFS). The PFS is often developed within a relatively short time, typically 6 months. This limited time must be judiciously shared between the assessment, project development, and the financial and/or technical recommendation phases, taking care to avoid exhausting resources in the initial fact-finding phase.

The pre-feasibility stage indicates that feasibility studies will eventually follow, and thus, the PFS team should limit themselves to conceptual design, with the more detailed work to follow during the feasibility study stage as noted in Section 4.

b) Data Collection

In the interest of using scarce resources most effectively, maximum use must be made of existing data in the PFS (reasonable data are often available in local reports, but not necessarily in English), rather than generating new primary data, which will require prior approval by the CDIA CMT. Consultant teams are expected to use their professional judgment to make appropriate assumptions (and spell these out clearly in their report) in the absence of adequate data and where financial and time constraints prohibit the team from developing such data. Where the need for new data collection has been identified, the team must ensure the inclusion of men and women in participatory and qualitative data collection methods, and gender disaggregation of data.

c) Design and Monitoring Framework

A design and monitoring framework (DMF)/log frame matrix will be a key output of the PFS and this must be attached to the final report. The DMF summarizes key expected outcomes, impacts, and activities; provides indicators for monitoring; flags risks; and describes proposed project activities for the investment. The development of the DMF, starting with a “problem tree,” is a very useful exercise in integrating team perceptions with those of city agencies and civil society stakeholders, thus, providing a shared vision of the task.⁶ Similarly, the team must ensure the inclusion of gender indicators, or provide justification for exclusion.

The DMF also enables CDIA to monitor during post-PFS stage whether crosscutting themes and development objectives are addressed in the feasibility and subsequent implementation phase of the projects as envisaged in the PFS. A template is provided in Appendix 2.

d) Accessing Finance for Projects

Experience has shown that a strong focus is needed throughout the PFS process when charting next steps (post-PFS). PFS reports must indicate how projects can be financed, clearly indicating who needs to be targeted to obtain financing for the identified investments.

The team leader and financial experts in the consultants’ team should, at an early stage, begin mapping the institutions that may be interested in financing projects or components of projects. Both public and private sector sources should be considered, and consultants should set out clearly what needs to be done to attract the targeted institutions. As set out in more detail in the sector guidelines in Appendix 3-B, it is important to map the private sector investment landscape when resource options are being considered for projects. PFS teams should advise their counterparts on the potential opportunities offered by adopting innovative approaches to financing projects such as through the private sector.

e) Building Support for the Investment Program

Investment programs and proposals need to be owned and endorsed by the public, political representatives, and other stakeholders within a city. This is especially true, when national and/or domestic resources are being considered in cofinancing arrangements to implement the programs. While this is the responsibility of city authorities and relevant government agencies, the consultants’ team must communicate the required process to the steering committee and assist where possible.

⁶ Reference ADB guidelines on DMF preparation. See <<insert link/URL here>>.

6.2 Pre-Feasibility Study Outcomes

The contents of the PFS report(s) will vary depending on the nature of the assignment. However, teams preparing the studies should ensure that their respective terms of reference (TOR) are met and delivered in the areas specified. Appendix 1 presents a generic PFS report structure.

a) Medium-Term Infrastructure Investment Programming (MTIIP)

In the absence of detailed and recent sector master plans, regardless of whether there is a city spatial master plan, it may be necessary for a PFS team to revisit projects and priorities within a sector in order to ensure sustainability outcomes of the proposed investments and to achieve potential synergies and efficiencies among investments. For this purpose, the PFS team may assist the city government in preparing a sector MTIIP, setting out a proposed investment program (using a similar methodology as used in the MTIIP guidelines and tool kit). The investment program needs to be calibrated and prioritized, considering available budget and financing limitations.

For example, within an urban transport pre-feasibility study, it is conceivable that a review of the public transport networks and the potentials for integration among nodes will see proposals emerging for a bus rapid transit system, road rehabilitation, and port terminal development. In some instances where the social, economic, financial, and environmental costs and benefits have been assessed and projects found viable, public funding may be the best financial source. Conversely, a team may conclude with the city that public sector borrowing options are limited, while the proposed projects are financially viable—in such a case, the only viable financing option is to engage the private sector for financing such projects.

b) Key development areas

The CDIA's support is geared towards promoting a more sustainable approach to the development of urban infrastructure that benefits all (including the poor), mitigates environmental degradation and climate change effects, and contributes to improving the process of urban governance. Therefore, these issues need to be at the heart of the PFS process. The CDIA requires consultant teams to ensure that these issues are integrated in investment planning and implementation under its PFS process. In this process, PFS teams will strive to achieve outcomes in the key crosscutting themes presented below.

c) Environmental sustainability, climate change effects, mitigation and adaptation

CDIA support must aim at improving environmental and health conditions through careful selection and design of infrastructure projects and investments. This means safeguarding the urban environment in a traditional way, and introducing and prioritizing environmental projects and environmental components within a project. For instance, a transport project initially dealing with road improvement and public transport may include components on renewable fuel, traffic management, and other elements that improve the urban environment. All projects must include an assessment of climate change effects mitigation potential and/or adaptation needs, and describe investments needed to address these issues. This may also have bearing on the financial analysis in terms of potential for accessing carbon credits and partial financing capital investment with such credits.

d) Urban governance

This is critical to efficient and equitable functioning of cities in Asia. When participation, civic engagement, and bottom-up planning do not come naturally to public sector organizations, and the ability of cities to prepare sustainable urban development solutions is compromised, what emerges is ad hoc development skewed in favor of the few. The urban poor are often marginalized with resulting social tensions.

e) Gender Equality

Gender is a critical factor in urban infrastructure investments. By taking into account the different needs, opportunities, and conditions of men and women, a more successful preparation, implementation, and operation of infrastructure systems can be achieved. Gender mainstreaming in the PFS process involves both *analysis* and *action* to ensure that development policy making, planning, and implementation are sensitive to the needs of women as well as men, and promote greater equality of opportunity and benefit.

f) Urban poverty

The urban poor are often neglected when city governments plan and develop urban infrastructure investments. The CDIA promotes a reversal of this process, focusing instead on improvements in the lives of the disadvantaged groups by identifying infrastructure investments that enhance their access to basic services and contribute to their economic development. PFS teams should work with counterparts in government to identify the poor, their needs, and the types of investments needed to pull them out of poverty. The PFS process must be participatory and consultative, leading to increased empowerment and relevance of urban plans and investments to the actual needs of the urban population.

g) Capacity development

The transfer of skills and technology from the PFS team to city government counterparts is an essential element in the PFS process, even though constrained by the limited PFS preparation time in the consultant teams' assignments. The following directions are consistent with the CDIA Capacity Development Strategy:

1. Joint working activities with city counterparts provide opportunities for transfer of skills, technology, and knowledge from the technical experts to their colleagues. Examples might include skills to design and conduct field surveys for transport projects, project prioritization and design, economic and financial analysis, presentation skills, and report writing, to mention a few. This methodology requires counterparts to be integrated into, and play an active role in, project teams.
2. Training sessions can be organized by either experts in the team or by CDIA-contracted staff—normally related to one of the number of tools developed in-house to build capacity within cities, for example, to prepare urban infrastructure investment planning and programming. The need and timing should be determined jointly by the city and consulting team.
3. The CDIA has identified potential national partner organizations (NPOs) in the region, which have aims compatible with its mandate. NPOs offer cities the opportunity to access technical resources for preparing investment programs and developing organizational capacity in this field. For example, an NPO specializing in financing feasibility studies through private sector participation could be linked with a city government to build public-private partnership capacity.

With the help of the CDIA core management team, PFS teams and the city government need to assess where NPOs could best add value to the PFS process and how they can be involved with the city in the short, medium, and long term.

4. The PFS process should recommend capacity development measures, which will need to be taken up by the feasibility study team. A draft scope of work and/or terms of reference outline should be prepared if possible.

Understanding these issues and building transparent, efficient, and pro-poor mechanisms into the design of infrastructure investment projects is thus essential. PFS teams and cities need to work closely to squarely address these issues and develop innovative solutions that are appropriate to the social and financial context.

6.3 Preparing for the Post Pre-Feasibility Study Phase

Once the PFS final report has been submitted and the consulting team disbanded, there can be an uneasy vacuum, despite the fact that this is the start of one of the most important phases in the project cycle. This new stage presents a number of challenges and raises several important questions.

The consultants, city officials, and the CDIA core management team should explicitly consider the following questions and agree on the terms:

- First, to which institutions, and in what form, should the final PFS reports be presented?
- Who will now lead the process of mobilizing resources to finance the feasibility study?
- Who will take responsibility for building political and public support for the investments identified in the MTIIP and PFS?
- What can CDIA do to facilitate this next stage where feasibility resources have not yet been earmarked?

The consultant team and the concerned CDIA CMT officer(s) should work with staff of potential financing and/or capacity building institutions to ensure a smooth transition. Typically, this might be with an ADB project preparatory technical assistance (PPTA) or a KfW feasibility study.

APPENDIX 1. INDICATIVE PRE-FEASIBILITY STUDY REPORT STRUCTURE

1 EXECUTIVE SUMMARY

1.1	Objectives	Brief information of project objectives and background	()
1.2	Summary of Analysis	Summary of the pre-feasibility study (PFS) stages, brief description of current situation, and recommended projects and strategies including tentative cost estimate	()

2 INTRODUCTION

2.1	Reporting Structure	Brief introduction to the PFS, objectives of the report, and how it is structured	()
2.2	Schedule	Indicate the schedule of the study	()
2.3	Consultant(s) and Counterpart(s)	Involved consultants(s) and counterpart staff	()

3 KEY DEVELOPMENT ISSUES IN THE CITY

3.1	Current Situation	Indicate project area, policy and legislation, institutional structure and finance, analysis and overview of the current situation and its impact (successes and failures) Possible diagnostic tools: political, economic, social, technological, legal, and environmental (SWOT/PESTLE)	()
3.2	Urban Development Context	Analyze previous urban development strategies, plans, sector plans, and investment programs. Were they successfully implemented or not? If not, why? What are the implications for developing new investment programs and financing? Highlight new urban development strategies and thrusts. Map investment trends, prominent sectors, neglected sectors, priority sectors, and spending review	()
3.3	Initial Urban Governance Assessment	Examine relationships between the following: <ul style="list-style-type: none"> - Other service providers - State/provincial government - Private/business sector (public–private partnerships (PPPs)) - Civil society - Citizens - Political representatives - Informal economy and sector Conduct stakeholder analysis linking to investment planning and programming, review legal and regulatory policies/frameworks, and environment Current institutional arrangements for implementing investment projects and programs. Are these successful? Where are the problems and	()

		will new modalities be needed in the future i.e., PPP, etc. (See institutional guidelines in Appendix 3-A)	
3.4	Initial Urban Poverty and Social Assessment	<p>Identify the poor; areas where poverty is concentrated; review how they participate in investment decisions; what role they play in civic governance; identify trends in infrastructure investment for the poor; assess their needs, compare with priorities set by city. Gender analysis to be included (different roles, usage, needs and priorities of men and women).</p> <p>Conduct a social policy analysis of previous investment programs in urban infrastructure areas. Map trends, patterns, and likelihood of future investment.</p>	()
3.5	Initial Environmental and Climate Change Assessment	<p>Highlight key environmental issues facing city; lack of infrastructure and its environmental and health effects as of now or in the future; identify regulatory framework, institutional capacity, and strategies for working with environmental sustainability.</p> <p>Level of climate change awareness, preparedness; areas for mitigation and potential adaptation investment areas.</p>	
3.6	Initial Capacity Development Assessment	<p>Identify where gaps exist in capacity—have these been addressed in the past; How is professional capacity built in the organization? What are the implications for urban infrastructure investment planning? Identify key focus areas for building capacity in taking city forward; prepare proposals for capacity development, including associated costs. Include examination of capacity for gender awareness in ongoing project development.</p>	

4 PROJECT IDENTIFICATION

4.1	Recommendations	<p>Study's recommendations and analysis to improve the urban situation. Alternative broad technical solutions and preliminary design, and social, environmental, and institutional aspects.</p>	()
4.2	Project Description	<p>Project description to include:</p> <ul style="list-style-type: none"> - Project title - Sector/Sub-sector - Location (maps, photos as required) - Implementing agency (institutional arrangements) - Technical description and aspects - The project's linkage to other urban project development, possible synergies, innovative technology - Project benefits and outcomes - Beneficiaries - Social, poverty, gender impacts (gender 	()

		<ul style="list-style-type: none"> - disaggregated discussion of project benefits, beneficiaries, and likely impacts) - Environmental impacts - Project costs (US\$) - Operation and maintenance cost - Capacity development needs recommended implementation schedule - Potential for private investment - Potential for community involvement/contributions 	
--	--	--	--

5 CROSSCUTTING ISSUES

5.1	Urban Governance and Poverty	Preliminary assessment of how the project is linked to urban environmental improvement, urban poverty reduction, urban governance improvement, and social and gender specific opportunities and synergies. Elaboration of possibilities to satisfy needs within these crosscutting areas, possible synergies, and connection between formal and informal development and activities	()
5.2	Adverse Environmental and Social Impacts	Preliminary assessment of possible adverse environmental and social (including gender specific safeguards) impacts and how to mitigate those by safeguards (environment, indigenous peoples and resettled people). Flag these issues for the anticipated feasibility study. (Refer to ADB checklists on social and environmental assessments.)	()

6 FINANCIAL AND ECONOMIC ANALYSIS

6.1	Project Costs	Preliminary estimates and summary of project costs of identified and prioritized projects.	()
6.2	Municipal Revenues	Analysis of the current municipal revenues, recurrent internally generated and other revenue (funds from irregular sources that can vary significantly from year to year). In addition, analysis of grants and loans situation.	()
6.3	Municipal Expenditure	Analysis of recurrent expenditure, other expenditure (operation and maintenance, possibly electricity, etc.) and development (capital) expenditure.	()
6.4	Financing Plan	Highlight municipal revenue streams and projections from where the investments might be financed. This could be set out in the short, medium, and long term based on previous trends.	
6.5	Financial Viability	Preliminary estimates of project costs. Analysis of the current investment situation to derive a financial envelope to finance the identified investment projects. Undertake financial analysis of the project (including FIIR). Elaborate various funding scenarios considering potential loans/grants from development banks, possible private investments,	()

		and government contribution, producing projections of financial statements as required to evaluate viability. (Refer to ADB guidelines on economic and financial analysis.)	
6.6	Economic Analysis	This will assess the costs and benefits of all projects. An EIRR analysis is to be prepared and presented, particularly spelling out the social and economic benefits yardsticks used and underlying assumptions. For revenue generating projects, the FIRR may be used as a starting point, modified by considering any externalities, if applicable. See ADB guidelines on economic and financial analysis.	
6.7	Conclusions	Conclusion remarks of the current investment situation and the affordability to finance identified investment projects.	()

7 IMPLEMENTATION ARRANGEMENTS

7.1	Implementation and Operation Arrangements	Recommend and elaborate likely implementation and operation arrangements for the potential project(s) including possible potential for public-private partnership (PPP). Indicate possible institutional weaknesses and suggested measures to rectify the situation. Identify gender balance and inclusion in governance and implementation arrangements.	()
-----	---	---	-----

8 RISKS

8.1	Assessment	Initial assessment of the key risks for each proposed project (political, institutional, social [including gender], economic, capacity, and environmental)	()
8.2	Assumptions	Identify the major assumptions made for recommended projects. Indicate if there are any circumstances outside the control of the recommended project, and if these occurred, would these prevent the achievement of the main objectives? These assumptions would be analyzed further at the feasibility stage.	()
8.3	Risks	Identify broad risks to both implementation and sustainability. Indicate risk management strategies, if relevant. To be further developed at the feasibility stage.	()

9 FORTHCOMING FEASIBILITY STUDY (if required)

9.1	Further Studies	Indicate the need and reasons for further studies, if required.	()
9.2	Feasibility Study requirements	Briefly summarize the requirements to indicate likely data and survey needs, required expertise, support facilities, locations, and institutions to be consulted,	()

		skills required on the team, and time requirements. Highlight the need for gender disaggregated data and analysis and the need for gender expertise.	
--	--	--	--

10 CONCLUSIONS AND RECOMMENDATIONS

10.1	Conclusions and Recommendations	Summarize the conclusions and recommendations from the study. Highlight key issues and suggested way forward for the local government and/or city.	()
------	---------------------------------	--	-----

11 APPENDIXES

11.1	Appendixes	To be attached as necessary, e.g., data and survey sheets, detailed technical descriptions and costing, project fiches, and key references, etc.	()
------	------------	--	-----

APPENDIX 2. SAMPLE DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources Reporting Mechanisms	Assumptions and Risks
<p>Impact</p> <p>Improved city environment and quality of life</p> <p>Effective industrial/solid waste management</p>	<p>Healthier living among citizens</p> <p>Decrease in waterborne diseases....by xxx%</p>	<p>Monthly progress reports</p> <p>Quality of life surveys</p>	<p>A. Political support</p> <p>A. Environmental improvement is a development priority</p>
<p>Outcome</p> <p>1. Municipal infrastructure replaced</p> <p>2. Improved primary waste collection system</p> <p>3. Private sector involved</p>	<p>Investments in infrastructure</p> <p>Informal sector working with government</p> <p>PPP formalized</p>	<p>Project monthly/quarterly reports</p> <p>EIA's by government</p> <p>Environmental health surveys</p>	<p>A. Availability of adequate financing</p> <p>A. Commitment to work with new stakeholders</p>
<p>Outputs</p> <p>1. Build xxx number of transfer stations</p> <p>2. Build xxx number of landfill sites</p> <p>3. Institutional and organizational development</p>	<p>Construction complete</p> <p>Construction complete</p> <p>Reforms under way</p>	<p>Project completion reports</p> <p>Project completion reports</p> <p>Project completion reports</p>	<p>A. Political support</p> <p>A. Adequate financial resources</p> <p>A. Commitment to change</p>
<p>Activities</p> <p>1. Establishment of OMU/recruitment of staff logistics</p> <p>2. Participatory planning/programming</p> <p>3. Social/environmental/economic impact analysis</p> <p>4. Institutional restructuring</p> <p>5. Organizational training and development</p>			<p>Inputs</p> <p>ADB: \$150 million</p> <ul style="list-style-type: none"> • Consulting services xxx PMs: \$xxx million • Civil works: \$xxx million • Equipment: \$xxx million • Training: \$xxx million • Contingencies: \$xxx million <p>Government: \$xxx million</p> <ul style="list-style-type: none"> • Personnel xxx PMs: \$xxx million • Transport and logistics: \$xxx million • Operating expenses: \$xxx million

ADB = Asian Development Bank, A = assumption, PM = person month, R = risk.

APPENDIX 3-A. GUIDELINES FOR URBAN GOVERNANCE AND INSTITUTIONAL DEVELOPMENT

Crosscutting Guidelines

URBAN GOVERNANCE AND INSTITUTIONAL DEVELOPMENT



A. Background

The Cities Development Initiative for Asia (CDIA) developed the Guidelines for Urban Governance and Institutional Development for consultants who conduct pre-feasibility studies in urban infrastructure projects. To develop a better understanding of how urban infrastructure projects can be planned and implemented successfully, it is essential to understand the institutional landscape within which city development takes place.

Urban infrastructure investment projects are not identified, designed, and implemented in a vacuum. Cities are complex systems, supported by processes, relationships, and diverse interests. This includes the interface between formal and informal actors, the rich and poor, and local politics, access to resources, and local governance. Understanding how a city is managed should form the basis for any urban infrastructure investment program.

Technical experts, project managers, and policy makers should begin by mapping the complex city system—i.e., the relationship between urban governance, service delivery, and poverty—which, from the CDIA perspective, must begin at the pre-feasibility study (PFS) phase. These PFS assessments need only be preliminary at the very least, but they should flag the areas in the feasibility study stage that require deeper and more thorough examination. This should enable the feasibility study team to focus on critical areas that pose the greatest potential risk to the successful implementation of infrastructure projects and investments.

PFS consultant teams dealing with institutional development and/or urban governance should cover the following areas as part of their assessments.



B. Key Urban Governance and Institutional Development Areas

1. Types and features of municipal government

Urban local governments vary in structure, urban administrative authority, and jurisdiction. Local government does not provide all public services. Higher levels of government, development authorities, or private concessionaires may be responsible for planning, administering regulations, and providing water supply, transport, and electricity. The local/municipal/city government may take care of providing local roads, parks, education, basic health, and solid waste management. It is important to understand the responsibility of implementing investment projects in a city. However, the administrative boundaries between local governments and other service providers do not always align. These boundaries have a significant impact on the institutional design of projects. The governance structure of all key stakeholders and city government service providers dealing with governance needs to be mapped.

Summary: *Identify the levels of municipal government and service providers, describe the types of services provided, and define their respective jurisdictions and boundaries of authorities*

2. Decision-making structures and processes

Urban local governments across Asia vary in decision-making structures, each facing a unique set of challenges particularly in investment planning and programming. The executive is often a directly elected mayor with an assembly that provides general oversight for increased transparency and accountability. Limitations to terms in office often constrain long-term development—senior officers may come and go, disrupting the continuity of plans, programs, and investments. Where several or all members of its local government administration are appointed, some countries deal with the issue of determining the extent to which externally appointed representatives are able to respond to local priorities.

Summary: *Describe the types of decision-making structures, identify approving authorities, and consider the implications of their role in investment planning and programming*

3. Urban politics

Whatever the system of governance, politics tends to play a central role in the way decisions are made, formally or informally. The impact of politics in the way cities are managed can be both positive and negative. Where decentralization has been implemented, multiparty systems have sometimes led to a more transparent decision-making process. However, decentralization has also created political fragmentation, where elite political representatives co-opt communities and civil society organizations to retain their influence. The relationship between politics and citizens' participation is important and raises questions critical to investment planning and prioritization: How are investments identified? Who identifies them? How do investments meet the needs of all segments of society, particularly the poor? To what extent are local and/or state politicians involved in prioritizing investments? Does the city vision reflect consensus between the legislative and executive offices of government? Past trends and practices should be reviewed to assess the likelihood of successful investment-planning exercises in the future.

Summary: *Describe the city's key political dimensions, the relationship between the legislative and executive branches of government, the extent of citizen and/or civil society*



Crosscutting Guidelines Urban Governance and Institutional Development

participation in investment planning and programming, and the role of the poor in urban governance and management in relation to investment planning

4. Relationship between political representatives and the executive office (public service management)

The type of interaction (or relationship) between political representatives and the executive office will often determine whether investments are endorsed and projects receive adequate financing. Elected representatives tend to view executive staff as hindering their plans and goals. Conversely, local bureaucrats see politicians as interfering and representing vested interests, and with a poor understanding of the “real” needs and a disregard for proper procedures and formal processes. Developing new and sustainable infrastructure investments will be difficult when this relationship is characteristically weak or unpredictable, thus posing considerable risk to investment projects.

Summary: *Describe the dynamics between the executive and legislative (local/provincial/national) branches of government and the effects of that relationship on capital investments in the past, and identify patterns and trends*

5. Internal organization

Urban local governments can be organized in a number of ways. Each organization will have developed its own structural, political, economic, social, and cultural system. The interplay between these forces will determine how effectively the local government is able to deliver its mandate. Leadership and management styles affect the manner by which new investments are identified, prepared, and executed. Relationships between the local government and external constituencies, such as civil society and the private sector characterize the traditional nature of public administration and governance. Poor human resource development, and management and finance issues compound matters for many local governments planning and preparing new investments.

Urban local government tends to deliver services using any one of the following ways:

- Semi-autonomous executive agencies or municipally owned enterprises
- Contracting out to private companies, nongovernment organizations, or community organizations
- Franchising services to private organizations
- Selling state-owned assets and service organizations to the private sector
- Public–private partnerships to develop new investments.

Summary: *Document the local government’s structure, culture, leadership and management style, the types of public service provided, and its experience in public service; describe the nature of the local government’s relationship with external constituents (e.g., private sector, civil society)*

C. Public Finance

Urban local governments are unable to meet infrastructure development needs often due to lack of financial resources. Traditionally, urban local governments feel under-resourced and are unable to allocate money to new investments for several reasons. First, because a major



Crosscutting Guidelines Urban Governance and Institutional Development

portion of any municipal budget is spent on meeting organizational overhead. Second, the local revenue (tax) base tends to be limited. Third, public expenditure management systems (e.g., budgeting, expenditure evaluation) tend to be inefficient. And finally, central government transfers may be intermittent and linked to a political agenda. Examining the capital expenditure trends and liquidity base of urban local governments will shed light on their capacity to finance new investments.

1. Financing capital investment

Urban local governments can use all or some of the following resources to finance capital investments:

- Charge for services
- Budget surpluses (if any)
- Government grants (national and state)
- Sale of assets
- Borrowing (if possible)
- Private investment and public–private partnership (PPP)
- Municipal bonds (if possible)
- Municipal credit institutions and development funds

The PFS team should explore these resources, and in conjunction with the team’s finance expert, address the following key questions:

- How much money is needed to meet the city’s capital investment needs?
- How did the city government finance capital investments in the past?
- Is it possible to continue using the same method of financing or are new ways needed? If so, what are these?
- Can new institutional finance partners be accessed? Who would they be? Why might they want to invest in the city? How can they be attracted?
- Does the city government have the capacity to undertake innovative financing of projects?

Summary: *Assess the management of public expenditure (including capacity) and capital investment trends and practices, and identify any local solutions; set out financing options—public and private, and the implications of the financing plan on the organization*

D. Relationship between the Formal and Informal Sector

In any city, the scale and type of stakeholders will vary. Some will be formal, such as government institutions, businesses, and civil society organizations. Others will constitute the informal economy, traders, community groups, and local businesses. The interplay between these stakeholders often determines the outcomes a city government can expect for its citizens. This is particularly true in sectors such as solid waste and transport. Mapping these relationships, and their political economies, deserves attention when planning large-scale investments, which will be formally regulated. For instance, street trading and other informal types of employment could amount to anything upward of 20% of a given city’s employment. Therefore, mapping these relationships and understanding the impact of city investments upon these relationships should be an essential component in planning city infrastructure investments. This can be done through stakeholder analysis and mapping.



Crosscutting Guidelines Urban Governance and Institutional Development

Summary: Define the formal and informal sectors; conduct a stakeholder analysis in focus sectors (mitigate negative impacts and strengthen positive areas); identify the winners and losers in urban sectors such as solid waste management (SWM), transport, and water supply; and consider trends and experiences (successes and failures)

E. Urban Policy Framework

A clear policy framework should drive investment planning and programming. Ideally, there should be a national policy, followed by a state and/or provincial policy, and a city or local government policy. Typically, the national framework sets the tone and can be linked to financing of investments, as is the case for example, with the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in India. In many instances, there will be a national policy for environment or climate change, but no local response. However, the PFS team should aim to capture the policy hierarchy (national, state, and local) and assess the likelihood of any gaps hampering successful implementation of investment programs. The team should also identify any opportunity to link to national policies and/or resources.

Summary: Describe the framework and hierarchy of national, state, and local policies for the urban sectors under investigation; the implications of this framework on investment planning and programming; and trends and experiences

F. Institutional Design Options for Sustainable Project Implementation

1. Overcome the lack of representation in the policy and/or project formulation process

Local and/or community representatives are often not formally involved in the policy or project formulation process. However, such representation is a prerequisite for effective implementation, especially where sensitive local conditions shape the environment in which projects will be implemented. Such measures enable all key stakeholders to play a part in developing and implementing projects and/or investment programs, thereby improving local governance and increasing the chances for successful completion and outcomes.

2. Establish an appropriate coordination mechanism

A high-level city development board and/or committee should be formed to coordinate between various departments and agencies during the planning stage, and for monitoring during project implementation. Members of this board could comprise local political representatives in higher levels of government, heads of key local and provincial departments, agencies and administrative secretaries, and representatives of civil society (including the private sector). The board and/or committee should meet periodically in the city itself, preferably with the city chief executive officer CEO, to present progress updates on the investment program and its development activities. This high-level board should ensure people's participation in formal meetings relating to project formulation and/or implementation, meet the people involved in projects, and facilitate coordination among diverse organizations.

3. Create a public–private partnership PPP or special purpose vehicle for innovative project financing and implementation

Small- and medium-sized urban local governments with a weak economic base and an unpredictable revenue stream are unlikely to raise financial or funding support from capital



Crosscutting Guidelines Urban Governance and Institutional Development

markets. In this instance, where a specific viable project can be ring-fenced, new ways of developing such infrastructure projects should be explored. Often referred to as special purpose vehicles (SPV), these institutions employ a range of financing arrangements, involving a mix of debt and equity, guarantees, and contracts to finance projects.

Options for risk-sharing partnerships between the public and private sector for bankable infrastructure projects can also be explored, usually by using an SPV structure. Typically, the public sector contracts or purchases the services on a short-, medium-, or long-term basis. The private sector provides the services, depending on the terms of the contract, sharing in the risks of delivery (costs and benefits). A wide range of options and structural arrangements are available: concession, build–operate–transfer, joint venture, or complete privatization (as set out in the CDIA public-private partnership PPP Manual).

4. Robust governance processes

Good monitoring, effective control processes, and leadership and accountability are essential for successful project implementation especially where complex institutional structures are being proposed. These take on greater prominence when the public and private sector come together for the first time. The design process should incorporate these elements and indicate precise roles for each institution—which one will provide leadership, take responsibility, and be accountable for project success.

G. Conclusion

Understanding the institutional landscape within which urban infrastructure investment plans and programs are framed is critical to the long-term success of projects. City development initiatives do not take place in a vacuum but are subject to the interplay of political, social, economic, and cultural forces. The institutional environment of a particular city is usually in a state of flux. To prepare successful investment plans and programs, the CDIA pre-feasibility studies team must consider these dimensions and identify the critical factors for the success of urban infrastructure investment programs.

APPENDIX 3-B. SECTOR GUIDELINES FOR PRE-FEASIBILITY STUDIES

Sector Guidelines

for Pre-Feasibility Studies on

URBAN RENEWAL



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to urban renewal and other related issues. These address the approach expected of consultants engaged at the PFS stage as regards urban renewal.

2. Objective

CDIA support to the formulation of any urban renewal project aims to enhance the sustainability and inclusiveness of the project. This means that the project should

1. Comprise a viable component of an *integrated urban renewal program* including consideration of housing, economic activity, transport issues, infrastructure provision, and social services (see section B);
2. Be *inclusive* in the sense that affordable and accessible housing and employment options are available to different income groups comprising the area's existing inhabitants and potential



new inhabitants, *and* that persons negatively affected by the project should be minimized and adequately compensated for any adverse impacts (see section C);

3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that revenues, subsidies, taxes or levies, concession/lease revenue, microfinancing, grants/loans, community service obligation payments, carbon credits, or any combination of these must be capable of funding capital and operational costs of various components of the project, including long-term maintenance and capacity building (see section D);
4. Be *environmentally sustainable* in that the proposed investments should contribute to improvements to the urban environment through reduction in environmental hazards resulting from poor solid and liquid waste management, sanitation, air pollution (including green house gas emissions), and contamination of water bodies and land (see section E); *and* that adequate measures will be taken to mitigate any potential adverse environmental impacts of the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Urban Renewal Project

The vision for any city in Asia must include an environment-friendly, energy-efficient, low-carbon, integrated, and inclusive development. To achieve this vision, urban renewal programs should aim to enhance the viability and livability of subject areas, utilizing and enhancing the potential of the existing environment and local economy, where possible, to retain the character of the area, and introducing new development. Such planning should be balanced and integrated across residential and commercial activities. The investment project should be based on a sound planning framework. The consultant should review this framework and the role of the urban renewal project within it. If it is not adequate in terms of its providing strategic guidance to the project as regards its social, economic, and environmental contribution to the city's development, the consultant should, within the limits of resources provided under the contract, set out proposed objectives based on available data and consultations.

The project design should describe the key subcomponents of housing, commercial development, and infrastructure investments and show how these will achieve the strategic goals discussed above. The documentation of the project design should also demonstrate how land development patterns and investments will contribute to sustainable transport and energy efficiency goals (see Sector Guidelines on these topics). Mechanisms to achieve such goals, for example, promoting pedestrian areas in respect of transport goals and refurbishment to provide better insulation in respect of energy efficiency, will normally need resources that must be funded and managed. Such issues are addressed in sections D and F respectively.

Summary

- ▶ Review planning framework to identify investment components and priorities
 - ➔ Fill "gaps" with rapid analysis of strategic goals.
- ▶ Demonstrate how the proposed design fosters economic development, particularly in respect of the poor.
- ▶ Demonstrate how the proposed design furthers sustainable transport and energy efficiency goals.



C. Developing an Inclusive Urban Renewal Project

The baseline for developing an inclusive urban renewal project is understanding the needs of existing residents, particularly the poor. This includes an analysis of the following:

- (i) Capacity for employment and constraints to expansion of economic activity. This includes a holistic view of the economy that takes into account informal economic activity involving, for example, cleaners, shopkeepers, street vendors, food stalls, informal transport systems, etc., which will invariably be affected positively or negatively by the project.
- (ii) The need for services such as health care and willingness to pay for these (by different income and other groups such as single-parent households)
- (iii) Safety and security is an important aspect, especially from a gender perspective.

The first major task for the consultant is to undertake a rapid screening of the proposed route(s) and facilities to determine the following:

- (i) The potential benefits to income and other groups and their employment opportunities; ("potential" should be gauged not just by likely cost of conventional delivery but also include potential for cost-reduced delivery and cross-subsidy possibilities); and
- (ii) Likely disruption to communities in terms of relocation, division, noise, disruption of the visual context of important historic or scenic sites. The scale and cost of relocation should be estimated along with options for near-site¹ resettlement (to minimize disruption to employment).

Changes to the design should be considered where (i) significant employment opportunities could be easily accessed, particularly by low-income groups, or (ii) significant disruption could be reduced. Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into governance arrangements (section F).

Summary

- ▶ Document the design by subcomponent, segmenting the market for housing, services, and access to infrastructure, and assessing outcomes for each group (segment the market by identifying key potential user and/or beneficiary groups by income and other characteristics e.g. gender).
- ▶ For the proposed design, estimate benefits by group.
- ▶ Consider alternative design options to maximize employment and other benefits, particularly for the poor, and to minimize disruption.

D. Ensuring Financial and Economic Viability

1. Financial Assessment

Crucial to the viability of the project will be a realistic assessment of revenue streams for each investment with a direct cost recovery component, such as health, water supply, housing, and others. Often, assumptions are "over optimistic," to say the least. The assessment of affordability and willingness to pay on the part of each market segment in each investment should be rigorous and well documented. If the assessment of existing preliminary estimates suggests they are

¹ Off-site resettlement is to be avoided wherever possible. Potentials for urban renewal in parallel to the transit development should be assessed to provide additional units for resettlement.



unrealistic, cheaper, more appropriate alternatives, or increase in the density of development should not only be considered but also strongly suggested. Costs should be benchmarked against average construction costs in country (preferably) or in like country. The latter is available on the web. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures.

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism for energy efficiency investments and other credit/subsidies from international agencies should be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise² to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing and standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved market rates for return in equity and debt should be the benchmark for viability.

In particular, the assessment must include an analysis of the cash flow of local government(s) with project capital expenses and subsidies included to determine the sustainability of the project in relation to the likely revenue streams for the local government(s). Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F). For example, public–private partnership (PPP) models can be used on unbundled, commercially viable components of projects. Thus, such analysis should be done in a preliminary form at the start of the consultant engagement.

Summary

- ▶ Rigorously assess revenue assumptions and costing and strongly advocate alternatives where such assessments make viability suspect.
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on (local governments) budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

2. Economic Assessment

Economic assessment techniques for urban renewal projects—basically involving property development and infrastructure investments—are well understood by professionals. These normally involve estimates of health improvement, employment (income increase or decrease), property value increase (due to improved accessibility), and externalities among others. Avoidance or generation of congestion and safety benefits are less commonly taken into account. The economist/financial analyst should be aware that these are potentially significant and make all efforts to estimate them, adopting proxy values such as land value increase where necessary as set out in ADB's Guidelines for the Economic Analysis of Projects.³ Care should be taken to avoid double counting such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are

² ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.

³ ADB. 1997. *Guidelines for the Economic Analysis of Projects*.



routinely set by ADB and other agencies in each country. ADB standards should be adopted where available.

Summary

- ▶ Estimate all benefits of proposed project across all involved sectors (see other Sector Guidelines)
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Urban renewal projects may have both environmental benefits and environmental impacts. The objective of the PFS is to maximize the former while minimizing the latter. The project should include measures to minimize GHG and maximize energy savings through (i) higher density development, (ii) energy efficiency of buildings and services such as water supply and wastewater treatment, (iii) distributed (e.g., solar) energy generation, (iv) and fostering nonmotorized transport (e.g., walking) and public transport. Options for these measures should be explicitly examined by the PFS. The revenues and cost implications of these measures, and their governance implications should be included in the financial (section D) and governance analysis (see section F).

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental or similar permit. At the PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.⁴ It is also vital that the requirements and the time frame for a full-blown EIA are identified already during the PFS stage to avoid delays in downstream work as well as unexpected investment costs for environmental protection measures.

In terms of reducing possible adverse environmental impacts, the process is similar to that adopted for social assessment. The proposed investments and facilities should be screened to determine (i) potential environmental impacts in terms of noise and pollution to communities, and (ii) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.⁵ Mitigation measures should be formulated and costed. The implications of these measures should be included in the financial assessment (see section D) and governance arrangements (section F) of the project.

Summary

- ▶ Document and cost proposed environmental benefits measures.
- ▶ Document and cost proposed environmental mitigation measures.

F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the city government.⁶ The ability to successfully implement urban renewal investments—achieving social and environmental benefits, mitigating adverse impacts, and achieving financial sustainability—depends on a sound governance structure.

⁴ ADB REA Checklists for categorization of the project

⁵ ADB. 2003. *Environmental Guidelines* [is this the full title of the publication? If not, please complete].

⁶ CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



The PFS must include the following:

- (i) Discussion of organizational options for design, construction/commissioning and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight and/or regulation of private operations needs to be considered. In terms of services integration, the arrangements for coordination across sectors and facility providers need to be described. Finally, arrangements for stakeholder participation (in particular, any affected persons as described in sections C and E) must be proposed.
- (ii) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements. For example, will existing landowners be shareholders in a redevelopment company? Will informal vendors be included in revamped retail facilities?
- (iii) Consideration of the legal basis of each involved organization, its sources of revenue and responsibilities for expenditures (the two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

Governance elements for urban renewal projects should reflect funding arrangements. Components of such developments, e.g., public markets, can be "unbundled" and will have their own SPV. Consultants must consider such requirements and design the governance structure accordingly. For example, what authority regulates the SPV, and on what legal basis? The organization design under construction may vary from that under operation. These should be described together with arrangements for the required transition.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

G. Institutional Strengthening

Since most Asian cities have various agencies working on different parts of the urban renewal problem, initial priorities for a PFS team should focus on ensuring all concerned agencies participate in the PFS process. The team should design a structure of participation to engage these agencies throughout the whole PFS period. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating approaches to investment.

H. Capacity Development

It is clear that capacity development is an essential foundation for sustainable urban renewal in any given city. The PFS must identify all stakeholders, define their respective responsibilities, and suggest a capacity development program that will match proposed projects and measures. Coordination between the local government, the private sector and international or national nongovernment organizations (NGO) can give synergies and a better impact. The overarching goal is to create a safe and sustainable system and ensure that investments in the sector are properly handled.



The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the PFS as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it will help a city to concretize its city development vision, examine alternatives to solve its urban renewal problems, and recommend investments for further feasibility study and/or implementation.

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the stated urban renewal goals of a city;
- *Impact*—the extent to which the investments impact, positively or negatively, the livability of the area, efficiency of land use, the local economy, nearby natural resources, air quality, energy, the urban transport network and access to services, etc.;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the alternatives are distributed fairly across different population groups.

Sector Guidelines

for Pre-Feasibility Studies on

SLUM UPGRADING



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to slum upgrading and other related issues. These address the approach expected of consultants engaged at the PFS stage as regards slum upgrading.

Slum upgrading consists of physical, social, economic, and environmental improvements made in partnership with citizens, community groups, businesses, and local authorities. These improvements often focus on providing better basic services, mitigating environmental hazards, regularizing security of tenure, and providing incentives for community management and maintenance. Similar to other sector guidelines on specific infrastructure sectors, these guidelines emphasize the need for a cross-sector approach; slum upgrading integrates these improvements through a participatory process leading to improved access to services, resources, and empowerment for disadvantaged groups.



Sector Guidelines: Slum Upgrading

2. Objective

CDIA support to the formulation of any slum upgrading project aims to enhance the project's sustainability and contribution to the overall development goals of poverty reduction, environmental improvement (including climate change), and the promotion of good governance. This means that the project should

1. Comprise a viable component of an *integrated urban investment program* that includes consideration of housing, economic activity, transport issues, infrastructure provision, and social services (see section B);
2. Be *pro-poor* in the sense that it should be sensitive to the problems, needs, and opportunities of marginalized groups and contribute significantly to an improvement in existing conditions. Conversely, potential negative impacts resulting from the project should be (a) minimized, and (b) adequately compensated (see section C);
3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that revenues, subsidies, taxes or levies, microfinancing, grants, loan financing, community service obligation payments, or any combination of these must be capable of funding capital and operations costs of the various components of the project (see section D);
4. Be *environmentally sustainable* in that the proposed investments should contribute to significant improvements to the urban environment through reduction in environmental hazards resulting, from poor solid and liquid waste management, sanitation, air pollution (including green house gas emissions), and contamination of water bodies and land (see section E); *and* that adequate measures will be taken to mitigate any potential adverse environmental impacts of the project (see section E); and
5. Promote *good governance* through sound, transparent governance arrangements enabling efficient financing, design and construction, commissioning, and operation of the project, and carried out through a participatory and inclusive process (see section F).

B. Developing an Integrated Slum Upgrading Project

Slums, or informal settlements, are commonplace throughout the developing parts of Asia, although they vary in magnitude, nature, and context. Typically, they are characterized by the lack of access to clean water and exposure to unsanitary conditions in terms of solid and liquid waste. Slums are usually high density and lack security of tenure. In addition, slums are often located in areas prone to natural disasters or along the periphery of the city. Housing is often substandard and lacks sufficient living space. Despite these daily hardships, slums are also places of community and vibrant economic and entrepreneurial activity.

A successful slum upgrading project must integrate the different aspects of basic service delivery, urban mobility, land tenure, housing and livelihood, and proposed and implemented through a process of community involvement and participation. It must also be integrated in the overall urban framework of planning and investments, rather than being treated in isolation. Slum upgrading projects, therefore, can often be components of a larger urban infrastructure upgrading program.

Slum upgrading projects must aim to enhance the livability of slum areas, utilizing and enhancing the potential of community-based initiatives and local (informal) economy where possible. The



Sector Guidelines: Slum Upgrading

investment project is to be based on a sound planning framework. The consultants will review this framework and the role of the slum upgrading project within it. If it does not adequately provide strategic guidance as regards a project's social, economic, and environmental contribution to the city's development, the consultants should, within the limits of resources provided under the contract, propose objectives based on available data and consultations.

The project design should comprise an integrated investment package of basic services, land and housing, urban transport and livelihood, and show how these will achieve the strategic goals discussed above.

Summary

- ▶ Review planning framework to identify target areas prioritized for improvements.
→ Fill "gaps" with rapid analysis of the urban poverty situation in the city.
- ▶ Analyze, through a consultative process, the key challenges in, and needs of the target communities.
- ▶ In consultation with affected communities, identify and prioritize improvements as part of an integrated slum upgrading project.
- ▶ Propose investments and approaches that positively affect the priority improvement areas and develop them to pre-feasibility.
- ▶ Demonstrate how the proposed design improves access to infrastructure services, and contributes to employment and empowerment with respect to poverty reduction.

C. Developing a Pro-Poor Slum Upgrading Project

The baseline for developing a successful pro-poor slum upgrading project is understanding the needs of the poor, and their priorities and opportunities. This includes an analysis of the following:

1. Brief socioeconomic profile of the target communities
2. The current state of infrastructure systems and services in, and in conjunction with the target area. An outcome should be a clear picture of the needs in terms of urban infrastructure, focusing on provision of basic services. Urban transport should be reviewed from a large geographical perspective, taking into account the needs for mobility to access employment, education, health, recreation, etc. Links between community-based secondary and/or tertiary systems and citywide primary systems should be explored.
3. Land tenure and ownership issues and their impact on investments in housing and infrastructure (rights-of-way)
4. Key gender issues, including safety and security, land ownership, and socioeconomic profile, etc. as important aspects
5. Potential for community participation and a stakeholder analysis of key community groups, including nongovernment organizations (NGO), etc.

The situation analysis should be used to develop a clear set of objectives and indicators for subsequent project development. Objectives should aim at maximizing positive impacts on key development issues. Prioritized projects and their implementation should draw on the full range of opportunities available, including microsavings and microfinancing, community implementation, and involvement in operations and maintenance. Bringing prioritized investments to pre-feasibility should focus not only on economic and financial viability and impacts on crosscutting issues, but



Sector Guidelines: Slum Upgrading

substantially on process, organizational set up, and institutions from a pro-poor perspective. Consultants should keep in mind the dynamics between formal and informal systems.

For the proposed project(s), estimated impacts (positive and negative) should be described, and indicators developed to measure progress against development objectives. The PFS should clearly describe what measures have been taken to ensure that the project benefits the urban poor and the environment, improves governance, and minimizes negative impacts.

Although special care should be taken to ensure that proposed investments benefit the urban poor, there are cases when negative social and economic impacts are unavoidable. Likely disruption to communities in terms of relocation, division, noise, and impacts on livelihood, etc. should be assessed and appropriate mitigation efforts put in place. The scale and cost of relocation should be estimated along with options for on- or near-site resettlement (to minimize disruption to employment). Off-site resettlement is to be avoided wherever possible.

Summary

- ▶ Analyze the situation and needs in the target community in terms of socioeconomic conditions, access to basic services, land tenure, community participation, and gender.
- ▶ Develop a clear set of objectives and indicators for overall development goals.
- ▶ Consider various design options and approaches to maximize positive impacts and minimize negative ones.
- ▶ Bring prioritized projects to pre-feasibility and document how the project is designed to maximize positive impacts on poverty reduction.
- ▶ Estimate impacts (positive and negative) against development goals.

D. Ensuring Financial and Economic Viability

1. Financial Assessment

Slum upgrading projects will ordinarily not generate any major revenue, unless the package includes land-tenure regularization for which residents pay a fee or land-lease charge. Occasionally, co-benefit revenues arise from linking slum upgrading to improving water supply and/or solid waste collection, for which fees are chargeable. In the absence of revenue prospects, financial analysis will be limited to the ability to finance the project. Costs should be benchmarked against average construction costs in country. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures.

The assessment must include an analysis of the local government's cash flow with project capital expenses and subsidies to determine the project's sustainability in relation to the likely revenue streams for the local government(s). Such an analysis should form the basis for discussions on alternate organizational structures for implementation (see section F).

Summary

- ▶ Review (land-based and service-based prospects) revenue prospects and costing and strongly advocate alternatives where such assessments make viability suspect.
- ▶ Adopt realistic return hurdle rates, if applicable.



Sector Guidelines: Slum Upgrading

- ▶ Assess impact of project on local government's budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates (if applicable).

2. Economic Assessment

Economic assessment techniques for slum upgrading projects—basically involving property development and infrastructure investments—normally involve estimates of health improvement and employment (income increase or decrease). These are potentially significant and consultants should make all efforts to estimate them, adopting proxy values such as land value increase where necessary, as set out in ADB's Guidelines for the Economic Analysis of Projects.¹ Care should be taken to identify the actual beneficiaries of such value increases. The project design should safeguard against coerced gentrification. Avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. Adopt ADB standards where available. If this is deemed impossible, at least a cost-effectiveness analysis must be undertaken.

Summary

- ▶ Estimate all benefits of proposed project, adopting proxy values if necessary.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Environmental Issues

Slum upgrading projects may have both environmental benefits and adverse environmental impacts. The objective of the PFS is to maximize the benefits while minimizing the adverse impacts.

An analysis for the environment situation in the target community is the first step in addressing environmental improvements. This should include impacts on the environment as well as the community in terms of exposure and vulnerability to natural hazards and disaster. The situation analysis should be used to develop a clear set of objectives and indicators for subsequent project development.

Consequently, the proposed project should include measures to significantly improve the urban environment through reduction in environmental pollution resulting from poor solid and liquid waste management, sanitation, air pollution (including greenhouse gas emissions), and contamination of water bodies and land.

Options for different environmental improvement measures should be explicitly examined by the PFS. The revenues and cost implications of these measures, and their governance implications should be included in the financial (section D) and governance analysis (section F).

The process of reducing environmental impacts is similar to that adopted for social assessment. The proposed investments and facilities should be screened to determine (i) potential environmental

¹ ADB. 1997. *Guidelines for the Economic Analysis of Projects*.



Sector Guidelines: Slum Upgrading

impacts to communities, and (ii) potential impacts on water resources as set out in ADB's environmental checklist.² Mitigation measures should be formulated and costed. The implications of these measures, if required, should be included in the financial assessment (section D) and governance arrangements (section F) of the project.

Summary

- ▶ Analyze the current environmental situation and its impact.
- ▶ Develop a clear set of objectives and indicators for environmental development goals.
- ▶ Consider various design options and approaches to maximize positive effects and minimize negative impacts.
- ▶ Bring prioritized projects to pre-feasibility and document how the project has been designed to maximize positive impacts on poverty reduction.
- ▶ Estimate both positive and negative impacts against development goals.

F. Governance Arrangements

The institutional arrangements for implementing, operating, and maintaining the project must be clearly described and agreed with the client government.³ Fundamentally, the ability to successfully implement slum upgrading investments, achieving social and environmental benefits, avoiding or mitigating adverse impacts, and achieving financial sustainability, depends on a sound governance structure.

Design of this structure must include the following:

- (a) Discussion of organizational options for design, construction/commissioning, and operation. In terms of services integration, the arrangements for coordination across sectors and facility providers need to be described. Finally, arrangements for stakeholder participation (in particular any affected persons as described in section C), taking special consideration to gender concerns, must be proposed.
- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements.
- (c) If land-tenure regularization is part of the package, the institutional arrangement for effectively implementing this part will need to be reviewed, and if current arrangements are found to be deficient, strengthening measures (see Section G) are to be proposed. This may be at the level of city government or deconcentrated units of national land management agencies.
- (d) Consideration of the legal basis of each involved organization, its sources of revenue and responsibilities for expenditures (the two must match), and the hierarchy of authority across organizations (the legal basis of coordination).
- (e) Consideration of risks and threats to a successful project implementation, including political, financial, public acceptability, corruption, etc.

² ADB 2003, *Environmental Guidelines*.

³ CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



Sector Guidelines: Slum Upgrading

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal, organizational, and financial basis of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

G. Institutional Strengthening

There are many different stakeholders involved in slum upgrading. These include both formal and informal stakeholders with varying degrees of power, mandate, influence, and resources. Initial priorities for a pre-feasibility team should focus on ensuring all concerned stakeholders participate in the PFS process. The PFS consultant team should design a structure of participation to engage stakeholders throughout the duration of the pre-feasibility study. Special care shall be taken to find structured forms for letting affected communities participate in planning, prioritization, and decision making. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating the approaches to investment.

H. Capacity Development

It is clear that capacity development is an essential foundation for successful slum upgrading in any given city. There is a need to raise awareness, generate and disseminate knowledge, and share good practices with local officials, planners, and engineers. It is especially urgent to improve dialogue and coordination between urban poor communities and planners and decision makers.

The PFS team should strive to identify these actors and stimulate dialogue between NGOs, government, and the private sector to ensure a common understanding and basis for action.

The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, for the whole duration of the PFS as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it will help a city concretize its city development vision, examine alternatives to solve the challenges of slums, and recommend investments for further feasibility study and/or implementation.

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the stated slum upgrading goals of a city;
- *Impact*—the extent to which the investments impact, positively or negatively, the livability of the area, security of residential land tenure, efficiency of land use, the local economy, nearby natural resources, air quality, energy, the urban transport network, and access to services, etc.;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the alternatives are distributed fairly across different population groups.

Sector Guidelines

for Pre-Feasibility Studies on

URBAN TRANSPORT



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to urban transport and other related issues. Finally, these guidelines focus on passenger transport and nonmotorized transport (NMT) and transport management interventions. Goods transport faces many of the same issues, but these guidelines do not address goods transport issues, such as how to address the logistics needs of local enterprises and intermodal nodes.

2. Objective

CDIA support to the formulation of any urban transport project aims to enhance the sustainability and inclusiveness of the project. This means that the project should

1. Comprise a viable component of an *integrated transport system* (see section B);
2. Be *inclusive* in the sense that there affordable and accessible options are available to different income groups comprising its potential users, *and* that persons negatively affected by the project should be minimized and adequately compensated for any adverse impacts (see section C);



Sector Guidelines Urban Transport

3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that fare box revenue, subsidies, taxes or levies, concession and/or lease revenue, microfinancing, grants/loans, community service obligation payments, carbon credits, or any combination of these must be capable of funding capital and operational costs of various components of the project, including long-term maintenance and capacity building (see section D);
4. Be *environmentally sustainable* in that the proposed transport solutions should maximize the energy savings and/or potential mitigation of greenhouse gas of the system *and* that adequate measures will be taken to integrate climate resilience into, and mitigate any potential adverse environmental impacts of, the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Transport System

The vision for any city in Asia must include an environment-friendly, integrated, and inclusive transport system. To achieve this vision, the system must effectively utilize the available transport modes and support the development of these and other modes with appropriate planning and regulatory framework. The investment program to implement a project within a system should be based on a sound planning framework. This planning framework should embody a people-centered approach to urban transport that focuses on the need for (personal) mobility and accessibility rather than on transport as such. The consultant should review this framework and, if it is not adequate, the consultant should, within the limits of resources provided under the contract, review the options for integration as they impact the proposed project and make recommendations on related modes.

An investment in a transit project may form part of a larger system in one mode—for example, one line in a metro system, or the whole system, but crucial to its success will be promoting related "feeder" modes and addressing "competing" modes. "Feeder" modes, e.g., bus ways to metros, tricycle taxis to bus ways, etc., must be accommodated and their frequency and capacity must complement the project investment. Facilities for interchange with these modes may thus be crucial to project viability. In respect of "competing" modes—cars and motorbikes—management is crucial. Parking at major destinations should be restricted and (relatively) expensive.¹ Public transport rights-of-way and footpaths should be kept clear or ridership will suffer from larger trip times and/or lack of access. Potentials for fuel switching to reduce costs and/or reduce environmental impact should also be considered. Such measures may need to be paid for (see section D) and institutionalized in the governance structure of the project (see section F).

Alternative investments in NMT and traffic management may also be a high priority in their own right. Again, these need to be seen as contributing to the effectiveness of an integrated transport system—promoting integration of "feeder" modes such as walking and bicycling, and addressing "competing" modes by controlling parking, managing traffic routes and speeds, clearing and improving footpaths, and developing pedestrian precincts in "heavily walked" areas. Such measures may need to be paid for (see section D) and institutionalized in the governance structure of the project (see section F).

¹ The exception should be parking at transit situations, which should be cheap or free, and adequate to circumstance.



Summary

- ▶ Review planning framework for integration priorities.
 - ➔ Fill "gaps" with rapid analysis of options.
- ▶ Design measures to foster feeder services.
- ▶ Design measures to discourage "competing modes."
- ▶ Integrate NMT and traffic management measures.
- ▶ Consider alternative fuels.

C. Developing an Inclusive Transport Project

The baseline for developing an inclusive transport project is understanding and accommodating the needs of the passengers, especially women, and others affected by it. This includes an analysis of the following:

1. The need for services and willingness to pay for these (by different income groups and in relation to employment opportunities) keeping in mind that "need for services" is not just a matter of where you need to go but also *how* and *when*.²
2. Safety is an important aspect, especially from both poverty and gender perspectives, to ensure that services are accessible for all.
3. The holistic view on transport that takes into account transport as not just passengers and transport systems, but a whole related network involving cleaners, shopkeepers, street vendors, food stalls, informal transport systems, etc., which will invariably be affected positively or negatively by the project.

The first major task for the consultant assessing a transit system is to undertake a rapid screening of the proposed route(s) and facilities to determine the following:

1. The potential ridership by income groups and their relation to employment opportunities, improved mobility in terms of accessibility, affordability, and safety and time savings; ("potential" should be gauged not just by likely cost of assumed mode, but also include potential for cost-reduced modes—nonair-conditioned buses, for example—and cross subsidy possibilities; and
2. Likely disruption to communities along the route in terms of a relocation, division, noise vibration, disruption of the visual context of important historic or scenic sites. The scale and cost of relocation should be estimated along with options for near-site³ resettlement (to minimize disruption to employment).

Changes to the route and/or mode type or design should be considered where (i) significant employment opportunities could be easily accessed, particularly by low-income groups, or (ii) significant disruption could be reduced—for example, extending the system to a low-income area, which would thus gain access to employment, or undergrounding an LRT to avoid a dense, historic area. Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into governance arrangements (section F).

² For example, the ban on taking luggage on the Delhi metro has discouraged some low-income groups from using it.

³ Off-site resettlement is to be avoided wherever possible. Potentials for urban renewal in parallel to the transit development should be assessed in order to provide additional units for resettlement.



Sector Guidelines Urban Transport

Similar issues are faced when considering an NMT, traffic management, or fuel switching project. The project will, positively or negatively, affect the same, usually informal categories of stakeholders including cleaners, shopkeepers, street vendors, food stalls, informal transport systems, etc. Measures for mitigating social impact (or cross subsidies where those benefiting, directly or indirectly, transfer some of that benefit to those adversely affected) will need to be developed. The project design will integrate these mitigation measures and include the cost in the financial assessment (section D) and incorporate required management systems into governance arrangements (section F).

Summary

- ▶ Document the routes—identify potential user groups by income and other characteristics (e.g., gender) along the proposed corridor, and assess their mobility needs and problems as basis for project design.
- ▶ For the proposed design, estimate ridership by group and their access to employment (destination) centers.
- ▶ Consider options for route, and mode type and design to optimize ridership and access, and minimize disruption.
- ▶ Document impacts and mitigation measures, both for transit and NMT or alternate investments.

D. Ensuring Financial and Economic Viability

1. Financial Assessment

Crucial to the viability of a transit investment project will be a realistic assessment of ridership and fare income on the revenue side. The assessment of affordability and willingness to pay on the part of each market segment and the level of mode shift should be rigorous and well documented. If the assessment of preliminary figures is unrealistic, cheaper or more appropriate alternatives should not only be considered, but also strongly suggested (bus way instead of metro, for example). Costs should be benchmarked against average construction costs in country (preferably), or in similar country. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures. For other NMT, transport management, and fuel switching projects, a similar approach is needed with other forms of revenue, such as parking fees, replacing fares as a main revenue source. Creativity, in terms of identifying potential alternative revenue sources, should be encouraged.

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism and other credit or subsidies from international agencies should be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise⁴ to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing as well as a standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved, market rates for return in equity and debt should be the benchmark for viability.

⁴ ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.



In particular, the assessment must include an analysis of the cash flow of local government(s) with project capital expenses and subsidies included to determine the sustainability of the project in relation to the likely revenue streams for the local government(s). Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F). For example, public–private partnership (PPP) models can be used on unbundled, commercially viable components of projects. Thus, such analysis should be done in a preliminary form at the start of the consultant engagement.

Summary

- ▶ Rigorously assess revenue assumptions and costing and strongly advocate alternatives where such assessments make viability suspect.
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on (local governments) budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

2. Economic Assessment

Economic assessment techniques for transport projects are well understood by professionals— time savings and reduced operating costs (or increased costs, e.g., increase in congestion from some types of transit projects) are standard. Less common are broader estimates of willingness to pay, followed by health, employment (income increase or decrease), safety benefits, and other benefits or disadvantages, among others, the disruption caused to affected communities, or the reduction of such disruption. The economist/financial analyst should be aware that these are potentially significant and make all efforts to estimate them, adopting proxy values such as land value increase, where necessary, as set out in ADB's Guidelines for the Economic Analysis of Projects⁵ or alternate analysis such as Goals Achievement Matrices. Care should be taken to avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. Adopt ADB standards where available.

Summary

- ▶ Estimate all significant benefits and disadvantages of proposed project in addition to those routinely incorporated in transport models.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Urban transport projects have both environmental benefits and environmental impacts. The objective of the PFS is to maximize the former while minimizing the latter. The project should include measures to minimize emissions of greenhouse gases and maximize energy savings through (i) fuel switching, (ii) discouraging private transport on the commute, (iii) fostering urban renewal (at higher densities and increased energy efficiency) along the transport corridor, and (iv) more efficient

⁵ ADB. 1997. *Guidelines for the Economic Analysis of Projects*.



Sector Guidelines Urban Transport

feeder systems/NMT linkages. Options for these measures should be explicitly examined by the PFS. The revenues and cost implications of these measures, and their governance implications should be included in the financial (section D) and governance analysis (section F).

To address climate resilience issues, the proposed route(s) and facilities should be screened to determine potential impacts of climate-related events, such as flooding, drying and/or melting of substrata, etc. Resilience measures should be formulated, and preliminary design(s), sufficient for PFS cost estimates, developed. The implications of these measures should be included in the financial assessment (see section D) and governance arrangements (section F) of the project.

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental or similar permit. At the PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.⁶ It is also vital that the requirements and the time frame for a full-blown EIA are identified already during the PFS stage to avoid delays in downstream work as well as unexpected investments costs for environmental protection measures.

In terms of reducing possible adverse environmental impacts, the process is similar to that adopted for social assessment. The proposed route(s) and facilities should be screened to determine (i) potential environmental impacts in terms of noise and pollution to communities, and (ii) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.⁷ Mitigation measures should be formulated and costed. The implications of these measures should be included in the financial assessment (section D) and governance arrangements (section F) of the project.

Summary

- ▶ Document and cost proposed environmental benefits measures.
- ▶ Document and cost proposed environmental mitigation measures.

F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the city government.⁸ The ability to achieve integration of transport investments and social and environmental benefits, avoid and/or mitigate adverse impacts, and achieve financial sustainability, depends on a sound governance structure to provide a coherent policy, planning, regulatory and enforcement framework.

The PFS must include the following:

- (a) Discussion of organizational options for design, construction/commissioning and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight and/or regulation of private operations needs to be considered. In terms of transport integration, the arrangements for coordination across modes and facility providers need to be described. Finally, arrangements for stakeholder participation (in particular, any affected persons as described in sections C and E) must be proposed.

⁶ ADB *Rapid Environmental Assessment checklists for categorization of projects*.

⁷ ADB. 2003. *ADB Environmental Assessment Guidelines*.

⁸ CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements. For example, will existing companies on existing routes participate in owning the proposed bus way? Will their drivers be hired under the new scheme?
- (c) Consideration of the legal basis for each involved organization, its sources of revenue and responsibilities for expenditures (these two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

Governance elements for public transport will often reflect funding arrangements. Components of public transport, e.g., the buses in a bus way can be "unbundled" and will have their own special purpose vehicle (SPV). Consultants must consider such requirements and design the governance structure accordingly. For example, what authority regulates the SPV, and on what legal basis? The organization design under construction may vary from that under operation. These should be described together with arrangements for the required transition.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

G. Institutional Strengthening

Since most Asian cities have various agencies working on different parts of the transport problem, initial priorities for a pre-feasibility team should focus on ensuring all concerned agencies participate in the PFS process. The team should design a structure of participation to engage these agencies throughout the duration of the pre-feasibility study. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating the approaches to investment.

H. Capacity Development

It is clear that capacity development is an essential foundation for sustainable urban transport in any given city. The PFS must identify all stakeholders, define their respective responsibilities, and suggest a capacity development program that will match proposed projects and measures. The PFS team should also strive to stimulate dialogue between non-government organizations (NGO), government, and the private sector to ensure a common understanding and basis for action. The overarching goal is to create a safe and sustainable system and ensure that investments in the sector are properly handled.

The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the PFS as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it may help a city concretize its city development vision, examine alternatives to solve its transport problems, and recommend investments for further feasibility study and/or implementation.



Sector Guidelines Urban Transport

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the stated transport problems in a city;
- *Impact*—the extent to which the investments impact, positively or negatively, nearby natural resources and neighborhood, air quality, energy, the connecting transport network and facilities, land use, the local economy, etc.;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the investments are distributed fairly across different population groups.

Sector Guidelines

for Pre-Feasibility Studies on

ENERGY EFFICIENCY



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to energy conservation and other related issues. These address the approach expected of consultants engaged at the PFS stage as regards energy conservation and efficiency.

Energy conservation activities primarily fall under two categories, energy efficiency and renewable energy. These guidelines will focus mainly on demand energy efficiency, which includes reductions in energy consumption through the provision of urban services as well as in public, residential, and commercial buildings and building users. Urban services such as street lighting, water pumping, and public buildings account for a significant amount of total energy consumption and make up a large portion of a municipality’s expenses. While energy consumption of most urban services comes under the direct control of the city authority, consumption by residential and commercial users is an important component that could be influenced by city governments. Although not discussed in detail, cities may also influence supply side energy efficiency and renewable energy. With the use of regulatory powers and fiscal incentives, cities may encourage activities such as the introduction of



Sector Guidelines Energy Efficiency

technological improvements in power plants, conversion to combined heat and power (CHP) generation, retrofitting buildings with solar or photovoltaic panels and mandating their use in new buildings, and developing electricity generation capacity from “green” sources such as wind, hydro, or solar. Henceforth, energy efficiency in these guidelines will relate to demand side energy efficiency unless otherwise stated.

2. Objective

CDIA support to the formulation of any energy efficiency project aims to enhance the impact, sustainability, and inclusiveness of the project. This means that the project should

1. Comprise a viable component of an *integrated energy conservation program*, including consideration of energy efficient urban development, low carbon transport, resource efficient industrial production,¹ environmental sustainability, and a conducive policy framework (see section B);
2. Be *inclusive* in the sense that affordable and accessible options are available for the stakeholders in the target areas *and* that persons negatively affected by the project should be minimized and adequately compensated for any adverse impacts (see section C);
3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that revenues, subsidies, taxes or levies, concession, lease revenue, microfinancing, grants/loans, community service obligation payments, carbon credits, or any combination of these must be capable of funding capital and operational costs of various components of the project, including long-term maintenance and capacity building (see section D);
4. Be *environmentally sustainable* in that the proposed project must aim at improving the existing environmental and health conditions and that adequate measures will be taken to mitigate any potential adverse environmental impacts of the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Energy Efficiency Project

The vision for any city in Asia must include an environment-friendly, low carbon, integrated, and inclusive development. To achieve this vision, energy efficiency programs are central. These programs are needed to transform the existing environment and local economy. Such programs should be broadly based, ideally integrated² across residential and commercial activities, and based on a sound policy and planning framework. The consultant should review this framework and the role of the energy efficiency project within it. If it is not adequate in terms of providing strategic guidance to the project as regards social, economic, and environmental contribution to the city’s development, the consultant should, within the limits of resources provided under the contract, propose enhancements to this framework based on available data and consultations. Based on an assessment of energy use by residential and commercial sectors, and on an analysis of resource use

¹ Resource efficiency encompasses both energy and material flows.

² Programs involving a single sector or subsector, e.g., energy efficient street lighting, are of course perfectly acceptable as the subject of a CDIA PFS but the guideline is written to encompass a more comprehensive approach to energy efficiency.



Sector Guidelines Energy Efficiency

by industry, priority investments for increasing the efficiency of energy and resource use³ can be identified.

Energy efficiency opportunities can be grouped into three broad fields of activities, urban development, transport, and industrial production systems. Key considerations for each group are set out below.

1. Urban Development

There are two main potential areas of application for energy efficiency:

- a. Greenfield projects would involve new and planned future urban development projects of a commercial and residential nature, involving subdivision of nonurban land. These would normally involve projects for new housing, regional shopping, and employment centers. The focus of energy efficiency activities would be on achieving an urban development pattern that would substantially reduce embedded energy costs in construction, and higher density development to support local public transport systems, energy efficient buildings, and a pedestrian environment.
- b. Retrofitting projects would involve reengineering and retrofitting existing residential, commercial, and public buildings to improve their energy efficiency by improving insulation, circulation, and introducing more energy efficient services.

Planning for more green space, urban agriculture, and orienting buildings to prevailing winds also reduce “heat island” effects, and consequently, energy use for cooling.

2. Energy Efficiency Transportation Projects

It is estimated that the transport sector contributes to 14% of greenhouse gas emissions.⁴ In cities, the figure is much higher. Given that Asian cities remain relatively dense, the following approaches to energy efficiency could significantly reduce the demand for energy in the transport sector:

- a. Mass Transit Systems
Most Asian cities lack good public transport systems with buses, trains, and ferries being overcrowded, and the network does not efficiently service employment areas. Investments to rectify this situation will have a large impact on energy efficiency with commuters switching to more energy efficient modes of transport.
- b. Engine Conversion
Several Asian cities have supported projects to remove, or replace two-stroke engines with four-stroke engines, to reduce particle emission levels and improve fuel efficiency. The conversion of motor vehicles to cleaner fuels and combustion, e.g., buses from diesel to gas usage, offers an important opportunity for energy efficiency.

³ Resource efficiency for industry will always result in energy savings but needs to be based on an analysis of resource flows, production processes, and the 3R—reduce, reuse, recycle—potential. Such analysis can never be made for all industry but the main industrial clusters in a city should be analyzed.

⁴ Stern Report (2006)



Sector Guidelines Energy Efficiency

c. Smart Transport Systems

The major part of the transport network in Asian cities is inefficient, with many competitors operating with excess carrying capacity on the arterial transport network. Development of smart transport systems that improve the efficiency of vehicle carrying levels and limit the number of operators permitted to engage in intra-urban transport services frees up capacity on the road network and improves energy efficiency. Other measures to improve traffic management, including the co-location of bus terminals with major retail, commercial, and industrial employment areas; the development of inter-modal transfer stations and facilities; and the introduction of congestion pricing are measures that boost the use of public transport and reduce per capita GHG emissions from the sector.

3. **Energy Efficient Industrial Area Design and Production Systems**

Industries are major contributors to energy demand and anthropogenic GHG emissions. The International Energy Agency (IEA) (2006) estimates that implementing energy efficiency policies could reduce industrial energy consumption by 10% in developing countries by 2030. There are two key measures that could be quickly applied:

a. Energy Efficient Industrial Area Design and Development

There is a tendency to segregate heavy industrial activities from other lighter scale industrial and/or commercial developments, which significantly reduces opportunities to create industrial synergies or clusters.⁵ Clusters help reduce transaction costs through sharing common infrastructure, facilities and services, and facilitate material recycling and reuse.

b. Cleaner Production Systems

Cleaner production involves firms utilizing fewer materials and adopting cleaner production technology to reduce material inputs and wastes from industrial processes. There are significant energy efficiency opportunities to support the conversion of production systems, such as boilers to more efficient and GHG reducing fuels and technologies.⁶

The project design should describe the key areas of integration across subcomponents relating to the aforementioned five broad fields of activities, infrastructure investments, and how these will achieve the energy efficiency potentials discussed above. Documentation of the project design should also demonstrate in broad terms how it will contribute to the GHG and/or energy efficiency outcomes as against “business as usual” scenarios. For specific infrastructure investments, for example, sector guidelines on urban transport and solid waste management are available. Mechanisms to finance the project should be described in section D, and to manage the project, in section F.

⁵ Enright. 2000. <<Add title of publication.

⁶ The *Journal of Cleaner Production* includes many articles on ways to make industrial systems cleaner.



Sector Guidelines Energy Efficiency

Summary

- ▶ Review planning framework to identify important gaps and recommend approaches for policy to bridge these gaps.
- ▶ Identify priority investment components in each of the key intervention areas.
- ▶ Demonstrate, and quantify where possible, how the proposed project improves on the “business as usual” scenario.

C. Developing an Inclusive Energy Efficiency Project

The base for developing an inclusive energy efficiency project is understanding the capacity of local communities, particularly the poor, to participate in and benefit from program components. This includes an analysis of the following:

1. Employment impacts and constraints to participation, including a holistic view of the community, taking into account informal economic activity such as cleaners, shopkeepers, street vendors, food stalls, informal transport systems, etc., which may be affected positively or negatively by the project.
2. The need for support to engage poverty groups in these programs (by different income and other groups such as single -parent households), with special focus on women who are the main energy consumers and buyers in household-related consumption (such as cooking gas, firewood and/or coal, and electricity).

The first major task for the consultant is to undertake a rapid screening of the proposed program components to determine the following:

- The potential benefits to income and other groups and their employment opportunities; (“potential” should be gauged not just by likely cost of conventional delivery but also include potential for cost-reduced delivery—local, rather than imported, materials for insulation, for example—and cross-subsidy possibilities); and
- Likely disruption to communities in terms of a relocation, division, noise, disruption of the visual context of important historic or scenic sites. The scale and cost of relocation should be estimated along with options for near-site resettlement⁷ (to minimize disruption to employment).

Changes to the design should be considered where (i) significant employment opportunities could be created or made more accessible, particularly for low-income groups, or (ii) significant disruption could be reduced. Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into the governance arrangements (section F).

⁷ Off-site resettlement is to be avoided wherever possible. Potentials for energy efficiency in parallel to transit development should be assessed, to provide additional units for resettlement.



Sector Guidelines Energy Efficiency

Summary

- ▶ Document the design by subcomponent and assess outcomes for each group (define market segments by identifying key potential users and/or beneficiary groups by income and other characteristics, e.g., gender).
- ▶ For the proposed design, estimate benefits by group.
- ▶ Consider alternative design options to maximize employment and other benefits, particularly for the poor, and to minimize disruption.

D. Ensuring Financial and Economic Viability

1. Financial Assessment

Crucial to the viability of the project will be a realistic assessment of revenue streams for each investment with a direct cost recovery component, such as energy production, water supply, insulation savings, and others. Often, assumptions are "over optimistic." The assessment of affordability and willingness to pay on the part of each market segment in each investment should be rigorous and well documented. If the assessment of existing preliminary estimates suggests they are unrealistic, cheaper, more appropriate alternatives, or increase in the density of development should not just be considered but also strongly suggested. Costs should be benchmarked against average construction costs in country (preferably), or in like country. The latter is available on the web. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures.

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism (CDM) for energy efficiency investments, and other credit/subsidies from international agencies should be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise⁸ to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing as well as a standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved, market rates for return in equity and debt should be the benchmark for viability.

In particular, the assessment must include an analysis of the cash flow of the participating (mostly local) government(s) with project capital expenses and subsidies included to determine the sustainability of the project in relation to the likely revenue streams for the local government(s). Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F). For example, public–private partnership (PPP) models can be used on unbundled, commercially viable components of projects. Thus, such analysis should be done in a preliminary form early in the consultant engagement period.

⁸ ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.



Sector Guidelines Energy Efficiency

Summary

- ▶ Rigorously assess revenue assumptions and costing and strongly advocate alternatives where such assessments make viability suspect.
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on local governments' budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

2. Economic Assessment

Economic assessment techniques for energy efficiency projects are understood by professionals. These normally include estimates of cost savings, health improvement, and employment (income increase or decrease). Benefits from avoided carbon emissions are less commonly taken into account. The economist/ financial analyst should make all efforts to estimate them, adopting proxy values such as where necessary as set out in ADB's Guidelines for the Economic Analysis of Projects.⁹ Care should be taken to avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. Adopt ADB standards where available.

Summary

- ▶ Estimate all benefits of the proposed project.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Environmental sustainability for cities calls for energy savings, energy efficient codes, and standards and measures to mitigate ecological degradation and maximize environmental benefits.

1. Energy savings are crucial for sustainability

Cities are major users of power and can achieve savings by introducing technical innovations such as automatic switching of street lighting and the use of energy-saving lights, and improving management and operation arrangements, including contracting out of maintenance services. Measures to optimize pumping operations in water and sewerage systems of frequent and large power users can also result in significant power savings. So can system improvements that reduce leakage. As energy savings become increasingly important, the incentives for more energy efficient housing and behavior will need to come mainly from national government policies, with legislative and financial instruments introduced in the city and/or regional government.

In addition to the transport and/or land use initiatives previously discussed, cities can reduce individual energy use by planning to cut energy consumption, encourage alternative energy generation such as wind and solar power, support the development and use of efficient transport

⁹ ADB. 1997. *Guidelines for the Economic Analysis of Projects*.



Sector Guidelines Energy Efficiency

technologies, and encourage the adoption of energy efficient development, housing, and construction materials. Much of the agenda can be accomplished or at least encouraged by formulating and enforcing appropriate planning and building regulations, utility pricing, and land tax.

2. Match building codes to sustainability requirements

Most cities can adopt bylaws to regulate the construction of buildings through design and construction requirements and administrative provisions for approvals, inspection, and enforcement. The practice of developing, approving, and enforcing building codes varies widely from country to country. Some codes include structural safety, fire safety, and health requirements, while others include noise mitigation and accessibility requirements. Traditionally, building codes have been long, complex sets of rules requiring a great deal of specialized knowledge to interpret. These codes have often been inappropriate for Asian cities and, in enforcing minimum standards, governments have increased development costs and often made it difficult for low-income families to afford housing built to legal standards. Asia's building codes—often based on those of the developed and industrialized countries that have different physical, climate, and social environments—should change to become more appropriate to the needs of dense, mixed-use, rapidly growing, and largely tropical or subtropical cities.

Lately, many Asian countries have begun relaxing building standards by reducing lot sizes and allowing mixed use. This flexibility can be expanded. For example, several countries, beginning with Australia, have moved to much shorter, objective-based buildings codes in recent years. Rather than prescribing specific details, these codes list a series of objectives that all buildings must meet but leave the question of methods open. When they apply for a building permit, the designers must demonstrate how they meet each objective. From the environmental perspective, building codes should aim at maintaining densities, encouraging the use of natural light and the harvesting of water, utilizing alternative energy, and dealing adequately with wastewater.

3. Maximizing benefits and minimizing impacts

Energy efficiency projects will have environmental benefits, but may also have environmental impacts. The objective of the PFS is to maximize the former while minimizing the latter. In terms of reducing environmental impacts, the process is similar to that adopted for social assessment. The proposed investments and facilities should be screened to determine (i) potential environmental impacts in terms of noise and pollution to communities, and (ii) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.¹⁰ Mitigation measures should be formulated and estimated. The implications of these measures should be included in the financial assessment (see section E) and governance arrangements (section F) of the project.

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental or similar permit. At the PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.¹¹ It is also vital that the requirements and the time frame for a full-blown EIA are identified already during the PFS stage to avoid delays in downstream work as well as unexpected investments costs for environmental protection measures.

¹⁰ ADB. 2003. *ADB Environmental Assessment Guidelines*.

¹¹ ADB *Rapid Environmental Assessment checklists for categorization of projects*.



Sector Guidelines Energy Efficiency

Summary

- ▶ Environmental sustainability can be accomplished or at least encouraged through the formulation and enforcement of appropriate planning and building regulations, utility pricing, and land tax.
- ▶ Building codes and standards should become more appropriate to the needs of dense, mixed-use, rapidly growing, largely tropical or subtropical cities.
- ▶ Document and cost proposed environmental mitigation measures.

F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the client government.¹² The ability to successfully implement energy efficiency investments—achieving social and environmental benefits, avoiding and/or mitigating adverse impacts, and achieving financial sustainability, depends on a sound governance structure.

The PFS must include the following:

- (a) Discussion of organizational options for design, construction/commissioning, and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight and/or regulation of private operations needs to be considered. In terms of services integration, the arrangements for coordination across sectors and facility providers need to be described. Finally, arrangements for stakeholder participation (in particular, any affected persons as described in sections C and E) must be proposed.
- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements. For example, will existing landowners be shareholders in a redevelopment company? Will informal vendors be included in revamped retail facilities?
- (c) Consideration of the legal basis of each involved organization, its sources of revenue and responsibilities for expenditures (these two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

Governance elements for energy efficiency projects should reflect funding arrangements. Components of such developments can be "unbundled" and will have their own SPV. Consultants must consider such requirements and design the governance structure accordingly. For example, what authority regulates the SPV, and on what legal basis? The organization design under construction may vary from that under operation. These should be described together with arrangements for the required transition.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

¹² CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



G. Institutional Strengthening

Since most Asian cities have various agencies working on different parts of the energy efficiency problem, initial priorities for a PFS team should focus on ensuring all concerned agencies participate in the PFS process. The team should design a structure of participation to engage these agencies throughout the duration of the PFS period and develop a communication strategy to ensure participation. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating approaches to investment.

H. Capacity Development

It is clear that capacity development is an essential foundation for sustainable energy efficiency in any given city. The PFS must identify all stakeholders, define their respective responsibilities, and suggest a capacity development program that will match proposed projects and measures. The overarching goal is to create a safe and sustainable system and ensure that investments in the sector are properly handled.

In many Asian cities, several international or national nongovernment organizations (NGOs) are active in public awareness programs or other capacity development. Although this is generally commendable and useful from an educational point of view, these activities are often isolated events and seldom coordinated with the local government programs, on a long-term basis. The PFS team should strive to identify these actors and stimulate dialogue between NGOs, government, and private sector to ensure a common understanding and basis for action.

The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the PFS as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it may help a city concretize its city development vision, examine alternatives to solve its energy efficiency problems, and recommend investments for further feasibility study and/or implementation.

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the needed energy efficiency goals of a city;
- *Impact*—the extent to which the investments impact, positively or negatively, the livability of the area, efficiency of land use, the local economy, nearby natural resources, air quality, energy, the urban transport network and access to services, etc.;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the alternatives are distributed fairly across different population groups.

Sector Guidelines

for Pre-Feasibility Studies on

SOLID WASTE MANAGEMENT



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to solid waste management and other related issues. These address the approach expected of consultants engaged at the PFS stage as regards solid waste management.

2. Objective

CDIA support to the formulation of any solid waste management project aims to enhance the impact, sustainability, and inclusiveness of the project. This means that the project should

1. Comprise a viable component of *integrated solid waste management* that includes a holistic approach to provision of services and infrastructure, institutional capacity, environmental and social concerns, and economic and financial systems (see section B);
2. Be *inclusive* in the sense that stakeholders should be involved (i) to ensure a tailor-made and sustainable solid waste management system, accessible and affordable to all regardless of



Sector Guidelines Solid Waste Management

income level, education, gender, etc. in the targeted areas, and (ii) minimize the risk of unfounded (investment) decisions and adverse impacts. Any risk of negative impact should be clearly communicated and measures taken to adequately compensate stakeholders (see section C);

3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that revenues, subsidies, taxes or levies, concession/lease revenue, microfinancing, grants/loans, community service obligation payments, carbon credits, or any combination of these must be capable of funding capital and operational costs, including long-term maintenance and capacity building in the various components of the project (see section D);
4. Be *environmentally sustainable* in that the proposed solid waste management system must aim to improve the existing environmental and health conditions *and* that adequate measures will be taken to mitigate any potential adverse environmental impacts of the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient planning, financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Solid Waste Management System

The vision for any city in Asia must include an environment-friendly, low-carbon, integrated, and inclusive development. To achieve this vision, proper solid waste management is one central component. The introduction of an integrated solid waste management system must make use of the existing infrastructure and build on sound visions, policies, strategies and plans, not limited to waste management but all sectors that influence the performance of such a system. The proposed investment project must also be based on a sound policy and planning framework and within the relevant regulatory framework. There should be a user-friendly approach where the system is developed to meet the needs of people rather than focusing on the investment in advanced infrastructure as such. In case the framework is not adequate, or threatens the successful implementation of the project, the PFS should at an early stage identify the key issues and determine how they can be solved.

An overall assessment of the current solid waste management, strengths, weaknesses, and areas for intervention, should be made based on baseline data, and assumptions where data are not available. The PFS should address the following key considerations in an integrated system:

- **Service provision to all**

Waste collection services are vital to all and the PFS should carefully investigate, as far as possible depending on availability of data or other input, the actual provision of services, particularly to marginalized areas. The role of women in waste management should be recognized and the project adjusted thereto. The reasons for non-service must be examined and innovative solutions including alternative, tailor-made systems, and cooperation, for example, with the informal sector, nongovernment and community based organizations (NGO and CBO), and private sector should be encouraged.



Sector Guidelines Solid Waste Management

The PFS should also, at least to some extent, study the mechanisms for waste collection and handling of waste from the private sector, hospitals, and other waste generators that are not part of the local (client) government's responsibility.

▪ **Appropriate technology**

The solid waste management project(s) proposed in the PFS should not be an isolated solution to a single problem, but be an integrated and logical part of a whole system, including the whole chain of events from the source to final treatment or disposal. Emphasis should also be put on the operation and maintenance of such a system, both in provision of funds and human resources, to ensure the sustainability of the project. The concept of appropriate technology should be adopted. This can include promotion of new, available technology (e.g., pyrolysis or gasification) and low-tech, labor-intensive solutions (e.g., composting) that meet the needs and suit the conditions of the area in question. The choice of technology or system can also depend on visions for renewable energy, green housing, climate change, etc.

▪ **Coordination with other development**

The solutions selected must also be coordinated with other infrastructure and development plans. For solid waste management, it is particularly vital to investigate the urban road network and conditions and how this will be developed or upgraded. The existence or plans of a wastewater treatment plant, for domestic or industrial effluents, will also have a bearing on decisions regarding the siting of new landfill or a biodigester, for example. As far as possible, given the limited time frame, the PFS must investigate these other plans and coordinate with the relevant departments as well as other stakeholders. Coordination with the private sector can lead to a mutual beneficial use of existing or planned infrastructure, e.g., energy supply from landfill gas extraction. By inviting the nongovernment or community based organizations (NGO/CBO) and informal sector, the choice of technology can be better founded, understood, and supported. The consultant should investigate if there is any other externally or nationally financed assistance in the sector and complement it.

▪ **Land use**

Strategic planning and the proposed projects in solid waste management must be coherent with land use plans for at least the next 15 years or more. Special attention should be given to the risk of locating a landfill or other waste treatment facility in an area that may be suitable and accessible today but will in a few years be too close to the expanding urban core, new housing development, an airport, etc. Any conflict in land use as well as the reduced value of land should be addressed and the proposed projects should be clearly presented, preferably with GIS.

Summary

- ▶ Review planning and regulatory framework to identify terms or gaps that may hamper the project and recommend approaches for policy to bridge these gaps.
- ▶ Identify the necessary building blocks in an integrated system—people's needs, appropriate technology, land use, human resources, and urban road network.
- ▶ Identify prioritized projects and necessary investments.
- ▶ Demonstrate, and quantify where possible, how the proposed project improves the environment, and living conditions of people, especially the poor and women.



C. Developing an Inclusive Solid Waste Management Project

The basis for an inclusive project would be to identify and invite all stakeholders to actively participate already during the planning process, for them, particularly the poor, to benefit from the project components. Gender aspects are crucial—women and children are more vulnerable to the adverse impacts of pollution, and women are often responsible for waste management in households, so they are vital to any development herein.¹ The overall aim is to develop a tailor-made and sustainable solid waste management system that is accessible and affordable to all, and to minimize the risk of unfounded (investment) decisions and adverse impacts.

The PFS should analyze the following:

1. Livelihood tied to waste management activities, particularly informal commercial activity connected to collection of recyclables at source or through scavenging the dumpsites, and how the project will affect this negatively or positively
2. New employment opportunities tied to project components and cooperation with and possibly formalization of the informal sector
3. Likely disruption to communities in terms of a relocation, division, noise, disruption of the visual context of important historic or scenic sites. The scale and cost of relocation should be estimated along with options for near-site resettlement (to minimize disruption to employment).

Changes to the design should be considered where (i) significant employment opportunities could be created and more easily accessed, particularly for low-income groups, or (ii) significant disruption could be reduced. Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into governance arrangements (section F).

Summary

- ▶ Identify stakeholders for consultation at an early stage.
- ▶ Identify livelihood issues and design a project that will benefit as many as possible, especially the poor, directly or indirectly.
- ▶ Propose a project that will minimize disruption to the community.

D. Ensuring Financial and Economic Viability

1. Financial Assessment

The primary aim of the financial assessment is to make a realistic assessment, as far as possible, of the project costs in investment and operation and maintenance (O/M) project revenues, and possible financing schemes, either from own sources or external funds. It should be acknowledged that given the early stage in project design, it may be difficult to estimate investment costs in particular. For instance, the site selection and land acquisition have yet to be finalized, or the final choice of technology have yet to be further elaborated in a feasibility study or detailed engineering design study. However, the PFS should include this primary, early assessment to indicate to both local government and potential investors whether the project is worth pursuing.

¹ See ADB checklists on involuntary resettlement, indigenous peoples planning, poverty reduction, participation and gender and development.



Sector Guidelines Solid Waste Management

It is vital for the viability of the project that consultants investigate revenue streams for each investment with a direct cost recovery component, whether it is based on user fees or revenues from energy production (landfill gas/biogas production), recyclables, compost, etc. Possible revenues should not be exaggerated. Recyclables may disappear before entering the formal system, and possibilities to actually sell organic fertilizer (from solid waste) may be limited. The assessment of affordability and willingness to pay on the part of each market segment in each investment should be rigorous and well documented. The possibilities of differentiated fee systems, based upon the polluter-pays principle and financial ability, should be investigated. The risk of noncompliance in payment of user fees and the possible measures should also be discussed.

Existing project cost estimates should be investigated so that new solutions, at reduced costs or better performance, etc., can be suggested. Costs should be benchmarked against average construction costs in country (preferably), or in a similar country. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures.

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism for investments, particularly for waste-to-energy/renewable energy through methane gas captured from landfills or biogas production should be investigated if considered viable and proven. Other credit/subsidies from international agencies should also be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise² to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing and standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved, market rates for return in equity and debt should be the benchmark for viability.

In particular, the assessment must include an analysis of the cash flow of participating local government(s) with project capital expenses and subsidies included to determine the sustainability of the project in relation to the likely revenue streams. Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F). For example, public-private partnership (PPP) models can be used on unbundled, commercially viable, components of projects. Thus, such analysis should be done in a preliminary form early in the term of consultant engagement.

Summary

- ▶ Assess project investment and O/M costs, as far and realistically as possible
- ▶ Assess revenue generation, both direct and indirect revenue base, and willingness to pay.
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on (local governments) budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

² ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.



2. Economic Assessment

The economic assessment in a solid waste management (SWM) project should include estimates of willingness to pay for services as a basic benefit yardstick, augmented by cost savings due to public health improvement, livelihood opportunities, more efficient land use, and increase in tourism among others. Special attention should be paid to the large informal sector in waste management and its economy, and how much people are paying for informal waste collection services. Livelihood issues should not be underestimated, but different models of engaging people in a comprehensive waste management system should be explored.

Benefits from reduced carbon emissions should also be shown in the PFS, adopting proxy values where necessary as set out in ADB's Guidelines for the Economic Analysis of Projects.³ Care should be taken to avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. ADB standards should be adopted in the PFS where available.

Summary

- ▶ Estimate all significant benefits and disadvantages of the proposed project.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Solid waste management projects would typically strive at improving the environmental and health conditions. The PFS should assess the impacts associated with the present system and how these will change after the proposed project implementation. The objective of the proposed PFS intervention is to maximize the positive impacts and minimize negative ones, if any.

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental or similar permit. At the PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.⁴ It is also vital that the requirements and the time frame for a full-blown EIA are identified already during the PFS stage to avoid delays in downstream work and unexpected investments costs for environmental protection measures.

In terms of reducing possible adverse environmental impacts, the process is similar to that adopted for social assessment. The proposed investments and facilities should be screened to determine (i) potential environmental impacts in terms of noise and pollution to communities; and (ii) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.⁵ Mitigation measures should be formulated and costed. The implications of these measures should be included in the financial assessment (see section D) and governance arrangements (section F) of the project. This includes the assessment of any positive or negative impacts related to climate change, mitigation through waste-to-energy approach, and needed

³ ADB. 1997. *Guidelines for the Economic Analysis of Projects*.

⁴ ADB *Rapid Environmental Assessment checklists for categorization of projects*

⁵ ADB. 2003. *ADB Environmental Assessment Guidelines*. ADB. 2009. *Safeguard Policy Statement for environment, involuntary resettlement, and indigenous peoples*.



adoption measures, including alternative routes for waste collection or landfill design better adjusted to flooding risks.

Summary

- ▶ Estimate the environmental and health improvement expected from the proposed project.
- ▶ Estimate the proposed project's possible environmental and health-related risks and impacts, and the costs for mitigating these risks.
- ▶ Investigate possibilities to reduce greenhouse gas emissions or minimize the risk of increased emissions (mitigation), and if the project is part of adaptation measures.

F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the city government.⁶ The ability to successfully implement solid waste management projects —achieving social and environmental benefits, avoiding and mitigating adverse impacts, and achieving financial sustainability - depends on a sound governance structure.

The PFS must include the following:

- (a) Discussion of organizational options for design, construction/commissioning and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight, monitoring, and regulating private operations needs to be considered. A monitoring system with clear and measurable key performance indicators must be discussed. In terms of services integration, the arrangements for coordination across sectors and facility providers need to be described. Stakeholders must be involved at an early stage, and their continued influence and input should be secured and institutionalized for the duration of the project.
- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements.
- (c) Consideration of the legal basis of each involved organization, its sources of revenue and responsibilities for expenditures (the two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

For solid waste management projects, good governance and strong, long-term leadership commitment is crucial, considering for instance, that a landfill is often designed for a period of 30 years and needs monitoring for another 30 years. Fee collection (willingness-to-pay) and resistance to development of infrastructure (e.g., not-in-my backyard) are politically sensitive issues that will demand a good approach and responsible management in project implementation and long-term operation.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

⁶ CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



G. Institutional Strengthening

Solid waste management is an area where many actors in the public and private sector as well as nongovernment or community based organizations, academe, etc. are involved. The PFS team must, at an early stage in the project, (i) identify and assess the valid regulatory framework for handling of solid waste and possibly also wastewater sludge, industrial by-products, hazardous waste, and other aspects relevant to the terms of reference; and (ii) identify the legally appointed actors in the SWM area as well as the actual operators and stakeholders in the whole solid waste chain—from the source to final disposal. Note that the institutional strengthening and the overall sustainability of the project should benefit from a closer inter-departmental interaction, e.g., better coordination between various government offices as well as dialogue and synergies with external players.

The PFS team shall assist the client to design and form a reference group or other structure, and develop a communication strategy to ensure participation of key stakeholders throughout the duration of the project. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating approaches to investment. Closer dialogue will enable faster and more accurate fact-finding and a possibility (for the local government) to elaborate on a better internal structure, including the extended lifetime of the reference group after the finalization of the project.

H. Capacity Development

Capacity development—on all levels from the top administration or governance level to households in informal settlements—is crucial in solid waste management.

The PFS must identify all stakeholders, define their respective responsibilities, present any potential capacity in the SWM area, and suggest a capacity development program that will match proposed projects and measures. This includes enhancing the skills in handling and monitoring an external operator in a PPP setup. The overarching goal is to create a sustainable system and ensure that investments in the sector are properly handled.

In many Asian cities, several international or national nongovernment organizations (NGOs) are active in public awareness and other capacity development programs. Although this is generally commendable and useful from an educational point of view, these activities are often isolated events and seldom coordinated with the local government programs on a long-term basis. The PFS team should strive to identify these actors and stimulate dialogue between NGOs, government, and private sector to ensure a common understanding and basis for action.

The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the pre-feasibility study as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it may help a city to concretize its city development vision, examine alternatives to solve its solid waste management problems, and recommend investments for further feasibility study and/or implementation.



Sector Guidelines Solid Waste Management

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the solid waste related issues and satisfy people’s needs in a city;
- *Impact*—the extent to which the investments impact, positively or negatively, the livability of the area, efficiency of land use, the local economy, nearby natural resources, air quality, energy, and the urban transport network and access to services, among others;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the alternatives are distributed fairly across different population groups.

Sector Guidelines

for Pre-Feasibility Studies on

WATER SUPPLY



China Photo&Getty Images

A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to water supply and other related issues. These address the approach expected of consultants engaged at the PFS stage as regards water supply.

2. Objective

CDIA support to the formulation of any water supply project aims to enhance the impact, sustainability, and inclusiveness of the project. This means that the project should

1. Comprise a viable component of *integrated water supply*, including a holistic approach to provision of services and infrastructure, institutional capacity, environmental and social concerns, and economic and financial systems (see section B);



Sector Guidelines Water Supply

2. Be *inclusive* in the sense that stakeholders should be involved (i) to ensure a safe and sustainable water supply system that is accessible and affordable to all regardless of income level, education, and gender in the targeted areas, and (ii) to minimize the risk of unfounded (investment) decisions and adverse impacts. Any risk of negative impact should be mitigated, clearly communicated and measures taken to adequately compensate stakeholders (see section C);
3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that revenues, subsidies, taxes or levies, concession or lease revenue, microfinancing, grants and/or loans, community service obligation payments, carbon credits, or any combination of these must be capable of funding capital and operational costs of various components of the project, including long-term maintenance and capacity building (see section D);
4. Be *environmentally sustainable* in that the proposed water supply system must aim at an improvement of the existing environmental and health conditions *and* that adequate measures will be taken to mitigate any potential adverse environmental impacts of the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient planning, financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Water Supply System

The vision for any city in Asia must include an environment-friendly, low-carbon, integrated, and inclusive development. The most basic need, access to water, whether for drinking, hygiene, or livelihood activities, must be secured for all people in the society. Rapid urbanization and economic growth put pressure on water resources, and climate change and extreme weather conditions add to the challenges of sustainable water supply.

To achieve this vision, it is imperative that both providers and water users—including households, commercial areas, government offices, hospitals, industrial sites, rural areas, and others—manage water resources in a responsible and sustainable manner. The PFS should suggest an integrated water supply system that makes use of existing infrastructure (if any) and build on sound visions, policies, strategies and plans, not limited to water supply but all sectors that influence the performance of such a system. The proposed investment project must also be based on a sound policy and planning framework and within the relevant regulatory framework. In case the framework is not adequate or threatens the successful implementation of the project, the PFS should at an early stage identify the key issues and discuss how these can be solved. An overall assessment of the current water supply system, strengths, weaknesses, and areas for intervention, should be made based on baseline data, and assumptions where data are not available.

The PFS should address the following key considerations in an integrated system:

- **Service provision to all**

Access to safe drinking water is a basic human right. The UN Millennium Development Goals on sustainable access to safe drinking water and basic sanitation include a goal for 2015, “access to improved source of water,” which can be interpreted in different ways. For CDIA, the PFS must include first, planning for provision of safe, sustainable, and affordable supply of drinking water to the people, and second, water supply for other functions in the city. The term “access to water” shall



Sector Guidelines Water Supply

as far as possible refer to convenient access to water, not including standpipes far away from the households. The term "sustainable" must include a reasonable regularity in water supply and secured for future needs.

The PFS should carefully investigate, as far as possible depending on availability of data or other input, for the actual provision of services, particularly to marginalized areas. Special attention should be paid to the risk of water contamination from sewerage systems, and in cases of flooding. The reasons for non-service must be examined and solutions recommended.

▪ **Appropriate technology**

In an urban setting, water supply is often centralized and handled by a provincial or regional government or the private sector. The PFS should aim at investigating available sources and their future availability, and design a treatment plant (if applicable) that considers future capacity needs, urban growth patterns, and land use in the entire water catchment area. A water treatment plant and distribution system is a long-term investment in static construction that may be difficult to change or adjust at a later stage. Thus, careful consideration must be made in the PFS to allow for flexibility as far as possible, to enable increased capacity or combine piped or non-piped connections, for instance.

The concept of appropriate technology should be adopted. This is particularly relevant for possible reuse of water, for example in industries, or for commercial district cooling, public parks, and agriculture, the latter being one of the most water consuming activities in society. The choice of technology or system can also depend on visions for renewable energy, green (eco-) housing, climate change, etc., and include simple low-cost solutions such as rainwater harvesting. If surface water from a lake or river is used, the need for chemical treatment is greater than if ground water were the source. Another concern is the need for electrical power - water treatment is energy intensive. The PFS should strive at reduced energy and chemical consumption and maximum resource utilization.

Special attention should be paid to the challenges in water supply for the poor in informal settlements, where installation of a conventional water distribution network is difficult. Small piped water networks, standpipes, on-site treatment, or other flexible solutions may be considered to allow for rapid and partly uncontrolled urban sprawl.

▪ **Integrated water resource management**

The PFS should focus on the urban water supply—how the water supply system should be set up in an urban setting. However, water management is often a regional or even transnational issue that cannot be handled in isolation by a local government unit. Water rights have been and will continue to be a reason for conflict between governments and other water users.

Whether the water source is ground or surface water, the quality and behavior of the water will depend on external factors, such as the water catchment area and its geophysical conditions, proximity to mountains or coastal plains, soil conditions, built or rural environment, pollution, erosion, climate, among others. Thus, the PFS must be based on Integrated Water Resources Management (IWRM) or Integrated River Basin Management and make use of existing studies, to the extent that it is reasonable and applicable to the studied urban area. This includes the need for close coordination with other local, regional, or national government stakeholders. The PFS may suggest projects that will require involvement by external stakeholders, e.g., riverbank rehabilitation or storage dams.



Sector Guidelines Water Supply

Water management is a highly cross-sector issue in terms of government offices and other key players. It may combine issues on drinking water, sewerage, and drainage and has impacts on the whole society, especially through its vulnerability to flooding that can seldom be predicted or controlled. It is affected by poor waste management, such as leachate from dumpsites that contaminates ground water, or illegal waste dumping in water bodies. Thus, the proposed projects in the PFS should be an integrated part of the whole system in harmony with other existing and planned infrastructure development. Given the limited time frame, the PFS must investigate these other plans and coordinate with the relevant departments and other stakeholders and explore possibilities for the private sector and the community to come in. The proposed project must also not collide with other interventions, financed by a foreign body or otherwise, but rather complement this development.

▪ Land use

The proposed water supply project must be consistent with land use plans. Special attention should be given to risks of contamination of water sources or to water distribution network due to other urban (or rural) development. The increased attractiveness and value of land after extending water supply to that area should be considered. Any conflict in water rights should be addressed at a very early stage.

Summary

- ▶ Review planning and regulatory framework to identify terms or gaps that may hamper the project, and recommend approaches for policy to bridge these gaps.
- ▶ Identify the necessary building blocks in an integrated system—people’s needs, appropriate technology, land use, human resources, urban road network, housing, etc.
- ▶ Identify prioritized projects and necessary investments.
- ▶ Demonstrate, and quantify where possible, how the proposed project will improve the environment, and the living conditions of people, especially the poor and women.

C. Developing an Inclusive Water Supply Project

The basis for an inclusive project would be to identify and invite all stakeholders to actively participate already during the planning process and for the poor in particular, to benefit from the project components. Gender aspects are crucial—women and children are more vulnerable to lack of water supply and subject to waterborne diseases as well as diarrhea. In many countries, women and children are responsible for collecting water and the family’s destiny relies on the amount and quality of water collected.

The overall aim is to develop a sustainable water supply system that accommodates all contributing flows and water consumers, and is accessible and affordable to all with minimal risk of unfounded (investment) decisions and adverse impacts.¹ The PFS should analyze how lack of water supply affects people, their health, livelihood, limitations in land use and urban growth, and how the proposed project can contribute to an inclusive, safe development. The PFS should include water supply solutions for both formal and informal settlements, and investigate possibilities for the poor to contribute in community-managed systems. Employment opportunities that are tied to project components should be examined. If relocation is considered, disruption in basic services to the

¹ See ADB checklists on involuntary resettlement, indigenous peoples planning, poverty reduction, participation, and gender and development.



Sector Guidelines Water Supply

affected population must be examined and measures to minimize such disruption suggested. Furthermore, possible disruption to communities in terms of a relocation, division, noise, disruption of the visual context of important historic or scenic sites should be examined. The scale and cost of relocation should be estimated along with options for near-site resettlement (to minimize disruption to employment).

Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into governance arrangements (section F).

Public awareness should be promoted for *all* water users to understand the implications and risks connected with discarding hazardous liquid waste into the sewerage system, into water reserves and river basins, and the benefits of hygiene and responsible water management and conservation.

Summary

- ▶ Identify stakeholders and invite them at an early stage.
- ▶ Identify livelihood issues and design a project that will benefit as many as possible, especially the poor, directly or indirectly.
- ▶ Propose a project that will minimize disruption to people.

D. Ensuring Financial and Economic Viability

1. Financial Assessment

The primary aim of the financial assessment is to make a realistic assessment of the project costs in investment and operation and maintenance (O/M), project revenues, and possible financing schemes, either from own sources or external funds. It should be acknowledged that given the early stage in project design, it may be difficult to estimate investment costs in particular. For instance, choice of technology for water treatment must be further elaborated in a feasibility study or detailed engineering design study. However, the PFS should include this primary, early assessment to indicate to both local government and potential investors whether is worth pursuing. In case a community-based water management system is considered, it will be much less costly in terms of investment and O/M, but more complex and unpredictable during the planning and implementation phases.

It is vital for the viability of the project to investigate revenue streams for each investment with a direct cost recovery component. The assessment of affordability and willingness to pay on the part of each segment of the market in each investment should be rigorous and well documented. The level of fees must not necessarily be set at cost but based on demand estimates, taking into account how much people pay informal vendors and other informal waste supply systems. The possibilities of differentiated fee systems, cross-subsidy, or tariff blocks, may enable service provision to also to the most vulnerable population, and should be investigated. Equity should be strived at. The risk of noncompliance in payment of user fees, nonrevenue water, and the possible measures should also be discussed.

Existing project cost estimates should be investigated so that new solutions, at reduced costs or better performance can be suggested. Costs should be benchmarked against average construction costs in country (preferably), or in a similar country. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures.



Sector Guidelines Water Supply

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism for water supply investments, and other credit and/or subsidies from international agencies should be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise² to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing as well as a standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved, market rates for return in equity and debt should be the benchmark for viability.

The financial assessment must include an analysis of the cash flow of participating (mostly local) governments with project capital expenses and subsidies included to determine project sustainability in relation to the likely revenue streams. Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F). For example, public–private partnership (PPP) models can be used on unbundled, commercially viable, components of projects. For water supply, the private sector may also have an advantage of not being tied to municipal boundaries, and are free to extend its services anywhere and thus have a better basis for revenues. Such analysis should be done in a preliminary form early in the term of consultant engagement.

Summary

- ▶ Assess project investment and O/M costs, as far and realistically as possible.
- ▶ Assess revenue generation, both direct and indirect revenue base, and willingness to pay.
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on (local governments) budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

2. Economic Assessment

The economic assessment in a water supply project should include estimates of willingness to pay—the economic value of water (e.g., how much is paid for informal water supply systems), augmented by externalities such as cost savings resulting from public health improvement and reduced time (costs) for water collection, and livelihood and investment opportunities due to more efficient land use and increase in tourism. Benefits from reduced carbon emissions should also be shown in the PFS, adopting proxy values where necessary as set out in ADB's Guidelines for the Economic Analysis of Projects.³ Care should be taken to avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. ADB standards should be adopted in the PFS where available.

² ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.

³ ADB. 1997. *Guidelines for the Economic Analysis of Projects*.



Summary

- ▶ Estimate all benefits of proposed project across all involved sectors.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Urban water supply projects would typically strive at securing access to safe drinking water, and water for other uses, e.g., hygiene, agriculture, and industrial and commercial activities. With partly uncontrolled urban sprawl and economic growth, the need for and extraction of water resources lead to environmental risks. The PFS should assess the impacts or risks associated with the present situation and define how this will change after the proposed project is implemented. The objective of the proposed PFS intervention is to maximize positive impacts and minimize negative ones, if any.

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental permit or similar. At PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.⁴ It is also vital that the requirements and the time frame for a full-blown EIA are identified already during the PFS stage to avoid delays in downstream work and unexpected investments costs for environmental protection measures. For water supply, considering the complex water issues in a water catchment area, a comprehensive risk assessment must be made in terms of water rights, land use, water quality and flooding, in coordination with all stakeholders and based on regulatory framework and disaster preparedness.

In terms of reducing possible adverse environmental impacts, the process is similar to that adopted for social assessment. The proposed investments and facilities should be screened to determine: (a) potential environmental impacts to communities; and (b) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.⁵ Mitigation measures should be formulated and costed. The implications of these measures should be included in the financial assessment (see section D) and governance arrangements (section F) of the project. This includes the assessment of any positive or negative impacts or needed measure related to climate change, e.g. renewable energy production from water/sludge and emissions of greenhouse gases.

Summary

- ▶ Identify the relevant environmental regulatory framework and its implications on project implementation.
- ▶ Estimate the environmental and health improvement expected from the proposed project.
- ▶ Estimate the proposed project's possible environmental and health-related risks and impacts, and the costs for mitigating these risks.
- ▶ Investigate the potential for mitigating climate change effects and/or reduction of GHG emissions (or increase).

⁴ ADB *Rapid Environmental Assessment checklists for categorization of projects*.

⁵ ADB. 2003. *ADB Environmental Assessment Guidelines*.



F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the city government.⁶ The ability to successfully implement water supply projects, achieving social and environmental benefits, avoiding and mitigating adverse impacts, and achieving financial sustainability, depends on a sound governance structure and valid national and local policies. This also includes governance of the water source as environmental reserve, for future livelihood and ecological services.

The PFS must include the following:

- (a) Discussion of organizational options for design, construction/ commissioning and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight, monitoring, and regulating private operations needs to be considered. A monitoring system with clear and measurable key performance indicators must be discussed. In terms of services integration, the arrangements for coordination across sectors and facility providers need to be described. Stakeholders must be involved at an early stage, and their continued influence and input should be secured and institutionalized for the duration of the project.
- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements.
- (c) Consideration of the legal basis of each involved organization, its sources of revenue and responsibilities for expenditures (the two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

For water supply projects, good governance is vital for a number of things - clarity of water rights and water-use rights, discipline and reliability in the system performance, long-term protection of water resources and public awareness on responsible water use, among others. High quality system performance requires experienced and highly skilled technical staff, and it may be a challenge particularly for local and/or provincial governments to keep these human resources. The obvious connection between paying for water and getting water supply is well understood, thus this is a good fundament for revenue collection, but it may be ethically difficult for a provider to put disruption of services to a poor household, for instance, in case tariffs are not paid. This process can only be successfully achieved if an open and transparent relationship between the service provider (water supply company) and service user and beneficiary (communities, citizens, civil society) exists.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

G. Institutional Strengthening

The PFS team must at an early stage in the project, (i) identify water rights and water governance boundaries; (ii) identify and assess the valid regulatory framework for water supply, water quality

⁶ CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



and other aspects relevant to the TOR; and (iii) identify the legally appointed actors in the area as well as the actual operators and stakeholders, which may be in a relatively large geographical area depending on the water catchment area. Institutional strengthening and the project's overall sustainability will require close inter-departmental interaction.

The client shall then, supported by the PFS team, design a reference group or other structure and a communication strategy to ensure key stakeholders' participation throughout the whole project. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating approaches to investment. Closer dialogue will enable faster and more accurate fact-finding and a possibility (for the local government) to elaborate on a better internal structure, including the extended lifetime of the reference group after the finalization of the project.

H. Capacity Development

The PFS must identify all stakeholders, define their respective rights, roles and responsibilities, present any potential capacity in water supply management, and suggest a capacity development program that will match proposed projects and measures. The overarching goal is to create a sustainable system and ensure that investments in the sector are properly handled. This includes technical and environmental expertise with operational staff, and the ability to manage and monitor the operation, especially in a PPP setup. It also includes public awareness addressing among others, the pollution of drinking water sources or tapping sewage pipes for irrigation purposes, and respective health risks.

For water supply, the jurisdictional area for water resources is not easily defined and as water resources become scarce, conflicts likely become more common. In the PFS, such conflicts can be investigated if there is a need to bring together stakeholders from a wider geographical and institutional area to learn more about water resource management and water governance, etc. Coordination between the local government and/or the private operation and international or national nongovernment organizations (NGOs) can give synergies and a better impact.

The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the pre-feasibility study as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it may help a city concretize its city development vision, examine alternatives to solve its water supply problems, and recommend investments for further feasibility study and/or implementation.

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments meet the water supply objectives of a city and satisfy the needs of the people;
- *Impact*—the extent to which the investments impact, positively or negatively, the livability of the area, efficiency of land use, the local economy, air, soil and water, nearby natural resources, energy, the urban transport network and access to services, etc.;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;



Sector Guidelines Water Supply

- *Financial sustainability*—the extent to which the funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the alternatives are distributed fairly across different population groups.

Sector Guidelines

for Pre-Feasibility Studies on

WASTEWATER MANAGEMENT



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to wastewater management and other related issues. These address the approach expected of consultants engaged at the PFS stage as regards wastewater management.

2. Objective

CDIA support to the formulation of any wastewater treatment project aims to enhance the impact, sustainability, and inclusiveness of the project. This means that the project should

1. Comprise a viable component of *integrated wastewater management*, including a holistic approach to provision of services and infrastructure, institutional capacity, environmental and social concerns, economic and financial systems (see section B);
2. Be *inclusive* in the sense that stakeholders should be involved (i) to ensure a tailor-made and sustainable wastewater treatment system after having considered a range of possible options for solutions that are accessible and affordable to all regardless of income level, education, gender, etc. in the targeted areas, and (ii) to minimize the risk of unfounded



(investment) decisions and adverse impacts. Any risk of negative impact should be clearly communicated and measures taken to adequately compensate stakeholders (see section C);

3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that revenues, subsidies, taxes or levies, concession/ lease revenue, community service obligation payments, carbon credits or any combination of these must be capable of funding capital and operational costs in various components of the project, including long-term maintenance and capacity building (see section D);
4. Be *environmentally sustainable* in that the proposed wastewater treatment system must aim to improve existing environmental and health conditions *and* that adequate measures will be taken to mitigate any potential adverse environmental impacts of the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient planning, financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Wastewater Management System

The vision for any city in Asia must include an environment-friendly, low-carbon, integrated, and inclusive development. To achieve this vision, it is imperative that all wastewater—whether from households, commercial areas, government offices, hospitals, industrial sites, or other sources—is treated properly before entering the natural bodies of water that people depend on. An integrated wastewater management system should typically make use of existing infrastructure (if any) and build on sound visions, policies, strategies and plans, not limited to wastewater management but all sectors that influence the performance of such a system. The proposed investment project must also be based on a sound policy and planning framework and within the relevant regulatory framework. In case the framework is not adequate or threatens the successful implementation of the project, the PFS should at an early stage identify the key issues and determine how these can be solved.

An overall assessment of the current wastewater management, strengths, weaknesses, and areas for intervention, should be made based on baseline data, and professional judgment where data are not available. The PFS should address the following key considerations in an integrated system:

▪ Service provision to all

The provision of sewerage network and the need for it may not be fully comprehended or appreciated by the public, if compared to the obvious nuisance from e.g. lack of solid waste collection services. The pollution from wastewater to surrounding water bodies is also less visible and more difficult to link to a specific source. However, the collection and treatment of wastewater is vital to a city's sustainability. The PFS should carefully investigate, as far as possible, depending on availability of data, the current situation as to provision of services, particularly to marginalized areas. Special attention should be paid to the possible combined storm water/drainage¹ and sewerage piping network, and the challenges to the system in case of heavy rainfall. The reasons for non-service must be examined and solutions recommended, bearing in mind disaster management and flooding issues. Technical considerations should include additional load to the wastewater treatment plant and potential impacts on septic tanks (e.g., overflow during flooding), failure at the treatment plant, and bypass of untreated water.

¹ CDIA 2011 *Sector Guidelines for Pre-feasibility Studies on Flood and Drainage Management*



Sector Guidelines Wastewater Management

The PFS should also, as far as reasonable, elaborate on the actual load and contributing flows to the common wastewater treatment plant (if any) from industrial sites, hospitals, and others that typically should provide their own water treatment facility prior to discharging to the public network.

- **Appropriate technology**

The location and design of a large-scale wastewater treatment plant must naturally be carefully considered for future capacity needs, urban growth patterns, and land use in the vicinity. The concept of appropriate technology should be adopted—i.e., the choice of technology can range from large-scale, more conventional plants to small-scale solutions that meet the needs and suit the conditions of the area in question. The choice of technology or system can also depend on visions for renewable energy, green housing, climate change, among others.

For wastewater treatment, high-capacity treatment plants are the urban norm, but septic—on-site or decentralized—systems should be considered for low-density urban areas. The installation and use of small-scale systems for domestic wastewater may be more suited for addressing rapid and/or partly uncontrolled urbanization, low-density development, and/or where there are difficulties in cost-recovery. Regardless of the size of the treatment plant, the PFS should strive at maximum resource recovery/reuse, whether it concerns water reuse, energy consumption (or production), or nutrients in water or sludge.

- **Coordination with other development**

The wastewater management project(s) proposed in the PFS should be an integrated and logical part of a whole system, i.e., be in harmony with other infrastructure development. The connected infrastructure in wastewater management—typically consisting of the sewerage network, wastewater treatment plant, and sludge disposal site—is a long-term investment in a construction that may be difficult to change or adjust at a later stage. Thus, careful consideration must be made in the PFS to, allow for flexibility. This would entail, for instance, allowing for expansion to increase capacity or preparing for connection to the electricity grid so that energy from biogas production can be supplied. The siting of a treatment plant may also depend on the urban road network, for example, and the existence or plans for a sanitary landfill for the transport and disposal of dewatered sludge. There may be added value through coordination and linkage to rural areas, e.g. utilization of dewatered sludge as fertilizer, or reuse of water for irrigation. As far as possible, given the limited time frame, the PFS must investigate these options, coordinate with the relevant departments and other stakeholders, and explore possibilities for public–private partnership (PPP). The consultants should also investigate if there is any other assistance in the sector. The proposed project must complement other externally or nationally financed interventions.

- **Land use**

The proposed wastewater management project must be consistent with land use plans, and the size and operation of such a plant often makes it difficult to find a suitable area. Special attention should be given to the risk of locating a wastewater treatment plant in an area that may be suitable today but will, in a few years, be too close to expanding urban areas or new housing development. The possibility of renewable energy production and distribution may also have a bearing on location. Any conflict in land use as well as the reduced value of land should be addressed.



Summary

- ▶ Review planning and regulatory framework to identify terms or gaps that may hamper the project and recommend approaches for policy to bridge these gaps.
- ▶ Identify the necessary building blocks in an integrated system—people’s needs, appropriate technology, land use, human resources, urban road network, and other infrastructure and housing.
- ▶ Identify prioritized projects and necessary investments.
- ▶ Demonstrate, and quantify where possible, how the proposed project will improve the environment, and the living conditions of people, especially the poor and women.

C. Developing an Inclusive Wastewater Management Project

The basis for an inclusive project would be to identify and invite all stakeholders to actively participate already during the planning process and for them, particularly the poor, to benefit from the project components. Gender aspects are crucial—women and children are more vulnerable to the adverse impacts of pollution, such as the contamination of a water source due to lack of proper sanitation.² Public awareness should be promoted for water users to understand the implications and risks connected with discarding hazardous liquid waste into the sewerage system, for example. The role of the private sector as water users and polluters should not be underestimated, and the load on the public sewerage network and facilities must be examined. The overall aim is to develop a sustainable wastewater management system, accommodating all contributing flows and water consumers, that is accessible and affordable to all with minimal risk of unfounded (investment) decisions and adverse impacts.

The PFS should analyze the following:

1. Limitations in land use, urban growth, livelihood, and public health due to adverse impacts from the present lack of wastewater handling, and how the project improve this.
2. New employment opportunities tied to project components, including indirect benefits tied to compost (sludge) sale and renewable energy.
3. Likely disruption to communities in terms of relocation, division, noise, disruption of the visual context of important historic or scenic sites. The scale and cost of relocation should be estimated along with options for near-site resettlement (to minimize disruption to employment).

Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into governance arrangements (section F).

Summary

- ▶ Identify stakeholders for consultation at an early stage.
- ▶ Identify livelihood issues and design a project that will benefit as many as possible and especially the poor, directly or indirectly.
- ▶ Propose a project that will minimize disruption to the community.

² See ADB checklists on involuntary resettlement, indigenous peoples planning, poverty reduction, participation and gender and development.



D. Ensuring Financial and Economic Viability

1. Financial Assessment

The primary aim of the financial assessment is to make a realistic assessment, as far as possible, of the project costs in investment and operations and maintenance (O/M), project revenues, and possible financing schemes, either from own sources or external funds. Given the early stage in project design, it may be difficult to estimate these costs. For instance, the site selection and land acquisition may not yet be finalized or the final choice of technology must be further elaborated in a feasibility study or detailed engineering design study. However, the PFS should include this primary, early assessment to indicate to both the local government and potential investors whether the project is worth pursuing.

It is vital for the viability of the project to investigate revenue streams for each investment with a direct cost recovery component, whether it is based on user fees or revenues from energy production (e.g., heat exchange or biogas production), water reuse, compost sale, among others. The assessment of affordability and willingness to pay on the part of each market segment in each investment should be rigorous and well documented. The possibilities of differentiated fee systems, based upon the polluter-pays principle and financial ability, should be investigated. Equity should be strived at. This is particularly valid for wastewater management, in which the facilities and network are often taken for granted as a public service with no counter-obligations. The risk of noncompliance in payment of user fees and the possible remediation measures should also be discussed.

Existing project cost estimates should be investigated so that new solutions, at reduced costs or better performance, etc., can be suggested. Costs should be benchmarked against average construction costs in country. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures.

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism (CDM) for energy efficiency investments and reduction of greenhouse gas (GHG) emissions through use of renewable energy (through biogas production), and other credit and/subsidies from international agencies should be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise³ to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing as well as a standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved, market rates for return in equity and debt should be the benchmark for viability.

In particular, the assessment must include an analysis of the cash flow of participating (mostly local) government with project capital expenses and subsidies included to determine the sustainability of the project in related to likely revenue streams. Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F). For example, public–

³ ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.



private partnership (PPP) models can be used on unbundled, commercially viable, components of projects. Thus, such analysis should be done in a preliminary form early in the consultant engagement period.

Summary

- ▶ Assess project investment and O/M costs, as far as possible.
- ▶ Assess willingness to pay and resulting revenue generation, both direct and indirect revenue base.
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on (local governments) budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

2. Economic Assessment

The economic assessment in a wastewater management project should have direct benefits estimated on the willingness to pay for services, augmented by externalities such as cost savings resulting from water reuse, public health improvement, and other things such as employment (income increase or decrease) and investment opportunities, due to more efficient land use and increased tourism. Benefits from reduced carbon emissions should also be explained in the PFS, adopting proxy values where necessary as set out in ADB's Guidelines for the Economic Analysis of Projects.⁴ Care should be taken to avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. ADB standards should be adopted in the PFS where available.

Summary

- ▶ Estimate all benefits of the proposed project.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Wastewater management projects would typically strive at improving the environmental and health conditions. The PFS should assess the impacts associated with the present system and how these will change after the proposed project implementation. The objective of the proposed PFS interventions is to maximize the positive impacts and minimize the negative ones, if any.

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental or similar permit. At the PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.⁵ It is also vital that the requirements and the time frame for a full-blown EIA are identified

⁴ ADB 1997. *Guidelines for the Economic Analysis of Projects*.

⁵ ADB *Rapid Environmental Assessment checklists for categorization of projects*.



already during the PFS stage to avoid delays in downstream work and unexpected investments costs for environmental protection measures.

In terms of reducing possible adverse environmental impacts, the process is similar to that adopted for social assessment. The proposed investments and facilities should be screened to determine (i) potential environmental impacts in terms of noise and pollution to communities; and (ii) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.⁶ Mitigation measures should be formulated and costed. The implications of these measures should be included in the financial assessment (see section D) and governance arrangements (section F) of the project. This includes the assessment of any positive or negative impacts related to climate change, e.g., renewable energy production from water/sludge and emissions of greenhouse gases.

Summary

- ▶ Identify the relevant environmental regulatory framework and its implications on project implementation.
- ▶ Estimate the environmental and health improvements expected from the proposed project.
- ▶ Estimate the possible environmental and health-related risks and impacts, and the costs for mitigating these risks.
- ▶ Investigate possibilities to reduce greenhouse gas emissions or minimize the risk of increased emissions (mitigation), and determine if the project is part of adaptation measures.

F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the city government.⁷ The ability to successfully implement wastewater management projects, achieving social and environmental benefits, avoiding and mitigating adverse impacts, and achieving financial sustainability, depends on a sound governance structure.

The PFS must include the following:

- (a) Discussion of organizational options for design, construction/ commissioning and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight, monitoring, and regulating private operations needs to be considered. A monitoring system with clear and measurable key performance indicators must be discussed. In terms of services integration, the arrangements for coordination across sectors and facility providers need to be described. Stakeholders must be involved at an early stage, and their continued influence and input should be secured and institutionalized for the whole duration of the project.
- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements.

⁶ ADB. 2003. *ADB Environmental Assessment Guidelines*.

⁷ CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



- (c) Consideration of the legal basis of each involved organization, its sources of revenue and responsibilities for expenditures (the two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

For wastewater management projects, factors such as good governance in terms of particularly discipline in the system performance and the public's and all other water users' awareness and collaboration are vital. Connection fees may be more difficult to justify compared to water tariffs for drinking water supply, for instance, where the lack of such service has immediate, detrimental effects. Possible resistance to development of infrastructure (not-in-my backyard) cannot be ruled out mainly due to the nuisance of smell from a wastewater treatment plant or sludge disposal site.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

G. Institutional Strengthening

The PFS team must, at an early stage in the project (i) identify and assess the valid regulatory framework for wastewater treatment, emission parameters, handling of wastewater sludge, landfilling and other aspects relevant to the TOR (ii) identify the legally appointed actors in the wastewater area as well as the actual operators and stakeholders. Note that the institutional strengthening and the overall sustainability of the project could benefit from closer inter-departmental interaction, e.g., better coordination between various government offices as well as dialogue and synergies with external players.

The city government shall then, supported by the PFS team, design a reference group or other structure and a communication strategy to ensure participation by the key stakeholders throughout the whole duration of the project. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating approaches to investment. Closer dialogue will enable faster and more accurate fact-finding and a possibility (for the local government) to elaborate on a better internal structure, including the extended lifetime of the reference group after the finalization of the project.

H. Capacity Development

The PFS must identify all stakeholders and their respective responsibilities as well as present and potential capacity in the wastewater management area and suggest a capacity development program that will match proposed projects and measures. The overarching goal is to create a sustainable system and ensure that investments in the sector are properly handled. This includes technical and environmental expertise with operational staff, but also ability to manage and monitor the operation, especially in a PPP setup.

The function of the system is also dependent on the water users' knowledge and level of responsibility, thus public awareness and training of industrial users (if applicable) are crucial activities. Coordination between the local government and/or the private operation and international or national nongovernment organizations (NGOs) can give synergies and a better impact.



The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the pre-feasibility study as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it may help a city to concretize its city development vision, examine alternatives to solve its wastewater management problems, and recommend investments for further feasibility study and/or implementation.

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the wastewater management goals of a city and satisfy the needs of the people;
- *Impact*—the extent to which the investments impact, positively or negatively, the livability of the area, efficiency of land use, the local economy, air, soil and water, nearby natural resources, energy, the urban transport network and access to services, among others;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the alternatives are distributed fairly across different population groups.

Sector Guidelines

for Pre-Feasibility Studies on

FLOOD AND DRAINAGE MANAGEMENT



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to flood and drainage management and other related issues. These address the approach expected of consultants engaged at the PFS stage as regards flood and drainage management.

2. Objective

CDIA support to the formulation of any flood and drainage management project aims to enhance the impact, sustainability, and inclusiveness of the project. This means that the project should

1. Comprise a viable component of *integrated flood and drainage management* that includes a holistic approach to provision of services and infrastructure, institutional capacity, environmental and social concerns, economic and financial systems (see section B);
2. Be *inclusive* in the sense that stakeholders should be involved (i) to ensure a tailor-made and sustainable system for drainage and preparedness for flooding mitigation that is accessible and affordable to all regardless of income level, education, gender, etc. in the targeted areas, and (ii) to minimize the risk of unfounded (investment) decisions and adverse impacts.



Sector Guidelines Flood and Drainage Management

Any risk of negative impact should be clearly communicated and measures taken to adequately compensate stakeholders. (see section C);

3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that capital costs can be met out of resources likely to be available and that operational costs including long-term maintenance and capacity building in the various components of the project can be met out of the recurrent revenues (see section D);
4. Be *environmentally sustainable* in that the proposed flood and drainage management system must aim at improving the existing environmental and health conditions *and* that adequate measures will be taken to mitigate any potential adverse environmental impacts of the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient planning, financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Flood and Drainage Management System

The vision for any city (in Asia) must include an environment-friendly, low-carbon, integrated and inclusive development. Rapid urbanization in combination with climate change and extreme weather conditions lead to challenges in handling surface water and drainage. Failure may lead to impacts on fresh water resources, loss of property and livelihood and in its extreme conditions, and death due to flooding. Stagnant water leads to mosquitoes breeding and spreading of diseases. In cases of combined network for sewage and surface water drainage, the risks of environmental and health impacts are increased.

The surface water/storm water management system should make use of existing infrastructure (if any) and build on sound visions, policies, strategies and plans, not limited to drainage management but all sectors that influence the performance of such a system. The proposed investment project must also be based on a sound policy and planning framework and be within the relevant regulatory framework. In case the framework is not adequate or threatens the successful implementation of the project, the PFS should at an early stage identify the key issues and determine how they can be solved. Based on baseline data and professional judgment where data are not available, an overall assessment of the current flood and drainage management, strengths, weaknesses and areas for intervention, should be made

The PFS should address the following key considerations in an integrated system:

- **Service provision to all**

The provision of flood protection and storm water drainage network can generally not be provided on an exclusionary basis to individual households, thus the service provision is considered to be an area-based public good. This includes the practice of using the public drainage network to remove any liquid (and solid) waste, for a wide range of domestic and industrial activities. However, the lack of such a system, especially during extreme loads, may have serious and direct impacts on people's property, livelihood, and health. It is vital that water from rainfall (precipitation), referred to as surface water or storm water is handled properly in an urban area in a way that it does not interfere with the functions of the city and provision of other services. It is equally important that sewerage and wastewater are handled and treated according to its properties, and in a manner that does not interfere with the storm water system.



Sector Guidelines Flood and Drainage Management

The PFS should carefully investigate, as far as possible depending on availability of data or other input, the current drainage system and its functionality. If flooding may occur, the PFS should examine the frequency and the magnitude, and distinguish between marginal and fundamental impacts. Special attention should be paid to the possible combined storm water/drainage and sewerage piping network, and the challenges to the system in case of heavy rainfall. The reasons for non-service must be examined and solutions recommended, bearing in mind disaster management and flooding issues.

▪ **Integrated water management and coordination with other development**

The PFS should focus on urban water and how drainage should be handled in an urban setting. However, water management is often a regional or even transnational issue that cannot be handled in isolation by a local government unit. The behavior of the water will depend on the water catchment area and its geophysical conditions, a river basin, proximity to mountains or coastal plains, built or rural environment, soil conditions, erosion, and climate, among others. Flood mitigation in one area may also lead to flooding in another. Thus, the PFS must be based on Integrated Water Resources Management (IWRM) or Integrated River Basin Management (IRBM) and make use of existing studies, to the extent that it is reasonable and applicable to the studied urban area. This includes the need for close coordination with other local, regional, or national government stakeholders. The PFS may suggest projects that will require involvement by external stakeholders, e.g. riverbank rehabilitation or storage dams. Temporary storage or leveling of water in upland of catchment area involves a larger jurisdiction. Uneven distribution downstream may also cause conflicts between stakeholders in the same river basin or water catchment area.

Water management is also a highly cross-sectoral issue in terms of local government offices, since it may combine issues on drinking water, sewerage, and drainage and has impacts on the whole society. The functionality of a drainage system is also closely linked to solid waste management since lack of collection services and other waste related issues causes blockage in the drainage canals. As this is all related to climate change, projections on changed precipitation must also be taken into account. Thus, the proposed projects in the PFS should be an integrated part of the whole system in harmony with other infrastructure development. The PFS must examine planned development, land use, urbanization, and urban growth pattern to design for future capacity needs and to conduct risk analysis/disaster management studies.

Traditionally, flood management projects have often been based on the assumption that any water flow can be controlled and that flooding must be a very rare event. For a storage dam, for instance, the investments are usually very high in terms of costs for material and construction works, and the investment and land use is locked. There is a great risk of negative environmental and social impacts in the dam area and other areas affected by the project. The flood return periods should determine the design, but the PFS should, where applicable, open up for a different approach where improved natural infiltration in green urban spaces or flood-resistant housing or roads would allow people to stay in a wetland area where the rise of the river has always been a natural part of that habitat.

▪ **Land use**

The proposed flood and drainage management project must be consistent with land use plans. Special attention should be given to disaster management plans and risk assessments, other systems in place to accommodate large water flows within the city, and the types of land use affected by flooding. Future land use and the potential risk of locating a storage dam in an area that is vital to agriculture must, in the future, be considered. Any conflict in land use as well as reduced value of land should be addressed.



Summary

- ▶ Review planning and regulatory framework to identify terms or gaps that may hamper the project and recommend approaches for policy to bridge these gaps.
- ▶ Identify the necessary building blocks in an integrated system—people’s needs, appropriate technology, land use, human resources, urban road network, other infrastructure, and housing.
- ▶ Identify prioritized projects and necessary investments.
- ▶ Demonstrate, and quantify where possible, how the proposed project improves the living conditions for people, especially the poor and the women, and the environment.

C. Developing an Inclusive Flood and Drainage Management Project

The basis for an inclusive project would be to identify and invite all stakeholders to actively participate already during the planning process and to make them, particularly the poor, benefit from the project components. Gender aspects are crucial—women and children are more vulnerable to the adverse impacts of pollution, such as the contamination of a water source due to flooding or the fact that they may have to walk far to find uncontaminated water supply.

The PFS should analyze how lack of drainage or the occurrence of floods affect people, their health, livelihood, limitations in land use and urban growth, and how the proposed project can contribute to an inclusive, safe development. Employment opportunities tied to project components should be examined. If relocation is considered, disruption in basic services to the affected population must be examined and measured to minimize such disruption.

The overall aim is to develop a sustainable flood and drainage management system that is accessible in all areas by stakeholders, regardless of income level, gender, etc. However, it may not be possible or financially viable to design a system that could accommodate and eliminate all possible water flows in extreme weather conditions or to assume that people are willing to be relocated from flood prone areas. The PFS should discuss alternative solutions and take into account the possibilities to readjust the developed areas including formal and informal settlement to accommodate flooding.

Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into governance arrangements (section F).

Summary

- ▶ Identify stakeholders for consultation at an early stage.
- ▶ Identify livelihood issues and design a project that will benefit as many as possible, especially the poor, directly or indirectly.
- ▶ Propose a project that will minimize disruption to the community.



D. Ensuring Financial and Economic Viability

1. Financial Assessment

The primary aim of the financial assessment is to make a realistic assessment, as far as possible, of the project costs in investment and operation and maintenance (O/M), project revenues and possible financing schemes, either from own sources or external funds. Given the early stage in project design, it may be difficult to estimate these. For instance, site selection and land acquisition may not be finalized or the final choice of technology must be further elaborated in a feasibility study or detailed engineering design study. However, the PFS should include this primary, early assessment to indicate to both the local government and potential investors whether the project is worth pursuing.

It is vital for the financial viability of the project to investigate revenue streams for each investment with a direct cost recovery component. For flood and drainage management, though, the benefits of service are not directly extended to individual users and cannot be charged through fees in the same way as for water supply or solid waste collection. However, in many cities, the surface water drainage is still combined with sewerage and the city may require households or other users to pay for connection to the public network. In that case, it would be easier to justify a drainage/sewerage fee and the revenues can cross-subsidize any improvements in flood control, among others. The risk of noncompliance in paying user fees (if any) and possible measures should also be discussed. Other funding sources for the construction, operation, and maintenance of drainage and flood control infrastructure should be investigated.

Existing project cost estimates must be investigated so that new solutions, at reduced costs or better performance can be suggested. Costs should be benchmarked against average construction costs in country (preferably), or in a similar country. Costs should explicitly include social (e.g. relocation) and environmental mitigation measures.

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism for energy efficiency investments, and other credit/subsidies from international agencies should be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise¹ to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing and a standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved, market rates for return in equity and debt should be the benchmark for viability. However, because of the difficulty in getting direct revenues, flood and drainage control will not likely involve the private sector.

In particular, the assessment must include an analysis of the cash flow of participating (mostly local) government with project capital expenses and subsidies included to determine the sustainability of the project in relation to the likely revenue streams, if any. Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F).

¹ ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.



Summary

- ▶ Assess project investment and O/M costs, as far and realistically as possible
- ▶ Assess revenue generation, both direct and indirect revenue base, and willingness to pay (if it can be combined with sewerage).
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on (local governments) budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

2. Economic Assessment

The economic assessment in a flood and drainage management project should involve estimates of cost savings resulting primarily from avoided damage to land and property, public health improvement accessibility on roads and its effect on gross domestic product, employment (income increase or decrease) and investment opportunities due to more efficient land use. Benefits from reduced carbon emissions should also be explained in the PFS, adopting proxy values where necessary as set out in ADB's Guidelines for the Economic Analysis of Projects.² Increased costs should also be taken into account, e.g. relocation of people in wetlands, provision of infrastructure in the new site, increased commuting transport costs, among others. If a storage dam for leveling of water is considered, the alternative land use must be discussed and included in the economic analysis.

Care should be taken to avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. ADB standards should be adopted in the PFS where available.

Summary

- ▶ Estimate all benefits of the proposed project.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Flood and drainage management projects would typically aim at improving the environmental and health conditions, including reducing the risk of human casualty. Such projects are often labeled as adaptation measures for extreme weather conditions due to climate change. However, there are many other factors and every day scenarios that also affect the urban area's capability to cope with precipitation and surface water. The PFS should make an assessment of the impacts or risks associated with the present situation and how this will change after proposed project implementation. The objective of the proposed PFS interventions is to maximize the positive impacts and minimize the negative ones, if any.

² ADB. 1997. *Guidelines for the Economic Analysis of Projects*.



Sector Guidelines Flood and Drainage Management

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental or similar permit. At the PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.³ It is also vital that the requirements and the time frame for a full-blown EIA are identified already during the PFS stage to avoid delays in downstream work and unexpected investments costs for environmental protection measures. For flood management, the risk analysis is crucial and available plans or regulatory framework on disaster management and preparedness must be carefully studied.

In terms of reducing possible adverse environmental impacts, the process is similar to that adopted for social assessment. The proposed investments and facilities should be screened to determine (i) potential environmental impacts in terms of noise and pollution to communities, and (ii) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.⁴ Mitigation measures should be formulated and costed. The implications of these measures should be included in the financial assessment (see section D) and governance arrangements (section F) of the project. This includes the assessment of any positive or negative impacts related to climate change.

Summary

- ▶ Identify the relevant regulatory framework for environmental issues as well as disaster preparedness and its implications on project implementation.
- ▶ Estimate the environmental and health improvement expected from the proposed project.
- ▶ Estimate the possible environmental and health-related risks and impacts connected to the proposed project and costs for mitigation of these risks.
- ▶ Investigate possibilities to reduce greenhouse gas emissions (mitigation) and adaptation measures in flood management.

F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the client government.⁵ The ability to successfully implement almost any infrastructure project, including achieving social and environmental benefits, avoiding and mitigating adverse impacts, and achieving financial sustainability, depends on a sound governance structure.

The PFS must include the following:

- (a) Discussion of organizational options for design, construction/ commissioning, and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight, monitoring, and regulation of private operations needs to be considered. A monitoring system with clear and measurable key performance indicators must be discussed. In terms of services integration, the arrangements for coordination across sectors and facility providers need to be described. Stakeholders must be involved at an early stage, and their continued influence and input should be secured and institutionalized for the whole project period.

³ ADB *Rapid Environmental Assessment checklists for categorization of projects*.

⁴ ADB. 2003. *ADB Environmental Assessment Guidelines*.

⁵ CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



Sector Guidelines Flood and Drainage Management

- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements.
- (c) Consideration of the legal basis of each involved organization, its sources of revenue and responsibilities for expenditures (the two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

For flood and drainage management projects, good governance would include securing system performance and O/M budget, particularly considering the lack of user fees or other direct revenues, and public (and all other water users') awareness and collaboration, particularly in a crisis situation and its aftermath.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

G. Institutional Strengthening

The PFS team must at an early stage in the project (i) identify water rights and water governance boundaries, (ii) identify and assess the valid regulatory framework for flood and drainage management (possibly including wastewater management) and other aspects relevant to the terms of reference, and (iii) identify the legally appointed actors in the area as well as the actual operators and stakeholders, which may be in a relatively large geographical area depending on the water catchment area. Institutional strengthening as well as the overall sustainability of the project will benefit from a closer interdepartmental interaction.

The client, supported by the PFS team, shall then design a reference group or other structure and a communication strategy to ensure participation by the key stakeholders throughout the whole project period. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating approaches to investment. Closer dialogue will enable faster and more accurate fact-finding and a possibility (for the local government) to elaborate on a better internal structure including the extended life of the reference group after the finalization of the project.

H. Capacity Development

The PFS must identify all stakeholders and their respective responsibilities and suggest a capacity development program that will match proposed projects and measures. The overarching goal is to create a safe and sustainable system and ensure that investments in the sector are properly handled. This includes technical and environmental expertise with operational staff, including how to handle warning systems, but also the ability to maintain the system.

Another crucial part in flood management is public awareness about the risks in flood prone areas and disaster preparedness as well as the roles of various stakeholders and function of levees and storage dams. Dumping of waste may adversely affect the functionality of the drainage system and ultimately increase the risk of flooding.⁶

⁶ See CDIA 2011 *Sector Guidelines for Pre-Feasibility Studies on Solid Waste Management*.



Sector Guidelines Flood and Drainage Management

Potential flooding in a city may depend on activities farther up in a river basin or a water catchment area. Thus, the PFS may suggest joint training and efforts to bring stakeholders together from a wider geographical and institutional area to learn more about water resource management, water governance, disaster management, and solid waste management (clogging of drainage).

The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the PFS as well as part of a future capacity development program.

I. Conclusion

Although a CDIA PFS will not support urban planning studies, it may help a city to concretize its city development vision, examine alternatives to solve its flood and drainage management problems, and recommend investments for further feasibility study and/or implementation.

The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the flood and drainage related goals of a city and satisfy the needs of the people;
- *Impact*—the extent to which the investments impact, positively or negatively, the livability of the area, efficiency of land use, the local economy, air, soil and water, nearby natural resources, energy, the urban transport network and access to services, and others;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the alternatives are distributed fairly across different population groups.



Cities Development Initiative for Asia

Suite 202-203 Hanston Building, Emerald Ave.

Ortigas Center, Pasig City 1600

Metro Manila, Philippines

Phone: +63 2 631 2342 • Fax: +63 2 631 6158

Website: www.cdia.asia

CDIA is supported by:

