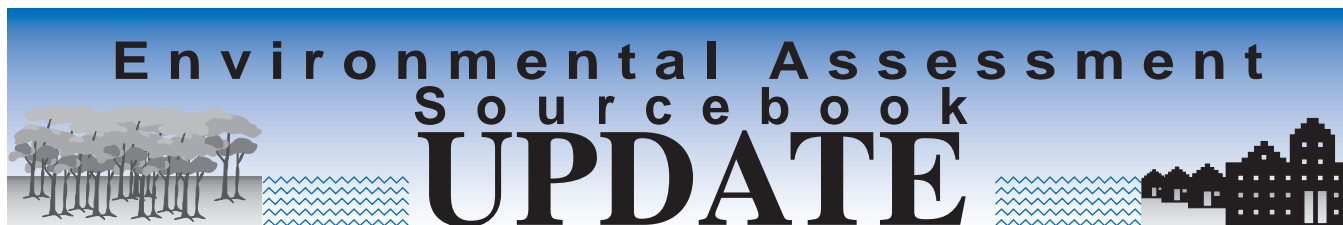


# Environmental Assessment Sourcebook UPDATE



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## Environmental Management Plans

*Prediction of the potential adverse environmental and social impacts arising from development interventions is at the technical heart of the environmental assessment (EA) process. An equally essential element of this process is to develop measures to eliminate, offset, or reduce impacts to acceptable levels during implementation and operation of projects. The integration of such measures into project implementation and operation is supported by clearly defining the environmental requirements within an environmental management plan (EMP).*

*EMPs provide an essential link between the impacts predicted and mitigation measures specified within the EA report, and implementation and operational activities. They outline the anticipated environmental impacts of projects, the measures to be undertaken to mitigate these impacts, responsibilities for mitigation, timescales, costs of mitigation, and sources of funding. This Update provides an introduction to mitigation measures and EMPs, identifies the policy framework for preparing EMPs for Bank financed activities, outlines the main components of EMPs, and discusses means to ensure that commitments within the EMP are carried through to implementation and operation. It complements information presented in Chapter 1 of the EA Sourcebook.*

### Introduction

A development project's **mitigation measures** encompass all actions taken to eliminate, offset, or reduce potentially adverse environmental impacts to acceptable levels. Such measures are typically associated with the latter stages of project planning, although in practice they may occur at any stage throughout the project cycle. Normally, potential impacts are identified early during the initiation and scoping stages of EA for a project, and measures to avoid or minimize impacts are incorporated into the alternatives being considered. In this respect, some of the most important measures to protect the environment or local communities become integral to the project design, and are never reflected within a formal environmental management plan (EMP). For example, the environmental and social bases for choosing a preferred location for a project will not necessarily be evident within the EMP. Some of the primary objectives of mitigation measures are summarized in Box 1.

Mitigation measures may be broadly defined as either **structural** or **non-structural**. Non-structural measures include improvements to the legal or institutional framework, economic incentives (such as realistic pricing of utility services), training, and measures to

enhance public awareness. An example is the introduction of irrigation service fees to promote efficiency of water usage and water conservation. Structural measures encompass design or location changes, engineered structures, or landscape treatments, based on the use of environmentally sound techniques and technologies.

*Environmental management plans (EMPs)* outline the mitigation, monitoring, and institutional measures to be taken during project implementation and operation to avoid or control adverse environmental impacts, and the actions needed to implement these measures. They provide a crucial link between alternative mitigation measures evaluated and described within the EA report (see *Update* no. 17, *Analysis of Alternatives*), and ensuring that such measures are implemented. EA reports are essentially planning documents with no legal basis. In many cases, mitigation measures outlined in EAs are described in illustrative terms, or have neither been committed to by the borrower nor reflected in the project design. In this regard, the EMP is a basis for negotiation and reaching agreement with borrowers on a project's key social and environmental performance standards. The components of an EMP are described in the section below on components.

### Box 1. Primary objectives of mitigation measures

Mitigation measures aimed at eliminating, offsetting, or reducing adverse environmental impacts can have a range of objectives. Some of these are briefly defined below in approximate order of priority. The first priorities are avoidance or prevention of impacts, whereas the priority of the other categories is less rigid.

- **Avoidance.** Avoiding projects or activities that could result in adverse impacts; avoiding certain types of resources or areas considered to be environmentally sensitive. This approach is most effective when applied in the earliest stages of project planning.
- **Prevention.** Measures aimed at impeding the occurrence of negative environmental impacts and/or preventing such an occurrence having harmful environmental and social impacts.
- **Preservation.** Preventing any future actions that might adversely affect an environmental resource or attribute. This is typically achieved by extending legal protection to selected resources beyond the immediate needs of the project.
- **Minimization.** Limiting or reducing the degree, extent, magnitude, or duration of adverse impacts. Mitigation can be achieved by scaling down, relocating, or redesigning elements of a project.
- **Rehabilitation.** Repairing or enhancing affected resources, such as natural habitats or water sources, particularly when previous development has resulted in significant resource degradation.
- **Restoration.** Restoring affected resources to an earlier (and possibly more stable and productive) state, typically “background/pristine” condition.
- **Compensation.** Creation, enhancement, or protection of the same type of resource at another location, to compensate for resources lost to development.

EMPs are essential elements of EAs for Category A projects, but for many Category B projects, a simple EMP alone may suffice. Typically, this applies to smaller projects not affecting environmentally sensitive areas, which present issues that are narrow in scope, well-defined, and well understood. Alternative approaches may be more effective in integrating environmental concerns into the planning process of such projects, including: environmental design criteria and emission standards for small-scale industrial plants; design criteria and construction supervision for small-scale rural works; and environmental siting criteria, construction standards, and inspection procedures for many social fund projects, such as housing or local schools projects.

For industrial rehabilitation, expansion, or privatization projects, an environmental audit and

associated action plan (in effect an EMP) is often the best approach to determining the nature and extent of environmental concerns at an existing facility. The plan should identify appropriate mitigation measures, estimate the cost of proposed measures, and recommend a schedule for implementing them. For certain projects, the EA report may consist of an environmental audit; in other cases, the audit is part of the EA documentation and the EMP.

### World Bank Policy in relation to EMPs

The Bank’s Operational Policy 4.01 (OP 4.01) identifies EMPs as an essential feature of category A projects; for category B projects, the EA may result in development of an EMP only, with no separate EA report. The specific requirements relating to EMPs are set out in Annex C to the Bank’s business procedure 4.01 (BP 4.01)—these procedures are mandatory. The content of BP 4.01 is largely reflected within this *Update*, which also includes many elements of recommended good practice.

### Components of an EMP

There is no standard format for EMPs. The format needs to fit the circumstances in which the EMP is being developed and the requirements which it is designed to meet. Mitigation measures and the means of ensuring their implementation for larger category A projects will often be described in some detail. Conversely, an EMP arising from an environmental audit might be summarized in a one or two page schedule. An EMP may be presented as two or three separate plans depending on borrowing country requirements and project circumstances.

The EMP should be formulated in such a way that it is easy to use. References within the plan should be clearly and readily identifiable. Also, the main text of the EMP needs to be kept as clear and concise as possible, with detailed information relegated to annexes. The EMP should identify linkages to other relevant plans relating to the project, such as plans dealing with resettlement or indigenous peoples issues. The following aspects should typically be addressed within EMPs.

**Summary of impacts:** The predicted adverse environmental and social impacts for which mitigation is required should be identified and briefly summarized. Cross-referencing to the EA report or other documentation is recommended, so that additional detail can readily be referenced.

**Description of mitigation measures:** The EMP identifies feasible and cost effective measures to reduce

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potentially significant adverse environmental and social impacts to acceptable levels. Each mitigation measure should be briefly described with reference to the impact to which it relates and the conditions under which it is required (for example, continuously or in the event of contingencies). These should be accompanied by, or referenced to, designs, equipment descriptions, and operating procedures which elaborate on the technical aspects of implementing the various measures. Where the mitigation measures may result in secondary impacts, their significance should be evaluated.

**Description of monitoring program:** Environmental performance monitoring should be designed to ensure that mitigation measures are implemented, have the intended result, and that remedial measures are undertaken if mitigation measures are inadequate or the impacts have been underestimated within the EA report. It should also assess compliance with national standards and World Bank Group requirements or guidelines.

The monitoring program should clearly indicate the linkages between impacts identified in the EA report, indicators to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions, and so forth. Although not essential to have complete details of monitoring in the EMP, it should describe the means by which final monitoring arrangements will be agreed. For additional details, refer to *EA Sourcebook Update* no. 14: *Environmental Performance Monitoring and Supervision*.

**Institutional arrangements:** Responsibilities for mitigation and monitoring should be clearly defined. The EMP should identify arrangements for coordination between the various actors responsible for mitigation.

Environmental management usually involves many governmental bodies and other agencies, and links between the various actors are often complex and the hierarchy for decision making unclear. Agencies may be somewhat territorial, and reluctant to consult with or share information with others. Conflicts may also arise between institutions, particularly between those promoting development and those with a mandate for environmental protection. Shared or overlapping responsibilities within several institutions can also hinder effective enforcement of environmental control measures. It is important to account for such location-specific circumstances and constraints in developing EMPs.

Some of the key legal and institutional considerations with respect to EMPs are:

- **Legal framework for environmental protection:** Is the framework for protection and management of resources affected by the project robust, and supported by enforcement measures?
- **Responsibilities for environmental management:** Are these clearly defined in relation to the resources affected by the project, and adequately resourced?
- **Responsibilities for implementing mitigation measures:** Are these clearly defined for environmental and social mitigation measures, and adequately resourced?
- **Legal basis for mitigation:** Do the project legal documents help to ensure that borrowers implement mitigation measures?

When the borrower's institutional or technical capacity to effectively implement mitigation measures proves inadequate, a specific environmental component may be included in the project to strengthen that capacity. Institutional difficulties may sometimes be best resolved through establishing an autonomous, stable and qualified project implementation unit. If the project implementing agency lacks sufficient commitment or capacity for carrying out mitigation measures, it may be preferable to contract out operational responsibility for these measures.

**Implementation schedule and reporting procedures:** The timing, frequency, and duration of mitigation measures should be specified in an implementation schedule, showing links with the overall project implementation plans (PIP). Where implementation of mitigation measures is tied to the project legal agreements, these linkages should be outlined. For example, some mitigation measures may be made conditions for loan effectiveness or disbursement.

Procedures to provide information on the progress and results of mitigation and monitoring measures should also be clearly specified. As a minimum, the recipients of such information should include those with responsibility for ensuring timely implementation of mitigation measures, and for undertaking remedial actions in response to breaches of monitoring thresholds. In addition, the structure, content and timing of reporting to the Bank should be designed to facilitate supervision. The Task Manager should carefully consider arrangements for tracking receipt (and subsequent dissemination) of monitoring reports.

**Cost estimates and sources of funds:** These should be specified for both the initial investment and recurring expenses for implementing all measures contained in the EMP, integrated into the total project costs, and factored into loan negotiations.

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Where practicable, decisions regarding appropriate mitigation measures should be justified by an economic evaluation of potential environmental impacts, aimed at:

- Measuring the cost-effectiveness of different mitigation options where a project is required to meet a set of environmental standards or achieve specific environmental objectives
- Determining the appropriate level of mitigation where there is scope for a trade-off between environmental quality and the costs (and benefits) of achieving it
- Internalizing the economic value of residual impacts or intended environmental improvements into the final economic appraisal of the project.

The level of mitigation required may be determined by political or legal considerations, Bank requirements, international agreements (see *Update* no. 10: *International Agreements on Environment and Natural Resources*), stakeholder needs, or a combination of these factors. It is important to capture all costs—including administrative, design and consultancy, and operational and maintenance costs—resulting from meeting certain standards or modifying project design. The aim is to satisfactorily mitigate adverse impacts at least cost.

The costs of preparing an EMP, which are borne by the borrower, vary depending on factors such as the complexity of potential impacts, the extent to which international consultants are used, and the need to prepare separate EMPs for sub-projects (for example with sectoral investment loans). Options for financing include the borrower's own resources, project preparation facilities (PPF), institutional development funds (IDF), or trust funds. Implementation costs may be met from the project loan, the borrower's/sponsor's own resources, or from trust funds.

### *Maintaining flexibility of EMPs*

EMPs should be dynamic flexible, and subject to periodic review. The extent to which EMPs should be reviewed and updated varies between and within sectors. As a rule, where the major environmental impacts are associated with the operational rather than the construction phases (particularly where operations are inherently variable), EMPs should be regularly revised. In part this is linked to the influence of changes in legislation on such operations. For example, an EMP for a road or a river crossing should be subject to review throughout the construction period, but thereafter the impacts are either static or best controlled by traffic management. Conversely, an EMP for a power plant or mining operation should be revised at regular intervals throughout the operational lifetime of the project.

Flexibility is best achieved by ensuring that response arrangements can be rapidly adapted to new and changing circumstances. Decentralization of responsibilities for EMP implementation, where appropriate, can aid flexibility, for example by empowering those responsible for monitoring to sanction and undertake remedial measures. In some cases, the project design changes following appraisal and even during implementation, which highlights the importance of periodically revising EMPs.

### *Public involvement in developing EMPs*

The EMP should clearly describe and justify the proposed mitigation measures to facilitate public consultation. Consultation with affected people and NGOs should be integral to all Category A projects, and are advisable for many Category B projects in order to understand the acceptability of proposed mitigation measures to affected groups. In some situations, the development of environmental awareness amongst stakeholders is important to ensuring effective consultation on the EMP. Where projects involve socially and politically sensitive land acquisition or resettlement, these issues should be fully addressed in either the EMP or resettlement action plan (RAP) or indigenous peoples development plan (IPDP).

The consultation process should help to design achievable mitigation measures. In this regard, it is recommended that the affected public participate in the design of such measures, particularly where their success depends on buy-in or actions on their part. Where appropriate, this may be supported by including formal requirements within the TOR for public participation in developing the EMP.

Usually there are no formal mechanisms for the public to determine whether environmental commitments made by a proponent or government in the EMP are followed. It is recommended that information on progress with implementing mitigation and monitoring activities should be shared with the affected public.

### *EMPs for strategic EAs*

Whereas the aim of project specific EAs is to ensure that projects are implemented in an environmentally acceptable manner, strategic EAs are aimed at ensuring that the choice and design of projects are inherently acceptable from an environmental perspective. They also aim to establish a sound basis for mitigation, monitoring, and management at the project level.

An EMP derived from a regional EA should help to establish a sound planning and management framework that provides for addressing cumulative, direct and



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indirect impacts of ongoing and planned investments through a spatial approach to mitigation, monitoring and management. EMPs for sectoral EAs should recommend measures for mitigating, monitoring, and managing impacts within the sector of interest, taking into account the overall environmental management capacity in the country.

EMPs for strategic EAs should include the following:

- Recommendations for mitigation measures, tied to alternative development scenarios, to be implemented at the national, area-wide or sector level
- Guidelines for strengthening, adjusting, developing or harmonizing long-term environmental monitoring programs, with reference to applicable standards and international obligations
- Recommendations for changes to the environmental management framework to ensure adequate environmental resources management, and interagency coordination.

Strategic EAs should highlight major impacts of concern in the sector or region, and strategic EMPs may prescribe standard approaches to subproject design and mitigation through environmental guidelines, manuals and monitoring requirements. This reduces the scope of work for individual EAs and EMPs for subprojects, and can positively influence investment activities throughout the sector or region.

### Ensuring implementation of EMP commitments

Effective implementation of commitments set out in EMPs is aided by the borrower and Bank staff understanding their responsibilities at each stage of the project cycle, and by translating these commitments into a form that is legally binding. These aspects are discussed below.

#### *Responsibilities of Bank staff and borrowers*

The borrower or sponsor is responsible for preparing and implementing the EMP, and TOR for EAs should clearly reflect the importance of preparing a comprehensive EMP. In practice, when the draft EA report and EMP are submitted to the Bank prior to appraisal, many mitigation measures will be tentative or illustrative. However, the EMP needs to be finalized during appraisal and agreed upon during negotiations, together with performance monitoring indicators.

The responsibilities of Bank staff vary depending on the stage of the project cycle. During appraisal, Bank staff are required to review the EMP with the borrower, to assess the adequacy of the institutions responsible for

environmental management, to ensure that the EMP is adequately budgeted, and to determine whether the mitigation measures are properly addressed in project design and economic analysis.

The Project Appraisal Document (PAD) should summarize the main measures contained in the EMP, describe environment-related loan conditionalities and covenants, and outline the program and budget for environmental supervision. During negotiations, Bank staff are responsible for translating the mitigation measures in the EMP into the project implementation plan (PIP) and loan agreement. Implementation and supervision of the EMP provisions should occur during project implementation, operation and evaluation.

During project implementation, the borrower reports on compliance with environmental commitments, the status of mitigatory measures, and the findings of monitoring programs as specified in the project documents. The Bank bases supervision of the project's environmental aspects on the EMP as set out in the legal agreements for the project.

#### *Translating EMP into legal agreement*

It is important to translate the main findings and recommendations of the EMP into the legal documents, the principal legal instruments being the "loan agreement" (for the IBRD and IFC) or "development credit agreement" (for IDA) entered into with the borrower and the "project agreement" entered into with the project executing agency (where applicable). The loan/credit agreements normally include the terms of the loan or credit/guarantee, repayment obligations, provisions for the use of the proceeds of the loan and for the procurement financed by it and, in this context, obligations with respect to the carrying out of the project in question. Such obligations can include the borrower's undertakings with respect to the environment and are complemented at times by detailed requirements in "project agreements" concluded with the project executing agencies.

A key condition for effective environmental implementation is the extent to which there are clear and specific environmental deliverables and performance indicators in the EMP and PIP, including adequate budgeting and specificity about financing of environmental measures, and associated environmental clauses in loan agreement and contract documents. When this is not the case: there is frequently less commitment on the part of the borrower and its implementing agencies; it is more difficult to supervise projects in terms of their environmental aspects; the supervision is less effective in terms of influencing the subsequent course of action;

and there is generally less environmental information in supervision reports. Lack of specific environmental clauses also makes it more difficult for implementing agencies and contractors to know what is expected. Some of the options for improving the legal basis for environmental mitigation are given in Box 2.

The vital link with the activities defined in the EMP is the environmental conditions and covenants the borrower and the Bank agree on. The basic factor to be considered include required activities and timing, assignment of responsibilities, and inclusion of appropriate funding and reporting arrangements. To reinforce

### Box 2. Improving the legal basis for mitigation

It is increasingly important to translate EMP commitments into appropriate language for environment-related conditions, covenants and implementation schedules in the legal agreements. For this purpose, several options are available:

**Conditions for loan negotiations, Board approval or effectiveness.** This approach limits flexibility, but may be the best means of ensuring progress with mitigation up to loan effectiveness.

**Conditions for disbursement.** While the Bank's leverage decreases as project implementation progresses, conditioning disbursement on the achievement of key environmental milestones carries considerable weight. For example, when subprojects of sector loans that may be environmentally damaging are not appraised prior to project approval, it is important to condition disbursement on satisfactory review of EA reports.

**Dated covenants.** NB—this needs revising; very general). These usually relate to the borrower's management decisions. As a result of these covenants, Bank supervision could effectively address problems and delays in the concerned areas whereupon implementation performance improved. Covenants have the advantage of bringing key issues to the full attention of both Bank supervision staff and the implementing agencies on the borrower side.

**Inclusion of mitigation measures within the Description of the Project under Schedule 2 in the legal agreement.** This approach is useful insofar as it recognizes that environmental aspects are integral to the project, on an equal footing with other components. It is also a useful place for providing a detailed timetable for undertaking mitigation measures. The timetable should ideally be reinforced by covenants and conditions in the main sections of the legal agreement.

**General statement.** This commits the borrower to following applicable national environmental regulations and/or international standards and practices, acceptable to the Bank. Where the regulations in a borrower's country and capacity for implementation and enforcement are adequate, a general statement may be sufficient.

the legal documents it is recommended that a monitoring summary be prepared that is linked to the project legal agreement.

### *Bidding and contract documents*

It is important to translate EMP requirements into bidding and contract documents to ensure that obligations are clearly communicated to contractors. The bidding documents might also include environmental criteria as

part of the basis for selecting contractors. Contractors should also be obliged to follow appropriate environmental, health, and safety standards to reduce associated risks during construction and operation (see EA Sourcebook). For example, construction specifications might include clauses relating to:

- Preservation of the natural landscape to the extent possible, and restoration in the event of unavoidable damages

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- Conversion of construction camps and buildings into permanent residences, or removal to avoid deterioration into shantytowns
  - Prevention of accidental spillage of contaminants, debris, or other pollutants, especially into streams or underground water resources
  - Noise, dust and sediment loading
  - Ensuring proper disposal of waste materials and rubbish.

#### *Supervision of the EMP*

Bank experience confirms that systematic supervision and monitoring are fundamental to the successful

implementation of projects, and EMPs in particular. Therefore, it is vital that an appropriate supervision program be developed—preferably in collaboration with governmental implementing and environmental agencies as well as with affected populations and NGOs—to monitor progress and analyze and overcome any obstacles encountered in the implementation of the EMP. Detailed guidance on environmental performance monitoring and supervision is provided in *EA Sourcebook Update* no. 14: *Environmental Performance Monitoring and Supervision*.

*Previously published EA Sourcebook Updates*

<b>Number and Title</b>	<b>Date</b>	<b>Number and Title</b>	<b>Date</b>
1 The World Bank and Environmental Assessment: An Overview	Apr. 93	13 Guidelines for Marine Outfalls and Alternative Disposal and Reuse Options	Mar. 96
2 Environmental Screening	Apr. 93	14 Environmental Performance Monitoring and Supervision	Jun. 96
3 Geographic Information Systems for Environmental Assessment and Review	Apr. 93	15 Regional Environmental Assessment	Jun. 96
4 Sectoral Environmental Assessment	Oct. 93	16 Challenges of Managing the EA Process	Dec. 96
5 Public Involvement in Environmental Assessment: Requirements, Opportunities and Issues	Oct. 93	17 Analysis of Alternatives in Environmental Assessment	Dec. 96
6 Privatization and Environmental Assessment: Issues and Approaches	Mar. 94	18 Health Aspects of Environmental Assessment	Jul. 97
7 Coastal Zone Management and Environmental Assessment (also in Arabic)	Mar. 94	19 Assessing the Environmental Impact of Urban Development	Oct. 97
8 Cultural Heritage in Environmental Assessment (also in Arabic)	Sep. 94	20 Biodiversity and Environmental Assessment	Oct. 97
9 Implementing Geographic Information Systems in Environmental Assessment	Jan. 95	21 Environmental Hazard and Risk Assessment	Dec. 97
10 International Agreements on Environment and Natural Resources: Relevance and Application in Environmental Assessment	Mar. 96	22 Environmental Assessment of Mining Projects	Mar. 98
11 Environmental Auditing	Aug. 95	23 Economic Analysis and Environmental Assessment	Apr. 98
12 Elimination of Ozone Depleting Substances	Mar. 96	24 Environmental Assessment of Social Fund Projects	Jan. 99

This *Update* was prepared by Aidan Davy, with assistance from World Bank environment specialists. The *EA Sourcebook Updates* provide guidance for conducting environmental assessments (EAs) of proposed projects and should be used as a supplement to the *Environmental Assessment Sourcebook*. The Bank is thankful to the Government of Norway for financing the production of *Updates*. Please address comments and inquiries to Colin Rees, Managing Editor, *EA Sourcebook Updates*, Environment Department, The World Bank, 1818 H St. NW, Washington, D.C., 20433, Room No. MC-5-143, (202) 458-2715.