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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

SecM91-1189

FROM: Vice President and Secretary

September 12, 1991

NOTICE OF SEMINAR

Operational Directive 4.01 on Environmental Assessment

A seminar of the Executive Directors will be held on <u>Thursday</u>, <u>September 19, 1991, at 10:00 a.m. in the Board Room</u>, to consider the attached Operational Directive 4.01 on Environmental Assessment.

The Operational Directive represents a modest revision of OD 4.00 Annex A, issued in October 1989. The changes incorporated, which are set forth in the Manual Transmittal memorandum accompanying the OD, are based on the limited experience with the environmental assessment process initiated under OD 4.00, Annex A.

Questions concerning the operational directive may be addressed to Mr. Goodland (X33203) and Mr. Daves (X84086).

Distribution:

Executive Directors and Alternates President President's Council Vice Presidents, Bank, IFC and MIGA Directors and Department Heads, Bank, IFC and MIGA

Manual Transmittal Memorandum

Operational Directive 4.01: Environmental Assessment

1. Attached for insertion in the new Operational Manual is OD 4.01. It incorporates the guidelines contained in OD 4.00, Annex A, dated October 31, 1989. Please retain that annex in the manual (see para. 4 below). This directive also incorporates the OPNSV instructions on the disclosure of information, contained in the following memoranda, which may now be discarded.

OPNSV Memorandum Environmental Assessments: Instructions to Staff on the Handling of the Borrower's Consultations with Affected Groups and Relevant Local NGOs, April 10, 1990

OPNSV Memorandum Environmental Assessments: Instructions to Staff on the Release of Environmental Assessments to Executive Directors, November 21, 1990

2. This directive provides guidance to staff on the Bank's policies and procedures for conducting environmental assessments (EAs) of proposed projects. Major changes from OD 4.00, Annex A, are as follows:

- (a) Global Environment Facility (GEF) projects, or GEF components of Bank projects, are subject to this directive (footnote 1).
- (b) The number of EA categories is reduced from four to three by dropping the D category. All projects are classified as A, B, or C depending on the nature and extent of environmental analysis needed (paras. 4 and 17; Annex E).
- (c) The borrower should normally engage advisory panels for highly risky and contentious projects with potentially serious and multidimensional environmental concerns (para. 13).
- (d) An outline of an environmental mitigation or management plan is in Annex C. Annex F provides a revised environmental data sheet for projects in the IBRD/IDA lending program. The data sheet for category A projects is included in a quarterly annex to the Monthly Operational Summary of Bank and IDA Proposed Projects (MOS).

3. The following procedures have been incorporated from the OPNSV memoranda referred to in para. 1:

(a) In order for meaningful consultations to take place between the borrower and affected groups and local nongovernmental organizations (NGOs), the borrower should make available, at some public place to the groups consulted, the EA report and summaries of (i) the project description and objectives, (ii) the potentially adverse effects of the proposed project, and (iii) the conclusions of the EA report (para. 21).

Manual Transmittal Memorandum

(b) The Bank requests the borrower's advance permission to release the EA report to the executive directors (EDs) because the report is the borrower's property. On receipt of a copy of the EA report from the borrower, an English-language summary is made available to the EDs, and a copy of the report is deposited in the EDs' library (para. 22).

4. The directive shall apply to all projects for which IEPSs are issued after . Projects for which IEPSs have been issued before that date are subject to OD 4.00, Annex A, issued on October 31, 1989; for these projects, the new provisions should be applied where appropriate and feasible.

- 5. Questions on this directive should be referred to the Director, Environment Department.
- 6. Additional copies are available on a self-serve basis in H 4234.

Attachment

Operational Directive 4.01: Environmental Assessment

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Environmental Assessment

Introduction

1. This directive outlines Bank policy and procedures for the environmental assessment (EA) of Bank lending operations, and related types of environmental analysis.¹ EA is a flexible procedure, which should vary in breadth, depth, and type of analysis depending on the project. It may be performed at one point in time or in discrete stages. EA is carried out during project preparation, before appraisal, and is closely linked to the feasibility study. For the purpose of this directive, EA covers project-specific and other environmental impacts in the area of influence of a project.² EAs use the findings of country environmental studies and action plans that cover nationwide issues, the overall policy framework, national legislation, and institutional capabilities in the country.

Purpose and Nature of EA

2. The purpose of EA is to improve decision making and to ensure that the project options under consideration are environmentally sound and sustainable.³ All environmental consequences should be recognized early in the project cycle and taken into account in project siting, planning, and design. EAs identify ways of improving projects environmentally, by preventing, minimizing,

mitigating, or compensating for adverse impacts. These steps help avoid costly remedial measures after the fact. By calling attention to environmental issues early, EAs (a) allow project designers, implementing agencies, and borrower and Bank staff to address environmental issues in a timely and cost-effective fashion; (b) reduce the need for project conditionality because appropriate steps can be taken in advance or incorporated into project design, or alternatives to the proposed project can be considered; and (c) help avoid costs and delays in implementation due to unanticipated environmental problems. EAs also provide a formal mechanism for interagency coordination on environmental issues and for addressing the concerns of affected groups and local nongovernmental organizations (NGOs). In addition, the EA process plays an important role in building environmental management capability in the country.

3. Like economic, financial, institutional, and engineering analyses, EA is part of project preparation and is, therefore, the borrower's responsibility. Close integration of EA with these aspects of project preparation ensures that (a) environmental considerations are given adequate weight in project selection, siting, and design decisions; and (b) EAs do not delay project processing.

^{1.} Unless the context otherwise requires, "EA" means the environmental assessment process required by this directive. "Bank" includes IDA; "loans" include credits; "operations" and "investments" include sector loans, rehabilitation loans, loans through financial intermediaries, and the investment components of hybrid loans. Global Environment Facility (GEF) projects, or GEF components of Bank projects, are subject to the provisions of this directive. IFC follows its own environmental review procedure. In addition, IFC ensures that its projects comply with all relevant Bank environmental policies and guidelines, adapted to its special needs. Bearing in mind its special circumstances, MIGA will ensure, to the extent possible, that the objectives of this directive are met in its operations.

^{2.} The World Bank, Environmental Assessment Sourcebook, Technical Paper No. 139 (Washington, D.C., 1991) (EA Sourcebook) provides guidance on the subjects covered in this directive. The EA Sourcebook should be used for guidance throughout the EA process. For the Bank's definition of "area of influence of a project," see para. 3 and Annex B2 of OD 4.00, Annex B, Environmental Policy for Dam and Reservoir Projects (to be reissued as OD 4.05). For a checklist of potential issues for an EA and related Bank policies, see Annex A.

^{3.} Guidance on sustainability is provided in OMS 2.36, Environmental Aspects of Bank Work (to be reissued as OD 4.00, Environmental Policies).

Types of Environmental Analysis

Project-Specific EAs

4. Project-specific EAs or other analyses are used to examine specific investment projects (e.g., dams, factories, irrigation systems). The detail and sophistication of an analysis should be commensurate with the expected impacts. Projectspecific EAs should normally cover (a) existing environmental baseline conditions; (b) potential environmental impacts, direct and indirect, including opportunities for environmental enhancement; (c) systematic environmental comparison of alternative investments, sites. technologies, and designs; (d) preventive, mitigatory, and compensatory measures, generally in the form of an environmental mitigation or management plan; (e) environmental management and training; and (f) environmental monitoring. To the extent possible, the following items are quantified: capital and recurrent costs, environmental staffing, training, monitoring requirements, and the benefits of proposed alternatives and mitigation measures. Annex A sets out a checklist of potential issues for an EA, and Annex B provides the outline of a project-specific EA report. Annex C describes the set of measures that should be included in an environmental mitigation or environmental management Annex D outlines the Bank's internal plan. procedures, Annex E provides illustrative lists of projects classified in categories A through C, and Annex F sets out the format for an environmental data sheet for projects in the IBRD/IDA lending program. The data sheet for each category A project is included in a quarterly annex to the Monthly Operational Summary of Bank and IDA Proposed Projects (MOS).

Regional and Sectoral EAs

5. Regional EAs may be used where a number of similar but significant development activities with potentially cumulative impacts are planned for a reasonably localized area. In such cases, regional EAs are generally more efficient than a series of project-specific EAs. They may identify issues that the latter might overlook (e.g., interSeptember 1991 OD 4.01 Page 2 of 6

action among effluents or competition for natural resources). Regional EAs compare alternative development scenarios and recommend environmentally sustainable development and land use patterns and policies. Impacts may sometimes extend across national boundaries. However, regional EAs with an institutional focus might follow administrative boundaries. Regional EAs are particularly useful when they precede the first in a series of projects or development interventions in an undeveloped region, where a region is slated for major developments, where cumulative impacts are anticipated, or in regional planning or agro-ecological zoning.

6. Sectoral EAs are used for the design of sector investment programs. They are particularly suitable for reviewing (a) sector investment alternatives; (b) the effect of sector policy changes; (c) institutional capacities and requirements for environmental review, implementation, and monitoring at the sectoral level; and (d) the cumulative impacts of many relatively small, similar investments that do not merit individual project-specific EAs. Sectoral EAs should also have the objective of strengthening the environmental management capability of the sectoral or other relevant agencies. Sectoral EAs may overlap with regional EAs.

7. Though in some cases regional or sectoral EAs cover some of the requirements of project-specific EAs, the latter are still needed for major investments. Nevertheless, the regional or sectoral EAs will have identified relevant issues, collected much of the data, and, in general, greatly reduced the work needed in subsequent project-specific EAs.

Alternatives to EAs

8. Many specific investment projects do not need a full EA. Typically, these projects are smaller, are not in environmentally sensitive areas, and present issues that are narrow in scope, well-defined, and well-understood. Alternative approaches may, therefore, be more effective in integrating environmental concerns into the borrower's planning process, and in focusing on

the environmental work needed. Such alternative approaches⁴ include, for example,

- (a) specific environmental design criteria and pollution standards, acceptable to the Bank, for small-scale industrial plants;
- (b) specific environmental design criteria and construction supervision programs for small-scale rural works projects; and
- (c) specific environmental siting criteria, construction standards, and inspection procedures for housing projects.

Sector and Financial Intermediary Lending

9. For sector investment loans and loans through financial intermediaries, for which subproject details are not known at the time of project appraisal, the borrower may not be able to prepare an EA as part of project preparation. Further, such projects usually consist of many small investments, which seldom require full EAs. In such cases, the project implementing institutions need to screen proposed subprojects and carry out appropriate environmental analyses consistent with this directive, prior to subloan approval. To ensure that this can be done, the Bank should appraise and strengthen, where necessary, the implementing agency's (a) screen environmental capabilities to subprojects along the lines of this directive (see para. 17 and Annex E), (b) obtain the necessary expertise for EA preparation, (c) review EA reports, (d) implement mitigation plans, and

(e) monitor environmental conditions during project implementation.⁵ The aim should be to help establish satisfactory environmental review systems in the appropriate agencies, rather than to focus only on those investments against which the Bank happens to disburse.

Emergency Recovery Projects

10. Because emergency recovery projects need to be processed rapidly, and seek mainly to restore existing facilities, they would not normally require a full EA. However, the extent to which an emergency was precipitated or exacerbated by inappropriate environmental practices should be determined. Based on this finding, corrective measures should be built into either the emergency project or a future lending operation.⁶

Global Issues

11. A number of agencies--inside and outside the United Nations (UN) system--carry out scientific investigations on global environmental issues (ozone depletion, global warming, sea level rise, ocean dumping, pollution of international waters, transport of hazardous wastes, biodiversity, etc.). While it keeps abreast of the findings of these agencies, the Bank is developing its own guidelines in these areas. The Bank also draws upon prevailing views in its own environmental, economic, sectoral, and investment policies and programs, with a view to minimizing possible adverse impacts on global environmental quality. The Bank encourages such issues to be considered in EAs where relevant and feasible.⁷

^{4.} In some cases, adherence to other existing directives is an acceptable alternative to an EA (e.g., OPN 11.01, Guidelines for the Selection and Use of Pesticides in Bank-Financed Projects and their Procurement When Financed by the Bank, to be reissued as OD 4.03, Agricultural Pest Management).

^{5.} The appraisal mission develops clear arrangements with the borrower for carrying out these functions during project implementation, indicating the sources of required expertise and the proper division of responsibilities among the ultimate borrower, the financial intermediary or sector agency, and the agencies responsible for environmental management and regulation. These arrangements ensure that subprojects that do not comply with accepted environmental standards are not financed under the project. In cases where subprojects are known prior to appraisal, they are subject to the normal procedures described in this directive. The EA Sourcebook provides further guidance on appraising the environmental aspects of sector and financial intermediary lending.

^{6.} See OD 8.50, Emergency Recovery Assistance.

^{7.} Guidance will be prepared on global environmental issues by the Environment Department (ENV) in cooperation with the Regional environment divisions (REDs).

Institutional Aspects

Strengthening Environmental Capabilities

12. The ultimate success of EA depends upon the capability and understanding of environmental matters of the government agencies concerned. Therefore, as part of the EA process, it is necessary to identify relevant environmental agencies and their capability for carrying out required EA activities. Projects with potentially major impacts normally require the strengthening of several environmental functions (e.g., environmental monitoring, inspection, management of mitigatory measures, EA scientific and technical review, and cross-sectoral coordination). In addition, policy strengthening is often needed through the development of legal or regulatory measures (including incentives) that ensure adequate environmental performance standards. These functions may be located in one or more units and at one or more administrative levels, depending on the country and project.8 Early focus on institutional involvement in the EA process (a) helps ensure that the executing agency's and central policy entity's knowledge and perspectives are taken into account, (b) provides on-the-job training for staff, and (c) provides continuity for implementing the EA's recommendations. In addition, to help develop EA capability in the country, the Bank encourages the use of local expertise and promotes EA training for local staff and consultants.9

Environmental Advisory Panels

13. For major, highly risky, and contentious projects with serious and multi-dimensional environmental concerns, the borrower should normally engage an advisory panel of independent, internationally recognized, environmental specialists to advise on (a) the terms of reference (TORs) for the EA, (b) key issues and methods for preparing the EA, (c) recommendations and findings of the EA, (d) implementation of the EA's recommendaations, and (e) development of environmental management capacity in the implementing agency.¹⁰

EA Procedures

14. Since project and country conditions, national legislation, and institutional experience vary among borrowers, both the borrower and the Bank must exercise judgment in using the EA process to design and implement projects that are both environmentally and economically sound, and that are consistent with the environmental laws, policies, and procedures of the borrower. The Environment Department (ENV), the Legal Department, and the Regional environment divisions (REDs) maintain information on these requirements.

EA Preparation

15. Though EA preparation is the responsibility of the borrower, the Bank's task manager (TM) assists and monitors the EA process, with support from the RED. The borrower and the Bank should agree as early as possible after issuance of the Initial Executive Project Summary (IEPS) on the terms of reference (TORs) for the EA, and on the EA procedures, schedule, and outline. This is because (a) EA preparation should form part of the overall feasibility study or preparation work for the project, so that the EA's findings can be directly integrated into project design; (b) some EAs require substantial time for preparation (see Annex D, paras. 6-7); and (c) completion of the EA report is a prerequisite for the departure of the appraisal mission. Major steps in the EA process are outlined in Annex D. The steps

^{8.} The first level of environmental involvement is on-site; a second, at the level of the implementing or executing agency, such as a Department of Agriculture, or Health; and a third at a central policy level, such as an environmental agency or other central policy-making body that oversees and coordinates intersectoral aspects.

^{9.} Guidance on institutional strengthening is in the EA Sourcebook.

^{10.} For more detail on the selection and functions of the panel, see para. 18 of OD 4.00, Annex B, Environmental Policy for Dam and Reservoir Projects (to be reissued as OD 4.05).

include (a) screening (see para. 17 and Annex E), (b) taking decisions based on the IEPS, (c) notifying the Board through the MOS, (d) preparing TORs for the EA, (e) preparing the EA, (f) reviewing the EA and incorporating environmental measures into the project, (g) supervising the project, and (h) evaluating the project ex post.

16. Borrowers may request Bank assistance for financing EAs through a Project Preparation Facility¹¹ (PPF) advance, from the Technical Assistance Grant Program for the Environment, or from trust funds. When the EA is prepared by specialists separately from the overall feasibility study for the project, the specialists should liaise closely with the project preparation or feasibility teams. For projects with potentially major adverse environmental impacts, such as large dams or projects involving large-scale resettlement, the borrower should retain independent EA experts not affiliated with the project.

Environmental Screening

17. The TM should screen projects/components at identification to determine the nature and extent of the environmental work required. As a result of the screening, the TM, with the concurrence of the RED, assigns the project to one of the following categories, in accordance with Annex E:

Category A: A full EA is required.

- Category B: Although a full EA is not required, environmental analysis is required.
- Category C: No EA or environmental analysis is required.

Interagency Coordination

18. Because environmental issues generally involve national, provincial, and local government agencies and cover a broad range of responsibilities (wildlife, health, water and land use, tourism, etc.), coordination among government agencies is crucial. Coordination is best achieved through interagency meetings convened by the proponent agency at key points, i.e., once the decision has been reached to carry out a full EA, and once the draft EA report has been completed. The meetings provide an opportunity to identify the issues, types of analysis required, sources of relevant expertise, responsibilities and schedule for the EA, mitigatory measures to be considered, and other recommendations.

Involvement of Affected Groups and Nongovernmental Organizations

19. The Bank expects the borrower to take the views of affected groups and local NGOs¹² fully into account in project design and implementation, and in particular in the preparation of EAs. This process is important in order to understand both the nature and extent of any social or environmental impact and the acceptability of proposed mitigatory measures, particularly to affected groups. Consultations also are a valuable way to improve decision making, to obtain feedback on the EA process and draft report, and to increase community cooperation in implementing the recommendations of the EA.

20. Such consultations should occur at least at the following two stages of the EA process: (a) shortly after the EA category has been assigned, and (b) once a draft EA has been prepared.¹³ In projects with major social

^{11.} See OD 8.00, Project Preparation Facility.

^{12.} For the Bank's overall approach to NGOs, see OD 14.70, Involving Nongovernmental Organizations in Bank-Supported Activities.

^{13.} Further consultations are encouraged at other appropriate points during EA preparation, after EA finalization, and throughout project implementation. Updates and information feedback between meetings are best when they are systematic and routine. One approach that has been effectively used by many countries is to follow the first interagency meeting with an initial consultation session with affected groups and local NGOs.

components, which require consultations pursuant to other Bank Operational Directives,¹⁴ the consultations on social issues and on EA may be linked.

Disclosure of Information

21. In order for meaningful consultations to take place between the borrower and affected groups and local NGOs, it is necessary that the borrower provide relevant information prior to consultations. The information should be provided in a timely manner and in a form that is meaningful for, and accessible to, the groups being consulted. Such information normally includes (a) for the initial consultation, a summary of the project description and objectives, and potential adverse effects of the proposed project; and (b) once the EA report has been prepared, a summary of its conclusions in a form and language meaningful to the groups being consulted. Any consultation should pay particular attention to those issues most likely to affect the people being consulted. In addition, the borrower should make the EA report available at some public place accessible to affected groups and local NGOs for their review and comment.

22. Bank policy is to request the borrower's advance permission to release the EA report to the executive directors (EDs) because the report is the borrower's property. When the need for an EA and the TORs for the EA are discussed with the borrower, the TM should seek the borrower's permission, in principle, for the release of the report to the EDs. Once the Bank has received a copy of the EA report from the borrower with the necessary permission for release, the country department (CD) should transmit the borrower's English-language summary of the EA to the Secretary's Department for distribution to the EDs. Further, because an important purpose of the EA process is informed decision making, the CD should transmit a copy of the EA report (without Bank endorsement) to the Secretary's Department for deposit in the EDs' library. If the borrower indicates at any time that it is not in a position to release such a report to the EDs, the Bank should not proceed with further work on the project, unless the Senior Vice President, Operations (OPNSV), decides otherwise on the recommendation of the Regional vice president concerned, and for objective reasons unrelated to the environmental soundness of the project.

^{14.} For example, OD 4.30, Involuntary Resettlement, and OD 4.20, Indigenous Peoples.

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Checklist of Potential Issues for an EA

Where applicable, EAs should address the following issues, which are subject to the Bank policies and guidelines identified here:

- (a) Agrochemicals. The Bank promotes the use of integrated pest management (IPM) and the careful selection, application, and disposal of pesticides (see OPN 11.01, Guidelines for the Selection and Use of Pesticides in Bank-Financed Projects and Their Procurement When Financed by the Bank, to be reissued as OD 4.03, Agricultural Pest Management). Due to their impacts on surface and groundwater quality, the use of fertilizers must also be carefully assessed.
- (b) Biological Diversity. The Bank promotes conservation of endangered plant and animal species, critical habitats, and protected areas (see para. 9b of OMS 2.36, Environmental Aspects of Bank Work, to be reissued as OD 4.00, Environmental Policies, and OPN 11.02, Wildlands: Their Protection and Management in Economic Development, to be reissued as OD 4.04, Wildlands).
- (c) Coastal and Marine Resources Management. Guidelines are available from the Environment Department (ENV) on the planning and management of coastal marine resources, including coral reefs, mangroves, and wetlands.
- (d) Cultural Properties. OPN 11.03, Management of Cultural Property in Bank-Financed Projects (to be reissued as OD 4.25, Cultural Property), confirms the Bank's commitment to protect

archaeological sites, historic monuments, and historic settlements.

- (e) Dams and Reservoirs. OD 4.00, Annex B, Environmental Policy for Dam and Reservoir Projects (to be reissued as OD 4.05), provides specific guidance for addressing environmental issues in the planning, implementation, and operation of dam and reservoir projects.
- (f) Hazardous and Toxic Materials. Guidelines are available from ENV on the safe manufacture, use, transport, storage, and disposal of hazardous and toxic materials.
- (g) Indigenous Peoples. OD 4.20, Indigenous Peoples (formerly OMS 2.34, Tribal People in Bank-Financed Projects), provides specific guidance for addressing the rights of indigenous peoples, including traditional land and water rights.
- (h) Induced Development and Other Sociocultural Aspects. Secondary growth of settlements and infrastructure, often referred to as "induced development" or "boomtown" effects, can have major indirect environmental impacts, which relatively weak local governments may have difficulty addressing.
- (i) Industrial Hazards. All energy and industry projects should include a formal plan to prevent and manage industrial hazards (see Technica, Ltd., and World Bank, Techniques of Assessing Industrial Hazards: A Manual, Technical Paper No. 55, Washington, D.C., 1988).

This directive was prepared for the guidance of staff of the World Bank and is not necessarily a complete treatment of the subjects covered.

- (j) International Treaties and Agreements on the Environment and Natural Resources. The EA should review the status and application of such current and pending treaties and agreements, including their notification requirements. The Legal Department, which maintains a list of international treaties, could obtain the information required on applicable laws in individual countries.
- (k) International Waterways. OD 7.50, Projects on International Waterways, provides guidance. This OD exempts from notification requirements any rehabilitation projects that will not affect the quality or quantity of water flows.
- (1) Involuntary Resettlement. OD 4.30, Involuntary Resettlement, renders guidance.
- (m) Land Settlement. Due to the complex physical, biological, socioeconomic, and cultural impacts, land settlement should generally be carefully reviewed (see OD 4.31, Land Settlement, to be issued).
- (n) Natural Hazards. The EA should review whether the project may be affected by natural hazards (e.g., earthquakes, floods, volcanic activity) and should propose specific measures to address these concerns when appropriate (see OD 8.50, Emergency Recovery Assistance).
- (o) Occupational Health and Safety. All industry and energy projects, and projects in other sectors where relevant, should include formal plans to promote occupational health and safety (see World Bank, Occupational Health and

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Safety Guidelines, Washington, D.C., 1988).

- (p) Ports and Harbors. Guidelines are available from the Infrastructure and Urban Development Department on addressing common environmental concerns associated with port and harbor development (see World Bank, Environmental Considerations for Port and Harbor Developments, Technical Paper No. 126, Washington, D.C., 1990).
- (q) Tropical Forests. The Bank's "Forest Policy" paper of July 1991 should be followed. OPN 11.02, Wildlands: Their Protection and Management in Economic Development (to be reissued as OD 4.04, Wildlands), also addresses issues relating to tropical forests.
- (r) Watersheds. Bank policy promotes the protection and management of watersheds as an element of lending operations for dams, reservoirs, and irrigation systems (see para. 6 of OD 4.00, Annex B, Environmental Policy for Dam and Reservoir Projects, to be reissued as OD 4.05).
- (s) Wetlands. The Bank promotes conservation and management of wetlands (e.g., estuaries, lakes, mangroves, marshes, and swamps). This subject is covered by OPN 11.02 (see (t) below).
- (t) Wildlands. The Bank is committed to protect wildlands and provides for compensatory measures when lending results in adverse impacts (see OPN 11.02, Wildlands: Their Protection and Management in Economic Development, to be reissued as OD 4.04, Wildlands).

Outline of a Project-Specific EA Report

1. A full EA report should be concise and should focus on the significant environmental issues. The report's level of detail and sophistication should be commensurate with the potential impacts. The target audience should be project designers, implementing agencies, and borrower and Bank staff. The report submitted to the Bank should be prepared in English, French, or Spanish.

2. The EA report should include the following items:

- (a) *Executive Summary*. Concise discussion, in English, of significant findings and recommended actions.
- (b) Policy, Legal, and Administrative Framework. Discussion of the policy, legal, and administrative framework within which the EA is prepared. The environmental requirements of any cofinanciers should be explained.
- (c) Project description. Concise description of the project's geographic, ecological, social, and temporal context, including any off-site investments that may be required by the project (e.g., dedicated pipelines, access roads, power plants, water supply, housing, and raw material and product storage facilities).
- (d) Baseline Data. Assessment of the dimensions of the study area and description of relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences. Current and proposed development activities within the project area (but not directly connected to the project) should also be taken into account.

- (e) Environmental Impacts. Identification and assessment of the positive and negative impacts likely to result from the proposed project. Mitigation measures, and any residual negative impacts that cannot be mitigated, should be identified. Opportunities for environmental enhancement should be explored. The extent and quality of available data, key data gaps, and uncertainties associated with predictions should be identified/estimated. Topics that do not require further attention should be specified.
- (f) Analysis of Alternatives. Systematic comparison of the proposed investment design, site, technology, and operational alternatives in terms of their potential environmental impacts; capital and recurrent costs; suitability under local conditions; and institutional, training, and monitoring requirements. For each of the alternatives, the environmental costs and benefits should be quantified to the extent possible, and economic values should be attached where feasible. The basis for the selection of the alternative proposed for the project design must be stated.
- (g) Mitigation Plan. Identification of feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels, and estimation of the potential environmental impacts; capital and recurrent costs; and institutional, training, and monitoring requirements of those measures. The plan (sometimes known as "action plan," or "environmental mitigation or management

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plan," outlined in Annex C) should provide details on proposed work programs and schedules. Such details help ensure that the proposed environmental actions are in phase with engineering and other project activities throughout implementation. The plan should consider compensatory measures if mitigation measures are not feasible or cost-effective.

- (h) Environmental Management and Training. Assessment of the existence, role, and capability of environmental units on-site, or at the agency and ministry level. Based on these findings, recommendations should be made concerning the establishment and/or expansion of such units, and the training of staff, to the point that EA recommendations can be implemented.
- (i) Environmental Monitoring Plan. Specification of the type of monitoring, who would do it, how much it would cost,

and what other inputs (e.g., training) are necessary.

- (j) Appendices
 - (i) List of EA Preparers--individuals and organizations.
 - (ii) *References*--written materials used in study preparation. This list is especially important given the large amount of unpublished documentation often used.
 - (iii) Record of Interagency/Forum/ Consultation Meetings--including lists of both invitees and attendees. The record of consultations for obtaining the informed views of the affected people and local NGOs should be included. The record should specify any means other than consultations that were used to obtain the views of affected groups and local NGOs.

Environmental Mitigation or Environmental Management Plan

1. A project's mitigation or environmental management plan consists of the set of measures to be taken during implementation and operation to eliminate, offset, or reduce adverse environmental impacts to acceptable levels. Also included in the plan are the actions needed to implement them. Mitigation plans are essential elements of category A projects (see Annex E). Mitigation plans alone suffice for many category B projects. During the preparation of a mitigation plan, project sponsors and their EA design team (a) identify the set of responses to potentially adverse impacts, (b) determine requirements for ensuring that those responses are made effectively and in a timely manner, and (c) describe the means for meeting those requirements.

2. A mitigation or management plan should include the following items:

- (a) identification and summary of all the significant adverse environmental impacts that are anticipated;
- (b) description and technical details for each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;
- (c) institutional arrangements--the assignment of the various responsibilities for carrying out the mitigatory measures (e.g., responsibilities which involve operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training);

- (d) implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans;
- (e) monitoring and reporting procedures to

 (i) ensure early detection of conditions
 that necessitate particular mitigation
 measures, and (ii) provide information
 on the progress and results of miti gation; and
- (f) integration into the total project cost tables of the cost estimates and sources of funds for both the initial investment and the recurring expenses for implementing the mitigation plan.

3. To strengthen environmental management capability in the agencies responsible for implementation, most mitigation plans cover one or more of the additional topics identified below:

- (a) technical assistance programs,
- (b) staff development,
- (c) procurement of equipment and supplies, and
- (d) organizational changes.

4. The borrower's decision to proceed with a project, and the Bank's decision to support it, will be in part predicated on the expectation that the mitigation plan will be executed effectively. Consequently, it is important to integrate the plan into the project's overall planning, design, budget, and implementation. Such integration should be achieved by establishing the mitigation plan as a component of the project. This precaution ensures that the plan will receive funding and supervision along with the other investment components.

5. Specific links should exist for (a) funding, (b) management and training (strengthening local capabilities), and (c) monitoring. The purpose of the first link is to ensure that the proposed actions are adequately financed. The second link helps embed in the overall management plan the training, technical assistance, staffing, and other institutional strengthening needed to implement September 1991 OD 4.01 -- Annex C Page 2 of 2

the mitigatory measures. The third link is necessary to provide a critical path for implementation and to enable the sponsors and the Bank to evaluate the success of mitigation as a part of project supervision and as a means for improving future projects. These linkages may be part of the conditionality in Loan Agreements or in the Minutes of Negotiations.

EA Procedures: Internal

Initial Executive Project Summary (IEPS)

1. After consulting with the Regional environment division (RED), the task manager (TM) indicates in the Initial Executive Project Summary (IEPS) (a) the key environmental issues, (b) the project category (see Annex E) and the type of environmental work needed, and (c) a preliminary EA schedule. In exceptional cases, if it is anticipated that an EA cannot be available prior to appraisal, the IEPS should propose special procedures to address the situation. The IEPS meeting should confirm the type, timing, and issues of environmental analysis.

Monthly Operational Summary

2. The TM ensures that the Monthly Operational Summary of Bank and IDA Proposed Projects (MOS), which is used to alert the executive directors to forthcoming projects, contains the EA category assigned to a project. He also prepares and updates as needed an environmental data sheet for all projects in the IBRD/IDA lending program (see Annex F). For category A projects, the environmental data sheet will be included in a quarterly annex to the MOS.

Preparation of Terms of Reference for the EA

3. Following the IEPS meeting, the Bank discusses with the borrower the scope of the EA, and assists the borrower, as necessary, in preparing the terms of reference (TORs) for the EA. Normally, a field visit for this purpose is conducted by Bank environmental staff or environmental consultants. The Bank should ensure that the TORs provide for adequate interagency coordination and consultation with affected groups and local nongovernmental organizations (NGOs). For category A projects, it is advisable for Bank staff to attend scoping and EA review meetings. 4. To help ensure a full EA report, the borrower should be (a) provided with the "Outline of a Project-Specific EA Report" (see Annex B) at the time the TORs for the EA are reviewed by the Bank and (b) informed of the need to have the report submitted to the Bank written in English, French, or Spanish. The requirement in Annex B for an executive summary, to be prepared in English, should specifically be called to the borrower's attention.

EA Preparation

5. The EA should form part of the overall feasibility study or project preparation, so that the EA's findings are directly integrated into project design. When the EA is prepared separately by specialists, the specialists should liaise closely with the project preparation or feasibility teams. For projects with potentially major adverse environmental impacts, such as large dams or projects involving large-scale resettlement, the borrower should retain independent EA experts not affiliated with the project. Borrowers may request Bank assistance for financing EAs through a Project Preparation Facility (PPF) advance, from the Technical Assistance Grant Program for the Environment, or from trust funds.

6. An EA for a major project typically takes 6-18 months to prepare and review. The EA report should be received by the Bank prior to the departure of the appraisal mission, and a summary should be circulated with the Final Executive Project Summary (FEPS)/white cover Staff Appraisal Report (SAR) to minimize the risk of project changes and delays at a later stage.

7. For some projects, a full year of baseline data is essential to capture seasonal effects of certain environmental phenomena, such as rainy and dry seasons or species migrations. In contrast, other effects (e.g., hydroclimatic variation) may require

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multiyear data. To avoid delay in critical project decisions in these cases, short-term monitoring should be used to provide conservative estimates of environmental impacts. In such instances, such short-term data can be a surrogate for annual data while longer-term data are being collected. Since special care in designing the baseline monitoring program is warranted, the borrower should be encouraged to discuss the matter with the Bank.

EA Review and Project Appraisal

8. For category A projects, the borrower submits the EA report to the Bank prior to the departure of the Bank's appraisal mission. This report follows (to the extent relevant) the outline for project-specific EA reports provided in Annex B and includes a separate English summary. The TM, with the advice of the RED, assesses the EA, taking into account the TORs agreed upon with the borrower. In addition, in view of the need for the borrower to take the views of affected groups and local NGOs into account, the TM ascertains the nature of the consultations undertaken with such groups and assesses the extent to which their views have been considered.

9. The FEPS summarizes the EA's status and describes how major environmental issues have been resolved or are to be addressed, noting any Prior to the FEPS proposed conditionality. meeting, the RED reviews and comments on the EA and on the EA annex in the white cover SAR. If the RED is not satisfied with the EA, it may recommend to the country department that (a) the appraisal mission be postponed, (b) the mission be considered a preappraisal mission, or (c) certain issues be reexamined during the appraisal mission. The appraisal mission reviews both the procedural and substantive elements of the EA with the borrower, resolves any issues, assesses the adequacy of the institutions responsible for environmental management in light of the EA's findings, ensures that the mitigation plan is adequately budgeted, and determines if the EA's recommendations are properly addressed in project design and economic analysis.

Distribution to Executive Directors

10. When an EA report is received from a borrower, the country department should ensure that copies of the full EA report and the Englishlanguage summary are sent to the Adviser and Board Operations, Secretary's Department--the full report for deposit in the executive directors' library and the summary for distribution to the executive directors. The transmittal memorandum, for signature by the country department director, should state that the EA report and summary

- (a) have been prepared by the borrower and have not been evaluated or endorsed by the Bank; and
- (b) are subject to review and possible change during the appraisal process.

11. The TM should also ensure that the next issue of the MOS contains, in the column entitled "Stage of Processing and Action on Procurement," an entry indicating the date on which the EA report was received. The receipt of the EA report should also be noted on the environmental data sheet (see Annex F).

Board Documents

12. The findings of the EA process and the procedures used in its preparation are summarized in the text of the SAR and in the Memorandum and Recommendation of the President. A SAR annex summarizes the EA of category A projects more fully. The summary covers, inter alia, environmental baseline conditions; the alternatives considered; preventive, mitigatory, and compensatory actions; the capability of environmental units and measures to strengthen them; environmental monitoring arrangements; revisions to the EA required as a result of the appraisal; and the borrower's consultations with affected groups and NGOs. These factors provide the basis for the RED's formal environmental clearance, prior to the authorization of negotiations by the Regional

the authorization of negotiations by the Regional vice president. The EA annex should also indicate if a revised EA report has been prepared and included in the project file. Measures critical to sound project implementation may require specific loan conditionality.

Supervision

13. EA recommendations provide the basis for supervising the environmental aspects of the project during implementation. Compliance with environmental commitments, the status of mitigatory measures, and the findings of monitoring programs are part of borrower reporting requirements and project supervision. When major issues arise, special supervision missions with adequate environmental expertise are programmed and budgeted in advance, where possible.

Ex Post Evaluation

14. The project completion report¹ submitted to the Operations Evaluation Department evaluates (a) environmental impacts, noting whether they were anticipated in the EA report; (b) the effectiveness of the mitigatory measures taken; and (c) institutional development and training.

Role of the Environment Department

15. Responsibility for all projects, including their EAs, is vested in the Regions. The role of the Environment Department (ENV) in the EA process is to support the Operations complex throughout. This EA support focuses on training, dissemination of best practices, reviews, guidelines, and other operational support as requested. To enable it to fulfill this role, ENV should be kept systematically informed of key decisions at relevant stages of the EA process, such as screening, public participation, EA schedules, and EA reviews. The REDs share with ENV copies of EA reports that are submitted by borrowers to the Bank prior to appraisal. ENV should be consulted as needed in special cases. ENV is available, when deemed necessary, to discuss or assist with all aspects of the EA process at any stage. ENV will share with the other Regions the EAs, related materials, precedents, and experience originating in one Region. ENV will conduct post hoc EA reviews selectively with the REDs in order to ascertain best practice and the development of policies in this area.

^{1.} See the OPNSV memorandum Guidelines for Preparing Project Completion Reports (PCRs), June 7, 1989, and OMS 3.58, General Guidelines for Preparing Project Completion Reports, which are to be combined and reissued as OD 13.55, Project Completion Reports.

This directive was prepared for the guidance of staff of the World Bank and is not necessarily a complete treatment of the subjects covered.

Environmental Screening

Determination of EA Category

1. The purpose of screening is to decide the nature and extent of the EA or environmental analysis to be carried out. The classification of each proposed project depends on the type, location, sensitivity, and scale of the proposed project, as well as the nature and magnitude of its potential impacts.¹ At identification and prior to the issuance of the Initial Executive Project Summary (IEPS), projects should be screened for environmental issues and assigned to one of three categories: A, B, or C.² The selection of the category should be based upon the expected environmental impacts. Best professional judgment is essential throughout this procedure.

Category A	A:	A	full	EA	is	required.
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- Category B: Although a full EA is not required, environmental analysis is required.
- Category C: No EA or environmental analysis is required.

2. The EA category should be assigned by the task manager (TM), with the concurrence of the Regional environment division (RED). An EA normally deals with the whole project, but it focuses most time and attention on the components with the potentially greatest negative impacts and their links with the rest of the project. Any project may contain environmentally benign components; however, in projects with

several components, those components with the most serious environmental issues should receive the principal focus. Projects are categorized according to the component with the potentially most serious adverse impact. Dual categories (e.g., A/C) should not be used. For instance, a relatively benign project with a single category A component is a category A project. The results of the screening should be reported in the *Monthly Operational Summary of Bank and IDA Proposed Projects* (MOS) and indicated on the environmental data sheet (see Annex F).

Revision of EA Categories

3. The EA category assigned to the project as part of the screening is based on the best judgment and information available at that early stage. If the project is modified or new information becomes available to justify reclassification, the TM should reclassify a proposed project. The reclassification should be done with the concurrence of the RED. The new classification that appears in the MOS should be followed by "(R)" to indicate a revision. The reasons for any reclassification should be recorded on the environmental data sheet (see Annex F).

Illustrative Lists

4. Bank and international experience shows that projects in certain sectors or of certain types are normally best classified as illustrated below.

 [&]quot;Location" refers to proximity to or encroachment on environmentally fragile areas, such as mangroves, wetlands, and rain forests. "Scale" needs to be judged by the task manager (TM) in the country context; if large, the project is likely to be a category A project. "Sensitivity" refers to issues such as impacts that are irreversible, affect vulnerable ethnic minorities, or involve involuntary resettlement.

^{2.} Projects classified in category D before this directive was issued should be reclassified, where practicable, by the TM with the concurrence of the Regional environmental division. An environment project formerly classified as category D may fall into any of the three categories.

These examples are only illustrative; they are by no means exhaustive.³

Category A Projects/Components

5. A full EA is required if a project is likely to have significant adverse impacts that may be sensitive, irreversible, and diverse. The impacts are likely to be comprehensive, broad, sectorwide, or precedent-setting. Impacts generally result from a major component of the project and affect the area as a whole or an entire sector.

- (a) Dams and reservoirs;
- (b) Forestry production projects;
- (c) Industrial plants (large-scale) and industrial estates;
- (d) Irrigation, drainage, and flood control (large-scale);
- (e) Land clearance and leveling;
- (f) Mineral development (including oil and gas);
- (g) Port and harbor development;
- (h) Reclamation and new land development;
- (i) Resettlement and all projects with potentially major impacts on people;
- (j) River basin development;
- (k) Thermal and hydropower development; and
- Manufacture, transportation, and use of pesticides or other hazardous and/or toxic materials.

Category B Projects/Components

6. The project may have adverse environmental impacts that are less significant than category A impacts. Few if any of these impacts are irreversible. The impacts are not as sensitive,

numerous, major, or diverse as category A impacts; remedial measures can be more easily designed. Preparation of a mitigation plan (see Annex C) suffices for many category B projects. Few category B projects would have a separate environmental report; most may be discussed in a separate chapter of the project preparation or feasibility study.

- (a) Agro-industries (small-scale);
- (b) Electrical transmission;
- (c) Aquaculture and mariculture;
- (d) Irrigation and drainage (small-scale);
- (e) Renewable energy;
- (f) Rural electrification;
- (g) Tourism;
- (h) Rural water supply and sanitation;
- (i) Watershed projects (management or rehabilitation); and
- (j) Rehabilitation, maintenance, and upgrading projects (small-scale).

Category C Projects/Components

7. An EA or environmental analysis is normally not required in this category because the project is unlikely to have adverse impacts. Professional judgment finds the project to have negligible, insignificant, or minimal environmental impacts.

- (a) Education,
- (b) Family planning,
- (c) Health,
- (d) Nutrition,
- (e) Institutional development,
- (f) Technical assistance, and
- (g) Most human resource projects.

^{3.} For example, highway and rural road projects and major urban water or sanitation projects, while normally category A, are not listed below because there are exceptions; hence they are not clear examples.

September 1991 OD 4.01 -- Annex F Page 1 of 1

Environmental Data Sheet for Projects in the IBRD/IDA Lending Program

Date (est.) for receipt of EA by Bank:	EA Category: A/B/C (circle one); date assigned:						
Lending Instruments:	Sector:						
Managing Division:							
Board Date:							
Appraisal Date:		Tour Hojeet Cost.					
Project Name:	Project ID No .:	Total Project Cost:					
country.							

Major Project Components: (presents description of project components)

Major Environmental Issues: (describes major environmental issues identified or suspected in project)

Other Environmental Issues: (describes environmental issues of lesser scope associated with project)

Proposed Actions: (describes actions proposed to mitigate environmental issues described above)

Justification/Rationale for Environmental Category: (presents reasons for environmental category selected and explanation of any changes from initial classification)

Status of Category A Environmental Assessment: (presents EA start-up date, EA first draft, and current status)

Remarks: (gives status of any other environmental studies, lists local groups and local NGOs consulted, tells whether borrower has given permission to release EA, etc.)

Signed by:

Country

Operations Division Chief

Signed by:

Regional Environment Division Chief

The World Bank Washington, D.C. 20433 U.S.A.

TIMOTHY T. THAHANE Vice President & Secretary

Mr. Moeen Qureshi

August 28, 1991

Environmental Assessment: Revised OD 4.00, Annex A

Moeen,

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Barber's decision memo of August 26, 1991 on the above O.D. Annex A includes a sentence to the effect that he does "not believe there is any need for an Executive Directors' Seminar on the subject at this time."

I stated at the PC Meeting that a seminar was promised and included in EDs' Work Program which was discussed in the Board in July. Messrs. Potter and Coady have repeatedly asked that a Seminar be held on the O.D.

Therefore, rather than risk confrontation on this, I suggest we proceed with a Seminar under your Chairmanship. We can report in the Seminar that assessments carried out so far do not permit meaningful conclusions or generalizations to be made.

Juin

cc: Mr. Thalwitz Mr. Sandstrom

cc: DAT done - 1/2

THE WORLD BANK Washington, D.C. 20433 U.S.A.

BARBER B. CONABLE President RECEIVED STSEP 27 Pit 4: 12 P R D D R

August 26, 1991

Messrs. Qureshi and Thalwitz

Environmental Assessment: Revised OD4.00, Annex A

The revised Operational Directive 4.00, Annex A, on Environmental Assessment should be issued after incorporating the minor changes in language suggested at the President's Council last week. Given the modest revisions to the original version issued in October 1989 and the limited experience to date with the policy and procedures stipulated therein, I do not believe there is any need for an Executive Directors' seminar on the subject at this time. We should explain to interested EDs the "living" nature of the Operational Directives and tell them that we expect to make periodic revisions to OD 4.00, Annex A, as our experience with its provisions evolves.

Clearly, a meaningful review of our experience must cover not only the environmental assessments conducted for Category A projects but the totality of the Directive's provisions for environmental analysis of <u>all</u> categories of projects. Such a review should be conducted during FY92 and should address the basic questions raised in Mr. Rajagopalan's covering note of August 16.

Finally, I am worried by comments regarding the poor quality of many environmental assessments and the serious imbalance across the four regions in the number of environmental assessments completed. I trust you will ensure that all Regional Management Teams are fully committed to sound and timely environmental analysis of projects financed by the Bank.

Bain lankin.

cc: Members, President's Council Messrs. Alisbah, Picciotto, Rajagopalan, Summers Bock, El-Ashry, Isenman, Wyss The World Bank/IFC/MIGA OFFICE MEMORANDUM

DATE: August 20, 1991 12:12pm

TO: Mohamed T. El-Ashry

(MOHAMED T. EL-ASHRY)

FROM: Tariq Husain, PRDDR

(TARIQ HUSAIN)

EXT.: 33957

SUBJECT: Comments on Revised Operational Directive on EA

It is probably late in the day but here are some reactions from an "operational" perspective on the above paper. I am sure all this has been thought through; but, just in case.

Memorandum To The Executive Directors, para 4 "The Bank now interprets this as sharing the project descrition and objectives with the affected people and local NGOs for their comments and input at the outset,"

<u>Question</u>: Inspite of the history the following questions remain relevant:

Is this practical? Feasible? Impact on project processing time?

OD 4.00, para 6 "Sectoral EAs are used for the design of sector investment programs. They are particularly suitable for reviewing (a) sector investment alternatives; (b) the effect of sector policy changes;"

<u>Question</u>: Is this being seen as sector work? Is it possible to carryout a sectoral EA? If yes, outline of what a regional and/or sectoral EA would comprise would be helpful. Appendix 1 only gives outline of project-specific EA.

para 6 continued "Sectoral EAs should also have the objective of strengthening the environmental management capability of the sectoral or other relevant agencies."

<u>Comment</u> In my view environmental management capacity building should be a direct goal rather than a by-product of an EA.

para 11 "the borrower should <u>normally</u> engage an advisory panel..."

<u>Question</u>: Will it be possible under "non-normal" (?) conditions not to engage a panel of experts? I think that for "risky and contentious" projects a panel should be mandetory. CC: Paul IsenmanCC: Costas MichalopoulosCC: Geoffrey B. LambCC: Robert LiebenthalCC: Institutional ISC Files

(PAUL ISENMAN)
(COSTAS MICHALOPOULOS)
(GEOFFREY B. LAMB)
(ROBERT LIEBENTHAL)
(INSTITUTIONAL ISC FILES)



ROUTING SLIP

DATE: 7-26-91

From the Senior Vice President Policy, Research and External Affairs

Name	Room No.	Name	Room No				
V. Rajagopalan	x	C. Michalopoulos					
L. Summers		G. Lamb	x				
P. Isenman	x	R. Liebenthal					
A. Shakow		R. Woodford					
G. Ingram		R. Voight					
K. Jay		J. Holsen					
Urgent		Comment					
For Action		Approval/Clearance					
X Information		Signature					
BEMARKS.							

REMARKS:

cc: Mr. El-Ashry

& World Bank and the Environment - FY91

femo from Ryrie to WT, July 25, 1991

FROM:

Patricia M. Gallagher

Ext.:

eadeluidaana

INTERNATIONALFINANCE CORFORATION OFFICE MEMORANDUM

DATE: July 25, 1991

TO: Mr. Wilfried P. Thalwitz, PRESV

FROM:

Mr. William S. Ryrie, CEXVP (\vec{r} ,

EXT: 30381

SUBJECT: The World Bank and the Environment - FY91

We found the subject report to be a useful and enlightening account of the many activities being undertaken by the Bank and IFC in the environmental area. The following comments are offered to strengthen the document:

 As requested earlier, we feel that because the report discusses not only IBRD activities but also the activities of other members of the World Bank Group, either the title should be changed to "The World Bank <u>Group</u> and the Environment Annual Report," or language similar to that found on page 3 of <u>The World Bank</u> <u>Annual Report 1990</u> should be used in the opening paragraph of <u>The World Bank and</u> <u>the Environment Annual Report</u> to clarify the terminology used in the report, i.e.,

"The World Bank," as used in this Annual Report includes the International Bank for Reconstruction and Development (IBRD) and its affiliate, the International Development Association (IDA). The IBRD has two other affiliates, the International Finance Corporation (IFC) and the Multilateral Investment Guarantee Agency (MIGA). The Bank, the IFC and MIGA are sometimes referred to as the "World Bank Group."

 Page 76--The transition from Chapter V to Chapter VI is rather abrupt. We suggest that the first paragraph should begin with the following sentence:

"The International Finance Corporation (IFC) is the member of the World Bank Group established to lend and invest in private sector projects in developing countries."

- 3. Page 77--Please revise the numbers in Table 1 to indicate 9 projects in Category A and 63 in Category B.
- 4. Page 81--We suggest that the last paragraph be replaced by the following:

"These forces will result in increasing numbers of environmental projects in developing countries in which the private sector can and should invest. For example, over 200 potential private sector environmental projects were identified in the nine countries studied. The private sector can make an important contribution to improving the environment in developing countries by providing needed technical, managerial, and financial resources."

cc: Messrs. Sandstrom, Khanna, Dehejia, Garrity, Raczynski, Riddle, Van Praag, Jabre Ms. Oliveira

THE WORLD BANK/IFC/MIGA OFFICE MEMORANDUM

Mr. Laurio. S-13-119.

DATE:	July 17, 1991		RECEIVED					
TO:	Mr. Wilfried P. Thalwi	tz, PRESV 91	JUL 18 PM 2: 2	8				
THRO:	Mr. V. Rajagopalan, PF	SVP	PRUPU					
FROM:	Mohamed T. El-Ashry, E	INVDR MTE		60				
EXTENSION:	33202			-restand				

SUBJECT: Environment - Annual Report FY91

Attached please find a copy of the Annual Report for submission to the President's Council. It has been revised to take account of comments by PRE committee members. An additional 20 copies are being sent to Mr. Lamb's office.

Distribution

Messrs./Mmes.

1

Colaco, Wyss, Munasinghe, Koch-Weser, Goodland, Johnson, Warford, van Praag, Hitchcock, Christoffersen, Davis, Seth, Birdsall The World Bank/IFC/MIGA OFFICE MEMORANDUM

DATE: 16-Jul-1991 02:33pm

TO: Geoffrey B. Lamb

(GEOFFREY B. LAMB)

FROM: Nicholas Van Praag, ENVDR

(NICHOLAS VAN PRAAG)

EXT.: 35102

SUBJECT: Environment Report

A fresh draft of the Annual Report will be ready to go tothe President's Council on the 18th. We will let you have copies on the 17th. Perhaps you would let me ' w how many you need as well as the correct routing for the memo. Should it be loom El-Ashry through Rajagopalan to Thalwitz? Or is there some more scenic variant?. Best, Nick.

Env. report El Scratz Integ. into contry makines, ESW - beefig up straken sections i reg. sections = por. liberalization - >50%; 10% ich 4. / - Futul directions - ton beef up is WDR discussion _ inc. "lessers"

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		5-13-11	9	Mr.	LAM	B
THE WORLD OFFICE 1		NANCE CORPORATION / MIGA		/		
DATE:	July 8, 1991	91 JUL -9 PM 3: 12	je st	'I en	love	hese
TO:	D. C. Rao, IECDR		`	comm	ents.	
FROM:	John C. O'Connor,	IECSE d S	4		9	ex and
EXT:	33805					118.
SUBJECT:	Second Annual Rep	oort on Environment				

The draft of this report, sent for comment by c.o.b. today, is an impressive inventory of Bank efforts that touch on the environment. It does a good job of showing that the Bank takes seriously the obligation to consider environmental implications of its programs and projects. I am assuming that is the main objective of the report, in giving the following answers to specific questions posed in Geof Lamb's cover note.

In response to Geof's paragraph 2, I think the treatment of regional activities is informative and supports what I take to be the objective of the report. However, it does not help the report convey an overall coherent picture--the goal is probably unattainable with something as pervasive as the environment.

I think the draft responds well to the Development Committe mandate to give special attention to forestry and energy efficiency (Geof's paragraph 3).

I would have liked a bit more discussion in the draft of the increase in the threshold definition for "significant" environmental objectives, from 10 to 50 percent, before answering the query in paragraph 4 of Geof's note, about the change. Specifically, I wonder which projects would have been regarded as "significant" last year by the proposed new standard, and how the high threshold would reshape the description of what the Bank does that is significant for the environment. My guess is that the high threshold will work against the integration of environmental concerns into "normal" Bank programs and projects, which could have a high disguised cost. Moreover, if the objective is to show how much the Bank is doing, and how pervasive our concern is for the environment, I think we should be sure that the tight standards are not misunderstood as slower expansion in effort.

The report has little to say about the need for more and more meaningful environmenal indicators. Scattered references to data collection efforts are made under urban-industrial waste, health, and research into national accounting for the environment. I think it is a pity that so little attention is given to how the Bank will evaluate and monitor progress over such a diverse topic.

cc. Messrs. Blazic, Garcia, Kearney (IECSE)

THE WORLD BANK/IFC/MIGA OFFICE MEMORANDUM

High Lant

DATE: July 8, 1991

TO: Mr. Mohammed El-Ashry, ENV

FROM: Andrew Steer, WDR

EXTENSION: 32924

SUBJECT: Annual Report on the Environment

Here are some comments on the draft report (June 26 version) to add to the myriad you have no doubt already received.

First, the report is very interesting, easy to read, and highly educational. Nobody could read this report and conclude that the Bank is still not taking the environment seriously. It is therefore already in good shape.

General comments

The Broad-and-Shallow Problem. The report is an effective shot-gun approach to the subject. It's main message is: the Bank is making great efforts across a wide range of environmental fields, and endeavoring to incorporate environmental concerns in all we do. In conveying this message it obviously sacrifices interesting insights on many of the specific areas.

By taking the broad and shallow approach, everybody will want more emphasis on their own area of preference. For my money, <u>sanitation</u> issues are severely underplayed. I think sanitation and water investments are the most important contribution that the Bank is making in the environmental field, and we have been doing so for many years; we don't expect credit from environmental groups for this, but we should emphasize our ongoing commitment in this area more clearly in this report. Other people will have different views, and of course one can't please everybody in a report that tries to cover everything environmental.

My recommendation to overcome the frustration of the broad-and-shallow approach is that the report states more clearly that, given the size of the field, each year will have one or two topics of special focus. Forestry partly plays this role this year, but so does energy efficiency. I suggest they are both highlighted at the beginning as having special focus. Interesting conclusions for research in these areas should then be pulled out of the Policy and Research section and a richer story for these special topics. Thus, for example, instead of

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saying things like "work is ongoing on energy use in industry, in transport, and at the household level" (p. 59), the report could briefly summarize what the <u>lessons</u> from the research actually are. For the focus topics, we should indicate how we are learning and how we are changing. There's not enough of that in the current draft.

The categorization of loans. A related problem to the above, and that needs to be noted in the report, is that we are becoming victims of our own success. On the one hand, we are seeking to incorporate environmental concerns into all of our lending. On the other hand, we calculate percentages spent on specific environmental investments. This calculation surely will and should become increasingly meaningless. Would not all energy projects that include higher power tariffs be environmental? Presumably all power hardware is now less polluting than old hardware. I would suggest two things: first, there needs to be a careful explanation of the concept (on page 34?). Second, it may be useful to distinguish between (a) protective and remedial expenditures (such as the financing of forest protection, or sewerage, or the clean-up of Cubatao) from (b) improvements in productive sustainability (cleaner power plants, better agricultural practices, etc.), from (c) all other expenditures. Of course there will be lots of blurring between the categories, and its probably too late and probably impossible to figure out numbers. But the concept may be important, and possibly helpful The second category of projects are justified on to the Bank. their efficiency grounds, but also have environmental benefits. The first category are justified primarily on their environmental benefits, but we believe that they may also have efficiency benefits.

Specific comments

 Starting the report with "Organization and Procedures" (page 3) hardly excites the wayward reader.

2. The policy recommendations with regard to the Amazon (page 32), (presumably from the Schneider study), are made to sound rather simple. A richer discussion should rather be switched into the special section, along with the OED findings, etc.

3. On Environmental Assessments, I very much liked the crisp presentation on pp. 36-37. "Components that would require a Category "A" are being dropped because of the extra work involved in preparing a detailed EA" is an interesting and brave statement. But is dropping these components a good thing? What are we losing as a result? I think the reader would be fascinated by a discussion of the <u>costs</u> of changing and dropping components. Dropping two of the three dams at Pak Mun saves a lot of resettlement effort--but how much electricity is forgone? By diverting water in the Lower Guayas Flood Control Project to avoid ecological disruption, how much did project costs rise? 4. <u>Making EAs public.</u> The bottom of page 38 says that we won't proceed unless governments agree to make all EAs public. Is this always happening? What about China?

5. <u>Impact of Population on Deforestation</u>. The paper (page 94) claims that research at the Bank demonstrated that population growth is a primary cause of deforestation in West Africa. We're of the view that the Nexus Study (which I think is being cited) asserts this rather than demonstrates it.

6. <u>Staff education:</u> On page 46 the report should note that by far the most significant channel of education is through seminars. Adding Regional, ENV, and WDR seminars, there must be at least one per day, mostly of very high quality.

7. <u>Policy and Research.</u> This is a good section. But slightly too much description of what the studies are trying to do and not enough on the lessons learned.

8. <u>World Development Report 1992.</u> We're grateful for the plug on page 78. Another possibility would be to add a section listing the themes and structure of the WDR. It could possibly serve to give advance publicity and whet the potential reader's appetite. I'd be happy to draft something if helpful.

All in all, a very interesting report. My congratulations to the authors.

cc: Messrs. Thalwitz, Summers, Warford, Van Praag, Lamb

THE WORLD BANK/IFC/MIGA OFFICE MEMORANDUM

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DATE: July 8, 1991

TO: Mr. El-Ashry, ENVIE ohl

FROM: Harindar S. Kohli, EMTDR

EXTENSION: 32676

SUBJECT: Annual Report on Environment, FY91: EMENA Comments

1. As requested in the memorandum sent to PRE Committee Members by Mr. Geoffrey Lamb on June 28, 1991, we have reviewed the draft 1991 report and suggest that the following changes be made in the draft report.

2. With respect to S. Europe/Middle East and N. Africa, we suggest: (a) adding a section in the introductory part, which spells out the elements of the sub-regional strategy, before going into individual countries; and, (b) an overview piece to bring out the lessons learnt from the country specific analytical work done to date. With respect to Central & Eastern Europe, we suggest adding a section at the end of the Environmental Strategy describing the future policy/analytical work including on the sub-regional environmental issues. We would also want to note the slow uptake of GEF activities in C & E Europe -- a deficiency we expect to correct in the next few months. In addition, we had some minor comments on both sections. Please find attached a proposed new text for EMENA sections incorporating these suggestions. In case your staff have any questions, they can contact Mr. Seth.

3. The presentation of operational activities by Region in the annual report, constitutes, we believe, an improvement on last year's report. This year's report will further gain in consistency and coherence if activities of each Region were presented following the same format (i.e. I. Introduction, II. Environmental Strategy, III. Environmental Lending, and IV. Global Environment Facilities).

4. We are also pleased to see a balanced and extensive discussion of forestry issues.

5. The intention to raise the threshold definition for "significant" environmental objectives or components of operations from last year's 10% of project costs to 50% this year is welcomed as it gives a better sense of the Bank's effort in that area. It would be useful to give a comparison of this year's lending achievements with last year's, revised to take into account the new definition of environmental components.

Attachment

cc: Messrs. Wapenhans, Karaosmanoglu, Dervis, Wiehen, Chopra, Cheetham, Blanchi, Seth, Lamb, Warford, Harris

EMENA Division Chiefs, EMTEN Staff

Southern Europe, Middle East and North Africa

Environmental Strategy. The countries of Southern Europe, Middle East and North Africa suffer from a fragile natural resource base, increasingly under pressure from fastgrowing population. Land erosion threatens the productivity of traditional agricultural and pastoral activities, while highly productive land in suburban areas are being lost to expanding cities. Water is increasingly scarce and its production requires always larger investments for dams and transfer infrastructure. Water scarcity is made more severe by the degradation of its quality from agricultural, industrial and urban waste discharges. Biodiversity of flora and fauna is being lost due to the growth of human activities, forest cutting, the degradation of forest and range land, and desertification. Finally, air and water pollution, following rapid economic and urban growth and industrialization, is now becoming a threat to human health and sustained economic growth.

In its efforts to help these countries slow down environmental degradation, the Bank recognizes that effective environmental management is currently hindered by a weak institutional and legal framework. Studies, carried out in Tunisia, Egypt, Morocco, Yugoslavia and Cyprus indicate that the primary focus of environmental efforts in this part of EMENA region should be in the following areas:

- Institutional and legal aspects: Public administrations must have a clear and coherent mandate regarding environmental management, with corresponding financial and staff resources. Strong capacities in policy formulation and implementation, monitoring, enforcement of laws and regulation, and coordination are needed. In many countries, laws on pollution and natural resource property rights must be updated. Education and awareness-raising are needed if environmental concerns are to be taken into account.
- <u>Economic incentives</u>: Economic incentives must be introduced or reinforced so that economic, environmental and natural resources depletion costs are borne by users of environmental goods and services (including pollution). Full environmental pricing should be a long term goal. In the short term, while institutional, legal, monitoring and enforcement capabilities are being developed, environmental management must rely on public investment and regulation. Adequate pricing should be already implemented when possible (water and sewage charges in particular).
- <u>Water</u>: In view of the rapidly increasing water depletion and degradation, particular efforts are needed in water resource management. Focus should be placed on a move toward integrated water management, improved water allocation planning, wastewater reuse, and water conservation through price and other measures.
- <u>Aid mobilization and coordination</u>: Efforts should be made at increasing aid mobilization and coordination so as to take advantage of international, often concessional, financial resources available for environmental programs. As an example, following extensive efforts the Government of Tunisia and the Bank on the preparation of a national environmental program, a donors' meeting was organized in December, 1990, in Tunis with participation of international financial institutions and bilateral donors in order to mobilize external financial resources.

EMENA has pursued during the fiscal year a three pronged strategy in dealing with the pressing environmental issues in the region. It consists of a regional program, a sectoral program, and a country-based program. The regional program deals with environmental problems that require concerted, multi-country actions. It is the Mediterranean Technical Assistance Program, which assists Mediterranean countries organize themselves for the preservation of the Mediterranean basin. The sectoral program deals with specific problems that are common to several countries of the region, and for which a common approach or common lessons are pursued. Under this program, this fiscal year saw the launching of a regional effort on water resource management. Country operations include a series of country environmental studies aimed at identifying the main environmental problems and proposing policy and investment actions, and specific environmental loans and components of loans.

<u>The Mediterranean Technical Assistance Program (METAP)</u>. Launched in spring 1990, METAP supports the development of environmental projects, the strengthening of institutional capacity and the definition of environmentally-sound policy. It is jointly funded by the Commission of the European Communities, the United Nations Development Program, the EIB and the World Bank, and implemented in a collaboration between these four institutions and the United Nations Environment Program's Mediterranean Action Plan. Activities are concentrated on the Mediterranean's southern and eastern rims, where the need for action is most acute.

Although slowed down somewhat by the Gulf war, METAP was active during the fiscal year and is now implementing some 66 actions in ten countries (Algeria. Cyprus, Egypt, Greece, Israel, Malta, Spain, Tunisia, Turkey and Yugoslavia). In order to foster the level of environmental lending in the region, METAP's primary function is at present is to identify and prepare environmental investment projects. In addition, METAP supports institutional development activities and policies studies that improve environmental management and enhance the impact of environmental investments. Priority areas are:

- Integrated water resource management: Efforts are concentrated in the Maghreb countries, where lack of water represents a major constraint on development. An example is Tunisia's proposal for a project of urban wastewater reuse and sludge commercialization.
- <u>Management of solid and hazardous wastes</u>: Requests for support in dealing with hazardous waste has been received from Algeria, Cyprus, Israel, Malta and Tunisia. For instance, Algeria requested support for a study of technological and financial options in waste management.
- Prevention of marine oil and chemical pollution: This area is particularly important in the Mediterranean sea, one of the world's most heavily travelled water bodies. Support for Turkey's maritime pollution prevention program in the sea of Marmara, the Dardannelles and the Bosphorus is an example of METAP's activities in that area.
- <u>Coastal zone management</u> focuses on institutional and regulatory issues, infrastructure and urban environmental quality, biodiversity and cultural property. In Yugoslavia, a management plan is being drafted to protect historic buildings and biodiversity on the islands of Cres and Losinj.

Policy work advanced during FY91 with several studies on financing mechanisms for pollution abatement. A study was also completed on coast development in Turkey. Institutional strengthening was assisted through the launching of the Mediterranean Protected Area Network (MEDPAN) which brings together managers of protected areas from the whole region. A number of training courses were organized and support continued for the United Nations Environment Program's pollution monitoring and research program (MEDPOL).

<u>Regional Water Resource Management Study</u>. Throughout most of the region, water is scarce, expensive, increasingly polluted and poorly managed. The resulting conflicts and inefficiencies put a brake on growth, strain public finances and damage the environment. A region-wide Bank study of the management of water resources launched in FY91 is an attempt to take stock of the deteriorating situation and formulate a more comprehensive approach. The scale of the problem warrants concern. Of the 11 countries in the arid areas of North Africa and the Middle East, seven are categorized as experiencing "absolute water scarcity" and in need of significant adjustment to keep up with demand. Meanwhile Iraq, Iran, Pakistan and Yugoslavia are classified as having "water management problems".

Getting prices right and adjusting fiscal incentive would do much to promote more efficient use of water particularly in the agriculture sector which still accounts for 80% of water use. But there are a host of cultural, social and political issues at stake that must be taken into account if they are not to undermine market mechanisms. In the absence of new technologies, the emphasis must be on rationalizing policy (in particular separating the role of the regulator, i.e. government, from that of the operator, i.e. public and private entities) strengthening water authorities, reforming incentive structures and improving planning. This means involving all water-users in the management process and obliging them to face up to a complicated series of trade-offs between fast growing urban areas and the country-side; between agriculture and industry; and among a variety of development objectives.

In many parts of the region the process is made more complicated by the fact that rivers and aquifers cross international borders. The headwaters of the Nile, the only source of water for Egypt, are controlled by Ethiopia and Sudan. Israel, Syria, and Jordan share the River Jordan. Turkey, Syria, and Iraq all draw on the Tigris and Euphrates rivers. A large part of southern part of North Africa depends on water from the same regional aquifer. In all these cases, continued use of shared water resources is vital to economic security and growth. Long-term sharing arrangements are thus vital to regional security and economic development. But they are only likely to be worked out as part of a broader aproach to water management which addresses the full set of risks and uncertainties that determine a country's willingness to share so vital a resource.

The first stage of the study (FY91-93) focuses on countries with the most pressing problems: severe shortages; rising cost; declining water quality and fierce competition from a variety of users. The aim is to improve water sector operations and to lay the technical groundwork for a comprehensive set of policy proposals. The study will include case-studies, seminars and discussions with governments. The resulting papers, reports, recommendations and guidelines will be used directly in World Bank lending activities and policy discussions with borrowing countries.

<u>Country studies</u>. During the fiscal year, studies of the main environmental problems faced by Egypt, Yugoslavia, Cyprus and Morocco. In Egypt, most environmental problems were found to arise from competing demands on limited resources of water, land, and energy by a fast growing population. Integrating environmental concerns into the country's economic

competing demands on limited resources of water, land, and energy by a fast growing population. As part of the study process, a round table conference with potential donors will be held in Cairo in September 1991. During this session, a national framework to assist in identifying and mitigating Egypt's environmental black spots will be discussed. In addition, a structural adjustment loan approved during FY91 incorporated various environmental components. They include energy conservation and industrial pollution abatement, and the improved management of rangelands and groundwater.

A desk report on the environment in Morocco was completed and discussed with the Government. The recommended action plan focuses on environmental issues related to the country institutional framework, water resources depletion and degradation, land resources management, industry and energy pollution, urban environment degradation, and the preservation of natural resources. A technical assistance project to assist in launching the action plan and in dealing with issues of national environment management is now considered.

Environmental Lending. The Pakistan Environment Protection and Resource Conservation Project, funded by IDA, is the first attempt at dealing comprehensively with that country's deteriorating environment. This US\$55.2 million free-standing environment project, with an estimated credit of US\$47.7 million is an integral part of IDA's stragegy for the agricultural sector. In order to safeguard substantial investments already made or planned in dams and irrigation systems, emphasis is placed on upgrading management of rangelands and watersheds and rehabiliting coastal areas and wild-life habitats. Rapid environmental degradation in Pakistan is made worse by fast population growth (3.1 percent a year) which places increasing strains on finite land resources. The evidence is found in declining crop yields and productivity, loss of forest cover, over-grazing, soil erosion, salinization of irrigated areas, water pollution and the loss of natural habitats, plants and animal species. The focus of the loan is strengthening central and provincial environment agencies. This includes the introduction of sophisticated environmental monitoring techniques and training to build up a local cadre of environmental assessors. A mass communications effort to bring the environmental message home to the poorest farmers is also part of the program.

In addition, several loans to countries in this region approved during FY91 contained environmental components. Examples include a loan to Morocco for port modernization which contains environmental provisions for the disposal of dredging materials and other debris; a project to restructure Tunisia's hospital system which deals with the handling of surgical waste; Turkey's technology development project which funds for studies of energy conservation and introduces safeguards for disposing of dangerous waste from laboratory tests; and a project training secondary school teachers in Yemen to develop a curriculum and text books on environmental science.

Global Environmental Facilities

Opportunities for securing concessional finance from the new Global Environment Facility and the Montreal Protocol Interim Fund gave rise to intense activity during the fiscal year. Three biodiversity projects in Algeria (national park), Poland (forest protection) and North Africa (screw worm eradication) were presented by the Bank and approved by the GEF's Participating Parties at their meeting in Washington DC in May 1991. Five other projects in the areas of biodiversity (Tunisia), global warming (Poland) and international waters pollution (Algeria, Morocco and Tunisia) were prepared and will be presented at the November, 1991 meeting. A country program framework for decreasing the use of ozonedepleting substances were initiated in Egypt, Tunisia, Turkey, and Yugoslavia. In parallel to this framework, a series of projects in each of these countries were prepared and submitted, for approval in principle, to the Executive Committee of the Montreal Protocol. In the coming year, in light of the slow progress of GEF in Eastern and Central Europe outside Poland, EMENA plans to increase its attention on GEF work in that region.

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Central and Eastern Europe

Environmental Strategy. Central and Eastern Europe's environmental problems remain daunting. But progress has been made in dealing with them by making the environment part of the process of economic reform. Political change has created high expectations throughout the region. The environment has acted as a rallying point for many people dissatisfied with the previous regimes, and progress in bringing about improvements is an important criterion against which the performance of the new governments is judged. The high level of technical expertise in the countries has fostered a collaborative effort between the Bank and the countries at all levels.

The magnitude of the pollution problems in Central and Eastern Europe is becoming increasingly apparent. For example, although initial estimates of the losses caused by environmental degradation may have been exaggerated, it now appears that Poland has been losing (largely through ill-health) as much as 5 percent of its annual Gross Domestic Product due to environmental degradation. This is two or three times higher than in the OECD countries. The challenge now is to open up the economies of Central and Eastern Europe and expose them to the sorts of pressures -- both in the form of regulations and the market place -- that have produced environmental improvements in many other parts of the industrialized world over recent decades.

Environmental and economic development issues are closely intertwined in Central and Eastern Europe. Bank efforts to address environment explicitly recognize this. For example, a joint team made up of experts from the European Communities, the U.S. Agency for International Development, and the U.S. Environmental Protection Agency, in addition to World Bank staff, spent several weeks in Czechoslovakia during FY91 working with the government and its constituent Czech and Slovak Republics on a joint environmental study. Their report says that the quickest returns to the environment will come from the removal of subsidies and other general price and market distortions. Once resources are more efficiently allocated, policies to improve environmental quality are likely to be more effective. They should include incentives to reduce pollution, to assume environmental costs and to move towards more sustainable use of resources. Reforms should include realistic pollution standards, a rational structure of charges, fines and fees, and effective monitoring, inspection and enforcement. The study identifies a number of projects as candidates for Bank funding as part of a three-year action plan.

A report on Poland comes to similar conclusions. It emphasizes the need to set priorities, taking into account especially the impact on human health, and the economic costs of environmental degradation. The report points out that the most effective investments need not be the most expensive, and that significant improvements are possible in the short-to-medium term.

Environmental studies are also underway for Yugoslavia, Bulgaria, Hungary, and Romania. Environmental concerns also feature heavily in economic and sector work being carried out in these countries. A major inter-agency study of the USSR economy (see below) also pays special attention to environment. Major issues emerging from all this work include the following:

<u>Market Clearing Prices.</u> Highest priority must go to increasing the price of energy and other natural resources to reflect scarcity values. The goal is to establish efficiency as the criterion by which to judge performance.

<u>Investments.</u> Large investments are needed to support industrial restructuring and to overhaul the energy sector; high priority should be given to reducing particulate emissions and modernizing the domestic heating system. Investments in the water sector will be expensive and will need to be phased over a longer period.

- Laws and Regulations. Realistic and enforceable regulations on effluent and emissions standards to prevent any further deterioration in water and air quality. Environmental impact assessments and the regulatory process in general should involve public participation.
- <u>Shared Responsibility.</u> Decentralization to regional and provincial authorities to achieve better environmental management, but with a mix of responsibilities between the center (regulatory framework) and regional levels (monitoring, enforcement, fine-tuning of regulations).

Regional Energy Plan

The energy sectors bears major responsibility for environmental problems in Eastern Europe, according to a number of recent Bank studies. Subsidized prices, soft budgetary constraints and the widely-accepted principle that environmental pollution was cost-free, led to massive consumption of energy. Environmental degradation of all sorts was the inevitable corollary. In response to this region-wide problem, the Bank has proposed a three-year Regional Energy Program. The first step would be to raise prices to reflect production and environmental costs, improve competition and promote conservation. Then it would set about tackling uncertainties about supplies of natural gas and oil from the Soviet Union by diversifying sources of supply. The program would also stiffen pollution controls, investigate alternative energy sources and review safety in the region's nuclear power facilities.

Meanwhile, the environment figured in the study of the USSR economy undertaken jointly by the World Bank, the IMF, the OECD, and the EBRD. The study, commissioned by the Group of Seven at the Houston summit in July 1990, said that environmental reform in the USSR must be closely integrated with the transition to a market-based economy. However, economic reform is not sufficient on its own, the report says. Pollution charges, environmental information and monitoring systems, environmental impact assessments, and international cooperation are also important. The report recommends that at first the emphasis should be on least-cost methods

Environmental problems originating in Central and Eastern Europe have also contributed to the degradation of the Baltic. An attempt to restore ecological balance to the sea was launched at a summit conference of Northern European governments meeting at Ronneby, Sweden, in September 1990. A task force was established charged with drawing up an action plan to resolve the Baltic's pollution crisis. The World Bank, the European Investment Bank (EIB), the Nordic Investment Bank (NIB), and the European Bank for Reconstruction and Development (EBRD) are working on the plan with governments. The task force plans to finalize its work program by the end of FY92. Each of the development banks is responsible for a number of studies on the worst affected areas of the Baltic. In addition to looking at causes, they will propose solutions in the form of investments and policy reform. The World Bank, in co-operation with EBRD, is taking the lead in the preparation of studies in Czechoslovakia and Poland (the Odra and Vistula River basins). It is coordinating efforts on the German portion of the Oder (Odra) River basin, and on the Soviet part of the Vistula River basin, with the EIB.

of increasing efficiency and reducing waste and pollution. Only later will it be possible to invest in the kind of modern, clean technologies which promise substantial gains in productivity and for the environment.

At a meeting in Prague of environment ministers from Europe, North America, and Japan, the Bank raised a number of issues which merit further review and analysis, and for which policy work at a regional level is being proposed:

- to what extent does economic transformation improve environmental quality? What kinds of investments focussing specifically on the environment are warranted during the restructuring period?
- what is the role of standards during the transition process and in light of prevailing enforcement capabilities?
- how can alternative economic instruments developed in Western countries be adapted to conditions in Central and Eastern Europe?
- how does the question of liability for past environmental pollution affect privatization programs and new investments?
- how should the costs of environmental investments be divided between the state, the public at large, and enterprises?

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The World Bank/IFC/MIGA OFFICE MEMORANDUM

DATE: 08-Jul-1991 10:05am

TO: Ibrahim Shihata

(IBRAHIM SHIHATA)

FROM: Geoffrey B. Lamb, PRDPD

(GEOFFREY B. LAMB)

EXT.: 32544

SUBJECT: environmental projects

Following our conversation I spoke to Jerry Warford in the Environment Department, the primary author of the Annual Report on the Environment. He'll be in touch with you a.s.a.p.

He tells me their latest figures indicate 7 free-standing environment projects, and 15 "primarily" environmental projects -- i.e. with environmental components greater than 50% of project costs. They have people working to get the loan amounts you need.

Please let me know if you need further help.

CC: Lynette Alemar

(LYNETTE ALEMAR)

ROUTING SLIP	DATE: July 8, 1991	
NAME		ROOM NO.
Mr. Jerry Warford		S-5033
APPROPRIATE DISPOSITION		
APPROVAL	NOTE AND RETURN	
CLEARANCE	NOTE AND SEND ON	
COMMENT	PER OUR CONVERSATION	
FOR ACTION	PER YOUR REQUEST	
INFORMATION	PREPARE REPLY	
INITIAL	SIGNATURE	
NOTE AND FILE	URGENT	
REMARKS:		
FROM: Geoff Lamb	ROOM NO.: S13-119	extension: 32544

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FORM NO. 75

The World Bank/IFC/MIGA OFFICE MEMORANDUM

DATE: 02-Jul-1991 11:49am

TO: Geoffrey B. Lamb

FROM: Asif Faiz, INUTD

(ASIF FAIZ)

(GEOFFREY B. LAMB)

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EXT.: 33983

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SUBJECT: Draft Annual Report on Environment-FY 91

I tried to reach you on the phone but you were busy. The s editing to correctly reflect our work in this area. I am sending you annotated comments on these pages by mail and would be grateful if you could arrange to have these changes incorporated in the report. I did not consider it appropriate to send these comments to Mr. El-Ashry or Mr. Thalwitz. Thanks for your help in this matter.

CC: Lou Thompson

CC: Michael Cohen

(LOU THOMPSON) (MICHAEL COHEN)

- CICE MEMORANDUM

DATE: June 28, 1991

TO: PRE Committee Members FROM: Geoffrey Lamb, Chief, PRDPD

EXTENSION: 32544

SUBJECT: Draft Annual Report on Environment -- FY91

Attached for your review and comment is the draft of this 1. year's annual report on the environment. We propose not to hold a PRE Committee Meeting on the paper, but we very much hope to have the benefit of your comments in finalizing the report, given its status as the Bank's main record of its activities in this sensitive field. Aside from other issues you may wish to raise, may I draw your attention to the following:

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2. This report deals with operational activities Region by Region, unlike last year's. Does this work? That is, does it convey an overall coherent picture, while indicating the different ways regional strategies are evolving and giving a good sense of operational content?

3. The Development Committee requested that special attention be given to Bank activities in FY91 in forestry and energy efficiency -- a year in which forest policy was subject of a major reconsideration. Is the paper's coverage appropriate?

4. Members should note that this draft signals an intention (Section IV) to raise the threshold definition for "significant" environmental objectives or components of operations from last year's 10% of project costs to 50% this year. Your reactions to this important

5. I would be grateful if you would send comments on these and/or on any other issues to Mr. Thalwitz (PRESV) and to Mr. El-Ashry (ENVDR), by c.o.b. Monday, July 8th.

Attachment

Distribution:

Messrs. Thalwitz (Chairman), G. El-Rifai, P. Isenman, W. Kaffenberger, A. Karaosmanoglu, R. Picciotto, V. Rajagopalan, I. Shihata, L. Summers, T. Thahane, W. Wapenhans, J. Wood

direct emissions measures, pollution estimates are being projected from existing industry and trade data. Collaborative arrangements have been made with the US Environmental Protection Agency and the US Census Bureau for the creation of a composite database which allows emissions factors to be calculated at the plant level for a sample of approximately 20,000 enterprises. The data will also be used to analyze sources of variation in industrial pollution between countries.

A study to develop a methodology for environmental management and pollution control with community participation is at the initial stages. The proposed program is for the design of software for integrated environmental management that involves community participation. The software package would enable a quick assessment of pollution levels in a given geographical area, establish priorities for pollution control, and identify environmentally-oriented programs that are economically and financially viable and acceptable to the community. The software would be used to identify pollutants, quantify emissions, assess the effects on population, vegetation and structures, and allow government, the private sector, the scientific community and affected citizens to rely on a sound framework for decisions and strategies.

Work on regulatory and economic incentives is in progress in the area of industrial waste minimization. Industrial waste disposal practices in different countries and regions reflect differing economic and regulatory conditions. Where strict regulation makes waste disposal expensive, enterprises will generally implement pollution prevention options such as waste remarketing and recycling. The same economic pressure will be felt if critical raw materials are heavily taxed or if they are subject to high transportation costs. Although the general directions of these economic effects are predictable, their magnitudes are largely unknown, and estimates of industry responsiveness to alternative regulatory and tax policies would obviously be of interest to policy makers in many countries.

Other work on regulatory instruments includes a forthcoming paper that reviews the economics of industrial pollution control across a number of countries, and compares theoretical prescriptions with existing international practice. Evidence from a large number of industrial and developing countries is considered, with a particularly detailed treatment of ten country cases. In light of an apparently large discrepancy between theory and practice, the paper suggests a revised view of optimal regulatory policy.

Air Pollution and Road Transport A number of new research activities in the field of air pollution focus on the potential for pollution reduction in the transport sector. As motor vehicle ownership approaches saturation levels in North America, Western Europe and Japan, most future growth will be in developing countries. Rising incomes in many developing countries, a growing need for travel and personal mobility, combined with the increased demand for fast and reliable distribution of goods will increase individual automobile ownership, bus transport, and reliance on trucks for freight transport. In the Bank, much of the work in this area is under the rubric of a joint program with the United Nations Environment Programme (UNEP) on Transport and the Environment.

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The program supports decisions makers in their efforts to reconcile transport investments with sound environmental management and provides them with relevant lessons from experience as well as necessary technical information. The program includes studies, policy analyses, and technical guidelines to assist decision-makers at national and local levels. The dissemination of information and experiences through workshops and seminars on transport and environment issues is also emphasized, and includes the creation of an international network of experts on differential fuel taxation, the subject. (e.g., emissi

Work in progress under this program includes a joint report with UNEP on options for the reduction of automotive air pollution. These options include the manufacture of energy efficient and environmentally clean vehicles, clean fuels, and improved traffic management. The most promising approach for developing countries is the development of a strategy that compines economic incentives, such as pricing interventions with increased emphasis on regulatory and technological interventions. Administratively simple policy measures are most appropriate for many developing countries; these could include, for example, a tax on leaded gasoline combined ith a rebate on the use of ethers as octane boosters. Appropriate economic policies could

encourage refineries to change their products. / Vehicle tax and license fees could be designed to discourage the ownership and of polluting vehicles.

(e.g., engine retrofits)

New studies to be undertaken as part of the joint Bank UNEP program include a study that investigates appropriate procedures and policies for managing urban bus and para-transit fleets to reduce pollutant emissions. Reviews of existing information and literature are also in progress on such topics as fuel substitution, cost effectiveness of various emissions control instruments and physical and socioeconomic variables that influence air pollution are envisaged. A draft report on the environmental assessment of land transport construction and maintenance has been prepared. The final report will be published and disseminated by the Bank and UNEP. More research is needed, however, on the characteristics and amount of automotive air pollution in urban areas in developing countries, and on the environmental characteristics of reformulated and substitute transportation fuels. An evaluation of vehicle inspection and maintenance

ograms is also needed.

, and on the interdependence between air transport policy measures. On the topio of economic and fiscal incentives, work is in progress on a system of road

inspection/

programs

user charges that take account of the costs imposed on society by motor vehicle accidents and delete air pallution/ The feasibility of internatizing the costs of accidents and environmental pollution by charging road usors for the damage they cause is addressed. While the estimation of accident and environmental costs caused by road users is a difficult exercise, the magnitude of these costs, as implied by certain estimates, indicates that more effort is needed to internalize them. Several instruments can be used to do this, including prices, taxes or subsidies, standards, and regulations. An array of market-based incentives and command and control mechanisms to reduce volumes of traffic, emissions per unit of fuel consumed and total emissions via cleaner vehicles and fuels, remains the most promising approach to addressing the problem of motor vehicle pollution in developing countries. Compulsory inspection and maintenance, tax allowances for new and cleaner equipment, differential fuel taxation and congestion charges are the set of instruments that, in combination, may address pollution from mobile sources in the

most cost-effective manner.

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Pollution and Marine Transport The environmental implications of port transport and harbors is a topic of increasing importance. A paper under preparation sets out an overview of the various environmental issues facing today's ports, particularly those in developing countries. These issues revolve around: the disposal of dredged materials, oil-spill contingency planning, the handling of hazardous cargoes, and the implementation of the International Convention for the Prevention of Pollution from Ships (MARPOL) (see below). The paper points to an emerging problem where some ship operators have withdrawn their services rather than face the insurance costs and financial risks of operating in the national waters of countries with strong legislation on the reimbursement of clean-up costs in the event of oil or chemical spills. The challenge here is to reconcile the requirement for environmental protection with the economic concerns of ship operators. Guidelines on oil spill contingency planning and response are also being prepared jointly with the International Maritime Organization (IMO).

A paper is under preparation on the elements of MARPOL, examining the objectives of the convention, the constraints it has faced, and the main issues and options it presents to developing countries. While most industrialized countries have both signed and ratified the convention, developing countries have been slower to do so. The implication of the Convention for developing countries is that they must meet the costs of providing port reception facilities, maintain and operate the facilities in an environmentally sound manner, and dispose of the collected wastes. It is this ultimate disposal problem which is the major difficulty. Where the volume of wastes to be received from ships is significant, major problems can develop. These problems are particularly acute for small island communities where the disposal of any form of waste is difficult to achieve in a sound environmental manner. The paper outlines the Bank's role in urging and assisting countries to sign and ratify the MARPOL Convention. This will not only contribute to the global improvement of the marine environment, but also to the protection and preservation of the country's own coastal zones and irreplaceable natural resources. The benefits are particularly obvious to countries that derive a substantial proportion of their revenues from tourism. The paper recommends that activities in port and harbor development and coastal zone management routinely address the building of appropriate port reception facilities and that municipal activities consider the impact of additional wastes received at adjacent ports and harbors.

Urban Environmental Issues

Urban environmental problems stem from the heavy concentration of population and economic activity in relatively confined spaces. The underlying causes of urban environmental problems are many, and range from inappropriate economic policies such as the underpricing of services -- leading to resource depletion and higher levels of pollution -- to inadequate land use controls or inappropriate land tenure systems that hinder effective land use or lead to over-regulation of land markets and force the poor to occupy marginal lands. In 1987, less than 60 percent of the urban population had access to adequate sanitation, and only one-third was

THE WORLD BANK/INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

DATE: July 3, 1991

TO: Mr. Geoffrey Lamb, Chief, PRDPD

FROM: Salah El Serafy, Economic Adviser, EAS

EXTENSION: 81940

SUBJECT: Draft Annual Report on the Environment

1. Herewith some quick thoughts which might help improve this comprehensive and well-written report. I feel the subject of integrating environmental concerns in country economic and sector work, and hence in policy advice and loan conditionality, is largely missing. This, to my mind, should be a crucial link in the integration process within the Bank. Some progress has already been achieved on this score, but the bulk of the task is yet to be accomplished.

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2. You no doubt realize that the environment is a dimension of development which for some years now has been covered in Country Strategy Papers, being one of Mr. Conable's issues of special emphasis, and as such it is incumbent on the Region to tailor Bank country strategy, including lending, to address this aspect of development. A significant and growing amount of country economic and sector work addresses environmental problems, including work on pricing, land tenure, natural resource management, etc., and this leads to proposals of policy change as well as lending operations that help the environment. Altogether I feel the draft report is focused on PRE activities with emphasis on project environmental impact, whereas country policy and macroeconomic issues do not receive the same attention.

3. Perhaps you judge that not enough has been done on this front to merit inclusion in the annual report this year. But maybe for the future we should set ourselves clear goals about integrating environmental concerns in country economic and sector work, and carefully monitor implementation so that the 1992 report would reflect this aspect of Bank work better. Meanwhile the coverage this year could improve by including at least reference to CSPs and adjustment operations with environmental conditionality.

cc: Messrs. Thalwitz, PRESV El-Ashry, ENVDR Summers, DECVP Grilli, EASDR Wyss, CODDR Mrs. Okonjo-Iweala, OPNSV

SESerafy/lcu

	Bank/IFC/MIGA E MEMORANDUM	
	02-Jul-1991 10:20am	
то:	See Distribution Below	
FROM:	Keith Jay, PRDRA	(KEITH JAY)
EXT.:	31051	

SUBJECT: PC CHANGES AND THE ANNUAL REPORT ON THE ENVIORMENT

AS WE DISCUSSED THE ANNUAL REPORT ON THE ENVIORMENT WAS CIRCULATED TO THE PRE COMMITTEE FOR COMMENT BY JULY 8. GEOFF SUGGESTS THE FOLLOWING APPROACH 1) IF PRE COMMITTEE MEMBERS DO NOT HAVE SERIOUS PROBLEMS WITH THE REPORT, IT COULD BE CIRCULATED TO PC MEMBERS FOR COMMENT AROUND THE 15TH OF JULY: THERE WOULD BE NO PC UNLESS PC MEMBERS REQUESTED ONE; COMMENTS WOULD BE INCORPORATED AND THE PAPER SENT TO THE BOARD ON AUGUST 6 FOR THE BOARD MEETING ON THE 29TH OF AUGUST. 2) IF THE COMMENTS FROM THE PRE COMMITTEE INDICATE A SERIOUS PROBLEM OR CONTROVERSY WE SHOULD GO AHEAD WITH A PC MEETING. GEOFF WOULD ALERT YOU REGARDING WHETHER 1 OR 2 APPLIED. IT WOULD APPEAR DESIRABLE TO HOLD OPEN A PC SLOT ON THE 26TH OR 29TH IN CASE A PC MEETING IS CALLED/NEEDED.

I HAVE ALSO INFORMED PEOPLE HERE THAT 1) THE RISK MANAGEMENT AND LEND ALLOCATION REVIEW WILL BE DISCUSSED AT THE PC ON THE 10TH NOT THE 8TH. 2) LENDING INSTRUMENTS AND HUMAN DEVELOPMENT PAPERS ARE NOW SCHEDULED FOR THE 15TH. 3) THERE IS NO PC CURRENTLY SCHEDULED FOR THE 10.

DISTRIBUTION: TO: Anupam Khanna CC: Geoffrey B. Lamb CC: Paul Isenman CC: Jeremy Warford CC: Robert Liebenthal CC: Patricia Gallagher CC: Yvonne Hensley

(ANUPAM KHANNA)
(GEOFFREY B. LAMB)
(PAUL ISENMAN)
(JEREMY WARFORD)
(ROBERT LIEBENTHAL)
(PATRICIA GALLAGHER)
(YVONNE HENSLEY)

THE WORLD BANK/IFC/MIGA

DATE: June 28, 1991

TO: PRE Committee Me: FROM: Geoffrey Lamb, C

EXTENSION: 32544

SUBJECT: Draft Annual Rep

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Attack_____

year's annual report on the environment. We propose not to hold a PRE Committee Meeting on the paper, but we very much hope to have the benefit of your comments in finalizing the report, given its status as the Bank's main record of its activities in this sensitive field. Aside from other issues you may wish to raise, may I draw your attention to the following:

2. This report deals with operational activities Region by Region, unlike last year's. Does this work? That is, does it convey an overall coherent picture, while indicating the different ways regional strategies are evolving and giving a good sense of operational content?

3. The Development Committee requested that special attention be given to Bank activities in FY91 in forestry and energy efficiency -- a year in which forest policy was subject of a major reconsideration. Is the paper's coverage appropriate?

4. Members should note that this draft signals an intention (Section IV) to raise the threshold definition for "significant" environmental objectives or components of operations from last year's 10% of project costs to 50% this year. Your reactions to this important change are sought.

5. I would be grateful if you would send comments on these and/or on any other issues to Mr. Thalwitz (PRESV) and to Mr. El-Ashry (ENVDR), by c.o.b. Monday, July 8th.

1 Attachment

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Distribution:

Messrs. Thalwitz (Chairman), G. El-Rifai, P. Isenman, W. Kaffenberger, A. Karaosmanoglu, R. Picciotto, V. Rajagopalan, I. Shihata, L. Summers, T. Thahane, W. Wapenhans, J. Wood THE WORLD BANK/IFC/MIGA

OFFICE MEMORANDUM

DATE: June 28, 1991

TO: PRE Committee Members

EXTENSION: 32544

SUBJECT: Draft Annual Report on Environment -- FY91

1. Attached for your review and comment is the draft of this year's annual report on the environment. We propose not to hold a PRE Committee Meeting on the paper, but we very much hope to have the benefit of your comments in finalizing the report, given its status as the Bank's main record of its activities in this sensitive field. Aside from other issues you may wish to raise, may I draw your attention to the following:

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Messrs./Mmes. Alisbah (PAAVP), Annez (WDR), Bock (OPNSV), Burmester (SECGE), Churchill (IENDR), Colaco (PRSVP), de Tray (DECVP), Golan (EDIDR), Grilli (EAS), Hamilton (PHRDR), Husain (LACVP), Ingram (RAD), Jaycox (AFRVP), Kashiwaya (CFSVP), Khanna (EXC), Liebenthal (PRDRA), Linn (CECDR), Michalopoulos (PRDDR), Okonjo-Iweala (OPNSV), Petit (AGRDR), Pfeffermann (CEIED), Piddington (ENVDR), Pouliquen (INUDR), Rao (IECDR), Sandstrom (EXC), Shakow (EXTDR), Shalizi (PRDPM), Steer (WDR), Wyss (CODDR)

cc: Messrs. El-Ashry (ENVDR), Warford (ENVDR)

GLamb: ltv

DRAFT

June 26, 1991

THE WORLD BANK AND THE ENVIRONMENT ANNUAL REPORT - FY91

OUTLINE

1. INTRODUCTION

Evolution of Bank Environmental Policy Scope of the Report

2. ORGANIZATION AND PROCEDURES

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3. REGIONAL ENVIRONMENTAL OPERATIONS

Africa Asia Europe, Middle East & North Africa Latin America and Caribbean

4. GENERAL OPERATIONAL ISSUES

The Process of Integration Environmental Assessments Operations Evaluation Energy Efficiency and Conservation Population Operations Staff Training

5. FOREST ACTIVITIESS

The Nature of the Challenge Deforestation The Growing Fuelwood Crisis Strategies for Forest Development Policies to meet the Growing Demand for Fuelwood Enhancing Forestry Institutions Role of the International Community Role of the World Bank

6. POLICY AND RESEARCH

Energy and the Environment Pollution Urban Environmental Issues Water Resources Management Forest and Land Management Social and Cultural Issues Environmental Economics Global Environmental Issues Conclusion

7. INTERNATIONAL FINANCE CORPORATION

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8. THE WORLD BANK AND THE INTERNATIONAL COMMUNITY

Outreach Activities GEF/Montreal NGOs External Training - EDI Technical Assistance

9. FUTURE DIRECTIONS

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- Annex I Organization of the World Bank (Chart)
- Annex II Illustrative List of Projects with Environmental Components or Objectives Fiscal 91
- Annex III Projects with Energy Efficiency Components or Objectives, Fiscal 91
- Annex IV Bibliography

SECOND ANNUAL REPORT ON ENVIRONMENT - FY91

I. INTRODUCTION

Evolution of Bank Environmental Activities

This second World Bank Annual Report on the Environment is the latest in a series of public statements made over the last five years which together have traced the recent evolution of Bank policy in this area.^{1/} A recurrent theme has been the ever-growing importance of the environment, and the need to integrate it in all aspects of development planning, and correspondingly, throughout the World Bank's own operations. This process, as the following pages demonstrate, continues to proceed rapidly. A consequence is that the distinction between environmental and other work in the World Bank - whether research or lending operations - is becoming increasingly blurred, and concern and responsibility for environmental work - as well as the relevant expertise - is now widely spread throughout the institution. Environmental issues are also now being addressed more systematically in the International Finance Corporation (IFC), the Bank's private sector affiliate.

Scope of the Report

The report begins with a description of how environmental responsibility is shared among various units in the World Bank. It briefly outlines the various available instruments (research; country environmental strategies; lending operations; evaluation), and enumerates the types of staff employed to do this work. Bank operations are then described by region reflecting the gradual tailoring of approaches to region-specific requirements. The strategic approaches are outlined, and the specific instruments are listed; country environmental strategies, lending operations, region-specific research and policy analysis. Generic operational issues in all regions are then covered; these include a review of the process of integrating environment into operations; implementation of the new environmental assessments procedure; operations evaluation; energy efficiency and conservation; population operations; and staff training.

Forestry is the topic of the next section, which reviews the nature and causes of the forestry problems and kinds of measures that are required to deal with them. An overview of the Bank's policy and research work during the year that follows. This work is grouped around a number of major themes: energy and the environment; pollution; urban environmental issues; water resources management; forestry and land management; social and cultural issues;

Environment, Growth and Development, Development Committee Pamphlet No. 14, 1987; Environment and Development: Implementing the World Bank's New Policies, Development Committee Pamphlet No. 17, 1988; World Bank Support for the Environment: A Progress Report, Development Committee Pamphlet No. 22, 1989; and The World Bank and The Environment, First Annual Report, Fiscal 1990.

environmental economics; and global environmental issues. This is followed by a section describing the rapidly evolving environmental work program of the International Finance Corporation.

The report goes on to describe recent international action to combat global environmental problems. This activity is dominated by the emergence of the GEF and implementation of the Montreal Protocol. The various ways in which the Bank participated in the international environmental community is described, as are the series of efforts the Bank made during the year to work more closely with nongovernmental organizations (NGOs), and to expand its external training function in the environmental area. Highlights of the report, some key lessons from recent experience, and implications for future work are contained in the section entitled "Future Directions". Annexes contain a World Bank organization chart; a list of projects with environmental components or objectives; another list which contains projects with energy efficiency components; and a bibliography.

II. ORGANIZATION AND PROCEDURES

Organization and Staffing^{1/}

Formal responsibility for environmental work in the Bank continues to be shared among several units. The Environment Department, in the Policy Research and External Affairs complex, is responsible for overall policy formulation, research, guidelines, staff training, and some aspects of external relations on the Bank's environmental work. It also has newly acquired responsibility for administering the GEF. Nevertheless, by far the majority of environmental policy and research work done in PRE is done in departments other than ENV. Other sector departments as well as departments in the Development Economics Vice Presidency, the External Relations Department and the Economic Development Institute have increasingly important environmental work programs.

Environmental Divisions located in the Technical Departments of each of the regions have day-to-day responsibility for ensuring the quality of Bank operations. They focus not only on individual projects, but also on more strategic approaches to addressing environmental problems on a country or regional basis. They also conduct or commission region-specific policy and research work. The Regional Environmental Divisions represent only a part of the total effort devoted by the Operations complex to environmental work. Increasingly, Country Operations Departments and other Technical Department divisions are taking responsibility for environment and are recruiting staff for specifically environmental responsibilities. Environmental advisory staff are also located in the Country Operations Department where, notably, GEF operational activities are coordinated.

Evaluation of environmental aspects of Bank operations is also of growing significance in the work of the Operations Evaluation Department. The Finance Department, which played a major role in the establishment of the GEF, continues to be active in this area, as do staff from the Legal Department. Finally, the environmental work program of the International Finance Corporation is expanding rapidly.

Estimates of the amount of staff effort devoted to environmental work in the Bank are difficult to make, in large part because of the extent to which environment is now becoming integral to a wide range of Bank activities. There are currently 106 higher level and 34 support staff in the Environment Department and four Regional Environment Divisions. These staff include economists, engineers, land use planners, ecologists, foresters, anthropologists, sociologists, and institutional experts. In addition to the three-person GEF unit in COD, there are a number of operational divisions which have specifically environmental functions. For example, there is an Energy and Environment Division in the Country Department covering Eastern Europe and an Environment, Human Resources and Urban Development Division in the Country Department dealing with China and Mongolia. The effort devoted to environment in FY91 has also been considerably enhanced by the team, consisting of 18 staff, preparing the

¹/ See Annex I for World Bank Organization Chart.

1992 World Development Report, which will have environment as its main theme. Overall, based upon time recorded by staff, about 270 staffyears (regular staff plus consultants?) were devoted to environment in FY91. This corresponds to about 10% of total Bank staff time, with 183 staffyears accounted for by Operations staff and 87 by PRE. The projected average in the period FY92 to FY94 is 314, of which 205 would be in Operations and 109 in PRE.

Because of the rapidly evolving nature of environmental work and of the range of skills required, heavy reliance is placed upon consultants and staff with fixed-term contracts. The contributions made by bilateral donors to the Bank's environmental work by provision of consultant trust funds (i.e., Belgium, Canada, Japan, Netherlands, Norway, Sweden, and the United States of America) and by secondment of staff (i.e., France, Norway and Switzerland) has been valuable.

Operational Instruments

The World Bank's growing concern with environment over the last few years has been accompanied by the evolution of a number of mechanisms designed to systematize the treatment of this subject in its day-to-day operations. Preparation of country environmental issues papers was initiated three years ago. Their objective was to ensure that, for each country, a coherent approach would be taken to environmental matters, reflecting inter-sectoral relationships as well as the linkages between environment and overall development policy. These papers, which are internal documents, have now been completed for virtually all countries. The issues they highlighted included (a) identification of key environmental problems in the country concerned (b) the direct and underlying causes of those problems (c) possible investment strategies and policy reform and (d) financing needs and possible sources.

These papers have set the scene for more in-depth analysis, leading to the establishment of Bank strategies for environmental work in borrowing countries. The essential elements of any country environmental strategy as outlined above are now being addressed in the Bank by various means. These include formal National Environmental Action Plans, conducted on a country-by-country basis, as well as regional analyses of specific environmental problems such as water resources management, or urban pollution. Environment is addressed at all stages of the project cycle, for example in urban, energy or agriculture sector work, through project identification, appraisal, implementation, and evaluation. It also increasingly features in the economic policy dialogue the Bank conducts with member countries, and in adjustment lending activities. Backing all this up is a growing research effort.

Introduction of the Bank's Environmental Assessment Operational Directive in October 1989 was an important milestone in the evolution of the Bank's environmental policy. It provides a systematic approach to environmental issues at all stages of project development. The directive identifies four categories of projects: Category A projects or components may have significant environmental impacts and normally require a full-scale environmental assessment. Category B consists of projects and components that may have specific environmental impacts for which a more limited analysis would be appropriate. Category C includes projects and components that typically do not have a significant impact, and would normally not require environmental analysis. Category D consists of projects which, because they have an environmental focus, do not require a separate environmental assessment. (As noted in Section IV below, experience in implementing the directive has suggested the need for some amendment of the above).

III. REGIONAL ENVIRONMENTAL OPERATIONS

In recent years the increased emphasis on environment in World Bank operations has been accompanied by growing recognition of the extreme diversity in the environment problems themselves as well as of the applicability of measures to counteract them. The wide variety of institutional, cultural and economic causes of environmental degradation requires that these strategies should be tailored very specifically to local circumstances. One consequence of this is that although the fundamental principles guiding environmental work are consistent throughout the institution, local variations are reflected in different approaches used in the Bank's four regional offices. These are described below.

AFRICA

Introduction

The Bank's Africa region, which covers 45 countries, presents a range of concerns including the degradation of drylands, the destruction of tropical forests, as well as urban problems exacerbated by rapid expansion of cities in many parts of the continent. Most of sub-Saharan Africa's population of 440 million earn less than \$340 a year, making it the world's poorest region. High population growth rates of more than 3 percent a year will increase its share of world population from less than 10 percent today to 20 percent by the middle of the twenty-first century. Population pressures, the uncertainty of land tenure and fierce competition for natural resources have led to further impoverishment. In the process, crop and range lands have been degraded as recurring droughts have exacerbated the typical symptoms of over-exploitation: soil erosion and declining yields.

The problem is further aggravated by the cultivation of marginal lands, destructive agricultural techniques, and increased herd sizes. Meanwhile, forests are cut down or burned to make way for new agricultural land and pastures, and to satisfy growing demand for fuel and timber. The threat to Africa's remaining moist tropical forests, with their rich variety of animal species and plants, is acute. Continued logging and agricultural encroachment has big economic and ecological implications. Depletion and pollution of water sources also poses a critical set of problems. Depletion is mainly due to poor water management and inefficient irrigation systems. Pollution in most rural areas is caused by increased use of chemical fertilizers. In Africa's fast growing cities, water pollution results from the lack of facilities to treat sewage and other forms of waste. Urban dwellers also face the usual array of metropolitan environmental problems, from air pollution to unplanned sprawl.

To deal with these complex issues, the Bank is integrating environmental issues into its activities in Africa in three distinct but complementary ways. First, by helping countries develop

national environmental strategies and action plans; second, through its research activities; and third, through its lending program.

Environmental Strategy and Action Plans

Over the last three years the Bank has placed increasing emphasis on the integration of environmental considerations into economic and social development. A first step was to prepare environmental issues briefs on each country in the region. These have proved useful in identifying environmental problems and are a good starting point to fill the information gaps. The next stage differs from country to country depending on the severity of the problems, the amount of information available, and what actions have already been taken by the government. In some instances, such as Nigeria (see below), the Bank has moved directly to produce a detailed analysis of country-wide environmental problems and a set of recommendations on how to deal with them through the preparation of a national action plan. Work on country environmental strategy papers for Niger, Senegal and Mali also began in FY91. These bring together existing information and are designed to help both the Bank and governments assess They are also intended to provide donors with a clearer sense of strategic options. environmental priorities. Special studies or sector reports that focus on the environmental implications of a specific problem or issue within a particular sector of the economy have also been conducted.

<u>National Environmental Action Plans (NEAPs</u>) The Bank is currently working with 17 countries in carrying out NEAPs. A first group includes the three pioneering countries (Madagascar, Mauritius, and Lesotho) where governments have formulated and approved the NEAP document and the action plans are being implemented. A second group is made up of Rwanda, Ghana, Bukina Faso and the Seychelles. Their plans have been completed; some of them approved (Seychelles and Rwanda); but none of them have yet been implemented. A third group includes Guinea and Togo, which are advanced in the process but have not yet completed their plans. A fourth group includes countries which have just started the process or are about to do so. They include Benin, Burundi, Congo, Cote d'Ivoire, Gabon, the Gambia, Guinea Bissau, Nigeria and Uganda.

Action plans are designed to ensure that decision-makers do not lose sight of environmental issues. The process is as important as the product. It depends on the participation of a whole range of groups representing many interests: national governments, local administrators, research and academic institutions, non-governmental organizations, and the private sector. The association of multi- and bilateral donors provides both access to expertise and establishes a framework for future development assistance.

Mauritius formulated its national environmental action plan in 1988. This led to the adoption of an US\$109 million environmental investment program in mid-1990. During FY91 the Bank approved a loan (see below) to support the program and took on responsibility for donor co-ordination to speed-up program implementation. Madagascar's plan, prepared in 1987-1988, sets out the country's environmental policy over a 15 year period. Its main objectives are

to conserve and manage Madagascar's biological diversity; to promote sustainable development through sound management of natural resources; to improve living conditions in rural and urban areas; and to develop the country's human resources and institutional capacity. A major investment program for Madagascar was approved by the Board in FY90 and was followed during the current reporting period with the initiation of the first five year segment of the action plan. In February 1991, a US\$26 million World Bank (IDA) loan became effective, bringing to almost US\$70 million the amount contributed by donors to the US\$85.5 million investment program. The balance is provided by the government of Madagascar.

The Environment Management Plan for the Seychelles focuses on infrastructure, watermanagement, biodiversity, and marine and coastal protection. A donor conference was held in early 1991 and resulted in pledges for an investment program worth some US\$40 million. Meanwhile, a national environmental action plan was completed in Ghana. An investment program is now being crafted to enable Ghana's government to act on the priorities set out in the NEAP. These include strengthening the national environmental agency and introducing an environmental information and monitoring system. The investment program will also support the conservation of sensitive ecosystems and critical natural resources, such as lagoons, forests and various types of wildlife.

A report issued during the year provides a detailed outline of the options facing Nigeria in the development of an NEAP. It focuses on how best to ensure that government policies, institutional capacities, data management systems and economic mechanisms integrate the need for environmental quality with economic growth. The report finds that soil erosion and degradation, water contamination and deforestation are the key environmental problems facing Nigeria. If nothing is done to stem the damage, the report says, long-term losses could reach some US\$5 billion a year (see box). The report says that the political will to deal with the problems exists but must now be supported by more research and analysis to guide policy formulation. As a first step to implementing the priorities outlined in the report, an environmental management project is in preparation to finance a set of activities to make Nigeria's environmental program operational. These include institutional support, an information network, and studies to identify specific investment projects aimed at alleviating environmental degradation.

Towards an Action Plan for Nigeria (Box)

A workshop on National Environmental Action Plans held in Dublin, Ireland, in December 1990, recommended that in future all plans include rigorous economic analysis and that the economic cost of environmental degradation should be systematically assessed. A major Bank study on Nigeria shows how this may be done. The purpose of the study is to provide policy makers with an assessment of the economic costs of environmental degradation as well as a framework for determining Nigeria's environmental priorities. It outlines a strategy for developing solutions to the country's environmental problems and proposes various options to alleviate the environmental concerns. Throughout, the report attempts to integrate the need for environmental quality with economic growth in Nigeria.

The report proposes a methodology for examining environmental issues on a national level and provides a means for quantifying economic losses which result from natural resource depletion and degradation. Preliminary estimates of economic losses are reported in terms of the long-term effect which inaction would have on Nigeria's "Sustainable Net National Product" (SNNP). SNNP differs from conventional measures of national economic performance such as GNP or GDP in that investments to maintain the integrity of the environment ("defensive expenditures") are excluded from the computation, as is the income generated from harvesting a resource stock over and beyond its capacity to be replenished ("depreciation of national capital"). The difference between SNNP and GNP can thus be used to demonstrate to policymakers the monetary value (loss) associated with policies which allow unsustainable use of a country's resources.

The report identifies three major environmental problems facing Nigeria: soil degradation, water contamination and deforestation. Although the impact of continuous soil degradation will not be evident for at least 20 years, the negative consequences of water contamination and deforestation are likely to appear in less than ten years, the report says. The long-term annual cost of continuous environmental degradation is estimated at some US\$5 billion. Programs designed to change this trend may require an investment of between three to twenty percent of current GNP. While the environmental problems – and some of their direct and indirect causes – are becoming clearer, the strategies available for addressing them are still in the early stages of development. In many cases it is not clear what the best solution is to any particular problem. It is expected that strategies and projects will emerge as a result of ongoing discussions. According to the report, policy-makers in Nigeria have five main options in dealing with the country's environmental problems: strengthening institutional capacity; initiation of legislative reforms and policy initiatives to address environmental problems; development of economic incentives and mechanisms to promote sound environmental management; establishment of a national environmental data management system; and creation of significant educational and public awareness program.

To take stock of its experience with national environmental action plans in Africa, the Bank co-sponsored an international workshop on the subject in Dublin, Ireland, in December 1990. The workshop was attended by representatives of 17 African countries, non-governmental organizations, and bilateral and multilateral development agencies. Participants emphasized that NEAPs should be "demand driven" (rather than imposed from the outside) and supported by governments at the highest level. They also cautioned countries against waiting for a NEAP before dealing with their environmental problems. The Dublin workshop highlighted the importance of popular participation and the need for professional environmental training. Among their many recommendations, participants underscored the need to make environmental information systems (EIS) an integral part of the NEAP process (see below). The Dublin meeting spawned the Club of Dublin which promotes the involvement of African experts in environmental strategy and planning, and has brought together distinguished thinkers and decision-makers from African governments, universities, non-governmental organizations, and the donor community. A second workshop on NEAPs was held in Mauritius in June 1991.

<u>Environmental Information System</u> Environmental information systems were discussed by an international advisory group set up by the Bank which met in Abidjan, Cote d'Ivoire in November 1990 and subsequently in Heidelberg, Germany in April 1991. The group of advisers recognized that the challenge facing Africa in the use of environmental information systems is great because of the magnitude of its environmental problems, its lack of resources, and a tendency to focus on short-term problems.

Together with other agencies and donors, the Bank has initiated a program to assist countries in sub-Saharan Africa to set up operational cost-effective environmental information systems. Resources are thus being mobilized for the collection, management, and analysis of information in various countries in Africa and, increasingly, in other regions. Guidelines for resource and environmental information management have been developed as part of the Bank's environment assessment procedures. Remote sensing and techniques such as geographic information systems are now increasingly used in the Bank's resource management and environmental monitoring activities. One of the main objectives is to ensure that operational or policy requirements dictate the type of information collected.

Forests A particular focus during the fiscal year was on the preservation and protection of Africa's remaining tropical rain forests. A conference on the forests of west and central Africa held in Abidjan, Cote d'Ivoire in November 1990 was the venue for the presentation and discussion of a number of important Bank papers on forests. The session was co-sponsored by the African Development Bank, the International Union for the Conservation of Nature, and the World Bank. A booklet summarizing the proceedings (see box) outlines the scale of the problem: some two million hectares of tropical forest are lost each year in the countries of west and central Africa; about 40 percent of their wildlife habitat has already disappeared; reforestation is insignificant. As a result, innumerable species have been lost, rainfall has declined, soil erosion has increased and crop yields have fallen. Meanwhile, the burning of forests contributes to the greenhouse effect.

Africa's Rainforests (Box)

Bank supported forestry lending for Africa began in 1968 with a forestry plantation development project in Zambia. The focus of forestry lending remained on industrial plantations until the late 1970s, when emphasis shifted to social forestry and agro-forestry projects that were intended to relieve the growing pressure on natural fuel wood resources. The Bank also supported public sector plantation development - but with less than satisfactory results. Recent Bank-financed forestry projects in Guinea, Ghana, Cote d'Ivoire, Uganda and Cameroon address a broader array of tropical forestry issues - with an underlying objective of encouraging actions that would reduce, and ultimately stop, deforestation. These projects include components of forest inventory, mapping, agro-ecological zoning, reduction in the size of logging concessions, creation of national parks, reserves and forest buffer zones, forest management, research extension and institution building. While these projects alone cannot halt deforestation in Africa, they offer management approaches to national governments for the sound use of their forest resources. "Saving Africa's Rainforests," a booklet published during the year, notes that many of the root causes of Africa's deforestation stem from factors outside the forestry sector itself, and that they need to be addressed from a broad development perspective. It also emphasizes the importance of a people-centered and ecologically sensitive approach, which is consistent with the general Bank philosophy outlined in Section V below.

A Bank paper on the links between population, agriculture, and the environment in sub-Saharan Africa presented at the conference points to rapid population growth as an important cause of forest destruction in the region. Traditional methods of farming and land-tenure cannot cope with rising population densities. The conference recognized that solutions are complex. Agricultural and logging practices will have to change. Local people, especially women, must play a greater role in conservation. At the very least, governments must provide incentives to make sure that logging and the gathering of fuel wood is sustainable -- itself a contentious proposition in some quarters. In environmentally delicate areas, the extraction of wood for timber or fuel must be eliminated altogether. Improved land-tenure is essential.

<u>Research</u> A series of research activities, specific to Africa, were undertaken during the year. These included a study of local participation in the management of wildlife which argues that people will be better off and Africa's wildlife habitat more likely to endure if local people have a concrete stake in ensuring its survival. Another on integrated pest management (IPM) in African agriculture makes clear that IPM is a management concept of considerable importance in reducing over-reliance on chemical pesticides. Technical notes published in FY91 cover a variety of subjects from participation of local people in the implementation of Madagascar's environmental action plan to separate studies on the links between government policies and environmental degradation in Botswana and Uganda.

Research on the experience of various African countries in dealing with large-scale migration and resettlement is underway and will be discussed at a regional workshop in early FY92. A study is also being done to determine the magnitude of environmental changes in Africa. The information will form the basis for a monitoring system to provide quick access to accurate information on environmental conditions. Another initiative on which the Bank has continued to work during the reporting period is the Sahelian Operational Review. This seeks ways to restore ecological systems in the Sahel and introduce sustainable land-use systems through a series of studies on natural resource management systems. Lessons learned are shared through publications, conferences, the funding of consultants, and networking among technicians working in the Sahel.

Five sector reports also picked up on environmental issues during the year. For example, a report on industrial adjustment in Madagascar notes that government involvement in the preservation of the country's physical environment is warranted but warns that environmental regulations should not become obstacles to growth. A report on Nigeria's urban transport crisis says that the most immediate environmental threat posed by vehicles is dumping sump oil in the drainage system. It recommends the provision of oil recycling facilities, particularly at bus stations and repair shops for commercial vehicles.

Environmental Lending

Environmental considerations have been progressively integrated into the Bank's lending program in Africa. In FY91 they featured in a variety of free-standing projects, sector and adjustment loans, and in several project components.

A US\$12.4 million loan made to Mauritius during FY91 (Environmental Monitoring and Development Project) is tied to the country's environmental action plan. It will fund a national physical development plan and various other measures including improved land-fill practices, integrated pest management, marine conservation and a national park. An Environmental Management Project in Burkina Faso was also approved. The US\$16.5 million IDA loan will fund the first five year phase of a long-term program to assist the government stop and reverse the process of natural resource degradation in order to secure sustainable agricultural growth, to restore biodiversity, and to manage forests and wildlife sustainability. The Forestry Development Project in Kenya -- worth some US\$20 million -- is designed to conserve and protect forest resources, and soil and water. It will improve the management of existing indigenous forests and industrial plantations, enhance the effectiveness of the government's forest department, and fund the preparation of a forestry master plan.

In all, some 37 projects approved in the Africa region during FY91 have a significant environmental component (see Annex I). Several have multiple environmental goals. These include education, health, population control, conservation of wildlife, energy conservation, forest and soil conservation, pollution and pest control, improved agricultural practices and livestock management, environmental planning and administration, sewage and waste treatment techniques, and water resource management methods. More than a third of the projects aim to improve water resource management and sewage treatment practices. For example, a public works and employment project in Niger will upgrade the drainage system, develop small scale sanitation plants and promote soil and water conservation. Almost a third of the projects target agriculture. Environmental components focus on curbing soil erosion and the harmful effects of pesticides and fertilizers. An agricultural rehabilitation and development project in Mozambique aims to teach farmers how to deal with soil erosion and deforestation. A number of projects deal with health. A loan to Mali will provide safe water to 180,000 people through the construction of 385 rural water points. A health sector improvement project in Madagascar includes measures to prevent water-borne diseases, such as malaria and typhoid. It also encourages the prudent use of pesticides.

A number of sector loans and adjustment programs deal with the environment. Some examples: an education sector project in Rwanda (First Education Sector Project) includes the environment in a new national curriculum; a petroleum sector loan to Tanzania (Petroleum Sector Rehabilitation Project) introduces measures to reduce the risk of oil spillage and pollution. An agricultural sector loan to Uganda (Agricultural Sector Adjustment Credit) will fund research on land-use, and forest and wildlife conservation. Meanwhile, a structural adjustment program in Togo (Fourth Structural Adjustment Credit) instigates a rural development strategy which emphasizes the role of local communities in rehabilitating the environment.

<u>Global Facilities</u> There was a rapid increase in staff time and effort devoted to the preparation of projects for funding under the new Global Environment Facility and the Montreal Protocol (for a general description see Chapter VIII). Participating parties are considering funding projects in Congo (wildlands protection and management), Kenya (preservation of the Tana river primate reserve), Mauritius (bagasse energy), and Uganda (forest gorilla reserve). Two regional programs are also under consideration. The first aims to conserve biological diversity in East Africa; the second to protect wildlife in Western and Central Africa. In addition, a first set of projects to help borrowers to comply with the Montreal Protocol, which provides for the phasing out of ozone-destroying substances, are planned in Ghana, Nigeria, and Kenya.

ASIA

Introduction

The Bank's Asia region stretches from India to the Pacific Ocean. High population growth, widespread poverty, rapid urbanization and fast industrialization have produced extensive environmental degradation. The region's population is projected to double over the next 40 years - from 2.5 billion to 5 billion - despite a rapid drop in the birthrate. It counts over half the world's mega-cities; those with 10 million people and more. Meanwhile, the number of its "large" cities (four million people plus) is set to increase from 20 to 50 by 2025. The rate of economic growth in some countries has reached 8 percent a year and the region as a whole is projected to maintain its economic momentum during the 1990s. Nevertheless, about 750 million people live in absolute poverty - more than the total number of poor in Africa and Latin America combined.

The statistics translate into a litany of environmental problems. Soil degradation is accelerating as pressure on marginal land grows. Some 50 percent of India's arable land is degraded through erosion, compaction (by animals and people) and salinization (because of poor irrigation practices). More people demanding more food means that by the end of the century, Asia will account for three-quarters of the increase in consumption of chemical fertilizers, adding considerably to the pollution of soil and water. Forests are disappearing at a rate of almost five million hectares a year. Competition for water resources is increasing while water quality declines. Access to safe drinking water is a major problem. Some 70 percent of China's rivers are polluted and industry is shut down in some parts of Indonesia during the dry season for lack of clean water. Air quality, too, is becoming progressively bad. Big cities are worst affected. Children in Bangkok, for example, show increasing levels of lead in their blood because of their exposure to automobile emissions. Meanwhile emissions of sulphur dioxide and carbon dioxide from thermal power plants are likely to increase by 50 percent over the next 10 years, making Asia a major contributor to acid rain and global warming.

The Bank's activities during FY91 addressed many of these problems. Work began on a report which will look at what lies behind the region's environmental problems and provide the basis for a comprehensive strategy to deal with them. The report will draw on a substantial body of region-wide research on environmental issues done by the Bank. A \$2.5 billion program on urban and industrial pollution control in Asia's major cities (see box on page ____) intensified its activities. Major initiatives were approved to control industrial pollution in India and improve natural resource management in the Philippines. The environment also figured as a component in a number of new investments and in the Bank's policy discussions with borrowing countries.

Environmental Strategy

Work began on a study covering the full gamut of Asia's environmental concerns. It will lay the groundwork for a major new regional environment initiative for Asia. The hope is to take advantage of the 1992 UN Conference on Environment and Development (UNCED) to focus greater attention, and financial resources, on Asia's environmental problems. Some of the analytical work for the initiative has already been done in the form of environmental action plans and issues papers completed in past years for most countries in the region. To add a broader dimension to this country-specific work, a number of background studies on region-wide environmental issues have been undertaken.

A strategy paper on forest policy paints a bleak picture of deforestation in Asia. Figures from the United Nations Food and Agriculture Organization (FAO) indicate that during the 1980s deforestation in the 15 countries of the region reached 4.7m hectares a year. Fuelwood is increasingly scarce. Loss of biodiversity has reached unprecedented proportions. Malaysia and Thailand, once major timber exporters, now have severe shortages. Within ten years, Asia's forests will cover only half of their original area. The paper emphasizes that deforestation is often due to misguided or narrowly focused government policies. It points to what it describes as a crisis of confidence in the management ability of existing forest institutions. International agencies, including the World Bank, have not improved the situation and need to review their approach, the paper says. It suggests that this poor performance stems from the fact that institutions responsible for forests are designed to extract surplus from the land and keep people away. Little attention is paid to the broader value forest resources represent to society as a whole.

The paper recommends that the Bank shift its support away from public sector institutions and promote an increased role for the private sector. The latter is largely responsible for logging and is unlikely to act in an environmentally benign manner unless it has a longer-term stake in prudent management. The paper also emphasized the need to better understand how policies (land tenure, for example) and investments (access roads and so on) outside the forest sector have a direct impact on it. Meanwhile, it says, more must be done to halt the encroachment of agriculture. Unless these issues are addressed seriously, the paper concludes, the region's remaining forests, complete with all their goods and services, are endangered.

Asia has a rich endowment of biological diversity but it is likely to lose more of it over the coming decades than any other region, according to a strategy paper on biodiversity in Asia to be completed in FY92. Setting up well-managed parks and protected areas is regarded as the most practical way to do the job. However, many of the region's parks and protected areas exist only on paper. A large number are almost totally degraded. One reason for this is the inappropriate system of administration most have adopted. This is based on the twin pillars of exclusion of local communities and enforcement of the law; a model which is not practical in face of acute population and economic pressures. Management is likely to be more effective if local communities and non-governmental organizations are involved. While increased funding is required to preserve biodiversity, absorptive capacity is low, and additional funds should be made available gradually. At the same time "perverse policies" which actually encourage the loss of biodiversity - through low stumpage fees, resettlement in forest areas and so on - must be addressed. It is recommended that the Bank place highest priority on countries with the greatest diversity - Indonesia, China, India, Malaysia, Papua New Guinea, and the Philippines. But almost every country in the region has significant biodiversity under threat and well thought-out programs would make sense in practically all of them. Only those which reconcile peoples' needs with conservation should receive priority attention.

Recognition that environment is considerably affected by macroeconomic policy is found in a study on trade policy and resource allocation in Indian agriculture. The study deals with the extent to which environmental externalities might modify the findings of the apparent comparative advantage of the major Indian crops. For example, cotton appears to be a low cost crop with excellent export prospects, but this conclusion is moderated by the extent of the adverse environmental effects on other crops of pest immunity resulting from the spraying of cotton. The study also recognizes the problems of waterlogging and salinity associated with irrigation, especially of rice and sugar cane in arid areas.

Work also began during the reporting period on a regional strategy to control emissions into the atmosphere. The focus is on acid rain and greenhouse gases. The former is responsible for the destruction of forests and the acidification of lakes. The long-term impact of greenhouse gases is not yet well understood but there is growing evidence that they contribute to global climate change. The industrialized world is responsible for the most of the emissions. But developing countries will contribute an increasing share of atmospheric pollution in the years ahead. For example, Asia currently contributes just over 20 percent of the world's greenhouse emissions. But it will provide about half of the world's new sources of these gases. The challenge is to design cost-effective programs and to provide financial mechanisms to support emission reduction programs in Asian countries. Acid rain and global warming are different problems but, often, have common sources. Thus, measures ranging from energy pricing to endof-pipe pollution abatement can, if well designed, have an impact on both.

While the problem of sulphur dioxide emissions - the main source of acid rain - is high on the agenda in Western Europe and North America, their reduction in the Asia region (and in other parts of the developing world) is more complicated. Emissions regulations are lax and mitigation measures costly. This, combined with the increased emphasis on coal for energy production in countries like China, India, Indonesia, Thailand and Korea means that the problem is likely to get worse. Technologies for dealing with emissions which cause acid rain exist but they are expensive. As the benefits are shared, it makes sense to share the costs of the solution. In other words, the "polluter pays" principle needs to be supplemented with special financial instruments when countries are poor and emissions cross boundaries.

Reducing greenhouse gases is more complicated and will require major interventions in the agriculture, forest and energy sectors. New cleaner energy technologies have an important role to play. But the overriding long-term challenge is to delink the relationship between economic development and energy use. For this to happen, the price of energy must include the full costs to society of harmful emissions. This prescription is echoed in a report on the environmental impact of coal use in China. It calls for action to mitigate the environmental effects of coal use through price reforms (for coal and gas), higher tariffs for electric power, and controls on air pollution.

Efforts continued during the year to assist virtually all countries in the region to develop wide-ranging environmental strategies. For example a study on how Indonesia manages its forests, land and water (and how it might manage them better in the future) was published in FY91. The premise is that sustainable development depends on the recognition that natural resources are finite and that their wasteful use today will cause an unnecessary sacrifice of income and wealth in the future. The report says that policy-makers in Indonesia are aware of their obligations in this respect, but that the country's abundant resources of forest, land, and water are under increasing pressure from a growing population and the fast pace of industrialization and urbanization. It is, therefore, essential to use resources more efficiently. The tools for doing this are proper pricing and improved management. About a million hectares of forest are destroyed each year as loggers seek to cut down as much as they can of what is treated as a virtually free resource. Loss of ground cover in turn gives rise to soil erosion and the loss of fertile land. The problem is particularly acute in Java where urban sprawl is consuming more and more prime agricultural land.

Water for irrigation is provided at little or no cost to farmers. The resulting excessive use reduces the amount available to competing urban and industrial users. The poor performance of many public utilities in supplying piped water has led to the overuse of groundwater and the intrusion of salt into aquifers. Untreated sewage and municipal waste are rapidly becoming a serious threat to water quality. The report concludes that where resources are scarce, sustainable development will depend on their intensive and efficient use. It also recommends clarifying institutional responsibilities for the environment and decentralizing decision-making.

Also underway is the preparation of a major environmental strategy paper for China. To be completed in FY92, preparatory work involves a review of the major problems such as pollution, agricultural land and water degradation, and loss of natural ecosystems. It addresses the magnitude and cost of their impacts and their underlying causes, and recommends strategies for dealing with them. It will also propose a Bank program of environmental assistance in China.

Metropolitan Environment Improvement Program (BOX)

Asian cities have grown rapidly over the last 30 years and this growth continues to accelerate. Based on current trends, 1.7 billion people (40% of Asia's projected population) will live in them by 2025. This is leading to the equally rapid degradation of air, water, and land which undermines development and imposes a heavy burden, particularly on the poor. Governments are concerned and are starting to invest in sewerage, solid waste disposal, and slum improvement; to establish and enforce environmental standards; and to use planning and impact assessment

procedures to guide urban development. However, most countries need to do more to strengthen environmental management.

The Metropolitan Environmental Improvement Program (MEIP) was established to fill this gap in late 1989 by the United Nations Development Programme (UNDP) and the World Bank. Its focus is on how better management can help reverse the process of urban environmental decline in Asia's largest and fastest growing cities: Beijing, Bombay, Colombo, Jakarta, and Manila. MEIP helps each participating city develop a work-program which takes into account broader regional concerns about urban management. Components include:

- Preparation of an Environmental Management Strategy (EMS) and a set of Action Plans for each sector.
- * strengthening the management and industrial pollution control (IPC) capabilities of the agencies involved in urban/industrial environmental management.
- feasibility and investment studies for emerging high-priority environmental management and pollution control projects.
- intercountry research and workshops on important urban environmental management issues.
- country-based research and demonstration projects undertaken by local research organizations and NGO's.
- * study visits, workshops, and information sharing networks among MEIP cities.

MEIP is administered by the World Bank. UNDP provides policy guidance and funding for program administration, intercountry workshops, and research. So far, UNDP has provided seed funding worth \$2.5 million. An additional \$3.0 million has been raised from bilateral and multilateral donor agencies and various national environmental trust funds. Another \$4.0 million is sought to implement projects in each of the five cities.

Environment Lending

The environment figured in an increasing number of projects and programs funded by the Bank in FY91. They include projects whose main objective is to improve the environment and others which incorporate environmental concerns as part of a regular project or adjustment loan. India's efforts to promote environmentally sound industrial development were bolstered during FY91 by a US\$124 million loan and a credit of US\$31.6 million for the Industrial Pollution control Project. It is the first Bank-supported project in Asia devoted exclusively to pollution control. India will use the loan to finance a program designed to reduce industrial pollution caused by chemical industries in the states of Gujarat, Maharastra, Tamil Nadu, and Uttar Pradesh. Producers of dyes, fertilizers, pharmaceutical, pesticides and petrochemicals are among India's worst polluters, discharging waste into rivers and other bodies of water.

A number of smaller industries have violated environmental codes because they are unable to meet the costs and technical requirements of installing safe systems. Many of these industries are located in industrial estates, where shared waste-water treatment facilities could be used. But even in areas where waste treatment facilities are available, effluents are often discharged untreated because there is insufficient enforcement of laws on waste disposal. The Bank's loan will help the government strengthen the capacity of monitoring agencies to ensure compliance with environmental laws. It also includes funds for building waste-treatment facilities in industrial parks to be used by small and medium sized industries which could not afford to do so on their own. India's industrial pollution problems have persisted partly because the country's protective trade regime and pricing policies have unintentionally encouraged wasteful use of raw materials. High tariffs have shielded smaller industries -- which operate at environmental standards well below world levels -- from competition. The success of the loan will depend in part on the commitment of the government to increase the costs of noncompliance with environmental regulations and, more important, on its ability to convince industrialists that their own long-term interests lie in pollution control.

Disaster Relief in Bangladesh (Box)

Bangladesh has been battered by cyclones and floods since time immemorial. Of the ten most disastrous storms of the century, seven struck Bangladesh. The series of cyclones that struck during April and May 1991 are estimated to have taken some 140,000 lives and caused extensive damage to infrastructure, factories, agriculture, and marine equipment and facilities. Immediately following the cyclones, the World Bank dispatched several field missions to study the extent of damage. Upon their assessment of the situation, the Bank will reallocate funds from existing IDA credits and will consider a free-standing rehabilitation credit if additional assistance is needed. Support for construction of cyclone shelters is also being considered.

As another major recovery program gets under way, questions are again being raised about the wisdom of current practices which place greater emphasis on relief than prevention. This is the subject of a recent Bank report, *Managing the Environment and Natural Disasters*, which places a good deal of responsibility for the consequences of natural disasters on human beings. A cyclone or an earthquake does not constitute a disaster until it affects lives or damages property. Many natural disasters could be prevented by thoughtful land-use management and effective environmental practices. This proactive approach is better by far, the report says, than restoring the country to its pre-disaster status and waiting for history to repeat itself.

The Bank also approved a US\$23 million loan and a US\$130 million IDA credit to the Dam Safety project in India. Institutional strengthening is a major objective. The project will also provide assistance in applying improved procedures to reassess the flood handling capability of about 940 large dams in four states, and fund remedial efforts where necessary. It is the first time the Bank has sponsored a dam safety project and it is hoped that the project will serve as a prototype for others.

A US\$158 million sector adjustment loan approved in FY91 is designed to enhance management of the Philippines' natural resources which are currently under severe threat. Only one million hectares of old growth forest still remain; a fraction of the total standing a generation ago. Shifting cultivation has led to severe soil erosion and changes in the hydrological regime. Meanwhile, overfishing, combined with the destruction of mangroves and coral reefs, has led to the depletion of inshore waters. These problems, which were analyzed in depth in the Environment and Natural Resource Management Study completed in the previous fiscal year, are linked in two ways. First, they involve what are supposedly publicly owned and managed resources which are exploited without restraint by private companies and individuals. Second, they affect the livelihood of the country's neglected and impoverished rural population. The loan includes provision for improved enforcement of logging rights, the introduction of secure tenure for people working the land, and training in new agricultural techniques for farmers in upland areas where the most severe environmental degradation is taking place. The loan promises to put in place a sound institutional basis to sustain the Philippines' forests and upland agricultural areas. The risks come mainly from possible delays in legislative action, weak management -- something the loan is designed to address -- and a reluctance on the part of people living in rural areas to change their ways.

China's problems of urban pollution are writ large in the capital Beijing. Work went ahead during FY91 on the preparation of a major stand-alone environment project designed to address them. The loan will go the Board in FY92. China will use the loan to establish a comprehensive environmental protection program focusing on the city's policy and institutional framework. The focus will be improving air and water quality, and dealing with solid waste generated by households and industry. In addition to reinforcing the city government's ability to manage the environment and develop long-term strategies to deal with the most pressing environmental problems, the project will provide finance to renovate or close-down Beijing's dirtiest industrial plants, to improve the sewer system, to build central heating facilities to replace large numbers of small boilers, and to dispose of hazardous waste.

More than 30 projects approved in the Asia region during FY91 included environmental components (see Annex II); several had more than one environmental goal. About a third of them were for soil, forest and water conservation. For example, the Fourth Rural Credit Project in China will help to establish a sustainable rangeland management system; facilitate development of fisheries; improve rural water supply and drainage networks, and encourage tree planting to contain soil erosion. In India, the Tamil Nadu Agricultural Development Project will also finance a range of activities designed to protect rainfed areas under ecological stress.

Pollution control is featured in several projects; the Indonesian Fertilizer Restructuring Project will finance studies to assess the environmental impact and standards of the fertilizer industry, including long-term objectives and preparation of an environmental management program for the industry nation-wide. Also in Indonesia, the Third Jabotabek Urban Development Project contains a wide range of provisions for improving pollution control in the most populous region of the country.

The vulnerability of the region to natural disasters is also reflected in the lending program. In addition to the response to the Bangladesh emergency (see Box), the Andhra Pradesh Cyclone Emergency Reconstruction loan to India aims at strengthening institutional capability in cyclone preparedness as it relates to irrigation and drainage, water supply, and flood protection. The Philippines Earthquake Reconstruction Project provides for reconstruction of infrastructure as well as institutional development. In general, institution building, aimed at improving the administration of environmental policy, with special reference to monitoring and regulation, environmental assessment capability, and training, is a feature of most environmental lending activities in the region.

Project Implementation

Overseeing existing projects to ensure that environmental safeguards are respected has received increasing attention during the year. In India, for example, the Bank continued to work with the governments of Maharashtra and Madhya Pradesh to improve resettlement planning for people displaced by the Narmada River Development Scheme - the Sardar Sarovar Dam and Power Project. It is encouraging local authorities to establish a dialogue with displaced people and to address opponents' grievances. A committee of resettlement officers and non-governmental organizations has been created to assist landless poor and tribal people during the resettlement process. In addition, the Bank has recently commissioned an independent review of the project's resettlement and environmental aspects. The review committee will be chaired by a former Administrator of the United Nations Development Program. The committee's findings and recommendations are expected early in 1992.

The resettlement of more than 5,000 families displaced in 20 villages by the Kedung Ombo Multipurpose Dam and Irrigation Project in Java, Indonesia has been a difficult and complex task. Construction of the dam is now complete and substantial progress has been made on a revised resettlement plan. During the year more than 1500 families moved to the areas designated for resettlement near the reservoir or transmigrated. They all received houses and land, and have access to a range of community facilities. Efforts still continue to resettle the last 558 families who remain on the greenbelt -- the five-meter zone above the reservoir which must be evacuated as a safety precaution. Although the clock cannot be turned back for the displaced families of Kedung Ombo, a number of lessons emerge. Many problems could have been avoided if the original resettlement plan had been more flexible and provided options for people to choose from. Resettlement plans for future projects involving involuntary settlement should be framed with the participation of the affected families.

Efforts also continue to address the change of environmental problems associated with development of the Singrauli region of India. The Bank has launched a series of studies to see how best to handle pollution, forest management and watershed protection, and industrial land reclamation. In addition, an environmental assessment of the entire region has identified priority problems. A more ambitious development and environment study is now proposed. Currently under consideration by the Indian government, the study would outline a comprehensive development strategy, including provisions to strengthen local institutions and create a tax base for environmental and development programs. Most important, development priorities will be established in cooperation with all people interested in the region's future.

<u>Global Financing Facilities</u> Six investment projects in the Asia region were presented to countries participating in the Global Environment Facility at the first meeting of Participating Parties in May 1991. They are located in Bhutan (trust fund for environment conservation), China (coal-bed methane pilot project; ports waste disposal); Lao PDR (wildlife and protected areas management); Philippines (management of protected areas; geo-thermal energy). Projects are also planned in Bangladesh, China, Malaysia, Philippines, Sri Lanka and Thailand to assist these countries in complying with the terms of the Montreal Protocol which calls on developing signatories to phase-out ozone-destroying substances by 2010.

EUROPE, MIDDLE EAST & NORTH AFRICA

Introduction

The Bank's Europe, Middle East and North Africa region (EMENA) includes 29 countries, which are at various stages of development. Despite their economic and cultural diversity, most have common environmental problems whose roots are found in inappropriate economic policies, such as subsidized prices for energy or water, and weak regulatory systems. They also share a number of region-wide environmental concerns which lend themselves in some instances to region-wide solutions.

The year saw a notable increase in the Bank's analytical work in the form of issues papers, policy briefs, and sector reports. There were also an array of new investments. Intensity of activity in Eastern Europe remained particularly high and tended to dominate environment activities in the region. An example was the new regional environment initiative in the Baltic Sea. Meanwhile, a similar multilateral program in the Mediterranean was consolidated. In addition, an ambitious overview of water shortages in the EMENA region was launched, a major environment loan to Pakistan was approved, and progress was made in the preparation of a new initiative in Egypt.

Eastern Europe

<u>Environmental Strategy</u> Eastern Europe's environmental problems remain daunting. But progress has been made in dealing with them by making the environment part of the process of economic reform. Political change has created high expectations throughout Eastern Europe. The environment has acted as a rallying point for many people dissatisfied with the previous regimes, and progress in bringing about improvements is an important criteria against which the performance of the new governments is judged.

The magnitude of the pollution problems in Eastern Europe is becoming increasingly apparent. For example, although initial estimates of the losses caused by environmental degradation may have been exaggerated, it now appears that Poland has been losing (largely through ill-health) about 5 percent of its annual Gross Domestic Product due to environmental degradation. This is two or three times higher than in the OECD countries. The challenge now is to open up the economies of Eastern Europe and expose them to the sorts of pressures -- both in the form of regulations and the market place -- that have produced environmental improvements in many other parts of the industrialized world over recent decades.

Environmental and economic development issues are closely intertwined in Eastern Europe. Bank efforts to address environment explicitly recognize this. For example a joint team made up of experts from the European Community, the US Agency for International Development, and the US Environmental Protection Agency, in addition to World Bank staff, spent several weeks in Czechoslovakia during FY91 working with the government and its constituent Czech and Slovak Republics on a joint environmental study. Their report, issued in June 1991, says that the quickest returns to the environment will come from the removal of subsidies and other general price and market distortions. Once resources are more efficiently allocated, policies to improve environmental quality are likely to be more effective. They should include incentives to reduce pollution, to assume environmental costs and to move towards more sustainable use of resources. Reforms should include realistic pollution standards, a rational structure of charges, fines and fees, and effective monitoring, inspection and enforcement. A number of projects in the study are identified as candidates for Bank funding as part of a three-year action plan.

In addition a series of specifically environmental studies that have been conducted in Poland, Hungary, Bulgaria and Romania. Environmental concerns also feature heavily in economic and sector work being carried out in these countries. A major inter agency study of the USSR economy (see below) also pays special attention to environment. Bank studies of environmental issues in these countries indicate that in general, fundamental changes are required, namely:

- <u>Market Clearing Prices</u>. Highest priority must go to increasing the price of energy and other natural resources to reflect scarcity values. The goal is to establish efficiency as the criteria by which to judge performance.
- <u>Investments</u>. Large investments are needed to support industrial restructuring and to overhaul the energy sector; particularly to control particulate emissions and modernize the domestic heating system. Improving water quality is also a priority.
- <u>Laws and Regulations</u>. Realistic regulations on effluent and emissions standards to prevent any further deterioration in water and air quality. Fees and fines must be high enough to deter polluters.
- <u>Shared Responsibility</u>. Decentralization to regional and provincial authorities to achieve better environmental management, but with a mix of responsibilities between the center (regulatory framework) and regional levels (monitoring, enforcement, fine-tuning of regulations).

Regional Energy Plan (BOX)

The energy sector bears major responsibility for environmental problems in eastern Europe, according to a number of recent Bank studies. Subsidized prices, soft budgetary constraints and the widely-accepted principle that environmental pollution was cost-free, led to massive over consumption of energy. Environmental degradation of all sorts was the inevitable corollary. In response to this region-wide problem, the Bank has proposed a three year Regional Energy Program. The first step would be to raise prices to reflect production and environmental costs, improve competition and promote conservation. Then it would set about tackling uncertainties about supplies of natural gas and oil from the Soviet Union by diversifying sources of supply. The program would also stiffen pollution controls, investigate alternative energy sources and review safety in the region's nuclear power facilities.

Environmental problems originating in Eastern Europe have also contributed to the degradation of the Baltic. An attempt to restore ecological balance to the sea was launched at a summit conference of Northern European governments meeting at Ronneby, Sweden in September 1990. A task force was established charged with drawing-up an action plan to resolve the Baltic's pollution crisis. The World Bank, the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD), and the Nordic Investment Bank are working on the plan with governments. The task force plans to finalize its work program by the end of FY92. Each of the development banks is responsible for a number of studies on the worst affected areas of the Baltic. In addition to looking at causes, they will propose solutions in the form of investments and policy reform. The World Bank, in co-operation with EBRD, is taking the lead in the preparation of studies in Czechoslovakia (The Oder and Vistula River basins) and Poland. It is coordinating efforts on the German portion of the Oder river basin with the EIB. The Bank's work on the Soviet part of the Vistula River basin is also being done with EIB.

Meanwhile, the environment figured in the study of the USSR economy undertaken jointly by the World Bank, the IMF, the OECD and the European Bank for Reconstruction and Development. The study, commissioned by the Group of Seven at the Houston summit in July 1990, said that environmental reform in the USSR must be closely integrated with the transition to a market-based economy. However, economic reform is not sufficient on its own, the report says. Pollution charges, environmental information and monitoring systems, environmental impact assessments, and international cooperation are also important. The report recommends that at first the emphasis should be on least-cost methods of increasing efficiency and reducing waste and pollution. Only later will it be possible to invest in the kind of modern, clean technologies which promise substantial gains in productivity and for the environment.

<u>Environmental Lending</u> During the year four loans to Eastern Europe contained significant environmental components: a free-standing environment project to improve the heating system in Poland; an emergency recovery project in Romania; and structural adjustment loans to Poland and Czechoslovakia.

The \$340 million Heat Supply Restructuring Project in Poland focuses on the country's inefficient domestic heating system. At present households have very little incentive to save energy because heating is provided to whole districts rather than to individual homes. Most people open and close their windows to regulate the temperature in their homes. The new loan will attempt to eliminate this inefficient practice by modernizing the district heating networks and providing equipment to deal with air pollution.

Fast track procedures were used to push through a \$180 million emergency loan to help Romania cover the foreign exchange costs of vital imports and to provide technical assistance in putting together a program of economic reform. The Romania Technical Assistance/Critical Imports loan includes provisions with a central environmental focus in the form of sectoral studies on irrigation, agro-industries, and petroleum, power, and industry.

Meanwhile, a \$300 million structural adjustment loan to support Poland's move towards the privatization and restructuring of state enterprises has a central environmental purpose: all enterprises that benefit from the loan will be obliged to operate in accordance with strict environmental standards. A structural adjustment loan to Czechoslovakia approved in FY91 requires the introduction of pollution charges and environmental assessments for all new investments.

A number of projects with environmental objectives reached advanced stages of preparation during the year. These include a project targetting coal mining and the chemical industry in Poland as candidates for environmentally-sound restructuring. In addition, work is underway on a major loan to finance Poland's financial sector. The rapid pace of economic reforms can only be sustained if financial institutions can mobilize savings, evaluate risk, and allocate resources efficiently. The loan is key to the success of the government's long term aim of achieving macro-economic stability, restructuring the least efficient (and most polluting) sectors of the economy, and laying the foundations for sustainable growth.

In Czechoslovakia, work continued during FY91 on the preparation of two loans related to the environment. An energy sector project will include substantial investments in the reduction of air pollution from thermal power plants. The disposal of various kinds of waste, mine-site reclamation and the clean-up of the highly polluted Ostrava region in the north of the country all feature in a free-standing environment project now being prepared.

A Bank study of Hungary encourages a shift away from subsidised energy towards more effective demand management and economic pricing. This perscription features in two projects currently being prepared: the first covers the energy sector; the second deals with industrial restructuring.

A Bank technical cooperation team visited Bulgaria early in the fiscal year and found serious environmental degradation in some places -- although the overall situation is not as bad as in Poland or Czechoslovakia. The Bank is now working on structural adjustment measures and a technical assistance loan which will incorporate many of the team's proposals into the economic reform program. Bulgaria is also drawing up separate strategy papers on energy and the environment.

Southern Europe, Middle East and North Africa

<u>Strategy</u> A study of the main environment problems faced by Egypt began during the fiscal year. It is the first stage in formulating a strategy to deal with them. Most of Egypt's environment problems arise from competing demands on limited resources of water, land, and energy by a fast growing population. Integrating environmental concerns into the country's economic framework is a now a central thrust of the Bank's work. As part of this process, a round table conference was held in Cairo in June 1991. During the session agreement was reached on a national framework to assist in identifying and mitigating Egypt's environmental black spots. In addition, a structural adjustment loan approved during FY91 incorporated various components affecting the environment. They include energy conservation and industrial pollution abatement, and the improved management of rangelands and groundwater.

The Mediterranean Environmental Technical Assistance Program (METAP), launched in spring 1990, is now well underway. The program supports the development of environmental projects, the strengthening of institutional capacity and the definition of environmentally-sound policy, and is jointly funded by the Commission of the European Communities, the United Nations Development Program, the EIB and the World Bank. Activities are concentrated on the Mediterranean's southern and eastern rim where the need for action is most acute.

Although slowed down somewhat by the Gulf war, METAP was externally active during the year and is now implementing some 66 actions in ten countries (Algeria, Cyprus, Egypt, Greece, Israel, Malta, Spain, Tunisia, Turkey and Yugoslavia). To increase the level of environmental lending in the region, METAP's primary function at present is to identify and prepare environment projects and to develop an investment program. Priority goes to four activities: integrated water resource management; management of solid and hazardous wastes; prevention of marine pollution caused by oil and chemicals; and containing damage in coastal waters.

- Integrated water resource management is concentrated in the Maghreb countries, where lack of water represents a major constraint on development. METAP activities in Tunisia, for example, include a project to examine the use of sludge for agricultural purposes.
- Requests for support in dealing with hazardous waste have been received from Algeria, Cyprus, Israel, Malta and Tunisia. An example is Algeria's proposal to study technological and financial alternatives in waste management.
- Marine oil and chemical prevention control is important in what is one of the world's most heavily travelled bodies of water. Support for Turkey's maritime

pollution prevention measures in the Sea of Marmara, the Dardannelles and the Bosphorus is an example of METAP's activities in this area.

Coastal zone management focuses on institutional and regulatory issues, infrastructure and urban environmental quality, biodiversity and cultural property. In Yugoslavia, for example, a management plan is being drawn up to protect historic buildings and biodiversity on the islands of Cres and Losinj.

Policy work advanced during FY91 with various studies on financing mechanisms for pollution abatement. A study was also completed on coastal development in Turkey. Institutional strengthening was furthered through the launch of the Mediterranean Protected Areas Network (MEDPAN) which brings together managers of protected areas from throughout the region. A number of training courses were organized and support continued for the United Nations Environment Program's pollution monitoring and research program (MEDPOL).

Throughout most of the region, water is scarce, expensive, increasingly polluted and poorly managed. The resulting conflicts and inefficiencies put a brake on growth, strain public finances and damage the environment. A region-wide Bank study of the management of water resources launched in FY91 is an attempt to take stock of the deteriorating situation and formulate a more comprehensive approach. The scale of the problem warrants concern. Of the 11 countries in the arid areas of North Africa and the Middle East, seven are categorized as experiencing "absolute water scarcity" and in need of significant adjustment to meet demand. Another three are in "water stress", requiring major investments to keep up with demand. Meanwhile Iraq, Iran, Pakistan and Yugoslavia are classified as having "water management problems".

Getting prices right and adjusting fiscal incentives would do much to promote more efficient use of water. But there are a host of cultural, social and political issues at stake that must be taken into account if they are not to undermine market mechanisms. In the absence of new technologies, the emphasis must be on strengthening water authorities, rationalizing policy, reforming incentive structures and improving planning, according to the Bank's research proposal. This means involving all water-users in the management process and obliging them to face up to a complicated series of trade-offs between urban areas and the country-side; between agriculture and industry; and among a variety of development objectives.

In many parts of the region the process is made more complicated by the fact that rivers and aquifers cross international borders. The headwaters of the Nile, the only source of water for Egypt, are controlled by Ethiopia and Sudan. Israel, Syria, and Jordan share the River Jordan. Turkey, Syria, and Iraq all draw on the Tigris and Euphrates rivers. And most of North Africa depends on water from the same regional aquifer. In all these cases, continued use of shared water resources is vital to economic security and growth. Long-term sharing arrangements are thus vital to regional security and economic development. But they are only likely to be worked out as part of a broader approach to water management which addresses the full set of risks and uncertainties that determine a country's willingness to share so vital a resource.

The first stage of the study (FY91-93) - coordinated by EMENA's regional environment division - focuses on countries with the most pressing problems: severe shortages; rising costs; declining water quality and fierce competition from a variety of users. The aim is to improve water sector operations and to lay the technical groundwork for a comprehensive set of policy proposals. The study will include case-studies, seminars and discussions with governments. The resulting papers, reports, recommendations and guidelines will be used directly in World Bank lending activities and policy discussions with borrowing countries.

The Pakistan Environment Protection and Resource Environmental Lending Conservation Project, funded by IDA, is the first attempt at dealing comprehensively with that country's deteriorating environment. This US\$47.4 million free-standing environment project is an integral part of IDA's strategy for the agricultural sector. In order to safeguard substantial investments already made or planned in dams and irrigation systems, emphasis is placed on upgrading management of rangelands and watersheds, rehabilitation of coastal areas and wild-life habitats, and the stabilization of sand dunes. Rapid environmental degradation in Pakistan is made worse by fast population growth (3.1 percent a year) which places increasing strains on finite land resources. The evidence is found in declining crop yields and productivity, loss of forest cover, over-grazing, soil erosion, salinization of irrigated areas, water pollution and the loss of natural habitats, plants and animal species. The focus of the loan is strengthening central and provincial environment agencies. This includes the introduction of sophisticated environmental monitoring techniques and training to build up a local cadre of environmental assessors. A mass communications effort to bring the environmental message home to the poorest peasant is also part of the program.

In addition, several loans to countries outside Eastern Europe approved during FY91 contained environmental components. Examples include a loan to Morocco for port modernization which contains environmental provisions for the disposal of dredging materials and other debris; a project to restructure Tunisia's hospital system which deals with the handling of surgical waste; Turkey's technology development project which funds for studies on energy conservation and introduces safeguards for disposing of dangerous waste from laboratory tests; and a project for training secondary school teachers in Yemen to develop a curriculum and text books on environmental science.

Global Facilities for EMENA

Opportunities for securing concessional finance from the new Global Environment Facility and the Montreal Protocol Interim Fund gave rise to intense activity during the fiscal year. Four projects in the EMENA region were presented to the GEF's Participating Parties at their meeting in Washington DC in May 1991. All three are in the area of biodiversity, and include conservation of national parks (Algeria), screwworm control (North Africa regional), and forest protection (Poland). A regional project for Environmental Management in the Danube River Basin was also presented. Projects in Egypt, Jordan, Tunisia aimed at reducing emissions of ozone-depleting substances were also readied for Montreal Protocol funding.

LATIN AMERICA AND THE CARIBBEAN

Introduction

The Latin America and Caribbean region includes 30 countries with a total population of 414 million people, growing at a little over two percent a year. Most of the countries in the region share low levels of economic growth and a complex set of environmental problems. Pollution of the air and water, deforestation on a grand scale, soil erosion, the degradation of coastal areas, and insufficient urban services have had a cumulative impact. The threat to human health steadily increases in rural areas and the fast growing cities which are now home to more than 70 precent of the region's population.

The scale and nature of the environmental problems in Latin America and the Caribbean gave a clear focus to the Bank's activities during the fiscal year. The general pattern was established by the previous year's Environmental Policy loan to Brazil. In FY91, a series of indepth country studies, aimed at strengthening environmental management capacity at the national level, and resulting in environmental sector policy lending, were in various stages of preparation. Actual lending operations included major loans to Mexico and Ecuador designed to strengthen environmental institutions in the two countries. Similar projects are being prepared in several other countries in the region. In all, more than 20 projects approved during FY91 included environmental components.

Environmental Strategies

During FY91 analytical work began on three major sets of environmental issues facing the region. First, pollution and contamination in the urban areas which now accommodate more than two-thirds of the region's population; second, the loss of tropical forests and the assets they represent both for the countries in which they grow and the rest of the world; and third, the region's response to global warming issues. By focusing on the region's most pressing problems the aim is to help put environmentally sound policy instruments in the hands of the Bank's borrowers.

Air and water quality are major concerns in many of the region's cities where the absorptive capacity of the environment has been affected by the unregulated growth of highlypolluting industries, the lack of such basics as sewage treatment, and unplanned urban sprawl which leaves cities choked by traffic. An already bad situation is made worse by the effects of perverse economic incentives, such as subsidized prices for water and electricity.

The urban pollution and policy study is studying the economic costs of urban pollution. Cities to be studied include Mexico City and Santiago, Chile. Key criteria in identifying policy options are ease of implementation and impact on the overall level of pollution. The study will also deal with how pollution affects economic growth and the implications for different socioeconomic groups of the various policy alternatives. The thrust of the study is to help define an appropriate balance between policies that discourage pollution, through price and other economic incentives, and those based on regulation and control.

Tropical forests in Latin America are being rapidly destroyed. Destructive practices include opening up of new agricultural land, clear-cutting for the timber market, and constant encroachment of neighboring populations. A study entitled "The Role of Native Forests and the International Timber Market" analyzes the way in which economic policies influence the various forms of deforestation. It covers the relative importance of government policies, market forces, and public and private investment. Individual country studies will examine a variety of policy instruments to reduce degradation. The role of the market in providing incentives for more rational resource use gets special attention. The study identifies two orders of benefits from forest cover in fixing atmospheric carbon and providing a habitat for many varieties of plants and animals. An important objective is to work out the additional costs of policies and investments necessary to obtain global benefits.

A \$250-million Rainforest Fund has been created to finance the five-year program. The fund will be used to provide grants and low-interest loans, and to underwrite debt-for-nature swaps. Disbursements will begin in spring 1992. Funding will be available for scientific research on ways to harness the forests' resources. Educational programs aimed at improving public awareness of the costs and benefits of rainforest protection will also be eligible for support. The fund will be used to strengthen public accountability and the enforcement of environmental regulations. Separate windows will be established for governmental agencies and non-governmental organizations to sponsor demonstration projects to manage the forests' biological wealth.

Another study of global environment issues as they relate to Latin America is being

Pilot Program to Protect Brazil's Rainforests (Box)

The Bank is working with the government of Brazil and the Commission of European Communities on an innovative effort to save Brazil's Amazon and Atlantic forests. The pilot program was proposed by the Group of Seven, made up of the world's seven leading industrialized nations, at the Houston Economic Summit in July 1990. The objective is to maximize the environmental benefits of Brazil's rainforests in line with the country's development goals. By reducing the rate of deforestation, the project should demonstrate the viability of the concept of sustainable development, help preserve the huge genetic resources of the rainforests, reduce the Amazon's contribution to global carbon emissions, and show the importance of cooperation between developed and developing countries on global environmental issues.

conducted. This study addresses the costs of reducing emissions of greenhouse gases, examining possible policy approaches and target emissions levels; the effects on growth, welfare, and macro-economic balances; and the resource transfers required to offset them. The study will pay particular attention to changes in broad sectoral policies (such as the elimination of subsidies on energy and fertilizers, and trade reform) which may have a significant effect on greenhouse gas emissions.

A number of sector and economic reports completed during the year also include environmental concerns. An example is a report on economic stabilization in Brazil which recommends a swift reduction in the supply of subsidized credit in rural areas and more government support for the kind of agricultural services (research, training and so on) that will most benefit the private sector. A sector report on adult health, also in Brazil, proposes measures to improve environmental quality. And a public sector expenditure review in Columbia makes the case for lowering energy subsidies.

Participation of affected people in the development process continues to be a major concern. In January 1991, with funds from the Swedish International Development Agency (SIDA), a special program was established in the Latin America and Caribbean region to promote participation of local communities and non-governmental organizations in Bank-funded projects dealing with environmental protection and the management of natural resources. During the first six months of 1991 the program funded some 12 initiatives. These included several which drew on the knowledge of indigenous peoples in the management of fragile lands and resources. Future plans include support for a training workshop in Bolivia on the management of protected areas, the participation of neighborhood associations in flood management in Brazil, and a film about community participation in rural resettlement projects in Mexico.

Property rights are an important determinant of the way natural resources are used. This is clearly the case in Amazonia. However, the precise nature of the relationship is not well understood. To find out more, a research project entitled "Property Rights and Net Loss of Tropical Forest Land in the Brazilian Amazon" is underway. The research seeks to establish how existing property rights contribute to the destruction of tropical forests and how they might be changed to encourage better maintenance and management.

The Bank has been working closely with government of Ecuador to minimize the environmental and social impacts of oil production in the Amazon. These issues were first identified during the preparation of the proposed Oil Development Project, whose objectives are to help Ecuador develop its oil resources in an environmentally sound manner. Although preparation is still at an early stage for the loan, the Environment Technical Assistance Project - which contains measures to safeguard the rainforest and tribal peoples from the impacts of oil production -- is expected to go to the Board for approval in FY92.

The challenge posed by Bank operations in the region amazon of Ecuador is to allow the country to exploit its oil resources while protecting its rainforest and tribal communities. An environmental assessment is underway to evaluate appropriate measures to protect the

environment and safeguard land rights of indigenous populations. A comprehensive environmental management plan for the oil sector was recently completed and will be complemented under the Environment Technical Assistance Loan. The plan includes a series of proposed environmental regulations and contingency plans for oil spills. As recommended in the plan, a new environmental unit has been created in the Ministry of Energy to monitor the performance of oil companies.

Environmental Lending

During FY91 the Bank assisted several Latin American countries prepare comprehensive environmental projects. These have a variety of objectives, from arresting various types of environmental degradation to protecting biodiversity, and controlling air and water pollution. The projects not only finance specific investments but also heavily emphasize nation-wide institution building, training, and policy reform. Two specifically environmental projects were approved by the Bank's Board during the fiscal year. They are designed to bolster national environment agencies in Ecuador and Mexico. Similar efforts are being prepared in Bolivia, Chile, the Caribbean region, Paraguay and Venezuela.

The Ecuador project (Environmental Technical Assistance Loan) will assist the central government establish the institutional capacity to deal with environmental issues in all sectors. In addition it provides for the preparation of environmental laws and regulations, and the means to enforce them. It should enable the country to deal with a range of intricate problems such as the environmental impact of oil exploration in some of the country's most ecologically-fragile areas. The Ecuador project will try to reverse some of the negative effects which resulted from the clearing of coastal mangroves to make way for agriculture and shrimp farming. In addition, the project will address the question of land-tenure in the oil producing areas of Ecuadoran Amazonia. Moreover, it will support the government's efforts to comply with the Montreal Protocol stipulations to phase out substances damaging the ozone layer.

The loan to Mexico (Decentralization and Regional Development Project for the Disadvantaged States) provides for improved management at the Secretariat for Urban Development and Ecology (SEDUE). It aims to increase the government's capacity to protect the environment and manage natural resources and to strengthen the institutional and policy framework. In doing so, the project supports the government's strategy of transforming SEDUE into a small, highly qualified organization to supervise and co-ordinate environmental work carried out by other levels of government or the private sector. More specifically, the project will protect natural reserve areas; strengthen institutional capacity to improve project assessment techniques and formulate environmental policies; and restorate selected archeological sites. It contains small-scale forestation programs; watershed protection; plant and animal disease control; and rural water supply and sewerage components.

The Bank also approved a number of loans during FY91 which are not directed exclusively at improving the environment but contain environmental components. In all, some

20 projects approved during FY91 have significant environmental components. Indeed many have more than one environmental goal (see Annex II). Such projects include the Mexico Water Supply and Sanitation Sector project, which provides for studies of medium and long-term water pollution strategies, involving consideration of effluent charges, standards and fees; the strengthening of environmental assessment capability; and a pilot water pollution control program. Environmental aspects of land management are addressed in the Agricultural Technology Development project in Bolivia which establishes a research program for pasture management and crop production to prevent wind erosion problems in the Altiplano. It also finances research aimed at reducing the dependence on chemical pesticides. A loan to Colombia for Industrial Restructuring and Development provides technical assistance to industrial enterprises to improve pollution control measures and to support a national environmental pollution control program. The range of lending operations which feature environment is further illustrated by the Public Enterprise Reform Adjustment Loan to Argentina. This will facilitate improvement in environmental management by public enterprises. Overall, about half of the projects with environmental components are intended to upgrade environmental administration and environmental assessment capability.

Project Implementation

Implementation of projects with important environmental components or consequences continues to be a matter of great concern throughout the Bank. Nowhere is this more evident than in Latin America and the Caribbean. Important lessons have been gained from the experience of a number of projects in the Brazilian Amazon, notably the Polonoroeste and Carajas projects. Based in part upon this experience, and to provide an analytical framework for future projects, the Bank conducted a study in FY91 on the causes and nature of environmental problems in the Amazon. Three key policy recommendations emerge. First, the study recommends eliminating economic incentives that promote environmental degradation. Second, it urges limiting access to new land as a way of making sustainable agricultural practices more tenable. And finally, it suggests increasing protection for parks and reserves, and resolving the vexed question of land tenure. The study's findings are now an integral part of several new initiatives. Two natural resource management projects still in the pipeline in the states of Rondonia and Mato Grosso focus on environmental policy reforms and rural development based on agro-ecological zoning -- a planning technique which differentiates land according to its most appropriate use. An industrial pollution project currently under preparation for all of Brazil will support several pilot programs in the Carajas region. In addition, a study of alternative energy options for the Carajas region is under discussion with the government. Meanwhile, the Group of Seven's Pilot Program for the Amazon will support projects to preserve vital areas of the ecosystem and sustainable economic development (see box).

Implementation of the Mexican Forestry Development Project (approved in FY89) has been delayed. The project, in the northern states of Chihuahua and Durango, aims to increase productivity of the forestry sector while reducing the negative environmental impacts caused by traditional forestry practices. It includes provisions to ensure protection of endangered species and the preservation of intact forest. The delay is due to slow progress on the environmental baseline study which must be completed before implementation can begin. The Bank worked closely with the Mexican authorities on this during FY91 and the study should be finalized by the end of 1991.

<u>Global Facilities</u> Projects in Brazil (biodiversity conservation units), Mexico (biodiversity), are under consideration for GEF funding. In addition, technical assistance projects have been proposed in Brazil (Conservation and Sustainable Management of Natural Resources in the Amazon), Columbia (Conservation of Biodiversity), and Guyana (Sustainable Tropical Forestry). A first set of projects to assist borrowers comply with the Montreal Protocol are also planned in Brazil, Chile, Ecuador, Mexico, Trinidad and Tobago, and Venezuela.

IV. GENERAL OPERATIONAL ISSUES

The Process of Integration

Continued progress in integrating environment into the Bank's operations is illustrated by the number and significance of projects with environmental components or objectives approved during the reporting period. (See Table 1). [Note that this year a project will be deemed to have a "significant" environmental element if either environmental costs or benefits exceed 50 percent of total project costs or benefits. Last year 10 percent was used. Obviously, estimates are going to be somewhat subjective]. In FY91, some ______ such loans were approved. This represents _____ percent of total projects approved during the year. Of these, eight loans had solely environmental objectives with a total value of US\$ _____. In FY90, eleven free-standing loans were approved (see the World Bank's First Annual Report on the Environment) for a total amount of US\$405 million.

In addition, four structural adjustment loans and one sector adjustment loan approved in FY91 addressed environmental objectives. This compares with four and five, respectively, in FY90. Sectors in which more than half the projects had an explicitly environmental orientation were energy, industry, agriculture, and population. Of the eight free-standing projects approved during the year, three were in the Africa region, namely Mauritius Environment Monitoring and Development; Burkina Faso Environmental Management; and the Kenya Forestry Development projects. The free-standing projects in Asia were both in India, i.e., the Dam Safety and Industrial Pollution Control projects. Other were the Pakistan Environmental Protection and Resource Conservation project in EMENA, and, in Latin America, the Ecuador Environmental Technical Assistance loan and the Mexican Decentralization and Regional Development project.

Sector	Number of loans	Loans with environmental components	Percentage of loans with environmental components
Agriculture and rural			
development	48		
Forestry	1		
Irrigation and drainage	10		
Area development	9		
Research and extension	7		
Agroindustry	2		
Other	19		
Transport	18		
Education	24		
Energy	21		
Oil, gas, and coal	12		
Power	9		
Population, health, and nutrition	26		
Urbanization	16		
Water supply and sewerage	10		
Nonproject	27		
Structural adjustment	22		
Other	5	×	
Technical assistance	14		
Development finance	24		
Industry	8		
Small-scale enterprises	4		
Public sector management	4 4 3		
Telecommunications	3		
Total	247		

Table 1. Loans with Environmental Elements, by Sector, Fiscal 1991

NOTE: Sector adjustment loans are included in the appropriate sector category.

As already noted, integration of environmental concerns into overall development policy is also proceeding rapidly, and becoming prominent in macroeconomic and sector work and adjustment lending. Integration of environment into the policy dialogue with borrowers and incorporation of the results into country lending strategies is an essential prerequisite for these activities. This has been recognized by the IDA donors, who have urged that recipient countries complete environmental action plans by the end of the IDA-9 period (June 30, 1993). This activity would provide a framework for integrating environmental considerations into a nation's overall economic and social development plans and would help promote a comprehensive national environment policy. The plans showed normally include (a) a summary of the country's economic development strategy; (b) a description of the salient features of a country's environmental setting; (c) identification and analysis of key environmental issues and their principal causes; (d) recommendations for specific actions for policy, legislative, and institutional change; (e) categories of investments and technical assistance needed to address priority environmental problems; and (f) recommended development strategy and requested actions by donors.

In fact, most countries are currently preparing environmental strategies or environmental action plans as part of the preparatory process for the 1992 UN Conference on Environment and Development (UNCED), and even prior to this many such exercises were already under way, sometimes conducted by the countries alone, but usually assisted by bilateral and international agencies. As the foregoing review of its operational activities shows, the Bank has assisted member countries in this area in a variety of ways. It has collaborated with a number of African countries in the formulation of National Environmental Action Plans, several of which have identified and resulted in project lending. In other regions as well, the Bank is increasingly carrying out in-depth analysis of selected environmental problems on a country-wide basis, using this work as a basis for making environmental policy loans.

Preparation of country environmental action plans are of course the responsibility of the concerned government. The process of preparation and form of presentation with, therefore, vary from country to country, as will the level of Bank support. The Bank maintains its dialogue with governments on environmental issues and use the findings and recommendations of the UNCED reports and other sources to develop its own country-by-country environmental strategy. This effort, for all IDA countries, will be completed within the timeframe prescribed by the IDA donors.

Environmental Assessments

Of the _____ projects approved in FY91, _____ were placed in category A, requiring a full environmental assessment and another ______ classified as B, in need of less intensive scrutiny. By region ______ category A projects were in Africa, _____ in Asia, _____ in EMENA, and ______ in Latin America and the Caribbean. Category A projects were to be found in the following sectors: [DESCRIBE]

Environmental Assessment Review A review of the first twelve projects with assessments yields some useful findings. Many EA measures are being incorporated into engineering specifications, rather than into a separate "environmental component". This has the advantage of pushing them far upstream in the project cycle. For example, standard engineering specifications for road building cover such environmental issues as: drainage, landscape quality, protection of trees, and disposition of topsoil removal for road bed. Many environmental measures enter project design under the rubric of engineering safety specifications; for example blowout prevention of offshore oil rigs (Oso Condensate, Nigeria), and enlarging a power channel beyond the size originally planned so as to serve as a spillway to relieve pressure on a 40-year old dam whose safety factor is low by today's standards and whose failure would be environmentally as well as economically damaging (Uganda - Power Project III).

In addition, however, projects have been modified as a result of the EA, for example, by rerouting a road to avoid archaeological sites (Botswana Tuli Block Roads); redesigning floodways to avoid disruption of a lagoon (Ecuador - Guayas, see box); and estimating the carrying capacity of rangelands before augmenting cattle herds (Uganda - Livestock) - as a result of controlling the cattle infected by the tsetse fly.

Even the mere requirement of an EA influences project design. Components that would require a category "A" are being dropped because of the extra work involved in preparing a detailed EA. One project that has undergone major design changes following an environmental assessment is the Pak Mun Hydropower Project in Thailand. Of the three dams originally planned, one has been dropped a ogether; the second has been lowered to reduce resettlement from 20,000 people to about 1,000; and the third is to be relocated to conserve a scenic waterfall and to avoid a National Park.

Lower Guayas Flood Control Project

The Bank's new environmental assessment procedures should help avoid the kinds of difficulties that have sometimes been encountered in the past. An example of how an EA can help identify and mitigate negative environmental consequences is provided by the Lower Guayas Flood Control Project in Ecuador. This is one of the Bank's first projects to incorporate the findings of a full-fledged environmental assessment (EA). The primary objective of the project is to control flooding and increase agricultural productivity in the Guayas River basin, but environmental considerations are an important part of the loan. The team conducting the EA found that the delicate ecology of the El Churute Reserve — an area containing the threatened Horned Screamer bird and the last of western Ecuador's tropical dry forest — would be put at risk if flood waters were channeled through it as was initially planned. They were also concerned about the reserve's poor administration and lack of financial resources. In its report, the team proposed rerouting a flood control channel away from El Churute's lagoon into a seasonal wetland, which would remove sediments and contaminants from the waters before they entered the mangroves and river network. It also recommended environmental education for the people living in the area and the hiring of local families as park guards. In addition, the team recommended funding a comprehensive management plan for the reserve and providing increased resources for the branch office of the forestry agency.

Another concern was the risk of pesticide contamination. The team estimated that with better flood control, agricultural activity – and the use of pesticides – would increase. To reduce the risk, the EA team proposed an integrated pest management program for the Guayas basin and enforcement of regulations banning the use of prohibited pesticides. Both proposals were incorporated into the project. Finally, the EA team said that problems encountered during implementation could be better identified and remedied if local environmental groups and scientists who had been members of the EA team participated in project supervision. The Bank and government of Ecuador agreed, with the latter providing logistical support to make project supervision more effective.

<u>Environmental Assessment Sourcebook</u> An "Environmental Assessment Sourcebook" was completed toward the end of the fiscal year. This 1000-page reference manual, the product of a major Bank-wide effort, is to be published in two volumes in the World Bank Technical Papers series. The manual codifies all the Bank's environmental policies and guidelines into one source. The Sourcebook amplifies the EAOD, disseminates "best practice" on EA, and provides standard terms of reference and checklists for EA in all sectors. Copies of the manual and of the EAOD itself are available free on request from the Bank's Environment Department.

The manual is aimed primarily for the borrower's EA teams. They need to know how to implement the Bank's EA policies, and how the Bank expects the 12 to 24 month EA process to be conducted. Bank project officers will also find the manual useful in understanding what the EA teams are engaged in, and how to expedite the EA process from the Bank's side.

All relevant sectors and all types of projects with the potential for major environmental impacts -- and some minor impacts -- are addressed, with emphasis on large infrastructure projects. Impacts are outlined in energy, agriculture, industry, transportation, urban development, and water supply and sewerage projects. While no new policies are made by this book, the Bank's position on several controversial issues is clarified. For example, statements are included on asbestos, nuclear energy and tobacco.

The newest and most innovative section is on public participation and community involvement in projects. The EAOD specifies that the Bank must obtain the informed views of the people who may be affected by the proposed project. This is relatively new for the Bank, and we have little successful precedent so far. The book amplifies experience to date. Although the draft has been widely used in-country and for training Bank staff over the last year, it is a pilot edition and will be revised on a regular basis. User comments are actively sought.

Environmental Assessment Fine Tuning. Following the first two years of experience, the Bank is in the process of "fine tuning" the policy. Gray areas are being clarified, guidance added where needed, and the text updated in the light of experience and changing circumstances. Highlights include dropping the D category under the old system all free-standing environment projects were classified as 'D's and as such did not require assessment. It is now recognized, however, that projects aimed at achieving environmental objectives may in fact have perverse and unanticipated effects. In future all projects will be classified A, B or C, depending on their likely environmental impact rather than their environmental aspirations. The three remaining categories designate the appropriate amount of environmental work needed. 'A' projects need a detailed environmental assessment. 'B" projects need environmental analysis, but not a formal assessment. 'C' projects need no environmental work.

The biggest change in the EAOD concerns participation by people likely to be affected by a project. At the outset, the Bank asks the borrower if they are prepared to obtain the informed views of the affected people and to share all environmental assessments. If the borrower is not prepared to follow these policies, the Bank ceases further work on the project. Success in this endeavor obviously depends heavily upon local capacity. In the Africa region, for example, the Bank made considerable efforts during the year to improve its understanding of the extent to which local ability needs to be strengthened. Moreover, in Africa, as in other regions, an extensive training program on environmental assessment is in process (See Section VIII below).

Operations Evaluation

As in previous years, the Bank's Operations Evaluation Department (OED) addressed environmental issues in its review of all project completion reports and its own performance audit work. In addition, it undertook four studies on environmental questions.

World Bank Lending for Forestry To help in the preparation of a Bank-wide policy statement on forestry development(referred to in Section VIII below), a special study was conducted during this period. This study draws lessons from experience in forestry development taking into account four different levels: the projects, their components, issues during implementation and sector work. Four important findings should be noted: (i) forestry projects and programs are becoming increasingly complex as these operations have to consider a very large array of development objectives (e.g., productivity, environment, poverty alleviation, biodiversity); (ii) sector work and analysis was practically absent during more than a decade of forestry development, limiting the ability to formulate sectoral strategies and policies; (iii) forestry management components have performed very poorly creating some serious concerns in light of recent trends to increase donors' involvement in the management of forests; and (iv) intersectoral relationships between the forestry sector and the rest of the economy were found to be much larger than expected. The sector is very vulnerable to changes in sectoral or macroeconomic policies. Within this context, the study defines the type of components future forestry programs will have to consider and it lists a series of themes that have become central to policy formulation at the sector and national levels. Whenever possible, the study points out where Bank activities will be most valuable to the countries involved and where governments need to take a more active role.

Other OED special studies specifically concerned with the environment include "The World Bank and the Environment in Brazil: A review of Selected Projects"; "The Management of Renewable Resources in Agriculture"; and "Early Experience of Involuntary Resettlement in Bank Supported Energy and Agricultural Projects".

The World Bank and the Environment in Brazil Based on four case studies, this review examines how--and how well--the Bank has handled physical and human environmental issues in a sample of large projects in Brazil. Among the issues addressed or raised by those operations are industrial pollution control and urban environmental management (Sao Paulo), cross-sectoral water resource use and involuntary resettlement at the river basin level (Sao Francisco valley) and tropical deforestation, biodiversity loss and possible climate change, together with the impact of rail and road investments on Amazonian tribal and other local populations (Carajas and Polonoroeste). Several of the operations introduced pioneering environmental and Amerindian protection or forced relocation measures, while contributing directly to the formulation of Bank policies in these areas. During FY91, drafts of the case study reports and the overview document for the study as a whole were completed and sent to the Brazilian Government for its observations. All five reports will be finalized and presented to the Joint Audit Committee early in FY92. <u>Renewable Resource Management in Agriculture</u> OED's natural resources management study is now in its second phase, of country case studies. A study of Nepal is nearly completed, and one in Bolivia was begun in the first half of 1991. It is expected to be completed in FY92. Both studies examine how the use and administration of natural resources has been treated in Bank country policy dialogue and economic and sector work, as well as the entire range of externally financed investment projects in these countries, during the past 25 years. A comparison of the two studies should provide lessons concerning the historical, cultural and socioeconomic circumstances which influence renewable resource management approaches under similar ranges of geographic and ecological conditions.

Involuntary Resettlement of Population OED is undertaking a study on early experience of involuntary resettlement in Bank-supported energy and agricultural projects. The objective of the study is to review, from the perspective of the settlers themselves, how resettlement was carried out, the impact of relocation on the affected people and the degree to which their economic livelihood has been reestablished. The study will cover sociological, environmental, legal and economic issues. Sociological issues span social welfare, production systems, survival ability and cultural identity of certain populations. Environmental aspects include impact on the watershed, farming of marginal land, health -- including exposure to water-borne diseases. Legal implications concern national legislation on the "right of eminent domain" and rights of those who have no land title but derive a living from the inundated land. economic issues comprise the degree of economic rehabilitation which has been obtained in the post settlement phase, compensation, and the impact on local labor markets. The methodology employed is impact evaluation analysis, where the central feature is specially commissioned socioeconomic surveys. The study concentrates on countries in Asia and Africa and includes successful as well as unsuccessful operations. The approach paper has been reviewed and endorsed by the Joint Audit Committee. Surveys have now been completed in Thailand and for one project in India, the remaining two are expected by fall 1991. The report is expected to be issued in FY92.

OED will continue addressing important environmental issues in its program of special studies. These may include issues related to water management in irrigation development as well as in water supply and sanitation, the assessment of environmental instruments and the environmental impacts of certain operations.

Energy Efficiency and Conservation

Increased energy consumption is a prerequisite for economic growth in the developing world. The difference between per capita energy consumption in the industrialized and developing countries is immense. For example, on average per capita electricity consumption of electricity in developing countries is one twentieth of that in the United States. Energy production and consumption, however, invariably raise important environmental issues, ranging from atmospheric pollution, global warming, local air and water pollution, flooding and resettlement problems associated with hydropower, the disposal of nuclear waste, and the tradeoffs between renewable and non-renewable energy sources and conservation. Historically, World Bank sector and lending operations have often addressed energy conservation and efficiency through efforts to bring about operational improvements, technology transfer, load management, loss reduction and interfuel substitution in its power projects. Pricing policies aimed at recovery of full economic costs of electricity consumption has always been a standard element of Bank power projects. Indeed, it is a necessary condition to achieve end-use efficiency among the various industrial, commercial and residential energy consumers. Unfortunately, the record of borrowers' compliance with loan conditions relating to tariff reform has not been good.

Energy conservation has often been a feature of industrial projects as well. Industrial modernization and rehabilitation has typically had energy conservation as a primary objective in a wide variety of industries. In the oil and gas sector, as in the power sector, interfuel substitution and rehabilitation, as well as heavy emphasis upon tariff reform have been important aspects of Bank operations. Finally, transportation projects also typically aim at increasing efficiency of travel, and therefore imply, for a given transport objective, energy savings.

The Bank has however come under criticism for not sufficiently emphasizing energy conservation in its projects, and for relying too heavily upon investments aimed at increasing consumption. In 1986 a Bank report entitled End-Use Electricity Conservation: Options for Developing Countries provided an indication of the range of policy interventions and investments to improve the efficiency of electricity utilization in developing countries. Critics claim that the recommendations in this report have not been followed adequately by the Bank.

<u>Energy Efficiency in Bank Operations FY91</u> Fifteen energy sector projects and three structural adjustment loans approved during FY91 contained provisions aimed at conserving energy and ensuring its more efficient use. They include price reforms and the phasing out of subsidies; reduction in transmission losses; improved administration of public utilities; interfuel substitution; and technical improvements in power generation to improve efficiency and reduce environmental damage.

Under Poland's structural adjustment loan, for example, the government undertook to phase out subsidies to the coal industry and increase energy prices to international levels by the end of 1992. Bangladesh, Benin, Burundi, Chad, Guinea-Bissau, Honduras, India, Morocco, Nigeria, Pakistan, Tanzania and Uganda also agreed to raise energy prices and review tariff structures as a condition for Bank lending to various energy projects and adjustment programs.

As part of its second structural adjustment program, Benin has committed itself to develop by 1992 a strategy for increasing energy efficiency and conservation. Adjusting energy prices is an important part of the package but the medium term focus is on reducing transmission losses. Chad's petroleum and power engineering credit (IDA) provides funds to strengthen the administration of the energy sector and to improve its capacity to interact with the private sector. The second rural electrification project in Morocco also contains provisions to bolster administration, planning and financial management in the power sector. A project in Nigeria (The Oso Condensate Field Development Project) has a component to assist the government harness the potential of natural gas as a substitute for liquid fuels, thus avoiding gas flaring and making more oil available for export. Interfuel substitution is also encouraged in a gas pipeline loan to Pakistan which promotes the use of gas as an alternative to higher cost petroleum products. Several loans introduce new environmentally-sound equipment and technology. A project in Bangladesh (LPG Transport and Distribution Project) establishes a program to enhance the role of women in the retail distribution of LPG cylinders and energy efficient stoves. In Tanzania, a project to rehabilitate the petroleum sector includes provisions to reduce oil spillage (and pollution) by improving storage and handling facilities. And a loan to raise efficiency at the Tata electric utility companies in India assists in mitigating sulphur dioxide emissions from power plants.

Energy efficiency also featured in five transport projects and one industrial development loan. The route to efficiency in the transport sector is mainly through incentives to encourage more economical use of fuel and improvements in road and rail networks. In Botswana, the government will raise levies on fuel (thus increasing prices to consumers) as part of the Tuli Block Roads Project. Better roads (projects in the Comoros and Sri Lanka, in addition to Botswana) also make for less congestion and lower fuel consumption. Meanwhile, Ghana's second transport rehabilitation project includes investments in new locomotives and rolling stock. This will contribute to greater efficiency in the transport system as a whole. Railway projects in Tanzania and Zimbabwe are likely to have a similar effect. In industry, there is a close correlation between modernization and energy efficiency -- and environmental improvement. A project to modernize the fertilizer industry in Indonesia includes provisions to improve energy efficiency in four fertilizer plants. This component is supported under a previous Industrial Energy Conservation Project.

Meanwhile, the Energy Sector Management Assistance Programme (ESMAP) is also involved in efforts to promote greater efficiency of energy use in the industrial sector. One of the main aims of its work in Pakistan and Columbia, for example, is to promote waste heat recovery and fuel substitution. This has a direct impact on air pollution as well as bringing about greater efficiency of energy use. Also, by targeting industries that rely heavily on fuelwood, such as brick and tile producers in Nepal, Indonesia, and Uganda, ESMAP assists countries to identify and provide a basis for sustainable management of forest resources.

In FY92, ESMAP plans a series of technical assistance activities related to energy efficiency and environment in Poland, Hungary, and Bulgaria. These will include preinvestment work on projects to reduce and control pollution in the industrial sector where profligate use of energy bears significant responsibility for environmental degradation. ESMAP also assists households and other small-scale energy users to make the transition from traditional fuels -- such as wood, charcoal, agricultural residues, and animal dung -- to more efficient and sustainable alternatives. Emphasis is placed on initiatives to improve the efficiency and sustainability of biomass supply, distribution and use, and to promote alternatives to biomass where this is economically justified.

New and renewable energy sources are explored by ESMAP where they offer the most

efficient and cost-effective means of meeting demand. Opportunities are currently limited but they could grow with technical development and further changes in costs relative to conventional forms of energy. ESMAP has focused on two promising areas: photovoltaics and co-generation with biomass residues. Because of the dramatic drop in prices over the last decade, photovoltaics has emerged from its traditional use as a power source for telecommunications to cost-competitive application for lighting, small-scale irrigation, water supply, and refrigeration of medical supplies in remote areas and islands. Cogeneration with biomass residues, such as bagasse in sugar mills and wood wastes from sawmills, often provide investment opportunities which not only improve energy efficiency in the mills but also produce excess power for export to the grid. In countries with chronic power shortages and limited public funds for expanding benefits. However, many legislative and institutional obstacles have prevented governments from capitalizing on this opportunity.

Elsewhere in the Bank work on household energy use includes a cross-country comparison of the successes and failures on various cooking stove programs. Energy use in buildings is also the subject of a review of building codes in various countries. Economic analysis for the expanded use of natural gas in the transport sector is envisaged in a number of key developing countries, with an emphasis on potential project activities.

On the supply side, the efficiency of energy use is being addressed through work on the efficiency of power generation. Developing countries aim to increase their installed power generating capacity by about 80 percent over the next decade. Although the overwhelming bulk of this capacity will be supplied by conventional thermal and hydro power, there is growing potential for the use of natural gas for thermal power generation and in industry. Provided leaks are avoided, natural gas is environmentally superior to coal, oil, or hydro sources. A major work program has been launched in this area, which includes several country studies of gas investment strategies, a study on the environmental costs and benefits of natural gas, as well as a regional study of gas resources and gas market potential in sub-Saharan Africa. Work is also in progress on the potential for adapting the more efficient combined cycle technology, especially for the case of natural gas.

<u>Energy Efficiency Task Force</u> Paralleling the various efforts to address energy efficiency and conservation in the Bank's operations, a major Bank-wide review of the topic was undertaken during the year. A Task Force comprised of policy and research as well as operations staff considered the appropriate role of energy efficiency policies in light of projected energy needs in developing countries; the feasibility of various policy and investment options; and the role of the Bank. The final report of the Task Force will be completed in FY92.

Population Operations

High fertility rates, particularly in the poorest countries, present a major obstacle to sound environmental management. Rapid population growth often forces families to cultivate marginal lands, to denude forests in search of land and fuel, to disrupt or destroy habitats of various animal and plant species, and places major stress on the capacity of urban communities to dispose adequately of waste products. Although, as noted below (Section V), much more needs to be learned about the nature of the relationship between population growth and environment, there is widespread agreement that curbing population growth is indispensable if economic development is to be sustainable.

Therefore, although not formally part of the World Bank's environmental program, its population activities form an integral part of its overall effort to address environmental concerns. Indeed, environmental arguments are increasingly used to justify investments in this sector. Research undertaken in the Bank demonstrates that rapid population growth (3% p.a.) and agricultural stagnation are the most important causes of forest degradation in Western and Central Africa. A series of country analyses of population-environment-agriculture linkages are currently under way in the region. Similarly, the demographic challenge to sustainable economic development, illustrated most clearly by the pressure on water resources, is the subject of ongoing study for the Maghreb countries (See Chapter III).

Lending for population has increased steadily in recent years; i.e., \$82 million in FY88; \$125 million in FY89; \$169 million in FY90, and \$341 million in FY91. Annual lending over the period FY92-FY95 is expected to be held at roughly the FY91 level. Population projects are sometimes free-standing, but are often combined with health lending, and may also form components of other social sector projects. See Table 2 for some details of FY91 lending for population projects or those with significant population components.

Table 2: FY91 Projects with Population Components (millions of \$US)

COUNTRY	PROJECT TITLE	TOTAL LOAN OR CREDIT	AMOUNT POPULATION
AFRICA			
Ghana	Health & Population II	\$27.0	\$4.9
Mali	Health, Pop & Rural Water II	26.6	3.0
Madagascar	National Health Sector	31.0	4.4
Malawi	Population, Health & Nutrition	55.5	6.3
Nigeria	National Population	78.5	78.5
Rwanda	First Population	19.6	19.6
Senegal	Human Resources Development	35.0	14.8
Togo	Pop & Health Sector Adjustment	14.2	4.3*
Zimbabwe	Family Health II	25.0	0.0**
ASIA			
Bangladesh	Fourth Population & Health	180.0	61.5
Indonesia	Population V	104.0	104.0
EMENA			
Pakistan	Family Health	45.0	13.5*
Tunisia	Population & family Health	26.0	26.0

These projects so thoroughly integrated population and health that it was impossible to derive a specific figure for population lending. Therefore, an arbitrary proportion of 30% for population was applied to each of these total loans or credits.

No IBRD money went directly toward family planning in this project. However, cofinanciers contributed ** \$17.7 million toward family planning service delivery out of a total project cost of \$116.9 million.

Total does not include lending for social sector projects which may include small family planning Note: components. A number of FY91 projects in the LAC region are in this category.

Staff Training

Staff training is an essential means of achieving the integration of environmental considerations into the Bank's operational, economic and sector work programs. Many Bank staff members received environmental training during the past year with a view to ensuring that they were up to date on current environmental policies and guidelines. As in the previous year, a wide range of topics were covered in the training program, but the principal focus of the FY91 program was environmental assessment training. Of the twelve formal training courses offered over a total of 424 training days, eight were on environmental assessment. About 200 staff members participated. The seminars covered such topics as EA concepts and procedures, implementation and evaluation, regional and sectoral EAs, public involvement, social assessment, sustainability and cost-benefit analysis, and environmental management and finance. The seminars in FY91 continued to use case studies and stress practical guidance, such as preparation of terms of reference, monitoring and supervision, and public participation in the assessment process.

Eight two-day long seminars were organized for task managers with the assistance of the Center for Environmental Management & Planning in Aberdeen, U.K. The remaining four courses, involving about 75 people, were related to such topics as environmental literacy, environmental action plans for Africa, protected area management, and social forestry.

In addition to the above, the Operational Directive on Environmental Assessment was the subject of about 12 seminars, each attended by about 25 Bank staff. Some 24 sessions were also run on special environmental topics. Each was attended by about 20 staff. Preparation of the Environmental Assessment Sourcebook included at least one workshop each for the document's 10 chapters. Over the last three years, about a dozen Bank staff have been trained on environmental issues outside the Bank for periods ranging from one year (at Duke University), to ten months (at Harvard), and two weeks (at Aberdeen). Each of the four regions have also arranged their own environmental training activities. These vary from two-day environmental retreats to a wide variety of informal seminars and workshops.

The other major need is to hasten the process of integrating environment into the economic work of the Bank. Dissemination of the results of the Bank's research activities in this area (see Section VI) is an important part of overall staff training. This is complemented by a series of informal seminars and workshops on environmental economics, about 100 of which took place during the year, as well as the on-going formal training program for Bank staff. The latter includes courses on environmental economics for country and sector economists, and courses, primarily for project staff, on valuation of the environmental consequences of projects and policies.

V. FOREST ACTIVITIES

The World Bank has shifted its involvement in forest activities over the past decade from an emphasis on commercial ventures towards more people-oriented and environmental initiatives. This transition has meant new and often difficult problems which have been the object of increasing sector and policy analysis. In recent years the Bank's lending program has increasingly reflected concern with the integral role forests play in agriculture, in the management of watersheds and other natural resources, in protecting biological diversity, and the sequestration of atmospheric carbon. All eight free-standing forest projects approved in FY90 addressed environmental concerns through such arrangements as buffer zone development, management of nature reserves, soil conservation activities, range land improvement, plantations etc.

Despite this evolution in the Bank's approach to forests, general concern on part of the international community regarding the observed rapidity of tropical deforestation and the perceived failings of the Tropical Forestry Action Plan (discussed in last year's Annual Report) has required the Bank to review its policies in this sector. Efforts to improve the TFAP, involving donor and developing countries, international agencies, the private sector and NGO's, are on-going. Furthermore, early in the fiscal year it was agreed that there would be a moratorium on Bank lending for forestry operations until its Board of Directors had approved a new forest policy paper, which would replace the original one, prepared in 1978.

Consequently, only one forestry operation was approved by the Board in FY91, namely the Kenya Forestry Development Project (a \$19.9 million credit). Objectives of this project include conservation of indigenous forest resources, and soil and water, on forest, farm and range land; alleviation of the accelerating fuelwood deficiency; and improved efficiency of timber production. Promotion of sustainable private tree farming is a major thrust of the project, as is the creation of a framework for the sector's long term development.

Average annual lending between FY92 and FY95 is expected to be US\$438 million, compared with an annual average of US\$217 million over the period FY85-90. Sectoral policy was the subject of extensive debate and analysis by Bank staff and other development agencies and NGOs during the year. Two Board seminars were also held to discuss the issue. The remainder of this section summarizes the views expressed by the Bank in the second of these two meetings.

The Nature of the Challenge

A critical feature of the forest sector that distinguishes it from most other primary activities is that private costs and benefits usually diverge markedly from national and global costs and benefits. The existence of these externalities implies that the free interplay of market forces will not bring about socially desired outcomes. Some of these externalities are national costs (e.g., soil erosion, degradation of watersheds and threats to the cultural survival of indigenous people who traditionally live in or near the forests), but some are costs that affect the international community (e.g., loss of biological diversity and induced changes in the global climate). Because the people who cut or plant trees typically have no incentive to consider the environmental or social consequences of their actions, externalities inexorably lead to excessive deforestation and insufficient planting of new trees.

Of the various challenges that arise from this divergence between private and social interests, two stand out as deserving special attention. The first is to prevent excessive rates of deforestation, especially in the tropical moist forests (TMFs). The second is to ensure adequate planting of new trees to meet the rapidly growing demand for fuelwood in developing countries.

Deforestation

Forests in the developing countries have declined by nearly half in this century, and the rate of loss is still increasing. Recent studies using remote sensing data and extensive ground surveys have found that the rate of deforestation is currently in the range of 17-20 million hectares per year, of which the largest share is closed TMFs.

The loss of the TMFs is especially worrying because unlike other major forest types -tropical dry forests (TDFs) and temperate forests (TFs) -- they have a much greater influence on the global climate, as well as being a major repository of biological diversity. Moreover, they are the more fragile forests in the sense that their soils are easily degraded once deforested, and even if reforestation or selective felling is attempted, experience to date suggests that their initial ecosystems cannot be fully renewed or sustained.

<u>The Causes of Deforestation</u> Deforestation, including the cutting of woodlands, and scattered trees, occurs because somebody finds it to be profitable. The individuals, communities and corporations responsible for deforestation, and their primary motives for cutting trees, vary widely across regions and forest types. While in terms of global importance, fuelwood gathering accounts for the largest share (80 percent) of wood use in developing countries, its impact is concentrated in the tropical dry forests and in nonforest wooded areas. The TMFs are being lost primarily to agricultural settlement (about 60 percent of the area cleared each year) with the balance split roughly between logging and other uses (roads, urbanization, fuelwood, etc). In reality, however, deforestation seldom involves only one type of decision maker, and the actions of one can lead to subsequent interventions by others.

Incentives to cut trees have grown in recent years for four sets of reasons: (i) the pressure of population on the natural resource base has grown sharply in many countries; (ii) income opportunities in settled agricultural regions have deteriorated in some countries, leading to increased migration and encroachment on forested land; (iii) increased access to the forest frontier has been dramatic in some areas because of infrastructure development -- especially roads; and (iv) subsidies for alternative land uses and logging have been deliberately introduced

to encourage frontier settlement in a number of countries.

Deforestation can contribute to short-term economic growth and poverty alleviation, but often it does so at the expense of other environmental and social goals, some of which are incurred within the country and some are borne by the international community. If these costs were more fully reflected in the incentives facing agents who cut trees, then there would be significantly less deforestation today. This effect is often aggravated by weak property rights in many forest and wooded areas; by high private discount rates (the rate at which individuals discount future costs and benefits), especially among poor people who encroach into the forests; by inappropriate government policies that make conversion of forest land artificially profitable; and by timber concession arrangements that unnecessarily encourage "mining" of trees.

The Growing Fuelwood Crisis The second major challenge is meeting the rapidly growing demand for wood. Most of the world's future need for wood for industrial purposes can continue to be met by trees grown on a sustainable basis in the temperate forests. Of much greater concern is the market for fuelwood and poles in many of the heavily populated developing countries. Demand is growing rapidly but supplies are increasingly obtained by mining the available stock of natural trees. Nearly 3 billion people depend on wood as their main or only source of household energy, and it is especially important to rural households and to the poor. As tree stocks diminish, women and children spend much more time gathering firewood from more distant sources, and have less time to spend in other vital activities. Fuelwood gathering contributes to land degradation, especially in agricultural regions with limited wooded areas, and to deforestation and degradation in forests adjacent to densely populated areas. These effects are most severe in TDFs and nonforest areas.

<u>The Causes of Inadequate New Planting</u> Many of the same social and economic forces that induce excessive deforestation also reduce the incentive to plant trees, either for fuelwood or for timber. As with any crop, a farmer's willingness to plant trees will depend on their profitability. There are discouragements to plant because the price of wood tends to be depressed by open access and poorly defined property rights to natural forests; there has been relatively little progress in developing higher yielding and quicker growing trees for farm conditions; and high discount rates of poor farmers make it particularly unattractive to tie up scarce capital for the relatively long payoff period involved. Large-scale, industrial plantation establishment is similarly restricted by low profitability.

Strategies for Forest Development

<u>Poverty Alleviation and Population Policy</u> Encroachment on public land by poor people is a major cause of loss of forests. Policies to protect the forests or to slow deforestation seem doomed when pitted against a growing tide of poor who need land to survive. General economic development, including increased diversification of the national economy, reductions in inequality and poverty, and slower population growth, are necessary for a long-term solution to the forestry problem. But in the interim, priority needs to be given to increasing agricultural productivity in poor, densely populated areas, especially those adjacent to forested areas or those from where most forest encroaches originate, and to expanding nonfarm employment opportunities in these target areas. In the long run, even if economic development takes place, specific policies will continue to be needed to deal with externality problems.

<u>Forest Zoning and Regulations</u> Part of the forest will have to be protected through specific legislation and regulatory measures, especially in the TMFs. Decisions on zoning and regulations should be based on an understanding of what is expected of the land and a realistic assessment of what is technically feasible in light of local capacities and incentive structures. Given the likely limitations on resources and the desirability of increasing protected areas, countries must develop workable priority criteria for setting aside specific forest areas which will be protected from any intrusion, and for managing areas designated for different uses. This involves undertaking appropriate natural resource surveys in the forested areas and determining which areas are of special value for their ecological diversity, which are essential for protecting indigenous forest dwellers or which protect sites that are environmentally fragile (e.g., hillsides and watersheds). Available resources for protective purposes can then be focused on these priority areas.

Commercial logging can be contained through a strict policy limiting the extent of timber concessions, and allowing them only in areas that can be put under sustained timber management systems. Given the practical difficulties of achieving sustained management in tropical forests, and the related environmental costs, governments should be cautious in allowing such activities, and should give priority to the preservation of intact tropical forests. In all types of forests, high priority should also be given to reforesting degraded areas, and new timber concessions could be tied to the successful replanting of degraded lands. Because these areas may have become the source of livelihood for some communities, the interests of these people need to be considered when reforestation is undertaken.

<u>Correcting Private Incentives</u> Enforcement of zoning and other regulations are likely to be ineffective unless private incentives are also changed. In many instances government policies systematically underprice forest concessions. At the same time, government reluctance to offer long-term concessions aggravates the incentive for quick "mining" of trees. Timber concession systems can be modified to increase stumpage fees or area concession rents to reflect the real value of the trees; to allocate timber concessions (felling leases or licenses, logging rights) by competitive bidding (auction, tender), open to the private sector, NGOs, and local communities; and to make concessions long term and, with appropriate controls, transferable.

Incentives for agricultural settlers have sometimes been distorted by policies which actually encourage deforestation (e.g., subsidies for livestock ranching in the Amazon, land titling tied to land clearance). These kinds of distortions should be removed wherever they arise. Customary land rights of forest dwellers need to be formalized and respected, to protect both forest dwellers and resources against agricultural encroachment or excessive exploitation by outside interests. <u>Public Investments</u> Access to forests needs to be carefully controlled. Many infrastructure projects, such as roads and reservoirs, inadvertently open up forest lands to settlers. Public investments need to be preceded by much more careful environmental assessments. Public investment can also be directed towards preservation. Substantial expenditures are required to strengthen forestry institutions to enhance their ability to protect designated forest areas; develop improved systems of silviculture, forest management and policy making; conduct forest research and development; and afforest and replant, especially degraded land.

Policies to Meet the Growing Need for Fuelwood

To achieve a more sustainable balance between supply and demand requires actions to reduce the demand for fuelwood and poles, as well as actions to increase the planting and husbandry of trees.

<u>Reducing Demand</u> As wood becomes increasingly scarce, more widespread and efficient markets will likely develop, and price increases will play a greater role in reducing the growth in demand. However, because of environmental externalities and inadequate property rights, market prices will generally not reflect the full social value of wood. Direct interventions to encourage conservation and use of more efficient technologies can be appropriate. These should include research and training to improve woodfuel conversion efficiency in household stoves, brick and charcoal kilns, and in other activities dependent on wood. In addition, more efficient markets for alternative fuels, such as kerosene, need to be developed. Investment subsidies may also be appropriate in the initial stages to encourage individuals to purchase the necessary equipment to convert from wood burning technologies, particularly where new and innovative technologies are involved (e.g., solar stoves).

Increasing Supply Most wood users in the developing countries live in rural areas, and the best way of satisfying their demand for wood is through utilization of their own underutilized labor and lands. Supply of rural wood through large-scale commercial operations is not likely to be viable on the scale required, nor is continuation of widespread wood gathering in forests sustainable or environmentally acceptable. It is increasingly recognized that wood production issues should be dealt with at the farmer level. Forest departments need to be reoriented in light of this recognition and the special activities of nongovernmental organizations concerned with poverty alleviation and environmental conservation should be mobilized to help users organize themselves for tree planting. Achieving the level of planting required will only be possible if economic incentives and abilities of farmers are also changed. This will require extension and training services, a ready supply of tree seedlings and other inputs and, in some cases, improvements in land and tree rights.

Past attempts to increase tree planting for fuelwood were based on community woodlots established on lands managed under common property tenure regimes. They often failed because

local communities were inadequately organized for collective action, and were unable to provide adequate rewards for those who provided labor. Future efforts need to be focused on smaller and more tightly defined groups of local actors, including the poor, who have a mutual interest in planting and raising trees. Recent programs based on family farm forestry and group farm forestry have proved promising.

Enhancing Forestry Institutions

Governments are increasingly recognizing that the scale of demands for conflict resolution and mediation now placed on forestry agencies was never adequately anticipated. Governments must recognize and act upon the critical need to revamp forestry institutions and introduce greater accountability and higher performance standards into the public sector. Creative uses of private sector contractors and consultants as auditors and monitors; and more rigorous intersectoral oversight by agriculture, environment, planning, finance and other relevant ministries are effective devices for improving the performance of government forestry agencies. Commitment at the highest levels of government is necessary for introducing these reforms.

The Role of the International Community

The international community must support developing countries in achieving their own national goals in managing forest resources, and in providing ways in which the value of the global externalities from forests can be better incorporated into incentive structures for local action. International legal instruments, currently discussed in various fora, demonstrate the existence of wide interest in these objectives for international action. The adoption of such instruments could facilitate the transfer of resources to promote the conservation of tropical forests. There are three major areas in which the international community can play an important role.

<u>Technical Assistance, Research and Institution Building</u> Developing countries need assistance: (i) in undertaking detailed resource inventories for establishing priority areas for forest protection; and for demarcating areas for sustainable commercial forestry or agriculture; (ii) in developing appropriate criteria for forest use plans; (iii) in providing training and specialized skills for forest management; and (iv) in strengthening local institutions in their forest planning, protection and management functions. International mechanisms for providing this assistance need to be strengthened including revamping the TFAP and reorienting the CGIAR to place greater emphasis on sustainable forestry.

<u>Financing</u> Special mechanisms may be needed to finance policy reform and investment. Market failures fall into three categories from a financing perspective: those that involve small incremental resource requirements, such as removal of perverse policies, and that will pay for themselves in reduced fiscal burdens; those involving domestic externalities and inadequate property rights that can be financed domestically or on nonconcessional terms from external sources; and finally, those, such as preservation of biological diversity or sequestration of carbon, in which the benefits accrue partly or entirely outside of the country, for which international financial transfers and concessionary terms may be appropriate.

The availability of financial support from international agencies, such as The World Bank, can reinforce the benefits of such policy adjustments. Concessional financing for supporting projects that have global benefits (e.g., debt-for-nature swaps) can also be helpful. However, such funds should be in addition to existing levels of official development assistance. The recently established Global Environment Facility represents a useful mechanism for testing innovative financing approaches. The experience gained in its operation may lead to follow-up initiatives.

International Trade Reforms Only a very small share of the wood that is cut from primary forests each year enters international trade, but the share is much larger for the high-value and rare species. Experience with other products suggests that consumers will modify their behavior substantially if they are given information on the ecological sustainability of the production process. For this reason, the international community should encourage organizations such as the ITTO to develop programs of green labelling to permit preferential market treatment for wood grown under sustainable conditions. In addition to lowering the overall demand for wood produced by unsustainable practices, such a scheme would remove the disincentive to adopt improved management practices and associated loss of competitiveness.

A more contentious issue is that of trade taxes on tropical timber. To the extent that (i) taxes (whether import or export) could be targeted to those species that are culled exclusively from primary forests, (ii) taxes would apply equally to processed wood as well as logs, and (iii) revenues raised would be returned to developing countries, to be used for forest protection activities, such taxes may be desirable. However, in the absence of such characteristics, trade taxes are likely to create additional distortions by discouraging new planting and plantation agriculture, protecting inefficient domestic wood processing industries and would place an unfair burden upon countries heavily dependent on timber exports. More research is needed on these issues before such taxes should be supported.

The Role of The World Bank

<u>Past Experience</u> Since its inception, the Bank has financed 80 projects in the forestry sector with total commitments in excess of \$2.3 billion. Lending has grown rapidly since the issuance of the 1978 Forest Policy Paper, with increasing emphasis on social forestry and, lately, environmental issues. Bank lending for other projects, particularly tree crops, agricultural settlements and infrastructure, has sometimes had an undesirable impact on forest resources.

According to the recent OED review of this ten-year experience (see chapter 5), there is a need for the Bank to strengthen its forestry sector work, and to link it more strongly to other country economic and sector work, to improve the technical performance of projects, and to design social forestry projects with a better understanding of local social dynamics and the motivations of different social actors in tree planting and management. Moreover, as the scope of forestry problems faced by developing countries has changed dramatically, and the understanding of their causes and implications has improved, a reformulation of the Bank's forestry policy is required.

<u>Principles of Future Involvement</u> Bank involvement in the forest sector will be designed as a component of a multisectoral approach. To relieve the fundamental pressures on the forest over the longer term, the Bank through its normal mechanisms will continue to support population policies, agricultural intensification, poverty alleviation and creation of employment opportunities in other sectors. The Bank will heighten its attention to and minimize the potentially negative effects of infrastructure and other land-using projects. In its efforts directly related to the forestry sector, namely aid coordination, country dialogue, sector work and lending, the Bank will focus on the following:

International Cooperation The Bank supports the adoption of international legal instruments conducive to sustainable forest development and conservation. The Bank will encourage international initiatives for the transfer of concessional resources to assist projects protecting globally important biological diversity. The Bank will continue to explore the feasibility of global transfers for carbon fixation in forests.

<u>Policy Reform and Institutional Strengthening</u> The Bank will assist governments in identifying and rectifying market and policy failures that encourage deforestation and inhibit sustainable land use. The Bank will assist governments in the completion of resource inventories and establishment of systems for continuous resource assessment and efforts will be made to enhance the technical performance of government forestry institutions.

<u>Resource Expansion</u> The Bank will expand its efforts to finance the creation of additional forest resources. In wood-deficit areas, the Bank will promote a continued reorientation of forestry toward people's participation in tree planting, public accountability and development. In the past, social forestry projects have had mixed results, primarily because they relied on community groups that were not adequately motivated to carry out collective actions. Greater emphasis will be given to farm-family and farm-forestry groups. Where the scope for plantations outside areas of intact forests is sound from a social, environmental and economic perspective, the Bank will assist in the establishment of plantations reducing pressure on the existing forest resource base and as a means of easing the transition to sustained yield forest management. The primary target areas for new planting will be potentially productive degraded forests, wastelands, forest fallow, shrublands and abandoned farmlands. Because there may be communities which depend on such areas, their interests will need to be considered in setting target areas.

<u>Preservation of Intact Forest Areas</u> The Bank will support initiatives to expand forest areas allocated as parks and reserves and to institute effective management and enforcement in new and existing areas. In tropical moist forests, the Bank will adopt, and will encourage

governments to adopt, a precautionary policy towards utilization. This policy is motivated by the remaining uncertainties regarding full valuation of environmental services, the inadequacy of knowledge regarding sustainable management systems and the irreversibilities associated with TMF loss. Specifically, the Bank Group will not under any circumstances finance commercial logging in primary TMFs. Financing of infrastructure projects (e.g., roads, dams, mines), which may lead to loss of TMFs, will be subject to rigorous environmental assessment as mandated by the Bank for projects that raise diverse and significant environmental issues. A careful assessment of the social issues involved will also be required. The Bank will continue to place more emphasis on supporting programs involving institutional development, forest protection measures and nonforest income-generating projects, the primary objective of which will be the preservation of TMFs. In implementing this strategy, the Bank will pay special attention to the 20 countries (accounting for 85 percent of the TMFs) whose forests are seriously threatened by encroachment and destruction. In these countries, special efforts will be made to support economic development in poor, densely populated areas around the forests, or in the origin areas of forest encroaches.

<u>Conditions for Bank Involvement</u> In all countries, and for all types of forests, lending operations in the forestry sector will distinguish between projects which are clearly environmentally protective (e.g., reforestation of degraded land), or which are small-farmer-oriented (e.g., farm and social forestry), and other forestry operations (e.g., commercial plantations). The first two types will be considered on the basis of their own social, economic and environmental merits. Other forestry sector operations will be subject to government commitment to sustainable and conservation oriented forestry. Such a commitment entails the following:

- adopting policies and institutional frameworks to ensure conservation and sustainable use of existing forests and to promote more active participation of local people and the private sector (with proper incentives) in the long-term management of natural forests;
- adopting a comprehensive and environmentally sound forestry conservation and development plan, including a clear definition of the roles and rights of the government, private sector and local people (including forest dwellers);
- undertaking social, economic, and environmental assessments of the forests considered for commercial utilization;
- setting aside adequate compensatory preservation forests to maintain biodiversity and safeguard the interests of forest dwellers in terms of access rights to designated forest areas;
- establishing institutional capacity to implement and enforce the above commitments.

If these conditions are present, projects will be judged on their individual merits. If they are not present, Bank support will be restricted to operations which help countries to achieve them.

VI. POLICY AND RESEARCH

Policy and research work on environment is conducted in all of the Bank's sectors, including energy, industry, urban, infrastructure, agriculture, and population and human resources. In addition to work in these sectors, research is undertaken on environmental economics at both the national and global levels.

This section outlines the policy and research activities conducted during the fiscal year, emphasizing topics of a generic, or cross-regional nature. Most of this work is carried out in the Policy, Research and External Affairs complex. Policy and research efforts that are specific to a particular geographic region are conducted primarily by Operations staff and have been described in Section III.

Over the past few years, research and policy work on environment has evolved significantly. Initially, sector departments had emphasized exploratory environmental work to gauge the impact of environmental degradation in their field or to identify broad environmental concerns. Today, and as will be seen in the sections of this chapter, environmental issues are addressed in a more substantive manner, with increasingly specific questions and objectives as understanding of environmental issues expands. The role of the Environment Department has also evolved in line with these changes. From being primarily concerned with catalyzing preliminary work on the environment in the various sectors, the Department now largely emphasizes cross-sectoral and cross-regional work.

The policy and research activities described below are grouped under a number of often overlapping themes, from urban environmental issues and energy use to water and land resources management. Because of the obvious overlap within and between the themes, and the difficulty of compartmentalizing environmental problems, much new work emphasizes an integrated approach to environmental management. This includes activities underway in energy, in the urban sector, in transport, and in the management of water resources.

Energy and the Environment

The incorporation of environmental impacts into energy decision-making has been a prime focus of activity. An expert task force, chaired by the Bank and representing eleven international agencies, recently prepared a comprehensive overview report on options to mitigate the environmental impacts of policies and projects in the energy sector. Several more specific country case studies are underway. The environmental issues being studied include pollution resulting from fossil-fuel use, the effects of hydroelectric dams -- including social impacts, and renewable energy options. The results of this work will be used to make practical recommendations on how existing energy decision-making tools such as power system planning models and pricing methodologies, should be modified to account for environmental

considerations.

The effects of rapidly growing energy use on pollution are the subject of several activities. In Brazil, a study on energy supply options in the Carajas area evaluates the principal energy and environmental issues posed by current proposals for pig iron, steel and other industrial investments in the Greater Carajas Region. The paper will review least-cost, environmentally acceptable, alternatives to charcoal use -- which is being proposed as the major energy base for the area's industries. Funding for this study has been received from the Federal Republic of Germany and the European Community.

Preparation of a new Bank policy paper for the electric power sector is also underway. The paper will address such environmental issues as pollution, energy efficiency and energy conservation. Also in the power sector, work is underway on the possibilities for the rehabilitation of thermal power stations for greater reduction in emissions, especially sulphur particulates.

Work on a coal policy paper for the Bank has been initiated. The paper will review past and upcoming Bank activities in the area, the environmental impacts of coal use, as well as technological issues. Possible future activities include a review of the options for substitution between natural gas, hydropower and coal and of the potential for improving the efficiency of coal use and for reducing emissions associated with its use -- especially among heavily polluting small-scale users. In China's Sichuan Province, for example, current use of the locally-mined, low quality coal dominates fuel use in the region. The environmental costs are substantial because of the coal's very high sulphur content.

Indoor air pollution is a major environmental issue in both urban and rural areas. Possibilities for inter-fuel substitution -- affecting both pollution and energy efficiency -- form the subject of a recently published paper on "Inter-fuel Substitution and Changes in the Way Households Use Energy: The Case of Cooking and Lighting Behavior in Urban Java". The paper considers the cost for developing countries of moving up the fuel chain -- e.g. from wood to kerosene -- and considers the various government policies that either encourage or slow down this substitution.

A topic of increasing importance is the growing emphasis in industrialized countries on the need for "clean fuels". The consequences of this trend on refineries in developing countries are the subject of ongoing work; the implication is that lower grade fuels will be left in developing countries, with concomitant effects on local pollution.

In addition to the consequences of energy use on pollution, an important environmental issue is that of energy efficiency. Attention to the opportunities for conservation and efficiency is necessary in both the supply of and demand for energy. Through more efficient energy supply and greater conservation and efficiency in end use, it may be possible to meet the growing need for energy in developing countries and at the same time to slow the rate of growth of energy consumption. In addition to economic ramifications, this has enormous implications for national and global environment, through for example, reduced emissions of carbon dioxide and decreased deforestation for fuelwood.

On the demand side, work is ongoing on energy use in industry, in transport and at the household level. On the supply side, work is in progress on the efficiency of power generation and on the growing potential for the use of natural gas for thermal power generation and in industry. A major work program has been launched in this area, which includes a paper on the environmental benefits of natural gas. The paper discusses the opportunities presented to developing countries for increased use of natural gas, including the increasing emphasis on environmental quality and air pollution at the local, regional and global levels, and the availability of improved technology for using natural gas in an efficient way to reduce air pollution. The paper presents a quantitative valuation of the benefits of natural gas and country studies that describe government approaches to the problems of severe air pollution. The paper also explores appropriate methodologies to guide governments on choices between alternative energy investment policies.

Finally, as indicated in the previous Section, a major Bank-wide review of the actual and potential role of energy efficiency and conservation was undertaken during the fiscal year. As part of this review, a number of background activities that encompass technological, economic, and institutional issues in the pursuit of energy efficiency are underway. Also, as described above, the Energy Sector Management Assistance Programme (ESMAP) has conducted numerous studies of household energy use with a heavy emphasis on improving efficiency in both the production and use of energy.

Pollution

Industrial Pollution The rapid industrialization that has occurred in many developing countries since 1960 has resulted in new patterns of global industrial pollution. These emerging patterns are examined in ongoing work that reviews trends across countries and over time. This work combines historical data for both industrial and developing countries with pollution intensity estimates; the aim is to develop a detailed analysis of the evolution of industrial pollution worldwide during the period from 1960 to 1988.

Work is also underway on a projection system for industrial pollution. Industrial emissions data are extremely scarce in most developing countries, and direct measures of industrial pollution are unlikely to be available for some time. Nevertheless, pollution data in some form is necessary for a variety of reasons, including the development of effective environmental regulation. Such data is also likely to be of increasing importance to international trade and competitiveness as the General Agreement on Tariffs and Trade (GATT) has already begun discussions of the "pollution content" of traded industrial commodities, with an eye to including environmental considerations in future trade negotiations. Data on industrial pollution is also important for developing countries as they estimate the environmental consequences of changes in the structure of industry resulting from changing trade patterns. In the absence of direct emissions measures, pollution estimates are being projected from existing industry and trade data. Collaborative arrangements have been made with the US Environmental Protection Agency and the US Census Bureau for the creation of a composite database which allows emissions factors to be calculated at the plant level for a sample of approximately 20,000 enterprises. The data will also be used to analyze sources of variation in industrial pollution between countries.

A study to develop a methodology for environmental management and pollution control with community participation is at the initial stages. The proposed program is for the design of software for integrated environmental management that involves community participation. The software package would enable a quick assessment of pollution levels in a given geographical area, establish priorities for pollution control, and identify environmentally-oriented programs that are economically and financially viable and acceptable to the community. The software would be used to identify pollutants, quantify emissions, assess the effects on population, vegetation and structures, and allow government, the private sector, the scientific community and affected citizens to rely on a sound framework for decisions and strategies.

Work on regulatory and economic incentives is in progress in the area of industrial waste minimization. Industrial waste disposal practices in different countries and regions reflect differing economic and regulatory conditions. Where strict regulation makes waste disposal expensive, enterprises will generally implement pollution prevention options such as waste remarketing and recycling. The same economic pressure will be felt if critical raw materials are heavily taxed or if they are subject to high transportation costs. Although the general directions of these economic effects are predictable, their magnitudes are largely unknown, and estimates of industry responsiveness to alternative regulatory and tax policies would obviously be of interest to policy makers in many countries.

Other work on regulatory instruments includes a forthcoming paper that reviews the economics of industrial pollution control across a number of countries, and compares theoretical prescriptions with existing international practice. Evidence from a large number of industrial and developing countries is considered, with a particularly detailed treatment of ten country cases. In light of an apparently large discrepancy between theory and practice, the paper suggests a revised view of optimal regulatory policy.

Air Pollution and Road Transport A number of new research activities in the field of air pollution focus on the potential for pollution reduction in the transport sector. As motor vehicle ownership approaches saturation levels in North America, Western Europe and Japan, most future growth will be in developing countries. Rising incomes in many developing countries, a growing need for travel and personal mobility, combined with the increased demand for fast and reliable distribution of goods will increase individual automobile ownership, bus transport, and reliance on trucks for freight transport. In the Bank, much of the work in this area is under the rubric of a joint program with the United Nations Environment Programme (UNEP) on Transport and the Environment. The program supports decisions makers in their efforts to reconcile transport investments with sound environmental management and provides them with relevant lessons from experience as well as necessary technical information. The program includes studies, policy analyses, and technical guidelines to assist decision-makers at national and local levels. The dissemination of information and experiences through workshops and seminars on transport and environment issues is also emphasized, and includes the creation of an international network of experts on the subject.

Work in progress under this program includes a joint report with UNEP on options for the reduction of automotive air pollution. These options include the manufacture of energy efficient and environmentally clean vehicles, clean fuels, and improved traffic management. The most promising approach for developing countries is the development of a strategy that combines economic incentives such as pricing interventions with increased emphasis on regulatory and technological interventions. Administratively simple policy measures are most appropriate for many developing countries; these could include, for example, a tax on leaded gasoline combined with a rebate on the use of ethers as octane boosters. Appropriate economic policies could encourage refineries to change their products. Vehicle tax and license fees could be designed to discourage the ownership and use of polluting vehicles.

New studies to be undertaken as part of the joint Bank UNEP program include a study that investigates appropriate procedures and policies for managing urban bus and para-transit fleets to reduce pollutant emissions. Reviews of existing information and literature are also in progress on such topics as fuel substitution, cost effectiveness of various emissions control instruments and physical and socioeconomic variables that influence air pollution are envisaged. A draft report on the environmental assessment of land transport construction and maintenance has been prepared. The final report will be published and disseminated by the Bank and UNEP. More research is needed, however, on the characteristics and amount of automotive air pollution in urban areas in developing countries, and on the environmental characteristics of reformulated and substitute transportation fuels. An evaluation of vehicle inspection and maintenance programs is also needed.

On the topic of economic and fiscal incentives, work is in progress on a system of road user charges that take account of the costs imposed on society by motor vehicle accidents and air pollution. The feasibility of internalizing the costs of accidents and environmental pollution by charging road users for the damage they cause is addressed. While the estimation of accident and environmental costs caused by road users is a difficult exercise, the magnitude of these costs, as implied by certain estimates, indicates that more effort is needed to internalize them. Several instruments can be used to do this, including prices, taxes or subsidies, standards, and regulations. An array of market-based incentives and command and control mechanisms to reduce volumes of traffic, emissions per unit of fuel consumed and total emissions via cleaner vehicles and fuels, remains the most promising approach to addressing the problem of motor vehicle pollution in developing countries. Compulsory inspection and maintenance, tax allowances for new and cleaner equipment, differential fuel taxation and congestion charges are the set of instruments that, in combination, may address pollution from mobile sources in the most cost-effective manner.

<u>Pollution and Marine Transport</u> The environmental implications of port transport and harbors is a topic of increasing importance. A paper under preparation sets out an overview of the various environmental issues facing today's ports, particularly those in developing countries. These issues revolve around: the disposal of dredged materials, oil-spill contingency planning, the handling of hazardous cargoes, and the implementation of the International Convention for the Prevention of Pollution from Ships (MARPOL) (see below). The paper points to an emerging problem where some ship operators have withdrawn their services rather than face the insurance costs and financial risks of operating in the national waters of countries with strong legislation on the reimbursement of clean-up costs in the event of oil or chemical spills. The challenge here is to reconcile the requirement for environmental protection with the economic concerns of ship operators. Guidelines on oil spill contingency planning and response are also being prepared jointly with the International Maritime Organization (IMO).

A paper is under preparation on the elements of MARPOL, examining the objectives of the convention, the constraints it has faced, and the main issues and options it presents to developing countries. While most industrialized countries have both signed and ratified the convention, developing countries have been slower to do so. The implication of the Convention for developing countries is that they must meet the costs of providing port reception facilities, maintain and operate the facilities in an environmentally sound manner, and dispose of the collected wastes. It is this ultimate disposal problem which is the major difficulty. Where the volume of wastes to be received from ships is significant, major problems can develop. These problems are particularly acute for small island communities where the disposal of any form of waste is difficult to achieve in a sound environmental manner. The paper outlines the Bank's role in urging and assisting countries to sign and ratify the MARPOL Convention. This will not only contribute to the global improvement of the marine environment, but also to the protection and preservation of the country's own coastal zones and irreplaceable natural resources. The benefits are particularly obvious to countries that derive a substantial proportion of their revenues from tourism. The paper recommends that activities in port and harbor development and coastal zone management routinely address the building of appropriate port reception facilities and that municipal activities consider the impact of additional wastes received at adjacent ports and harbors.

Urban Environmental Issues

Urban environmental problems stem from the heavy concentration of population and economic activity in relatively confined spaces. The underlying causes of urban environmental problems are many, and range from inappropriate economic policies such as the underpricing of services -- leading to resource depletion and higher levels of pollution -- to inadequate land use controls or inappropriate land tenure systems that hinder effective land use or lead to over-regulation of land markets and force the poor to occupy marginal lands. In 1987, less than 60 percent of the urban population had access to adequate sanitation, and only one-third was

connected to sewer systems. Indoor air pollution, substandard housing, and industrialization also take their toll on the health of urban dwellers. The pressure placed on natural resources by metropolitan areas can have long-term effects that threaten not only human health and ecosystems, but also long-term development prospects. Groundwater depletion and contamination, the loss of land resources due to uncontrolled development of erosion-prone areas, coastal zones or wetlands and the unregulated disposal of hazardous industrial wastes may all affect the sustainability of cities.

The Bank's recently published paper on Urban Policy and Economic Development: an agenda for the 1990s proposes a policy framework and strategy to redefine the urban challenge in developing countries. A central recommendation is for more attention to reversing the deterioration of the urban environment in order to improve the economic performance of the urban sector in developing countries. In the long term, urban environmental problems add to global environmental problems because of the intensity of energy and resource use and the concentration of wastes and emissions. In the shorter term, congestion, air and water pollution, inadequate sanitation, erratic waste collection and disposal, and the destruction of marginal lands affect the health and productivity of individuals, households, and communities.

In line with the paper's recommendation, a new component on urban management and the environment has been added to the ongoing Urban Management Program funded by UNDP, and jointly executed by the World Bank and the United Nations Centre for Human Settlements (UNCHS-Habitat). The first stage of the program is a two-year effort to develop an analytical framework for understanding urban environmental problems and formulating responses. The framework will link the impacts of specific problems to the corresponding underlying causes, and will assist in ranking such problems in a given city and in identifying potential cures. Activities will cut across several sectors and geographic regions. Strategies to implement the recommended approaches for improving environmental conditions in cities will also be proposed.

An Urban Environmental Team has been formed at the World Bank to carry out the work with a counterpart team at UNCHS in Nairobi. The teams draw on expertise and inputs from other activities in the Bank as well as from programs in UNCHS, UNEP and other external support agencies, NGOs, and consultants and institutions in developing countries. One of the central themes of the program has been summarized in a paper entitled "Energy-Environment Linkages in the Urban Sector." This paper presents a framework for characterizing urban environmental problems related to the structure of urban energy use, assessing the magnitude of health, ecological and other impacts associated with both production and consumption of energy in cities, and identifying and costing alternative interventions. Approaches for ranking options and implementing solutions are also reviewed.

Another paper, "Alternative Approaches to Pollution Control and Waste Management: Regulatory and Economic Instruments," presents an overview of the most common strategies and regulatory and economic instruments used in industrialized and developing countries to control air and water pollution, protect ground water, and manage solid and hazardous wastes. The paper concludes that most economic instruments cannot be successfully implemented without preexisting standards and effective monitoring and enforcement systems. Moreover, among the various economic instruments, charges appear to have the most potential for contributing to the achievement of pollution control and waste management objectives in developing countries --- given adequate enforcement mechanisms.

Additional papers are being prepared on priorities for urban waste management and pollution control, and on issues related to land degradation, occupation of hazard-prone areas, and protection of cultural property. Other research activities underway in the program include a literature review of the health impacts of poor environmental conditions in urban areas; valuation of economic impacts of various urban problems; development of a framework for urban environmental data collection that defines a common set of indicators and recommends priority data collection activities in urban areas; an evaluation of remote sensing and Geographic Information Systems applications for urban environmental planning; environmental management of water resources for urban use; and financial and institutional alternatives for urban waste management. A series of six city case studies on priority environmental problems are also being prepared for Sao Paulo, Katowice, Tianjin, Accra, Jakarta, and the Singrauli Region of India. These will serve as the basis for designing environmental management strategies and action plans.

Results of the background activities described above are to be compiled into a paper that outlines the strategic options for managing the urban environment. This paper will form an input into the United Nations Conference on Environment and Development in 1992. It is also expected to lead to the preparation of a World Bank policy paper on the urban environment in 1993.

Another activity addresses the poor condition of urban sanitation in developing countries. A research team is currently developing a new way of thinking about the planning and delivery of urban sanitation services. A demand-driven approach to sanitation planning and management has been developed to promote increased equity and accountability in the institutions that supply urban services. The new approach also stresses flexibility in management and the feedback of experience. This institutional work is being developed as part of a larger World Bank/UNDP program on water and sanitation.

Work on economic policy and urban pollution control includes a paper entitled "Internalizing the Social Costs of Pollution: Overview of Current Issues in Air Pollution." The paper argues that political will is the first step needed to reverse urban environmental degradation. For the successful long-run reduction of air pollution, it is necessary for governments to set clear objectives within a regulatory and institutional framework that provides for the necessary appropriation of resources and for the monitoring of compliance with the established environmental objectives.

Work on urban issues has also focussed on the prevention and mitigation of disasters. While development is a necessary condition for mitigating the effects of disasters, the qualitative aspects of development and growth and their impact on a country's natural resource are not always positive. For development to increase countries' resilience to disaster, it must not result in destruction of the natural resource base. Ongoing activities in this area include a two-year program on Disaster Prevention and Mitigation in Metropolitan Areas, launched in FY91. The program takes the position that it is crucial to prepare more effectively for natural disasters and to design strategies to mitigate their effects; recent events in Bangladesh, Costa Rica and the Philippines support this view. The objective is to provide governments with mechanisms to improve their capacity to mitigate extreme events, and to deal with the cumulative effects of environmental degradation. The program will be based on a number of case studies, including work on vulnerability assessment in the energy sector in Costa Rica, institutional aspects of disaster management in Asia, post-earthquake recovery efforts in Nepal, and aid coordination in for flood emergency in Sudan. Additional background work is now underway for policies on technological, economic, financial, poverty, demographic and technical issues. The replicability of strategy and policy conclusions and recommendations will be emphasized.

Selected materials from a colloquium on Environment and Natural Disaster Management have recently been published under the title: *Managing Natural Disasters and the Environment*. The volume was issued in conjunction with the International Decade for Natural Disaster Reduction (IDNDR) at a time of great concern for reducing environmental degradation and preventing and mitigating disasters. The report summarizes Bank financed initiatives in reducing the negative impact of disasters. Strategic issues in disaster mitigation -- including technology transfer and risk management -- are addressed, and lessons of experience are presented through case studies on flood reconstruction and prevention, housing and earthquake reconstruction, and fire rehabilitation.

Water Resources Management

With the increasing scarcity of water in certain regions, countries have been developing a comprehensive approach to water resource management. Within the Bank, a major intersectoral program is also underway, working towards a comprehensive approach to water resource management. The aim is to address water issues not merely from the perspective of water as an input into a particular sector such as irrigation, water supply or hydropower, but to design an integrated, multi-sectoral Bank strategy towards the management of water resources. Work in the Bank's research complex is supplemented by programs underway in the various regions (see Section III). Ongoing activities review the economic, institutional, technical, environmental and social issues involved in water management in the agricultural, urban and industrial sectors. A Bank policy paper on water resource management will follow from this work. The policy paper will assess appropriate water management in areas which expect to face water scarcity in the 21st century and will identify appropriate policy and institutional reforms as well as relevant technological options.

As part of the overall water resources management program, a multi-country study on water resource policies in urban areas has been initiated. The study will demonstrated the magnitude -- in economic, financial, and environmental terms -- of potential improvements in

water management in urban areas, and will evaluate the costs and benefits of various policy instruments in a number of ecological, development and institutional settings. The bulk of the work will be based on empirical investigations.

Work on irrigation and drainage is an important aspect of overall activities on water resource management. World population is expected to grow from over five billion today to at least eight billion by 2015. Indications are that average annual growth rates in yield of over 2 percent in agriculture as a whole -- and about 3 percent in irrigated agriculture -- will be necessary to achieve food security and improve the quality of life in developing countries. Yet the benefits of irrigation -- such as increased food production, water management, and flood control -- could be offset by damage to the environment and by the social costs of resettlement of affected peoples. The construction of dams and irrigation channel networks, while providing water for irrigation and power, also affects soil moisture, changes the depth of groundwater, and alters water quality. These effects may appear in even the best-managed irrigation schemes in ways that scientists are just now beginning to understand. Other concerns include the effects of stagnant water in canals and drainage areas that lead to public health problems like bilharzia and malaria.

Lack of a clear water management policy in many developing countries has encouraged misallocation of water resources. Water-pricing polices and inadequate systems and methods for cost recovery are other problems. The challenge is to meet the world's growing needs through investment in well-conceived and environmentally sound irrigation projects. A joint program between the World Bank and the United Nations Development Programme, and supported by bilateral donors is currently underway to review options and policies in irrigation and drainage, and to create international networks for information exchange. The program will review the causes of these problems in three country case studies (Pakistan, Egypt and Mexico), and propose alternative procedures for implementing large scale irrigation schemes. In particular, it will examine the optimal timing and phasing of drainage components in such projects.

As part of the effort to find practical solutions to the growing problems of water supply, governments and international agencies are focusing more attention on the quality and quantity of basic data that is available in meteorology, surface-water hydrology and hydroecology. This data forms a vital prerequisite to the formulation of integrated water sector development planning. Work is ongoing on a Sub-Saharan Africa Hydrological Assessment; the assessment is being undertaken in collaboration with the UNDP, The African Development Bank, and various bilateral agencies. Since water resources are often shared by groups of countries, the program was designed with a regional focus. The assessment will evaluate the status of existing water resource data, identify important data gaps, and recommend means to enhance countries' capability to measure, retrieve, process and publish hydrological information.

Institutional issues are being addressed under an activity recently initiated with the UNDP for exploring options for building institutional capacity in the water sector. A paper on training, legal and regulatory issues has been completed.

A book entitled *Water Supply and Environmental Management* was completed during the year, and will be published in FY92. This volume covers integrated water resources planning, least cost solutions, and pricing policies, and emphasizes the environmental aspects of both the supply and the disposal of water in an integrated water resource management context. A preliminary report has also been completed on the linkages between water, land and environmental degradation; the report will be followed by country case studies on policies for integrated water resources management.

Forest and Land Management

A major Bank-wide activity this year was the preparation of the forest policy paper, details of which are described in the previous section. Reflecting the variety in regional circumstances, separate forest strategy papers were also prepared in the Africa and Asia Regions (See Section III).

The degradation of land and forest resources poses one of the most serious problems facing developing countries, and results from the increased pressures of population growth and various economic activities on land resources, combined with ambiguous property rights and external shocks. Work is underway on a study to value the environmental impact of forest management schemes in Madagascar. The objective of this research is to develop practical means of improving the design of projects and policies.

Work on forest conversion has concentrated in Latin America where a region-wide analysis investigated the causes of agriculture's geographic expansion, which has often occurred at the expense of forests. The analysis yielded insights into how this pressure on forest resources can be accommodated. Growth in crop and livestock yields -- associated with investment in non-land assets in the agricultural sector -- was shown to alleviate the pressure for frontier expansion that is associated with increased demand for food. The finding suggests that there are important complementarities between agricultural development and conservation of tropical forests and other natural environments in Latin America and that there is a general underestimation of the degree to which non-land inputs can be substituted for land in the production of crops and livestock. The substitution of non-land assets for land is seen as an important option for reducing pressure on forest resources.

Other work on forest conversion -- in this case in Costa Rica -- indicates that most deforestation is not the result of incursion by squatters, but is driven by commercial activities of the timber, banana, and cattle producers. The existing incentive structure is the major culprit. Work has been initiated to examine these processes in greater detail, to determine the types of land being converted, and to identify and quantify the benefits obtained from recently cleared land.

Identifying the conditions conducive to investment in woodlots by small farmers is the objective of another study, which will develop recommendations for the formulation of projects

and programs. A field survey of farmers in two districts in Kenya is currently underway, and results indicate that decisions to establish or convert woodlots are based on a number of variables. These include: the existence of a reliable market as well as economic returns for timber; the specific characteristics of the plot -- with steeper plots being more likely to be used as woodlots; the availability of viable economic alternatives; and family life-cycle considerations, i.e., future family needs and likely availability of household labor.

Drylands issues are receiving particular attention. Policy-makers are faced with a number of problems in developing strategies for the improved management of drylands. First, the physical nature and the extent of what has been termed "desertification" is not well understood, partly due to poor data. Second, the underlying causes of land degradation in drylands, which might appear clear at first sight, often become less clear when probed more deeply. Third, the impact of changes in public policy aimed at improving land management are not easy to predict and depend on both geographic location and a country's stage in economic development. A paper on "The Management of Drylands" completed during the fiscal year examines some of these difficulties, and explores the physical processes, the adaptive strategies of populations, and the economic environment within which such strategies have evolved. It also suggests some possible policy responses to achieving sustainable development.

On a related topic, the Bank is collaborating with the Commonwealth Secretariat and the Overseas Development Institute on a review of rangeland management practices in areas under communal control in Sub-Saharan Africa. The review focuses on the potential for increasing the flexibility of herd management in order to increase overall productivity. A workshop on operational priorities was held during the year. This highlighted a number of research needs. Among these is the need for better understanding of farmers' attitudes, beliefs, and decisionmaking processes regarding soil degradation. Another priority is for an improved understanding of the available technologies for sustainable land management. Work has been initiated on these topics, focussing in particular on the costs and benefits at the farm level of various soil management options, including a review of a range of cultivation and crop management practices.

It was also noted at the workshop that while much concern has been expressed over land management trends, relatively little has been done to assess experience in this area. With support from Overseas Development Agency (UK) and the Rockefeller Foundation, a review is underway of the changes in land management practices adopted over the past 60 years by farmers in a district in Kenya -- a district where there has been much public concern about land degradation, and where there has been a four-fold growth in population. Preliminary results emphasize the importance of the availability of economically viable land-use options for farmers. Work is also being initiated in Central America on lessons of experience from programs designed to encourage farmers to adopt sound practices for soil conservation and agroforestry. The review will be carried out in collaboration with CATIE and will stress the institutional and economic aspects of promoting sound land use.

The legal and institutional framework is a crucial determinant of land management

practices. This is reflected in on-going work on in the area of land tenure. A paper is under preparation that presents a typology of legal and tenure situations, and reviews the conditions where land titling and registration may be necessary for improved land management.

Social and Cultural Issues

<u>Health</u> Macroeconomic and sector policies affect health directly, and through environmental changes they bring about. These complex relationships are the subject of a joint review carried out by the World Health Organization (WHO) and the World Bank on the effects of development policies on health. This study, published in a book entitled *The Impact of Development Policies on Health*, reviews the impact of macroeconomic, agricultural, energy, industrial and housing policies on health. It demonstrates that the impact of such policies can be profound, and recommends that more strenuous efforts to take account of these relationships should become a feature of development planning. The need for an integrated approach to environmental health is also put forward in a technical paper entitled "Environmental Health Components for Water Supply, Sanitation, and Urban Projects" (See Box).

Over the past two years the Bank has been undertaking, with a number of collaborators, a review of priorities in the health sector. The core of the review is a series of papers on the public health significance of major clusters of diseases in the developing world and on the cost and effectiveness of currently available technologies for their prevention and case management. In addition, as part of the review, a number of cross-cutting papers provide

Environmental Health Components for Water Supply, Sanitation, and Urban Projects (Box)

The need to improve health in the face of stagnant or shrinking national budgets has prompted policymakers to search for new options to enhance health at minimum cost. In response, a practical methodology for including environmental health components in water, sanitation and urban development projects is proposed. The methodology is based on the premise that it is possible to improve the quality of life of project beneficiaries with relatively inexpensive components that rely on linkages between various sectors.

Improved understanding of these linkages has led to a reevaluation of the evolution of health improvements. In Western Europe during the nineteenth and twentieth centuries, major respiratory and diarrheal diseases had often already begun to decline in advance of medical breakthroughs. Reduction in mortality have thus not been primarily due to improvements in water supply and sanitation, as commonly postulated. Rather, they occurred as an integral part of overall economic development and improvement of living standards — including better water supply, sanitation, housing, medical services, education and other social programs. This confirms that health improvements depend not on one but on many interrelated factors.

The paper stresses the need to build interlinkages to foster cooperation among agencies responsible for various sectors, and among governmental and non-governmental organizations. Relatively simple interventions are proposed, both to reduce costs and to encourage beneficiaries to accept programs more readily. The importance of beneficiary participation, especially of women, in campaigns to improve hygiene and dietary habits is stressed.

The paper's message is one of caution and promise: health benefits are often difficult to detect, and may be slow to mature. But health can be greatly improved with a modest investment that can reach those most in need, the urban and rural poor.

demographic background, discuss issues involved in setting priorities, and review illustrative areas of intervention. The need to improve environmental quality, and the various means of doing so is addressed.

A report on the health of adults in the developing world, edited by staff members of the Bank, WHO, Harvard University School of Public Health, and the London School of Hygiene and Tropical Medicine, has been substantially completed. The report documents the nature and extent of adult ill-health in developing countries, and identifies environmental factors as one of its key determinants.

Policy guidelines on lending for tobacco are near completion, and aim to change Bank policy on tobacco lending. In addition to the known health risks of tobacco smoking, the cultivation and processing of tobacco is also known to have potentially serious environmental consequences that may lead to soil degradation and to fuelwood depletion. With regard to soil degradation, nearly continuous cropping of tobacco on easily erodible soil is often practiced and can lead to relative exhaustion of the land. In addition, tobacco is often cured in a process that is energy demanding, with most of the energy being provided by wood fuel. One hectare of wood is required for each hectare of tobacco cured, with the result that tobacco can be an important contributor to the destruction of local timber supplies. Widespread, largely uncontrolled use of pesticides and herbicides on tobacco may pose additional health risks as well as environmental risks.

Different industrial pollutants pose varying risks to human health and ecosystems. Work is currently underway to collect and incorporate the best available risk assessments on industrial pollutants, and to combine them with raw emissions data in order to produce weighted risk indices for various industrial sectors. A database has been assembled that contains the US Environmental Protection Agency's current risk estimates for several hundred pollutants, including separate numerical assessments for human toxic risk, human carcinogenic risk, and eco-toxic risk.

Education Activities in the field of environmental education have been rather limited in the Bank, and a number of fundamental questions remain to be addressed. These include issues such as the identification of the most effective target groups for environmental education, whether environmental education should be integrated into science subjects or into technologyrelated subjects, and so on.

One of the increasingly important tasks for education is to prepare the ground in developing countries for constructive and relevant technology transfer, adaptation and development. This approach, addressed in the Bank's new Science and Technology program,

defines a new role for the institution and is of special relevance for the environment. Here, advances in science and technology will play an increasing role, directly through encouraging sound environmental management, and indirectly through determining international competitiveness of agriculture and manufacturing. Modern technology in environmental science has become increasingly relevant, necessary, and accessible in developing countries, yet the successful transfer and adaptation of high technology requires considerable local knowledge. Continually growing concern in developing countries for the environment is likely to lead to an increase in the demand for scientists with the interdisciplinary skills needed to handle the great variety of environmental issues facing most developing countries. Reliable monitoring of environmental conditions, including the effects of infrastructure projects and agricultural and industrial activities, is very demanding, both qualitatively and quantitatively, and is closely related to basic scientific research. Similarly, the design of new products and production methods with more acceptable environmental impacts is a major task for both agricultural and industrial research.

An ongoing activity is the attempt to broaden the audience for the Bank's World Development Report 1992 on the environment to young people still at the secondary-, and perhaps even the primary-, school level. The production of this "Youth World Development Report" brings to the fore several questions regarding the most desirable direction for the Bank's focus on environmental education.

Environment, Population and Women The Bank continues to emphasize population control issues and their importance as a basic determinant of prospects in both development and the environment. Nevertheless, there is still insufficient knowledge regarding the precise relationship between rapid population growth and environmental degradation to properly guide developing country policies and Bank population lending. Exploratory work is underway on the linkages between population and environment issues, including a literature review and the identification of appropriate case studies. The eventual study should provide new insights on the effect of rapid population growth on the alleviation of poverty and on environmental management.

In the area of women and the environment, there are two general lines of work: the promotion of smaller families -- which through the population link is fundamentally an environmental issue -- and activities directed specifically to women farmers, stressing in particular extension services. Women are the major producers of food -- and increasingly, of cash crops and livestock -- in many regions; they carry the main responsibility for meeting the family's needs for household water and fuel. Thus, they are important not only as economic agents but also as managers of natural resources. At the same time, and like men, they are also polluters through their use of inappropriate technologies, inorganic fertilizers, and other agrochemicals. Yet their access to technology, advice and other inputs and services remains limited, and far from commensurate with their role as economic agents and resource managers. The need to improve women and extension in Africa, and has now been extended to cover other regions.

Thus, although there is not a specific stress on environmental issues in the Bank's program on Women in Development, the two lines of work outlined above do promote sounder environmental management through increasing women's economic productivity and earning capabilities, thereby decreasing poverty, lowering birthrates, and providing women with the option to improve their use of natural resources by lengthening their decision horizons. Indirectly, the increased options available to women will also open up access to education, credit, and other services that can only enhance environmental management.

<u>Cultural Issues</u> The development of policy on cultural heritage issues received increased attention during the year. A review of the Bank's Operational Directive on Cultural Property is now in the final stages. A study of cultural heritage issues in sub-Saharan Africa is also underway, and will be published as a handbook. A review of cultural issues in biologically diverse areas is also under preparation and regional studies to support it have been initiated. The impact of development on indigenous populations is being addressed in a paper on the effect of development on forest peoples in the rain forests of Central and West Africa.

Environmental Economics

A series of case studies in energy, forestry and water resources seek to use the tools of environmental economics and cost-benefit analysis to improve policy and project design. Where economic valuation is not feasible, other multi-criteria techniques are being explored as a practical tool to better incorporate environmental considerations into decision-making. As a first step in this process, a state-of-the-art survey paper was prepared on how environmental concerns can be integrated into economic analyses of projects and policies. The paper deals with four key issues: physical impacts of projects and policies; valuing these impacts in monetary terms; the discount rate; and issues of risk and uncertainty. The main emphasis is on methods of valuing environmental impacts. Where possible, practical examples illustrate strategies to address what have often been referred to as externalities. The paper concludes that the major need at present is not for more theory or techniques, but for application of existing methodology and approaches to concrete problems, particularly in developing countries.

Work on fiscal instruments to address environmental degradation addresses the general concern that the policy response to environmental degradation may have often been misdirected, including, for example, a heavy reliance on regulatory arrangements that are difficult to enforce or that distort behavior. Work has been initiated on developing and applying an analytical framework for evaluating the environmental effects and economic costs of alternative public finance instruments in developing countries -- with specific reference to pollution control. The project emphasizes the need to consider various alternatives that take local characteristics, such as the capacity to enforce regulations and monitor compliance, into account. Case studies will be conducted in Mexico and Indonesia. On the same topic, a paper entitled "Environmental Policy and the Public Revenue in Developing Countries" was published during the year (See Box).

Environmental Policy and the Public Revenues in Developing Countries

The range of environmental concerns continues to expands, and few sectors of economic activity remain untouched by them. Yet claims on public and private financial resources are already large. How then, can environmental policies be made more "affordable"?

The paper addresses the role of regulations and taxes in the reduction of environmental damage, and suggests that developing countries would be better served by following the tax and investment approaches to environmental policy in most situations, rather than the regulatory route that the industrial countries have followed over the past century.

While the use of regulations is self-evidently appropriate in some cases, such as the control of hazardous wastes, in the majority of cases the tax approach has significant advantages. Taxes are economically efficient and more wide-reaching in their impacts, less demanding on information, and are administratively less burdensome as they could be grafted onto existing structures of tax administration. Economists have often held most such advantages to be applicable in the industrial countries. The paper concludes that they would apply with even greater force in the developing countries.

Research has also been initiated on general issues in environmental protection, resource management and economic growth. The preliminary output expected from this activity will be an essay that reviews existing and optimal practices in various sectors such as forestry, oil and gas, and hydroelectricity and draws implications for economic growth. The view that environmentally sound policies are also economically beneficial will be examined, and policies that are compatible with sustainable development will be identified. Subsequently, the relationship between the costs of environmental control and economic growth will be examined by constructing a detailed model of these costs and their consequences in one developing country.

Most developing countries face enormous economic pressures, both international and domestic, to overexploit their natural resource base, and to undervalue environmental degradation. For economic analyses, to measure economic performance, and to direct public policy, the Bank as well as countries rely heavily on the major aggregates shown in the national income accounts, compiled in accordance with the UN System of National Accounts (SNA). The current SNA tends not to account for the consumption of natural capital. A framework is therefore needed which addresses the concerns regarding the accounting for natural resource consumption and which permits the computation of an Environmentally Adjusted Net Domestic Product and an Environmentally Adjusted Net Income. Such measures would help to better capture environmental services, account for the depreciation of both man-made and natural capital, exclude relevant categories of defensive environmental expenditures, and estimate damages as a result of economic activities.

The Bank has since 1983 encouraged the consideration of environmental issues in the

ongoing revision of the UN System of National Accounts, and has proposed as an interim measure the creation of a set of environmental satellite accounts. To assist this process, the Bank recently published a survey of the experience of industrial countries with various environmental and resource accounting approaches. The purpose was to evaluate past experience and to extract lessons that may be of value for developing countries to better deal with environmental and sustainability concerns from the accounting side. The work concluded that there is a need for a great deal more empirical work in the area of environmental accounting. Most of the efforts will be devoted to two case studies in developing countries: Mexico and Papua New Guinea. These are being carried out jointly with the United Nations Statistical Office (UNSO). The attempt will be to integrate environmental data sets with existing national accounts information while maintaining existing SNA concepts as far as possible.

Work was also completed on *Environment and Development*, a book that traces the recent evolution in environmental economics, emphasizing the shift from the traditional microeconomic or project-by-project approach to one which increasingly reflects the role of macroeconomic and sector policy. The linkages with population and poverty are explored, and the contribution of market and policy failures to environmental degradation are analyzed. International environmental policy and the global environmental issue also receive detailed treatment. The book, which will be published in FY92, contains case material to illustrate general theoretical principles.

During the past two decades, many countries have liberalized their trade regimes to some degree. The resulting patterns of industrial restructuring may have had important environmental implications. An ongoing study addresses some of the issues raised by trade liberalization and attempts to identify the conditions -- with regard to endowments of environmental resources, technology, demographic factors and income distribution -- that would lead trade policy reform to worsen environmental degradation. The development of detailed industrial emissions data will enable the estimation of pollution and of the intensity of resource use in internationally traded products with more precision than is currently possible. More generally, a survey of the literature on trade and the environment is currently under preparation.

Also on the topic of trade liberalization, activities are underway with specific reference to the agricultural sector. A paper has been prepared on "Agricultural Trade Liberalization, Price Changes and Environmental Effects", and addresses the question of whether the environmental effects of trade liberalization can be unambiguously determined. The paper concludes that while higher international prices and less price instability would lead to economic benefits for developing countries, the associated environmental effects may be negative due to more intensive resource use as well as other factors. Empirical work is needed to estimate the magnitude of the effects of trade liberalization on the environment and to identify the parameters involved.

Another activity on trade policy -- with reference to West Africa -- addresses the implications of trade liberalization on agricultural productivity and growth. The study specifically considers the changes in natural vegetation cover associated with such policies,

analyzing the importance of natural vegetation as a factor of production and studying the effects of changes in relative prices induced by trade liberalization on natural vegetation. The central hypothesis of the research is that the systems of property rights prevailing in many parts of Western Africa (namely, common property rights) lead to overexploitation of vegetation and an excessive rate of land clearing. Thus, increased agricultural prices -- as may occur with trade liberalization -- will have adverse implications for agricultural productivity because of the induced degradation of the biomass stock. The approach used to test this hypothesis was to combine household survey data with remote sensing data obtained from satellite. The research suggests that community income could in the long run increase very substantially by reducing the area under cultivation. The policy challenge is how to minimize the expansion of cultivated area in environmentally fragile areas as more liberal policies improving the overall agricultural terms of trade are implemented. A potential second-best policy -- provided that administrative capabilities are sufficient -- would be to accompany trade liberalization with complementary policies to tax land-intensive commodities that are more environmentally demanding while subsidizing labor-intensive commodities that are environmentally benign. Further case studies in other West African countries are planned under this project.

The opposite trend, namely the effect of environmental degradation on international trade is addressed in a draft paper that briefly reviews environmental policy interventions, primarily in OECD countries, in the context of the potential or actual influence they exert on trade policy. Alternative approaches are analyzed in terms of their potential impacts on trade policy, followed by a consideration of the forms that international cooperation might take to minimize trade disputes, including a brief review of what has already been done at the international level. The paper then considers the interface between GATT and the environment, with particular reference to the question of how far the GATT currently goes in providing a policy framework to deal with environment-related trade issues and in addressing trade disputes that are likely to arise in this area. The paper concludes with suggestions for appropriate responses to trade concerns induced by environmental policies. A related activity on trade and protectionism, which includes a collection and review of laws with an environmental rationale, and an analytical review of the justification of these laws, is also in progress.

It is commonly argued that the decline in world commodity prices relative to income is an indicator that there is no scarcity of natural resources. Research has therefore been initiated that addresses the implications of prevailing commodity prices for the market's perception of natural resource scarcity. The study will look at the impact of technological progress on the efficiency of natural resource use and on substitution, and at its impact on the prices of natural resources. The consequences of resource price changes on world trade patterns are also addressed, as are the effects on developing countries.

Global Environmental Issues

A number of policy and research activities have been stimulated by the growing concern

over the "global commons" environmental issues, particularly the threat to the ozone layer and the prospect of global warming. In addition to specific project activities, among the contributions the Bank made during the year to the implementation of the Montreal Protocol, was a paper on the incremental cost of substituting for ozone-depleting substances. The Ozone Fund can only be used to finance projects or activities that are designed to reduce global emission of ozone-depleting substances and that incur a net economic cost (i.e. an incremental cost) to the country concerned. The paper addresses the conceptual basis for making such estimates, and the measurement and implementation issues involved.

While relatively straightforward for the ozone issue, a similar type of calculation is required for the emission of greenhouse gases, and this will be much more difficult to establish. Cost-effectiveness tests on a global scale have to be established in order to determine the justification for the financing of projects to reduce emissions of greenhouse gases financed under the Global Environmental Facility (see Section VI below). Research on this topic is under way, and will include a number of country case studies to be completed in early FY92. These will address the incremental costs of reducing carbon dioxide emissions by energy efficiency improvements as well as by a variety of other means, including forestry activities.

Several other activities are underway on environmental issues of global importance. The significance of global externalities in potentially retarding or accelerating economic development is addressed in a paper currently under preparation. The externalities addressed include the effects of global warming on agricultural productivity, labor migration, and micro-climate change; the effects of ocean pollution on coastal fisheries; and the effects of the depletion of biodiversity on tourism and pharmaceutical industry. The research will also address the potential significance of global policy responses in slowing the development of poorer countries (such as permits under global emission limitation schemes, higher energy costs, and developing country waste disposal standards.)

A research proposal is under preparation on the various instruments within countries for carbon taxation. The proposed study will review carbon taxes and tradeable permits and draw implications for trade, industrial relocation and the transfer of resources across nations. Initially, a research program would be developed around four separate themes: the growth-retarding effect of carbon taxes on developing countries; the incidence effects of carbon taxes - will developing countries gain or lose under alternative carbon tax schemes?; the design of carbon tax schemes and comparison with alternative systems of global permits; and the design of an approach most suited for developing countries.

A theoretical paper on the same topic uses the example of carbon emissions to analyze how various countries are affected by an international agreement to limit carbon emissions depending on their income per capita. An analytical model is developed which explores optimal emissions levels under different international conditions. The model is used to show that a cooperative game with transfer payments results in the optimal outcome. The nature of the transfer between the North and the South -- e.g. cash transfers or debt forgiveness -- is a crucial factor in the viability of such an international agreement. Technology transfers play a particularly interesting role in this model of a North-South deal.

Work is also under way on energy use and global greenhouse issues. The object of the research is to study the impact of environmental initiatives likely to be pursued worldwide in the international energy market, specifically on the global production and consumption of various forms of energy and on international energy prices.

In the area of biodiversity protection, a new generation of experimental projects attempts to link the conservation of biological diversity in protected areas with local economic and social development. These new approaches can be grouped under the heading of Integrated Conservation-Development Projects (ICDPs). ICDPs have received considerable attention among conservation organizations, international development agencies, and private foundations; nevertheless, field experience has been limited and there has been a lack of analytical work in this relatively new area.

The Bank, in collaboration with the World Wildlife Fund and the U.S. Agency for International Development, has recently completed a study of ICDPs to be published in late 1991 -- People and Parks: Linking Protected Area Management with Local Communities. The study, which will be published later this year, considers ways of translating success lessons from existing ICDPs into projects and programs to make a significant contribution to the conservation of biological diversity in protected areas. More than 20 projects from fourteen countries in Asia, Latin America and Africa were studied.

These projects aim to achieve their conservation goals by promoting development and providing local people with alternative income sources which do not threaten to deplete the flora and fauna of the protected area. The projects range considerably in scale and scope: smaller projects include biosphere reserves, multiple-use areas and buffer zones on the boundaries of national parks; larger ones include development projects with links to protected areas. All are based on the premise that protected area management must reach beyond traditional conservation activities inside park and reserve boundaries to address the needs of local communities outside. The study's conclusions emphasize the importance to conservation of a supportive legal and institutional framework, clear and explicit linkages between conservation and development components of projects, local participation, the availability of additional concessional long-term financing, and strong on-site management.

Threats to biodiversity also affect marine resources. A study of the feasibility of marine parks and their economic and social benefit to local communities is under way. This comparative analysis of several marine parks will examine ways of maintaining sustainable populations of threatened species. Paralleling the study are efforts to determine priorities for marine biodiversity conservation, and a taskforce is developing a program for the Bank in the general area of marine environments.

Conclusion

Many of the research projects described in this chapter are being prepared as background material for the 1992 World Development Report which will focus on the environment and development. Work on the report is helping to identify priorities for further study, and to lay the foundation for a long-term research program. A number of conceptual issues remain to be resolved, but the greater need is for applied, multidisciplinary research conducted on a case by case basis. This will be the thrust of the Bank's environmental work program in the years to come.

VII. THE INTERNATIONAL FINANCE CORPORATION

To strengthen its capability in dealing with environmental matters, in February 1991, The International Finance Corporation (IFC) established an Environmental Unit within the Engineering Department to be the focal point for environmental activities within the Corporation. The Unit is responsible for the environmental review and subsequent monitoring of all IFC projects. The Unit also plays the lead role in the development of IFC's environmental policies, procedures and programs, and coordinates IFC's environmental activities with the Bank and other agencies. The Unit assists the Multilateral Investment Guarantee Agency (MIGA), a member of the World Bank Group, in the environmental review of projects and represents IFC's interests in such activities as the Global Environment Facility and the 1992 United Nations Conference on Environment and Development. It also identifies and promotes investments for IFC in the production of environmental goods and services in developing countries. I F C addresses environmental issues in three broad areas: review of investment projects, advisory services, and investment initiatives.

Project Review

Given its extensive experience with private sector projects throughout the developing world, IFC brings a unique perspective to environmental issues within the context of economic development. In its work with the private sector, IFC finds that companies are paying increasing attention to environmental protection and pollution prevention measures. However, occupational health and safety issues need more attention, and progress on this front is slow. Private sector interest in environmental issues is due not only to legal requirements but also to a growing awareness of corporate responsibility, public pressure, increasing "green" consumerism, and concerns about corporate liability for industrial pollution and its consequences.

As part of project appraisal, IFC reviews all new projects for consistency with the spirit and intent of appropriate World Bank, international, and host country environmental laws and guidelines. The review covers not only environmental issues but also socioeconomic concerns, resettlement issues, occupational health and safety, major hazard analysis, and risk to life and property. While IFC procedures rely on World Bank guidelines and overall policy, the review process is adapted to the nature of IFC investments in the private sector.

The definitions of project categories are similar-but not identical-- to those used by the Bank. Category A projects require an environmental assessment (EA). Category B projects require a more limited analysis, and Category C projects, primarily those associated with the development of capital markets, require no environmental review. During fiscal year 1991, IFC conducted environmental reviews of 100 new projects in 37 countries (see Table I). (*Note: Project statistics will be updated in next draft to include final quarter results). In order to increase awareness of pollution prevention opportunities which may arise during the project appraisal process, the Environmental Unit sponsored a pollution prevention seminar for IFC's

Engineering Department staff conducted by the Pollution Prevention Office of the United States Environmental Protection Agency.

Some projects submitted to IFC do not meet established environmental criteria. Unless changes can be made so that the projects meet required environmental standards, IFC will not proceed with such projects. IFC will work with the companies concerned as appropriate to improve the project's environmental performance. However, this fiscal year a number of projects were dropped because of environmental problems.

In addition, IFC reviewed its portfolio to determine whether corrective measures or, in extreme cases, divestiture of any projects were warranted due to environmental impacts; no major problems were identified.

IFC's investments cover a wide range of industrial, forestry, fisheries, and agricultural sectors. Thus, IFC deals with a broad spectrum of environmental issues and has excellent opportunities to influence the projects in which it invests. (See Boxes 1 and 2 for examples of projects involving significant environmental issues).

Advisory Services

IFC's Environmental Unit offers advisory services to international groups, government authorities, and companies. For example, during FY91 IFC worked with the Business Council for Sustainable Development on preparations for UNCED in 1992. IFC is represented on the Trade and Environment Committee of the National Advisory Council for Environmental Policy and Technology, which reports directly to the Administrator, United States Environmental Protection Agency. The Environmental Unit made presentations on private sector opportunities in environmental goods and services at international conferences in Vancouver, Paris, Stockholm, Helsinki, New York, and Kuala Lumpur. IFC is assisting the government of Poland to set up an environmental fund in a debt-for-environment swap. It also provided municipal authorities in several countries with assistance in privatization and financing of municipal wastewater treatment systems, and provided advice to a number of companies on preparation of EAs, including terms of reference, project management activities, and technical issues.

Investment Initiatives

The worldwide market for environmental goods and services is expected to grow rapidly during the next decade, doubling from roughly US\$300 billion to US\$600 billion by the year 2000. Annual growth rates range from 5 to 25 percent. This market is still relatively new in developing countries, yet investment opportunities are emerging at a fast pace and will contribute

Table I.Projects byEnvironmental AssessmentCategory

Category	No.
Α	5
В	47
С	48
Total	100

Box 1. IFC Project Examples

Bombay Suburban Electric Supply Limited (BSES), India

IFC is participating in the financing of a new 500 MW coal-fired thermal power plant to be built and operated by BSES. The power plant is located approximately 100 km north of Bombay. Environmental issues have been of major concern. IFC worked very closely with BSES in the preparation of a detailed environmental assessment (EA), including preparation of consultant's terms of reference, review of consultant's studies and discussions with relevant government departments. As a result of the EA and government permit requirements, BSES has agreed to install extensive air and water pollution control systems, to develop an extensive greenbelt around the plant site, and to provide training and employment opportunities to the local tribal population. The power plant will comply with World Bank and internationally accepted environmental guidelines, as well as the requirements of the Indian authorities. BSES will undertake an extensive monitoring program during plant construction and operation to ensure ongoing compliance with all environmental requirements.

Bosques y Maderas S.A. (BOMASA), Chile

BOMASA is a project to construct a plywood plant to produce quality technical plywood and laminated technical plywood for export, and acquisition of natural temperate hardwood forest to supply the project's raw materials requirements. An EA found the project to be designed with proper attention to environmental and safety measures, and its environmental impact is expected to be minimal. Selective logging will open the forest canopy and allow young trees to grow, and enrichment planting will rejuvenate the forest with only native species. This management technique, which is finding growing acceptance in Chile's forestry industry, should result in a healthy forest which will supply logs of commercial species on a long-term sustainable basis and will keep the adverse impact on the flora and fauna to a minimum. BOMASA's own and third party logging operations will be closely monitored by Chile's National Forestry Corporation (CONAF), as well as by IFC, for compliance with an approved forestry management plan and implementation of sound logging and enrichment planting policies.

Genex S.A., Bolivia

IFC is investing in a compressed natural gas project that is expected to develop a compressed natural gas market in Bolivia and contribute to a significant reduction in pollution levels. Genex SA, a Bolivian company, will utilize Bolivia's abundant, underutilized natural gas resources with the construction of four compressed natural gas filling stations in Santa Cruz de la Sierra. Genex will supply and install 3,600 conversion kits in motor vehicles (taxis and minivans) to substitute liquid gasoline with compressed natural gas. Compressed natural gas helps to reduce the emission of gases that contribute to global warming and climate change. This reduction in atmospheric pollutants occurs for several reasons: (i) compared to gasoline and diesel fuel, compressed natural gas is carbon poor and produces about one-third less carbon dioxide than gasoline; (ii) air and natural gas mix better than air and gasoline and facilitate more complete combustion. This complete combustion reduces hydrocarbon emissions by 35-50% compared to gasoline; (iii) the remaining hydrocarbon emissions from natural gas converted vehicles do not exist in Bolivia. Accordingly, as Genex develops a compressed natural gas market in this country, polluting gasoline will be displaced with cleaner burning natural gas which will positively impact the environment.

significantly to growth of the market.

In developed countries, the private sector plays a major role in the provision of

environmental goods and services. IFC has been helping to transfer this experience to developing countries. This market represents a substantial business opportunity which will also make a significant contribution to development. Therefore, in addition to acting responsibly with respect to its own investment projects, IFC is actively seeking opportunities to invest in businesses in developing countries which provide environmental goods and services.

Many factors are driving the growth of the market for environmental goods and services.. Rapid industrialization and urban growth have placed extraordinary demands upon antiquated and informal systems of waste management and water treatment. Pollution in many urban areas has reached critical proportions, leading to public outcry and demands for improvement in environmental quality. As governments respond with environmental legislation, strengthened environmental protection institutions, and increased enforcement, opportunities are being generated for private sector investments in environmental goods and services. Moreover, limited public resources to provide traditional public sector services such as wastewater treatment or solid waste collection and disposal are forcing governments to look to the private sector for help in providing such services.

Many companies, especially suppliers of pollution control equipment and environmental consulting services, are recognizing the market for environmental goods and services as an area of new business growth. Moreover, globalization of the economy and lower trade barriers are fostering an international competitive which mandates increased climate efficiency and modernization of plants and industries. This is particularly true in Central Europe and in other countries undergoing major economic transitions and privatization of state-owned industries. Many developing countries now require all new investments to meet environmental assessment requirements and stringent pollution control standards, generating opportunities for the production and sale of environmental goods and services.

Private sector opportunities also exist in areas such as renewable energy applications, energy conservation and

Box 2. FINAP Project, Paraguay

IFC transferred a 58,000 ha. parcel of undisturbed subtropical forest in Eastern Paraguay to The Nature Conservancy and Fundacion Moises Bertoni para la Conservacion de la Naturaleza, a Paraguayan environmental group. The property, which was acquired by IFC in a foreclosure in 1979, supports one of the richest ecosystems in Eastern Paraguay. Within the site more than 300 species of birds have been identified, as well as populations of river otters, giant nutria, and numerous other animal species which are in peril of extinction. IFC transferred the land to the environmental groups for US\$2 million, which is substantially below the US\$5-7 million the land would bring if sold to developers for commercial logging and agriculture. As a condition of the sale, the land must be used solely as a nature reserve, a trust must be established to defray operating expenses, and the local indigenous population must be permitted to use the land for traditional hunting and gathering.

improvement in energy efficiency, ecotourism, game ranching, and plantation forestry. Because Because little was known about the market for environmental goods and services, during the year IFC completed a number of country studies, using Trust Funds, aimed at assessing the role of the private sector in the provision of environmental goods and services and at identifying specific market and project opportunities. The studies focused primarily on the waste management and pollution control technology aspects of the market. IFC also conducted a general assessment of investment opportunities in renewable resource related areas such as ecotourism.

Environmental markets in Chile, Mexico, Poland, Hungary, Turkey, Pakistan, Thailand, Malaysia, and Indonesia were analyzed in the country studies. IFC retained five consultants to complete the studies: Environmental Resources Limited (ERL) from the United Kingdom, Euroconsult from the Netherlands, VBB Viak from Sweden, and EKONO and Devecon from Finland. Local consultants also assisted with in-country data gathering. Financial support for the studies was provided by the Commission of the European Communities: E.C. International Investment Partners, the Swedish Agency for International Technical and Economic Cooperation, the Finnish International Development Agency, and the Minister for Foreign Trade of the Netherlands.

The general conclusion of the country studies is that the market for environmental goods and services in developing countries is still in its infancy, but is poised for rapid growth as a result of increasing public and government concern about environmental issues. Growing urbanization and rapid industrialization with little attention to the environment have created similar environmental problems in the nine countries studied:

- o Inadequate industrial and municipal wastewater treatment facilities;
- o Lack of disposal, treatment and storage systems for solid and hazardous wastes;
- o Severe air pollution caused by uncontrolled industrial and vehicular emissions; and
- o Pressures on water supplies, both in quantity and quality.

These problems present opportunities for private sector provision of environmental goods and services such as the manufacture and installation of pollution control equipment; design, construction, and operation of infrastructure and utilities; and consulting services. Additional business opportunities may be found in areas such as ecotourism and in sustainable forestry, fisheries, and agriculture projects. The largest markets are water and wastewater treatment and solid and hazardous waste management. The fastest growing markets are air pollution control, air quality monitoring and consulting services.

Most of the countries studied have functioning environmental laws and regulations, although some are more comprehensive than others. Chile and Poland are currently undergoing extensive revision of their environmental laws. Weak enforcement is a universal problem, but this situation is improving in most countries studied due to increased public and international pressure.

Severity of environmental problems is raising public concern in all of the countries. Government agencies and responsible private sector companies are increasingly conscious of their environmental obligations, especially in southeast Asia, and are taking the initiative. The "green" movement appears to be a more significant political factor in Turkey, Chile, Thailand, and Hungary. In Mexico the "green" movement is growing, but still fragmented.

There is increasing pressure for international harmonization of environmental standards and enforcement practices. Turkey is strongly influenced by its ambition to join the European Community and by the resulting need for consistent environmental standards and enforcement practices among member nations. The same is true of Mexico with respect to the planned United States/Canada free trade group. Major exporting countries such as Malaysia, Thailand, and Indonesia are under increasing pressure from export market countries, which are becoming intolerant of competitive advantages gained through lax environmental standards and enforcement. In most of the countries studied, environmental impact assessments and pollution control systems are now required for all new investments.

A lack of public resources--both financial and human--makes it difficult for the public sector in these countries to provide services for which it has traditionally been responsible, creating private sector opportunities in areas such as wastewater treatment and solid waste disposal. Privatization programs in Mexico, Malaysia, Poland, and Hungary are expected to have a positive long-term impact on the market as competition and plant modernizations create demand for clean, process-integrated technology.

These forces will result in increasing numbers of environmental projects in developing countries in which the private sector can and should invest. The nine country studies identified over 200 potential environmental projects, representing only a small sample of opportunities available in the developing world.

The Role of IFC

IFC is in a unique position to work with the private sector to develop and support the market for environmental goods and services in developing countries. IFC's special strengths include its extensive experience in structuring projects and companies throughout the developing world, ability to find joint venture partners, willingness to fund projects in higher risk environments, access to advanced technologies and experience in technology transfer, ability to mobilize financing from other sources, and willingness to partially support up-front costs which are often higher for these types of projects, such as pre-feasibility studies. IFC can also advise member governments on how to create an appropriate legal and investment framework and establish environmental services within the private sector.

IFC believes that the market for environmental goods and services in developing countries is a substantial business opportunity which can make a significant contribution to development. Thus, in addition to ensuring that its investment projects meet appropriate environmental standards, IFC encourages and supports the development of private sector capability to provide environmental goods and services in developing countries.

VIII. THE WORLD BANK AND THE INTERNATIONAL COMMUNITY

Outreach Activities

The Bank's outreach activities increased significantly during the fiscal year. They included the launch of the Global Environment facility (with UNDP and UNEP) and work on implementing the Montreal Protocol; co-operation with nongovernmental organizations on an array of environmental issues; and an expanding program of external training run by the Bank's Economic Development Institute. Environmental objectives to which the Bank subscribes also benefitted from other financing mechanisms, including technical assistance and debt-for-nature swaps.

In addition, the Bank has played an active role in preparations for the United Nations Conference on the Environment and Development (UNCED) which will take place in Rio de Janeiro, Brazil, in June 1992. The Bank's main contribution to the conference will be the World Development Report which will examine in considerable detail the links between the environment and development. The report will be published in April 1992. The Bank has also worked with the World Health Organization, United Nations Industrial Development Organization, and other agencies in their preparations for the Rio conference.

Co-operation with the rest of the UN family took a number of forms. The Bank participated in the Twelfth Annual Meeting of the Committee of International Development Institutions on the Environment (CIDIE) which met in Washington DC in April/May 1991. Topics covered included relations with nongovernmental organizations; the UNCED conference; and the Global Environment Facility (GEF). The Bank also continued to work closely with other development banks and international economic institutions. It undertook a joint study of the economy of the USSR with the International Monetary Fund, the European Bank for Reconstruction and Development (EBRD), and the OECD. The Bank also worked with the European Investment Bank (EIB), the Nordic Investment Bank and EBRD on the new Baltic Sea clean-up program. Bank staff were regular participants in OECD meetings on issues related to environmental economics and the global commons. In addition to project co-financing, close co-operation was maintained with the regional development banks on policy issues. A conference on rainforests in west and central Africa was co-sponsored with the African Development Bank, and staff worked with the Asia Development Bank on a review of economic policies for sustainable development in Asia.

Bank officials also participated in numerous international conferences and seminars during the year in which the environment featured prominently. The President of the Bank played an active role in this respect. Speaking at The Observer newspaper conference on the environment held in London in March 1991, he said "environmental success and failure has already yielded one invaluable truth: that development and environmental protection are mutually dependent". In his address to the summit meeting of the Organization of African Unity in Abuja, Nigeria, in June 1991, he pledged Bank support to Africa's quest for economic progress matched by environmental betterment; he noted that broad based environmental action plans were required, and that the linkages between agriculture, population and environment needed to be recognized, and appropriate actions taken to preserve Africa's patrimony.

Another important international conference at which the Bank was represented was the Environment for Europe Conference held in Prague in June, 1991. The Environment Department continued publication of its quarterly Environment Bulletin, providing a regular update on the Bank's environmental research and lending to some 12,000 subscribers around the world. And the joint Bank/International Monetary Fund publication, Finance and Development, increased its in-depth coverage of environment issues.

Global Environmental Facility and Montreal Protocol

The fiscal year was marked by the creation of the Global Environmental Facility (GEF). It was established by representatives of a group of industrialized and developing countries in Paris in November 1990. At a Board meeting on March 14, 1991 the Executive Directors reviewed and endorsed the agreement to establish the Facility.

The GEF is a three-year pilot program providing grants and low interest loans to developing countries to assist them in carrying out programs to address global environmental problems in four areas:

- * reducing the emission of greenhouse gases which cause global warming;
- * preserving biological diversity and maintaining natural habitats;
- * arresting the pollution of international waters; and
- * protecting the ozone layer from further depletion.

The GEF consists of the "core" trust fund (GET) thus permitting various cofinancing arrangements. Funds will be committed over a three year period. The GEF's ozone protection role will be coordinated with that of the Montreal Protocol on substances that deplete the ozone layer, which already has its own interim multilateral trust fund. Under the Montreal Protocol, US\$240 million has been pledged to help developing countries move away from the use of ozone-depleting substances. The link between the GEF and the Montreal Protocol is important not only because of the technological relationships involved (chlorofluorocarbons are a major contributor to the "greenhouse effect") but also because the two initiatives together reinforce the principle of collective insurance against severe global environmental damage.

Some 25 countries have contributed to the GEF through direct contributions to the GEF's trust fund and, in the case of three countries, through joint financing schemes. The Bank also

made a direct contribution to the trust fund of SDR 27 million (\$ equivalent) as a transfer from its net income.

The GEF is co-managed by the Bank, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). The bank chairs the GEF; administers the Facility's trust fund; prepares and disseminates policy and strategy papers on issues of direct and substantive interest to the GEF; and identifies, appraises and supervises GEF-funded investment projects. UNEP provides scientific and technological guidance and has convened a Scientific and Technical Panel (STAP) to provide advice on broad scientific and technical issues. UNDP coordinates and manages pre-investment and technical assistance activities. Through its resident representative offices in over one hundred countries, UNDP plays a role in identifying projects and communicating with recipient governments. UNDP will also manage a small grants window for local NGOs.

During the year, GEF donors (called Participants) met twice. In addition to the Paris meeting where the establishment of the Facility was approved, the donors met in Washington to review overall progress in setting up the Facility, to determine the operational modalities, and to review the work program for the first group of GEF projects. A number of policy issues were also discussed.

By the end of FY91, some 26 projects had been presented for review to the participants. They included fifteen investment projects with an estimated total cost of \$214 million. They are expected to be approved by Bank management by the end of calendar year 1991. Of these, eleven are biodiversity projects (averaging \$15 million each); three are global warming reduction projects (averaging \$15 million); and one international waters project. The other eleven projects are technical assistance projects managed by UNDP. Their total cost is estimated at \$59 million.

From the outset, the Participants have stressed the need for the GEF to move as rapidly as possible to an operational mode. Four broad principles have been adopted to achieve this objective: (i) that no new GEF structure would be created; (ii) that modest modifications to existing institutions and organizational structures of the implementing agencies would be made; (iii) that emphasis would be placed on consensus building and informal working arrangements; and (iv) processes for ensuring the technical and scientific integrity of proposed GEF activities would build upon outside expert scrutiny. The Chairman of the GEF plays an important role in fostering the collaboration and cooperation needed between the implementing agencies and the Participants. Important policy issues may, at the Chairman's discretion, be submitted to the Heads of the implementing agencies at their regular meetings. At the working level, meetings between the agencies will play a key role in reaching consensus on program and policy matters. The STAP will provide an independent view of the validity of the scientific underpinnings of the GEF and technical review procedures have been established to ensure scrutiny by outside experts.

The GEF has moved rapidly into its operational phase. The first investment project (s) was/were approved on However, the GEF represents more than simply a portfolio of

investment and technical assistance projects. It is also an opportunity to test new approaches, policy instruments, and regulatory frameworks, and with this in mind, a policy and strategy work program is underway (see Section VI).

Collaboration with Nongovernmental Organizations

Over recent years the Bank has tried to expand interaction with many different kinds of NGOs, from community associations to private voluntary organizations, and environmental organizations. Social and environmental aspects of development have dominated the dialogue which covers both projects and policies. Sub-Saharan Africa has historically had the largest share of NGO-associated projects, but Asia and Latin America and the Caribbean, are catching up. The bulk of projects have been in agriculture and rural development. Recent years, however, have seen a growing NGO involvement in Bank-supported "social-dimensions-of-adjustment" work and environmental projects. Today, nearly 80 percent of NGO-associated projects involve either indigenous intermediary NGOs or grassroots groups.

The Bank expects its borrowers to take full account of the views of affected groups and local NGOs in project design and implementation, and, in particular, in the preparation of environmental assessment reports. To keep NGOs informed, some 250 of them around the world receive the Bank's Monthly Operational Summary which in 1990 began to categorize planned projects in terms of their likely environmental impact. A list of upcoming Bank-supported operations in which Bank staff see potential for NGO involvement is also published.

The rapid expansion of NGO involvement and interest in Bank-financed operations has occurred against a backdrop of intensified discussion between NGOs and the Bank on policy issues related to the environmental and social aspects of development. A growing number of NGOs have attend the annual meetings of the Bank and the International Monetary Fund, where special seminars on Bank policies are now a regular feature. Topics covered during the annual meetings in September 1990 included environmental assessment, the Global Environment Facility, and forest policy. In April 1991, the Bank organized consultation for NGOs to pursue discussion on forest policy. Some 65 representatives of environmental groups and development NGOs, including 25 from developing countries, participated in the meeting. This was the first time the Bank has involved NGOs in the development of an operational policy document.

NGOs have also played a role in the Global Environment Facility (GEF). From the outset, NGOs have provided specialized scientific and technical knowledge in project identification, review and preparation. In addition to providing project services for government-sponsored projects, NGOs have access to a US\$5 million Small Grants Window for biodiversity projects. NGOs also engaged in dialogue with the implementing agencies on broader questions on GEF and policy and strategy. As part of this process, the implementing agencies are to hold a special forum for NGOs on the day before each biannual meeting of GEF participants.

The NGO-World Bank Committee, formed in 1982, provides a formal, international

forum for policy discussions between senior Bank managers and NGO leaders from around the world. At its tenth annual meeting in Washington in November 1990, a session was devoted to environmental assessment and related issues. At a meeting in Senegal, in March 1991, the steering committee of the NGO-Bank Committee met with the head of the Bank team charged with writing the *World Development Report 1992* which will focus on the environment and development.

Popular participation in development decision-making has been discussed frequently in the NGO-Bank Committee over recent years. This dialogue helped set the stage for the launch in fiscal 1991 of a three-year Bank-wide program which will focus on how the Bank may need to modify its operational policies to encourage broader popular participation.

External Training - Economic Development Institute (EDI)

EDI continued to give high priority to environment in its program for FY91. Environmental Assessment training for developing country project managers and administrators was of particular importance. During the year EDI continued the series of national EA seminars started in early 1990. Six took place in the Latin America and Caribbean region (Argentina, Bolivia (2), Chile, Paraguay, and Uruguay) and one in Egypt. EDI also contributed to a seminar in Botswana managed by the African Region's Environment Division (AFTEN). In addition, and jointly with AFTEN and the University College (Dublin), EDI conducted a seminar in Ireland where a number of countries from the Africa region presented and compared experiences with the preparation and use of National Environmental Action Plans.

EDI also initiated collaboration with the Amazon Cooperation Treaty Secretariat through its support of the meetings of three of the six Special Committees responsible for forming an integrated strategy for the sustainable development of Amazonia and the 25 million people who live in the Amazon Basin (which extends to eight countries). EDI supported the meetings on Science and Technology, Transport and Health (which linked closely with other meetings on the Environment), and Indigenous Peoples and Tourism.

An EDI seminar on the Environmental Management of Water Resources was held in Malaysia in June 1991. It follows on from a similar seminar on Water Resources and the Environment held in Thailand a year earlier. On the same topic, EDI is contributing to, and assisting in the management of, a Bank International Workshop on Comprehensive Water Resources Management Policies to be held in Washington D.C., also in June 1991.

EDI conducted a major seminar on energy investments and the environment, in Washington D.C. in October 1990. A similar seminar in French will be held in France in June 1991. An African francophone seminar on energy policy and planning, which included attention to the environment was held in Senegal, during the year.

In addition to the training materials developed for each of the above activities, the

following generic and model material was produced in FY91: a NGG chart the area in the second chart the chart the second model curriculum for a seminar on EA with recommended readings for each terms session (to be included in the EDI Review for October 1991). The design of a training program on Environmental Assessment; with supporting training material and list of references.

- Guidelines for Trainers to accompany the World Bank Environmental Assessment Sourcebook. This is designed initially for the training of Bank staff, but will later be used for training others.

Other Financing Mechanisms

<u>Technical Assistance</u> Over the last few of years, increasing amounts of grant money from bilateral donors have been made available - through the Bank - to help developing countries design better environmental projects and policies. A major objective of the technical assistance grants program is to facilitate project preparation, which until recently has been a major obstacle to the development of environmental projects. When the technical assistance program was set up in 1989, it was expected to become a multilateral program underwritten by several donors. Japan has been the main contributor and in FY91 made two additional grants totalling some US\$25 million. ______ and ______ also contributed to the program during the year, in the amounts of US\$______ and US\$______ respectively.

During the year the program financed a wide range of project preparation and other preinvestment activities. They include a grant of \$241,000 to Egypt for the preparation of an agriculture project and US\$900,000 to Paraguay for a land-use plan, forest and watershed management, and environmental training. Another grant to Cote d'Ivoire is being used to establish a national natural resource management and land use plan. Another is being used for the preparation of an industrial pollution control project in Thailand. In Yugoslavia, the program is assisting in the preparation of the Sava River Environmental Project designed to reduce water pollution in the upper Sava River Basin. The Mexico City Transport and Air Quality Management Project, aimed at reducing pollution caused by the transport sector, also received a grant from the program.

<u>Debt-for-Nature Swaps</u> To date, non-governmental organizations have helped arrange 16 debt-for-nature transactions in several countries, including Bolivia, Costa Rica, Dominican Republic, Ecuador, Madagascar, the Philippines, Poland and Zambia. Funding has come from the NGOs themselves, donor governments, and a commercial bank. The face value of the debt involved in these swaps has been about US\$97 million.

The debt-for-nature swap mechanism as it has developed is not directly applicable to the Bank as an institution which lends to governments. The Bank neither purchases debt from commercial banks nor lends to NGOs for that purpose. Adjustment loans may, however, contain environmental components. In IBRD countries where there is a program for debt and debtservice reduction, a portion of such adjustment loans may be set aside for debt repurchase or exchange, within the guidelines for such operations. Local currency resources thereby released could then be available to finance environmental activities. In the case of IDA-only countries, finance for debt and debt-service reduction could be provided through the Debt Reduction Facility, though funds allocated to the facility are limited. In addition, the Bank has facilitated debt-for-nature transactions by bringing concerned parties together and by helping to create the institutional capacity for such assistance to be absorbed efficiently. It will continue to seek opportunities to assist the international environmental community in this way.

IX: The FUTURE DIRECTIONS Generating a purpose. A crustiment sector that the sector in the sector in

As the preceding sections indicate, the World Bank has continued over the last year to step up its environmental activity. This has been exemplified in its use of the various instruments it has at its disposal, ranging from research to lending operations. Two ma aspects of the Bank's environmental work a forestry and energy efficiency - have be extensively reviewed during the year, and more pro-active environmental approaches are being developed in each area. The work of the team preparing for the 1992 World Development Report has done much to stimulate thinking throughout the Bank about environmental issues, and will help lay the foundation for its future program of research.

The last several years have witnessed a rapid evolution in both the perception and the reality of the environmental problems facing the planet. Of major significance has been the growing recognition that partnership between industrialized and developing countries is indispensable if sound environmental management on a global scale is to be achieved. This principle has become evident in many ways; by a shifting of priorities by governments and international and bilateral development agencies, and by innovative financing mechanisms such as debt-for-nature swaps.

Most significant of all however has been the major international co-operative effort which resulted in the Montreal Protocol and the establishment of the Global Environmental Facility. Establishment of the GEF and the Ozone Fund recognizes that developing countries require compensation for the incremental costs they bear in addressing "global commons" issues, particularly since the industrialized countries are primarily responsible for the problems occurring in the first place. The GEF and Ozone Funds established a precedent of immense importance; it will be a major test for the international community in general, and the Bank, UNEP and UNDP in particular to demonstrate the full potential of this type of funding mechanism over the next two or three years. This requires inter alia that eligibility criteria will be satisfactorily determined, and a substantial and innovative program of investments and policy reform addressing key global concerns will emerge.

Experience gained during fiscal 1991 has reinforced a number of principles that had guided the Bank's environmental work in the preceding years. The importance of institutional capacity-building; the multidisciplinary nature of issues; the necessity of public participation; and the role of economic instruments has been illustrated repeatedly in Bank operations. Also illustrated, perhaps most dramatically in the case of Eastern Europe, is the fact that market liberalization, in general, is a necessary condition for sound environmental - as well as economic - management. If prices do not reflect real costs there is no incentive to use resources efficiently and avoid waste. However, experience has also shown that a free market is not a sufficient condition for environmental improvement. Where external costs arise, public intervention, and the consequent need for capacity-building, must be developed.

Moreover, since conflict tends to be characteristic of environmental problems, market liberalization must be accompanied by political liberalization. Those adversely affected by environmental degradation must be able to articulate their concerns, and stimulate the appropriate remedial action. If the environmental consequences of projects or policies are to be handled properly, participation of affected people must be ensured. This will continue to be a major Bank objective in its future lending operations as a complement to economic reform.

Developing and industrialized countries alike continue to be concerned about the cost of environmental protection, and the trade-offs between short term economic growth and long term sustainable development. Clearly, such trade-offs exist, but there also remain many opportunities for policy reform and investment which meet both economic and environmental criteria. The Bank will continue to give priority to projects and policies which satisfy both objectives. Reduction in rates of population growth and technical progress are key elements of any long term strategy. Population and human resource development work will, therefore, continue to be integral to the Bank's overall environmental program.

A major thrust of the Bank's environmental work in the last few years has been to been to complement its concern for individual projects with greater attention to overall policy measures which influence environmental behavior. Research projects to better understand the relationships between trade and fiscal policy on environment are under way; numerous environmental action plans and sector-specific analyses of environmental issues are being completed; and environmental policy loans, and adjustment loans with an environmental focus are also being made. This represents a major change in approach in recent years, but more still needs to be done. Applied research, accompanied by training on environmental issues for country economists, will continue to be an important feature of the Bank's environmental work program in the coming year. Annex I. World Bank Organization Chart

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Annex II. Projects with Environmental Components or Objectives Fiscal 1991

This annex provides details on ______ of the _____ projects approved in fiscal 1991 that had environmental components. These projects cover countries from all four regions of the Bank: Africa, Asia, Latin America and the Caribbean, and Europe, Middle East, and North Africa. The list illustrates the range of environmental components included in Bank projects.

[NOTE: This preliminary list clearly does not conform to the 50 percent criteria referred to in Section IV. The Annex will be completed when a decision is made about whether or not the 10 percent or 50 percent indicator will be used].

Country	Project	Environmental components
AFRICA		
Benin	Second Structural Adjustment Program	Introduce policies to give rural population the responsibility of managing natural resources (e.g., increased security of land tenure; preparation of land tenure code); preparation of an Environmental Action Plan to develop a national capacity for identifying, studying and formulating action plans, and defining national policies on environmental protection and natural resource management.
Botswana	Tuli Block Roads Project	Construction phase of project to address environmental protection issues (e.g., stripping of vegetation, storage of topsoil, protection of trees within road reserve); archaeological surveys to preserve national resources and archaeological sites.
Burkina Faso	Education IV	Training programs for teachers to integrate environmental education into teaching methodology; Project to support the IDA Environmental Management Project by providing education infrastructure and services required by beneficiary communities.
	Environmental Management Project	Provide support to about 120 communities in designing and implementing Terroi Management Plans and forest protection program; technical support for existing

	97	
Country	Project	Environmental components
		natural resources management operations in 18 provinces; establish national environmental and project impact monitoring systems.
Burundi	Energy Sector Rehabilitation Project	Improved energy efficiency through reforms in charcoal, wood pricing and woodfuels consumption; training to improve charcoal production techniques; improved stoves program.
Central African Republic	Enterprise Rehabilitation and Development Project (ERDP)	Subloans to be granted under the project are required to make an environmental assessment of any significant environmental impacts; training programs under the project to cover environmental issues including occupational health and safety standards.
Chad	Petroleum and Power Engineering Credit	Technical assistance to address environmental issues related to project; preparation of an environmental assessment.
Comoros	Highway Maintenance Project	Repair of road drainage to reduce erosion and flooding risks; technical assistance to develop local capacity to evaluate environmental impacts of road works.
Congo	National Agricultural Extension and Adaptive Research Project	Adaptive research on fertility managemen (e.g., legume fallow/cover crop rotation mulching techniques, alley cropping) training on soil/moisture conservation and plant protection.
Cote D'Ivoire	Women in Development Pilot Support Project	Rural programs to include primary healt care, potable water, conservation of fish improved stoves for fuelwood efficiency crop rotation, and agro-forestry techniques
Djibouti	Second Urban Development Project	Rehabilitation/construction of drainag networks and storm water collectors of prevent flooding in low-lying areas; wate supply and a sewerage systems.
Equatorial Guinea	Crop Diversification and Agricultural Services	Introduction of cropping systems in improved land use and soil conservation

	98	
Country	Project	Environmental components
	Project	practices (e.g., alley cropping systems).
Ghana, Republic of	Agricultural Diversification Project	Technical advise to farmers on site selection to prevent soil erosion; agreements not to use toxic agrochemicals and compliance with IDA's Environmental Guidelines; construction of an effluent treatment facility near palm oil/rubber processing mills.
	Second Health and Population Project	Improvement in the quality and coverage of the primary health care; immunization program.
	Second Transport Rehabilitation Project	Support of community-sponsored activities to improve, well-water supply and the environment through involvement of local NGOs; drainage facilities to avoid erosion and siltation; increased road traffic safety.
	Structural Adjustment Program II (Supplement)	To study the environmental consequences of rapid population growth and expansion of food production.
Guinea-Bissau	Energy Project	Petroleum barge to be provided with fire protection equipment and facilities for cleaning accidental oil spills; personnel training in the prevention of oil spillage; installation of oil-water separator
		and incinerator to dispose of waste oil and fuel and prevent contamination of the water table.
Kenya	Export Development Project	Water supply and sewerage/industrial waste treatment facilities; preserve "greenbelts" around industrial site to safeguard woodland and wildlife; implement land zoning to preserve wildlife access to Nairobi National Park.
	Forestry Development Project	Conservation/protection of indigenous forest resources, soil and water on forest, farm and range land; technical assistance in farm forestry extension and agroforestry; preparation of land use plans for rational use of forest land; improvement of forestry infrastructure, forestry research (through upgrading facilities and staff proficiency),

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Country	Project	Environmental components
		forestry education (i.e., develop curricula on farm forestry and forest management), and forest extension services; preparation of a forestry development master plan; strengthen planning and implementation capacities of forestry agencies.
	Second Agricultural Sector Adjustment Operation	Policy analysis component to strengthen the process for environmental, natural resource conservation and land use planning; soil testing in various agroecological zones to make the use of fertilizers environmentally sound.
	Second National Agricultural Extension Project	Develop natural resource conservation prototypes arid/semi arid areas; technology dissemination to assist farmers in soil and water conservation; integrated pest management.
Madagascar	Health Sector Improvement Project	Integrated disease control programs for communicable diseases; primary health care services and sanitation programs; training in safe application of pesticides (e.g., DDT for the control of malaria).
Malawi	Financial Sector and Enterprise Development Project	Evaluation of Industrial Sites Component to determine potential adverse environmental effects; subproject design to include measures to minimize adverse environmental impacts; subprojects with environmental effects that cannot be mitigated would not be eligible for financing from the IDA credit funds.
	Fisheries Development Project	Research activities to conserve Malawi's natural resource base of water bodies (e.g., assessment of fish stocks; pilot lake conservation and management programs; fish farming models to integrate aquaculture into farming systems in different ecologic zones; quatic weeds control etc.
Mali	Agricultural Services Project	Adaptive research programs to cover soil and water conservation, cropping systems and ecologic zones, and soil fertility;

	100	
Country	Project	Environmental components
		national extension program to strengther relations between crop, livestock and environmental services; forestry development programs.
	Second Health, Population and Rural Water Supply Project	Immunization programs; rural water suppl to benefit 180,000 people.
Mauritius	Environmental Monitoring and Development Project	Preparation of a National Physica Development Plan to guide the Spatia development of Mauritius (e.g., land us control, infrastructure investment an environmental management at local levels establishment of environmental laboratories site selection and design for an industri- park including roads, water supply drainage, etc; national solid wass management plan; research on integrate pest management; marine conservation.
Mozambique	Agricultural Rehabilitation and Development Project	Development of sound integrated per management practices; National Irrigation Development Master Plan to deal with water resource management studies for major river basins in the country; irrigation development.
Niger	Public Works and Employment Project	Drainage network cleaning, including sma sanitation works, water and so conservation, garbage collection, plantin and park works, etc.
Nigeria	Oso Condensate Field Development Project	Project design to prevent environment damage: e.g., drilling operations to subject to current international regulation and practices regarding blow-out preventi- as well as instituting fire and tubular latest metallurgical alloys to inhibit corrosion; use of corrugated plat interceptor and induced gas flotation unit process oily waters before discharge into the sea.
	National Water Rehabilitation Project	Develop policy guidelines for design a maintenance of water supply systems, wa

	101	
Country	Project	Environmental components
		quality standards, and standards for water treatment chemicals, establish and maintain a water resources and water quality data base for surface and groundwater sources used for domestic and industrial purposes; special studies on pollution and water quality; agreement to formulate dam and reservoir maintenance programs to ensure that their operation would not constitute a risk to environmental health.
Rwanda	First Education Sector Project	Reform primary education curricular to include subjects on environment.
Tanzania	Agricultural Adjustment Program	Use of fertilizer products to be reviewed to determine if they properly address environmental issues; proposed closure of a fertilizer factory to reduce environmental damage to land, shore and groundwater.
	Petroleum Sector Rehabilitation Project	Measures to reduce oil pollution and spillage/leakages: e.g., energy conservation; pollution control and rehabilitation of refinery and pipeline facilities; construction of new depots to include fire and safety equipment as well as pollution control equipment.
Togo	Fourth Structural Adjustment Program	New Rural Development Strategy to include protection and rehabilitation of the environment with active participation from local communities; formulate a rural youth settlement policy to deal with land tenure; cropgrowing, stockraising and reforestation; integrated strategy of soil conservation.Population and Health Sector Adjustment Infections disease prevention; improving environmental sanitation.
Uganda	Agricultural Sector Adjustment Credit	Land Policy Research Program (e.g. promote rational land use/management; protect forest and wildlife research; develop policies for accessing communal grazing lands); agreement that procurement of pesticides and other agrochemicals to meet Bank guidelines.

Country	Project	Environmental components
	First Urban Project	Improvement of urban services: e.g., provision of water facilities rehabilitation of solid waste collection and disposal system, upgrading of urban markets, maintenance of urban roads and storm drains.
	Livestock Services Project	National animal disease control; forage development; training and technical assistance.
Zaire	Education Sector Rehabilitation Project	Introduction of environment themes in school curricula, with participation by World Wildlife Fund.
	Pilot Feeder Roads Project	Monitoring and evaluation of the project's environment impacts; repair of road drainage system; technical assistants to develop local capacity to evaluate environment impacts of road works and design remedies.
	Social Sector Project	Development of new policies on population and environment with special attention to public health and human ecology operational support to the expanded program of immunization; technical support for preparing a National Environment Action Plan; technical assistance for sanitation in urban areas, pest management, ar
		introduction of new techniques for environmental protection.
Zambia	Economic Recovery Program	Support to basic health and sanitation service.
ASIA		
Bangladesh	Agricultural Support Services Project	Technical assistance to support the technology transfer, involving better use water resources and evaluate environment issues; promote the use of green manual advise farmers on the optimal use pesticides and promote integrated per management techniques; Subject Matt Specialists would receive specific overse

	103	
Country	Project	Environmental components
		training in environmental planning and protection.
	Shallow Tubewell and Low Lift Pump Irrigation Project	Irrigation development; nationwide environmental monitoring system to ider the effects of irrigation on resource (e.g., groundwater pollution, potable water supplies, fisheries).
	Third Inland Water Transport Project	Create an environmental map of the waterway system to identify specific environmentally sensitive areas; provide test facilities for dredge materials/bottom sediments and training of personnel in the use of equipment; technical assistance to the
		department of shipping to develop regulations for the protection of inland waters.
China	Fourth Rural Credit Project	Introduction of a mandatory Area Management Plan to achieve sustainable rangeland livestock production system; fishery development; water supply and drainage networks (to prevent fish pond water contaminating other bodies of water); investment in fruit trees would reduce soil erosion.
	Jiangsu Provincial Transport Project	Rehabilitation of the Grand Canal at Danyang to improve water quality and to eliminate erosion; environmental and resettlement plans were reviewed by the Bank and found satisfactory.
	Key Studies Development Project	Research and training to address environmental issues; establish state laboratories in environmental geochemistry and geo-engineering; research areas to include atmospheric physics, river mouth
		sedimentation, natural disaster, etc.
	Liaoning Urban Infrastructure Project	Technical assistance for institutional development in water supply, water conservation, water pollution control (e.g., develop effective methods for industrial
		wastewater treatment) and for strengthening environmental protection laws/regulations;

	104	
Country	Project	Environmental components
		procurement of equipment for environmenta pollution monitoring.
	Medium-Sized Cities Development Project	Provide pollution monitoring equipment to Environmental Protection Bureaus; improve city-wide compliance with national industria wastewater discharge standards.
	Mid-Yangtze Agricultural Development Project	Irrigation development; contour terracing green manuring to improve soil fertility system for monitoring disposal o agricultural wastes and the safe use o agrochemicals.
	Rural Industrial Technology (Spark) Project	Technology development for mitigating adverse environmental impacts of rura industrialization; Environmental Protection Bureaus to prepare land use planning may and to enforce strict zoning regulations fo potentially polluting industries; agreement that all activities to be supported by Project should fully comply with national/locat regulations for environmental protection.
	Shanghai Industrial Development Project	Install sewer interceptor and collection systems to reduce organic pollution load into Suzhou Creek; adequate expenditur allotted for controlling environments pollution.
India	Industrial Pollution Control Project	Promote effective enforcement of existin legislation on environmental protectio regarding industrial sources; suppor assessments, extension services and researce in waste minimization, resource recover and pollution abatement in industry; focu on the chemical and related industries.
	Maharashtra Rural Water Supply and Environmental Sanitation Project	Expanding access to potable rural wate supply systems and environmental sanitation facilities; strengthen the institutional capacit to promote improved environment sanitation.
	Private Power Utilities (TEC) Project for the Tata	Control sulphur dioxide emissions from co and oil fired power plants (e.g., use of flu- gas desulplurrization; plant design to me

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Country		Project	Environmental components
			Government standards.
	×	Andhra Pradesh Cyclone Emergency Reconstruction Project	Cyclone reconstruction operations and programs for mitigation of future similar disasters strengthen institutional capabilities in cyclone preparedness and mitigation; irrigation and drainage; rural water supply; tidal and flood protection embankments; technical assistance to develop a plan for water management in delta upland river areas.
		Agricultural Development Project - Tamil Nadu	Protection of rainfed areas under ecological stress; agriculture extension (e.g., soil/water management, fodder development and tree farming); technical support for watershed development, livestock development; forestry development; rural water supply; staff training on use and handling of pesticides.
		Maharashtra Rural Water Supply and Environmental Sanitation Project	Upgrade water supply and drainage schemes (e.g., construction of piped water supply schemes, main line drains, cross drains and disposal pits); development and implementation of an environmental sanitation strategy (e.g., programs to increase latrine usage, improved solid wastes management, etc.); health communications program to increase community awareness of the caused problems and need for a clean
			environment.
	8	Second Technician Education Project	Curriculum development to incorporate environmental concerns into existing curricula or prepare new ones on the environment.
		Second Petrochemicals Development Project	Agreements to design and operate project facilities to meet national/local environmental discharge standards for liquid, gaseous and solid wastes, as well as health and safety standards.
Indonesia		Agricultural Financing Project	Staff training for participating banks to better understand risks of agricultural/agribusiness operations,
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Country	Project	Environmental components
		requirements of environmental regulations, and environmental impacts of activities to be supported by Project, and to mitigate possible adverse effects on the environment.
	Fertilizer Restructuring Project	Studies to assess the environmental impact and standards of the fertilizer industry, including identification of long-term objectives for environmental improvement and preparation of an environmental management program.
	Provincial Irrigated Agriculture Development Project	Irrigation works including minor canal and drainage systems; flood protection works; environmental protection including forest surveys and erosion control; survey of land use in catchment areas of project schemes.
	Second Higher Education Development Project	Assistance to 12 Environmental Study Centers in developing environmental expertise and advising local, regional, and national government agencies, and private businesses on complex environmental problems; provide funds for management training, staff development, research and equipment as these relate to environmental planning and management.
	Third Jabotabek Urban Development Project (JUDP III)	Strengthen pollution control and environmental protection in the Jabotabek region (e.g., preparation of a natural resources inventory; provision of water supply and drainage services; solid waste management); feasibility studies to prepare environmental projects dealing with industrial wastes treatment.
	Urban Development Project in the Provinces of East Java and Bali	Improve infrastructure development covering water distribution system, solid waste management, drainage and sanitation; institutional development to strengthen local government capacity to handle community participation in environmental management.
	Yogyakarta Upland Area Development Project	Improve upland productivity via soil conservation measures and soil stabilization
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Country	Project	Environmental components
	(Bangun Desa II)	with microwatersheds; on-farm technology displays covering vegetative conservation (e.g., fodder legumes to stabilize slopes), alley-cropping, etc. to strengthen technical basis for intensive microwatershed development in the uplands.
Lao People's Democratic Republic	Highway Improvement Project	Road design to include measures to prevent downstream erosion and siltation.
Nepal	Urban Water Supply and Sanitation Rehabilitation	Water supply rehabilitation (e.g., repairs of service reservoirs, repair/replacement of chlorination plants, etc.); groundwater treatment plants (for iron, ammonia and manganese); rehabilitation of sewer system and sanitation (e.g., provide over 15,000 toilets in unsewered areas).
Papua New Guinea	Public Sector Training Project	Overseas fellowship to be award in the following areas: policy relating to natural resource management, and environment and conservation; fellowship to cover the Department of Agriculture and Livestock, Minerals and Energy, Fisheries and Marine resources, Forest, etc.
	Special Interventions Project	Drainage improvement on national roads technical assistance for expansion of urbar services (e.g., water supply, sewerage waste disposal, etc.).
Philippines	Cottage Enterprise Finance Project	Pollution-abatement assistance to cottage enterprises; technical advice on waste minimization and waste treatment for firm in electroplating, leather tanning, and food processing.
	Earthquake Reconstruction Project	Reconstruct essential infrastructure includin damaged irrigation system; technica assistance to mitigate earthquake damage is the future, including the provision of training in geology and seismology and the procurement of equipment for seismologica studies.
	Industrial Restructuring	Strengthen the institutional framework for

Country	Project	Environmental components
	Project	environmental protection through training and technical assistance; investments in energy conservation and pollution control; support to Environmental Management Bureau to carry out industrial environmental audits and develop generic environmental impact assessments.
	Second Communal Irrigation Development Project (CIDP II)	Construction of new (10,000 ha) and rehabilitation of existing (15,000 ha) communal irrigation systems; erosion and pest management control; soil and water conservation; technical assistance to strengthen National Irrigation Administration capacity to manage communal irrigation system and improve its ability to assess micro-catchment hydrology.
Sri Lanka	Third Roads Project	Rehabilitation/construction of drains and cross-drainage structures damaged by floods to prevent pollution of water courses and groundwater.
	Poverty Alleviation Project	Rural works program, including watershed protection and soil conservation/soil forestry, irrigation maintenance and rehabilitation, water supply, and village sanitation.
Fhailan d	Second Land Titling Project	Grant secure documented tenure to rural landholders that would serve as an incentive to invest in land improvements, reduce encroachment into forest reserves and minimize shifting cultivation practices.
Vanuatu	Housing Project	Land development component to include piped municipal water supply, roads with drainage, and on-site sanitary systems (e.g. septic tanks, latrines).

EUROPE, MIDDLE EAST AND NORTH AFRICA

Iran

Earthquake Recovery

Develop long-term measures for seismic risk

Country	Project	Environmental components	
	Project	prevention and mitigation; improve seismic design standards in the reconstruction of housing.	
Jordan	Emergency Recovery Project	Develop long-term measures for seismic risk prevention and mitigation; improve seismic design standards in the reconstruction of housing.	
Morocco	Port Sector Project	Technical assistance to strengthen environmental capabilities and raise environmental awareness in the port subsector; study to develop criteria for environmentally sound disposal of dredging materials; agreement that sub-projects would be designed according to acceptable environmental health and safety standards.	
Pakistan	Microenterprise Project	Assessment of the adequacy of environmental protection measures in lease contracts; compliance by leasing companies to environmental guidelines issued by Bank.	
	Sui Northern Gas Pipelines Limited (SNGPL)	New purification plant would remove hydrogen sulphide and carbon dioxide from Sui gas; flare stack to be designed in compliance to Bank's emission guidelines; installation of an air quality monitoring system at plant and personnel training to operate the system.	
	Environment Protection and Resource Conservation	Will upgrade management of rangelands, and watersheds, and rehabilitate coastal areas and wildlife habitants. Strengthening of environmental agencies at central and provincial levels.	
Poland	Structural Adjustment Loan	Government to review and revise curren system of laws and regulations affecting environmental management; adoption of new and adequate environmental standards by industrial enterprises.	
Tunisia	Hospital Restructuring Support Project	Study to assess the handling of medica wastes, and training fellowships fo managerial hospital staff in charge o	

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Country	Project	Environmental components
		environmental hazard protection.
Turkey	Technology Development Project	Strategic studies on energy conservation technology relating to needs of the Turkisi industry; applied research laboratories environmental/chemical informatio technology; introduce environmenta safeguards in disposal of liquid and soli wastes from laboratory tests.
Yemen	Secondary Teacher Training Project	Establish Science Resource Centers a improve environmental education curriculum and textbook development is environmental science; review of the environmental component in the science education program.
	Multi-Mode Transport Project	Construction of side drains, cross drainages structures and retaining walls to prote areas adjacent to road from erosion.
LATIN AMERICA A	ND THE CARIBBEAN	
Argentina	Public Enterprise Reform Adjustment Loan	Proposal to establishing norms as regulations for an adequate control of t environmental consequences of pub enterprise operations.
	Agricultural Services and Institutional Development Project	Animal health and phytosanitary component to provide mechanisms to control disease pests and amount of chemical residues foodstuffs; program to monitor fisher resources and determine maximus sustainable catches; research to impro- forest plantation management.
	Provincial Development Project	Construction of public infrastructu including drainage, water supply a sanitation facilities; technical assistance strengthen institutional capacity of province governments to screen investments and environmental assessments.
	Water Supply and Sewerage Sector Project	Upgrade the quality of water supply a sewerage services; introduce metering

Country	Project	Environmental components
		increase efficiency of water use, reduce wastage and amount of sewage disposal; develop regulatory framework to encourage private sector in provision of water and sanitation services; develop institutiona capabilities to assess the environmental impacts of sector projects.
Bolivia	Agricultural Technology Development Project	Establish a research program for pasture management and crop production to preven wind erosion problems in the Altiplano research on varietal resistance and biologica control of pests and diseases to obviate need for heavy use of toxic agrochemicals.
	Major Cities Water and Sewerage Rehabilitation Project	Expand water distribution and sewerag networks to benefit a population of about one million; improve the institution capacities of central agencies for overseein the water sector.
Brazil	Science Research and Training Project	Support for environmental science to complement the recently approve Environment Project which focuses of strengthening the capacity of governme environmental agencies to deal wi environmental problems.
Colombia	Industrial Restructuring and Development Project	Technical assistance to industrial enterprise to improve their pollution control measures investments to help reduce hazardo emissions; technical assistance to support Environmental Pollution Control Program the National Planning Department; sta- training.
	Rural Development Investment Program	Cofinance watershed management a environmental protection projects in the Andean zone: investments to protect so and vegetation in critical catchment area increased sustainability of agricultur production through agroforestry as applications of soil conservation technique training and community organization programs in support of watersh
		management and environmental protect projects.

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Country	Project	Environmental components
Ecuador	Lower Guayas Flood Control Project	Construction of bypass (flood relief) channels to rivers that cause most of the floods; drainage improvement works to benefit an area of about 61,000 ha; support for land titling to encourage farmers' willingness to invest in on-farm improvements; specific interventions to improve the ecology of the Guayas Basin (e.g., institutional strengthening, master plan development, integrated pest management, mangrove management and exploitation, and
	Environmental Technical Assistance	environmental monitoring). Improved institutional and policy framework; protection of natural areas, encouragement of small scale forestation programs; watershed protection.
	Municipal Development and Urban Infrastructure Project	Construction and rehabilitation of public infrastructure (e.g., water, sewerage, storm drainage, solid waste collection and disposal), and parks; program to help municipalities develop the capacity to do environmental impact assessment of infrastructure investments.
Haiti	Economic and Social Fund Project	Health components (e.g., immunization program and epidemic control); construction of small water supply and sewerage systems.
Honduras	Social Investment Fund Project	Provide support to government's social programs (e.g., construction and rehabilitation of water and sewerage systems, drainage and irrigation canals; rehabilitations of ruins to protect cultural heritage and ethnic minorities; reforestation).
	Structural Adjustment Credit	Complement the proposed Agriculture Sector Adjustment Loan which would deal with forest management issues and land tenure policies.
Jamaica	Road Infrastructure Planning and Maintenance Project	Develop a format for environmental analysis of all proposed investments by the Ministry of construction (works) to allow inclusion of mitigating measures in the project design;
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Country	Project	Environmental components
		staff training in environmental issues related to highway design, construction and maintenance.
Mexico	Export Sector Loan	Environmental impact analysis of upgrading or expanding productive capacity of expor firms.
	Basic Health Care Project	Prepare guidelines for environmental impact studies and waste disposal analyses related to the expansion and rehabilitation of healt facilities to ensure that these civil work would not have negative environmental consequences.
	Decentralization and Regional Development Project for the Disadvantaged States	Environment and cultural site protection component (e.g., protect natural reserve areas; strengthen institutional capacity to improve project assessment techniques an environmental policies formulation restoration of selected archeological sites; agriculture component (e.g., small-scal forestation programs; watershed protection plant and animal disease control; drainage rural infrastructure component (e.g. construction and rehabilitation of wate supply ad sewerage system to benefit about two million people).
	Water Supply and Sanitation Sector Project	Construction and maintenance of wat supply and sewerage systems; specializ studies to define medium and long-ter water pollution strategies and policies (e.g waste minimization and reuse strategie effluent regulations, standards and fees implement a pilot water pollution contr program to test national water polluti control policies; strengthen environmen assessment capability.
Venezuela	Social Development Project	Improve basic health services (e.) immunization programs; control a prevention of infectious diseases).

ANNEX III. ENERGY CONSERVATION AND EFFICIENCY LENDING FY91

AFRICA

Benin: Second Structural Adjustment Program

- Project will develop an overall strategy for increasing the efficiency of energy use and conserve energy (e.g., medium-term will focus on reduction of transmission losses). Introduce efficient pricing of electric power by tariff increases.

Botswana: Tuli Block Roads Project

- Project provides for resources to recover costs from road users (to include levies and duties on fuel); Government has recently increased fuel taxes.

Burundi: Energy Sector Rehabilitation Project

- Improve the efficiency in the use of energy resources through reforms in the pricing structure of electricity, petroleum products and woodfuels;
- Expand the access of the population to electricity;
- Reduce negative environmental effects of the use of energy through the execution of charcoal efficiency and improved stoves programs;
- Training to improve reforms in charcoal production techniques.

Chad: Petroleum and Power Engineering Credit

- Ensure that the petroleum and electric power pricing, institutional and environmental issues concerning the main project are addressed and resolved before the main project investment is undertaken in earnest;
- Ensure that Republic of Chad's administration of the energy sector is adequately strengthened so it can manage the sector effectively and improve its ability to interact with private investors.

Ghana: Second Transport Rehabilitation Project

- <u>Railway</u> Include systemwide investments in locomotives, and rolling stock to replace existing worn-out equipment. This contributes to a more efficient and effective transport system.
- Road Rehabilitation and maintenance: main benefits are reduction in vehicle operating costs.

Guinea-Bissau: Energy Project

- Rehabilitation and expand existing electricity generation and petroleum storage/handling facilities with a view to improving their efficiency, reliability and safety in operation;
- Technical assistance and training to strengthen the institutions in the energy sector (e.g., training in the prevention of oil spillage);
- Provide an incinerator for the bissau power plant to assist in recycling waste oil and fuel, and eliminate the possibility of contamination of the water table.

Nigeria : Oso Condensate Field Development Project

- Assists process of increasing energy prices to reflect economic costs. also assists Nigerian National Petroleum Corporation preventive maintenance and rehabilitation of assets; enhancing the utilization and efficiency of its existing refineries; and monitoring and controlling environmental pollution.

Tanzania: Petroleum Sector Rehabilitation Project

- Reduce the haulage cost of petroleum (e.g., replacing long-distance road transport with improved rail system using dedicated block trains for bulk movement of petroleum products; increase use of sea transport for supply);
- Reduce oil pollution and the threat to the environment from spillage and leakages due to deteriorated condition of storage and handling facilities;
- Implement and sustain an appropriate petroleum pricing policy designed to encourage and support private sector investments in petroleum supply and distribution.

Togo: Power Rehabilitation and Extension Project

Uganda: Third Power Project

Establishment of realistic electricity tariffs is immediate project objective, with provision for series of tariff increases in subsequent years.

Zimbabwe: Second Railways Project

- Fleet modernization (e.g., procurement of main line locomotives; repowering of shunting locomotives; procurement of passenger coaches; this will result in:
 - (a) reductions in variable operating costs and

(b) diversion of incremental traffic from by road to by rail, would relieve congestion in roads.

ASIA

Bangladesh: LPG Transport and Distribution Project

Technical assistance training component: to establish a program to enhance the role of women in the retail distribution of LPG cylinders and energy efficient stoves; to train commercial agents in development and promotion of energy-efficient cooking stoves will help to introduce economically efficient LPG pricing.

Bangladesh: Third Inland Water Transport Project

- Project benefits include savings in vessel time, vessel operating costs, and passenger time. Such benefits are associated with the aids to navigation components (e.g., upgrade of waterways; installation of shore lights) and repair/maintenance of inland pontoon facilities to facilitate passenger and cargo movements.

China: Ertan Hydroelectric Project

- Provide additional generation capacity to the power system in Sichuan province in order to alleviate an acute electricity shortage;
- Provide technical assistance in project design and implementation;
- Studies of power pricing and power plant and reservoir operation.

India: Private Power Utilities (TEC) Project for the TATA Electric Companies

- Mitigate the sulphur dioxide emissions from the coal and oil fired power plant (e.g., use of flue gas desulplurrization; plant design to meet Government standards);
- Support increased private sector participation in the supply of power;
- Encourage improved tariff structures and load management procedures for TEC's direct consumers.

India: Private Power Utilities Project (BSES) for Bombay Suburban Electric Supply Limited

- Provide additional generation, transmission and distribution capacity to meet increasing electricity demand in the Bombay area.;
- Assist BSES in its transformation from a distribution company to an integrated power utility which operates generation, transmission and distribution facilities.

India: Gas Flaring Reduction Project

- Eliminate the flaring of associated gas in the Bombay High Oil field and improve the management of the Bombay High reservoir.
- Reduce energy shortages and improve the efficiency of energy use in India's Western Region;
- Support the Oil and Natural Gas Commission's (ONGC's) efforts to improve the safety of its offshore operations and reduce the risks to the environment form these operations.

Indonesia: Power Transmission Project

- Expand, strengthen and upgrade the transmission facilities for the Java-Bali system to supply electricity to new consumers, and to meet increases in electricity demand arising from existing and new consumers.

Indonesia: Fertilizer Restructuring Plant

Construction of new Ammonia/Urea plant to be based on proven energy-efficient technologies. Project will assist general modernization of the industry, specifically aimed at energy savings, energy and raw materials efficiency, capacity and productivity gains and pollution control improvements.

EUROPE, MIDDLE EAST & NORTH AFRICA

Morocco: Second Rural Electrification Project

- Expand electricity supply to the rural areas;
- Strengthen the administrative, planning and financial capabilities in the power subsector;
- Encourage further reforms in the electricity tariff structure;
- Contribute to the Government's policy of improving the efficiency of energy consumption (e.g., promotion of energy conservation through price measures and non-price measures; encouragement of economically profitable interfuel substitution);
- Recommended changing the structure of petroleum product and coal prices in order to encourage increased economic efficiency.

Pakistan: Sui Northern Gas Pipelines Limited (SNGPL) Corporate Restructuring and System Expansion Project

- Promotes the substitution of gas for higher value petroleum products in the northern part of the country;

India: Gas Flaring Reduction Project

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EUROPE, MIDDLE EAST & NORTH AFRICA

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- Recommended changing the structure of petroleum product and coal prices in order to encourage increased economic efficiency.

Pakistan: Sui Northern Gas Pipelines Limited (SNGPL) Corporate Restructuring and System Expansion Project

- Promotes the substitution of gas for higher value petroleum products in the northern part of the country;

Assists rationalization of consumption and supply of gas through pricing and demand management.

Poland: Structural Adjustment Loan

Government to phase out subsidies (to coal mines) and export tax on coal during 1991-92 to allow the domestic price to adjust to international level. Agreement to adjust prices of other energy (fuel oil, gas, electricity, lignite) to reach international levels.

LATIN AMERICA & CARIBBEAN

Honduras: Structural Adjustment Credit

An <u>Energy SECAL</u> is under preparation to complement the SAL; initial actions already taken include an increase in electricity tariffs. Focus of SECAL will be improvement in power company's financial situation and less reliance on fiscal resources.

Annex IV. BIBLIOGRAPHY

The following titles were formally published by the World Bank during fiscal 1991 and may be obtained from the bookstores at the Bank offices in Washington, D.C., and Paris or through the Bank's authorized commercial distributors and depository libraries throughout the world. (University press books are available also from the presses named.)

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THE WORLD BANK / IFC / MIGA OFFICE MEMORANDUM

DATE: June 26, 1991

TO: Mr. Geoffrey Lamb, PRDPD

FROM: Mohamed T. El-Ashry, Director, ENV MTE

EXTENSION: 33202

SUBJECT: Annual Report on Environment - FY91

Attached is a copy of the draft Annual Report on Environment FY91, for the PRE Committee review. Another 60 copies are being sent to you separately. Please note that we have yet to obtain complete data for the fiscal year, but this should not affect the general thrust of the report. There is one important message that I would like you to convey to the recipients of this draft. In preparing the draft, projects were identified as having "significant" environmental components or objectives if at least 10% of their costs or benefits were environmental. This is what we did last year. This year we have however decided to use a stricter interpretation of what constitutes a significant element, i.e. 50% of costs or benefits, and this will be reflected in the next version of the report.

Attachment

cc: F. Colaco (PRSVP)

- V. Rajagopalan (PRSVP) (o/r)
- M. Munasinghe (ENVPR)
- M. Koch-Weser (ENVAP)
- I. Johnson (ENVGE)
- R. Goodland (ENVDR)
- J. Warford (ENVDR)
- Z. Partow (ENVDR)
- N. Van Praag (ENVDR)

DRAFT

June 26, 1991

THE WORLD BANK AND THE ENVIRONMENT ANNUAL REPORT - FY91

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SECOND ANNUAL REPORT ON ENVIRONMENT - FY91

I. INTRODUCTION

Evolution of Bank Environmental Activities

This second World Bank Annual Report on the Environment is the latest in a series of public statements made over the last five years which together have traced the recent evolution of Bank policy in this area.^{1/} A recurrent theme has been the ever-growing importance of the environment, and the need to integrate it in all aspects of development planning, and correspondingly, throughout the World Bank's own operations. This process, as the following pages demonstrate, continues to proceed rapidly. A consequence is that the distinction between environmental and other work in the World Bank - whether research or lending operations - is becoming increasingly blurred, and concern and responsibility for environmental work - as well as the relevant expertise - is now widely spread throughout the institution. Environmental issues are also now being addressed more systematically in the International Finance Corporation (IFC), the Bank's private sector affiliate.

Scope of the Report

The report begins with a description of how environmental responsibility is shared among various units in the World Bank. It briefly outlines the various available instruments (research; country environmental strategies; lending operations; evaluation), and enumerates the types of staff employed to do this work. Bank operations are then described by region reflecting the gradual tailoring of approaches to region-specific requirements. The strategic approaches are outlined, and the specific instruments are listed; country environmental strategies, lending operations, region-specific research and policy analysis. Generic operational issues in all regions are then covered; these include a review of the process of integrating environment into operations; implementation of the new environmental assessments procedure; operations evaluation; energy efficiency and conservation; population operations; and staff training.

Forestry is the topic of the next section, which reviews the nature and causes of the forestry problems and kinds of measures that are required to deal with them. An overview of the Bank's policy and research work during the year that follows. This work is grouped around a number of major themes: energy and the environment; pollution; urban environmental issues; water resources management; forestry and land management; social and cultural issues;

Environment, Growth and Development, Development Committee Pamphlet No. 14, 1987; Environment and Development: Implementing the World Bank's New Policies, Development Committee Pamphlet No. 17, 1988; World Bank Support for the Environment: A Progress Report, Development Committee Pamphlet No. 22, 1989; and The World Bank and The Environment, First Annual Report, Fiscal 1990.

environmental economics; and global environmental issues. This is followed by a section describing the rapidly evolving environmental work program of the International Finance Corporation.

The report goes on to describe recent international action to combat global environmental problems. This activity is dominated by the emergence of the GEF and implementation of the Montreal Protocol. The various ways in which the Bank participated in the international environmental community is described, as are the series of efforts the Bank made during the year to work more closely with nongovernmental organizations (NGOs), and to expand its external training function in the environmental area. Highlights of the report, some key lessons from recent experience, and implications for future work are contained in the section entitled "Future Directions". Annexes contain a World Bank organization chart; a list of projects with environmental components or objectives; another list which contains projects with energy efficiency components; and a bibliography.

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II. ORGANIZATION AND PROCEDURES

Organization and Staffing^{1/}

Formal responsibility for environmental work in the Bank continues to be shared among several units. The Environment Department, in the Policy Research and External Affairs complex, is responsible for overall policy formulation, research, guidelines, staff training, and some aspects of external relations on the Bank's environmental work. It also has newly acquired responsibility for administering the GEF. Nevertheless, by far the majority of environmental policy and research work done in PRE is done in departments other than ENV. Other sector departments as well as departments in the Development Economics Vice Presidency, the External Relations Department and the Economic Development Institute have increasingly important environmental work programs.

Environmental Divisions located in the Technical Departments of each of the regions have day-to-day responsibility for ensuring the quality of Bank operations. They focus not only on individual projects, but also on more strategic approaches to addressing environmental problems on a country or regional basis. They also conduct or commission region-specific policy and research work. The Regional Environmental Divisions represent only a part of the total effort devoted by the Operations complex to environmental work. Increasingly, Country Operations Departments and other Technical Department divisions are taking responsibility for environment and are recruiting staff for specifically environmental responsibilities. Environmental advisory staff are also located in the Country Operations Department where, notably, GEF operational activities are coordinated.

Evaluation of environmental aspects of Bank operations is also of growing significance in the work of the Operations Evaluation Department. The Finance Department, which played a major role in the establishment of the GEF, continues to be active in this area, as do staff from the Legal Department. Finally, the environmental work program of the International Finance Corporation is expanding rapidly.

Estimates of the amount of staff effort devoted to environmental work in the Bank are difficult to make, in large part because of the extent to which environment is now becoming integral to a wide range of Bank activities. There are currently 106 higher level and 34 support staff in the Environment Department and four Regional Environment Divisions. These staff include economists, engineers, land use planners, ecologists, foresters, anthropologists, sociologists, and institutional experts. In addition to the three-person GEF unit in COD, there are a number of operational divisions which have specifically environmental functions. For example, there is an Energy and Environment Division in the Country Department covering Eastern Europe and an Environment, Human Resources and Urban Development Division in the Country Department dealing with China and Mongolia. The effort devoted to environment in FY91 has also been considerably enhanced by the team, consisting of 18 staff, preparing the

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See Annex I for World Bank Organization Chart.

1992 World Development Report, which will have environment as its main theme. Overall, based upon time recorded by staff, about 270 staffyears (regular staff plus consultants?) were devoted to environment in FY91. This corresponds to about 10% of total Bank staff time, with 183 staffyears accounted for by Operations staff and 87 by PRE. The projected average in the period FY92 to FY94 is 314, of which 205 would be in Operations and 109 in PRE.

Because of the rapidly evolving nature of environmental work and of the range of skills required, heavy reliance is placed upon consultants and staff with fixed-term contracts. The contributions made by bilateral donors to the Bank's environmental work by provision of consultant trust funds (i.e., Belgium, Canada, Japan, Netherlands, Norway, Sweden, and the United States of America) and by secondment of staff (i.e., France, Norway and Switzerland) has been valuable.

Operational Instruments

The World Bank's growing concern with environment over the last few years has been accompanied by the evolution of a number of mechanisms designed to systematize the treatment of this subject in its day-to-day operations. Preparation of country environmental issues papers was initiated three years ago. Their objective was to ensure that, for each country, a coherent approach would be taken to environmental matters, reflecting inter-sectoral relationships as well as the linkages between environment and overall development policy. These papers, which are internal documents, have now been completed for virtually all countries. The issues they highlighted included (a) identification of key environmental problems in the country concerned (b) the direct and underlying causes of those problems (c) possible investment strategies and policy reform and (d) financing needs and possible sources.

These papers have set the scene for more in-depth analysis, leading to the establishment of Bank strategies for environmental work in borrowing countries. The essential elements of any country environmental strategy as outlined above are now being addressed in the Bank by various means. These include formal National Environmental Action Plans, conducted on a country-by-country basis, as well as regional analyses of specific environmental problems such as water resources management, or urban pollution. Environment is addressed at all stages of the project cycle, for example in urban, energy or agriculture sector work, through project identification, appraisal, implementation, and evaluation. It also increasingly features in the economic policy dialogue the Bank conducts with member countries, and in adjustment lending activities. Backing all this up is a growing research effort.

Introduction of the Bank's Environmental Assessment Operational Directive in October 1989 was an important milestone in the evolution of the Bank's environmental policy. It provides a systematic approach to environmental issues at all stages of project development. The directive identifies four categories of projects: Category A projects or components may have significant environmental impacts and normally require a full-scale environmental assessment. Category B consists of projects and components that may have specific environmental impacts for which a more limited analysis would be appropriate. Category C includes projects and components that typically do not have a significant impact, and would normally not require environmental analysis. Category D consists of projects which, because they have an environmental focus, do not require a separate environmental assessment. (As noted in Section IV below, experience in implementing the directive has suggested the need for some amendment of the above).

III. REGIONAL ENVIRONMENTAL OPERATIONS

In recent years the increased emphasis on environment in World Bank operations has been accompanied by growing recognition of the extreme diversity in the environment problems themselves as well as of the applicability of measures to counteract them. The wide variety of institutional, cultural and economic causes of environmental degradation requires that these strategies should be tailored very specifically to local circumstances. One consequence of this is that although the fundamental principles guiding environmental work are consistent throughout the institution, local variations are reflected in different approaches used in the Bank's four regional offices. These are described below.

AFRICA

Introduction

The Bank's Africa region, which covers 45 countries, presents a range of concerns including the degradation of drylands, the destruction of tropical forests, as well as urban problems exacerbated by rapid expansion of cities in many parts of the continent. Most of sub-Saharan Africa's population of 440 million earn less than \$340 a year, making it the world's poorest region. High population growth rates of more than 3 percent a year will increase its share of world population from less than 10 percent today to 20 percent by the middle of the twenty-first century. Population pressures, the uncertainty of land tenure and fierce competition for natural resources have led to further impoverishment. In the process, crop and range lands have been degraded as recurring droughts have exacerbated the typical symptoms of over-exploitation: soil erosion and declining yields.

The problem is further aggravated by the cultivation of marginal lands, destructive agricultural techniques, and increased herd sizes. Meanwhile, forests are cut down or burned to make way for new agricultural land and pastures, and to satisfy growing demand for fuel and timber. The threat to Africa's remaining moist tropical forests, with their rich variety of animal species and plants, is acute. Continued logging and agricultural encroachment has big economic and ecological implications. Depletion and pollution of water sources also poses a critical set of problems. Depletion is mainly due to poor water management and inefficient irrigation systems. Pollution in most rural areas is caused by increased use of chemical fertilizers. In Africa's fast growing cities, water pollution results from the lack of facilities to treat sewage and other forms of waste. Urban dwellers also face the usual array of metropolitan environmental problems, from air pollution to unplanned sprawl.

To deal with these complex issues, the Bank is integrating environmental issues into its activities in Africa in three distinct but complementary ways. First, by helping countries develop

national environmental strategies and action plans; second, through its research activities; and third, through its lending program.

Environmental Strategy and Action Plans

Over the last three years the Bank has placed increasing emphasis on the integration of environmental considerations into economic and social development. A first step was to prepare environmental issues briefs on each country in the region. These have proved useful in identifying environmental problems and are a good starting point to fill the information gaps. The next stage differs from country to country depending on the severity of the problems, the amount of information available, and what actions have already been taken by the government. In some instances, such as Nigeria (see below), the Bank has moved directly to produce a detailed analysis of country-wide environmental problems and a set of recommendations on how to deal with them through the preparation of a national action plan. Work on country environmental strategy papers for Niger, Senegal and Mali also began in FY91. These bring together existing information and are designed to help both the Bank and governments assess strategic options. They are also intended to provide donors with a clearer sense of environmental priorities. Special studies or sector reports that focus on the environmental implications of a specific problem or issue within a particular sector of the economy have also been conducted.

National Environmental Action Plans (NEAPs) The Bank is currently working with 17 countries in carrying out NEAPs. A first group includes the three pioneering countries (Madagascar, Mauritius, and Lesotho) where governments have formulated and approved the NEAP document and the action plans are being implemented. A second group is made up of Rwanda, Ghana, Bukina Faso and the Seychelles. Their plans have been completed; some of them approved (Seychelles and Rwanda); but none of them have yet been implemented. A third group includes Guinea and Togo, which are advanced in the process but have not yet completed their plans. A fourth group includes countries which have just started the process or are about to do so. They include Benin, Burundi, Congo, Cote d'Ivoire, Gabon, the Gambia, Guinea Bissau, Nigeria and Uganda.

Action plans are designed to ensure that decision-makers do not lose sight of environmental issues. The process is as important as the product. It depends on the participation of a whole range of groups representing many interests: national governments, local administrators, research and academic institutions, non-governmental organizations, and the private sector. The association of multi- and bilateral donors provides both access to expertise and establishes a framework for future development assistance.

Mauritius formulated its national environmental action plan in 1988. This led to the adoption of an US\$109 million environmental investment program in mid-1990. During FY91 the Bank approved a loan (see below) to support the program and took on responsibility for donor co-ordination to speed-up program implementation. Madagascar's plan, prepared in 1987-1988, sets out the country's environmental policy over a 15 year period. Its main objectives are

to conserve and manage Madagascar's biological diversity; to promote sustainable development through sound management of natural resources; to improve living conditions in rural and urban areas; and to develop the country's human resources and institutional capacity. A major investment program for Madagascar was approved by the Board in FY90 and was followed during the current reporting period with the initiation of the first five year segment of the action plan. In February 1991, a US\$26 million World Bank (IDA) loan became effective, bringing to almost US\$70 million the amount contributed by donors to the US\$85.5 million investment program. The balance is provided by the government of Madagascar.

The Environment Management Plan for the Seychelles focuses on infrastructure, watermanagement, biodiversity, and marine and coastal protection. A donor conference was held in early 1991 and resulted in pledges for an investment program worth some US\$40 million. Meanwhile, a national environmental action plan was completed in Ghana. An investment program is now being crafted to enable Ghana's government to act on the priorities set out in the NEAP. These include strengthening the national environmental agency and introducing an environmental information and monitoring system. The investment program will also support the conservation of sensitive ecosystems and critical natural resources, such as lagoons, forests and various types of wildlife.

A report issued during the year provides a detailed outline of the options facing Nigeria in the development of an NEAP. It focuses on how best to ensure that government policies, institutional capacities, data management systems and economic mechanisms integrate the need for environmental quality with economic growth. The report finds that soil erosion and degradation, water contamination and deforestation are the key environmental problems facing Nigeria. If nothing is done to stem the damage, the report says, long-term losses could reach some US\$5 billion a year (see box). The report says that the political will to deal with the problems exists but must now be supported by more research and analysis to guide policy formulation. As a first step to implementing the priorities outlined in the report, an environmental management project is in preparation to finance a set of activities to make Nigeria's environmental program operational. These include institutional support, an information network, and studies to identify specific investment projects aimed at alleviating environmental degradation.

Towards an Action Plan for Nigeria (Box)

A workshop on National Environmental Action Plans held in Dublin, Ireland, in December 1990, recommended that in future all plans include rigorous economic analysis and that the economic cost of environmental degradation should be systematically assessed. A major Bank study on Nigeria shows how this may be done. The purpose of the study is to provide policy makers with an assessment of the economic costs of environmental degradation as well as a framework for determining Nigeria's environmental priorities. It outlines a strategy for developing solutions to the country's environmental problems and proposes various options to alleviate the environmental concerns. Throughout, the report attempts to integrate the need for environmental quality with economic growth in Nigeria.

The report proposes a methodology for examining environmental issues on a national level and provides a means for quantifying economic losses which result from natural resource depletion and degradation. Preliminary estimates of economic losses are reported in terms of the long-term effect which inaction would have on Nigeria's "Sustainable Net National Product" (SNNP). SNNP differs from conventional measures of national economic performance such as GNP or GDP in that investments to maintain the integrity of the environment ("defensive expenditures") are excluded from the computation, as is the income generated from harvesting a resource stock over and beyond its capacity to be replenished ("depreciation of national capital"). The difference between SNNP and GNP can thus be used to demonstrate to policymakers the monetary value (loss) associated with policies which allow unsustainable use of a country's resources.

The report identifies three major environmental problems facing Nigeria: soil degradation, water contamination and deforestation. Although the impact of continuous soil degradation will not be evident for at least 20 years, the negative consequences of water contamination and deforestation are likely to appear in less than ten years, the report says. The long-term annual cost of continuous environmental degradation is estimated at some US\$5 billion. Programs designed to change this trend may require an investment of between three to twenty percent of current GNP. While the environmental problems -- and some of their direct and indirect causes -- are becoming clearer, the strategies available for addressing them are still in the early stages of development. In many cases it is not clear what the best solution is to any particular problem. It is expected that strategies and projects will emerge as a result of ongoing discussions. According to the report, policy-makers in Nigeria have five main options in dealing with the country's environmental problems: strengthening institutional capacity; initiation of legislative reforms and policy initiatives to address environmental problems; development of economic incentives and mechanisms to promote sound environmental management; establishment of a national environmental data management system; and creation of significant educational and public awareness program.

To take stock of its experience with national environmental action plans in Africa, the Bank co-sponsored an international workshop on the subject in Dublin, Ireland, in December 1990. The workshop was attended by representatives of 17 African countries, non-governmental organizations, and bilateral and multilateral development agencies. Participants emphasized that NEAPs should be "demand driven" (rather than imposed from the outside) and supported by governments at the highest level. They also cautioned countries against waiting for a NEAP before dealing with their environmental problems. The Dublin workshop highlighted the importance of popular participation and the need for professional environmental training. Among their many recommendations, participants underscored the need to make environmental information systems (EIS) an integral part of the NEAP process (see below). The Dublin meeting spawned the Club of Dublin which promotes the involvement of African experts in environmental strategy and planning, and has brought together distinguished thinkers and decision-makers from African governments, universities, non-governmental organizations, and the donor community. A second workshop on NEAPs was held in Mauritius in June 1991.

<u>Environmental Information System</u> Environmental information systems were discussed by an international advisory group set up by the Bank which met in Abidjan, Cote d'Ivoire in November 1990 and subsequently in Heidelberg, Germany in April 1991. The group of advisers recognized that the challenge facing Africa in the use of environmental information systems is great because of the magnitude of its environmental problems, its lack of resources, and a tendency to focus on short-term problems.

Together with other agencies and donors, the Bank has initiated a program to assist countries in sub-Saharan Africa to set up operational cost-effective environmental information systems. Resources are thus being mobilized for the collection, management, and analysis of information in various countries in Africa and, increasingly, in other regions. Guidelines for resource and environmental information management have been developed as part of the Bank's environment assessment procedures. Remote sensing and techniques such as geographic information systems are now increasingly used in the Bank's resource management and environmental monitoring activities. One of the main objectives is to ensure that operational or policy requirements dictate the type of information collected.

<u>Forests</u> A particular focus during the fiscal year was on the preservation and protection of Africa's remaining tropical rain forests. A conference on the forests of west and central Africa held in Abidjan, Cote d'Ivoire in November 1990 was the venue for the presentation and discussion of a number of important Bank papers on forests. The session was co-sponsored by the African Development Bank, the International Union for the Conservation of Nature, and the World Bank. A booklet summarizing the proceedings (see box) outlines the scale of the problem: some two million hectares of tropical forest are lost each year in the countries of west and central Africa; about 40 percent of their wildlife habitat has already disappeared; reforestation is insignificant. As a result, innumerable species have been lost, rainfall has declined, soil erosion has increased and crop yields have fallen. Meanwhile, the burning of forests contributes to the greenhouse effect.

Africa's Rainforests (Box)

Bank supported forestry lending for Africa began in 1968 with a forestry plantation development project in Zambia. The focus of forestry lending remained on industrial plantations until the late 1970s, when emphasis shifted to social forestry and agro-forestry projects that were intended to relieve the growing pressure on natural fuel wood resources. The Bank also supported public sector plantation development - but with less than satisfactory results. Recent Bank-financed forestry projects in Guinea, Ghana, Cote d'Ivoire, Uganda and Cameroon address a broader array of tropical forestry issues - with an underlying objective of encouraging actions that would reduce, and ultimately stop, deforestation. These projects include components of forest inventory, mapping, agro-ecological zoning, reduction in the size of logging concessions, creation of national parks, reserves and forest buffer zones, forest management, research extension and institution building. While these projects alone cannot halt deforestation in Africa, they offer management approaches to national governments for the sound use of their forest resources. "Saving Africa's Rainforests," a booklet published during the year, notes that many of the root causes of Africa's deforestation stem from factors outside the forestry sector itself, and that they need to be addressed from a broad development perspective. It also emphasizes the importance of a people-centered and ecologically sensitive approach, which is consistent with the general Bank philosophy outlined in Section V below.

A Bank paper on the links between population, agriculture, and the environment in sub-Saharan Africa presented at the conference points to rapid population growth as an important cause of forest destruction in the region. Traditional methods of farming and land-tenure cannot cope with rising population densities. The conference recognized that solutions are complex. Agricultural and logging practices will have to change. Local people, especially women, must play a greater role in conservation. At the very least, governments must provide incentives to make sure that logging and the gathering of fuel wood is sustainable -- itself a contentious proposition in some quarters. In environmentally delicate areas, the extraction of wood for timber or fuel must be eliminated altogether. Improved land-tenure is essential.

<u>Research</u> A series of research activities, specific to Africa, were undertaken during the year. These included a study of local participation in the management of wildlife which argues that people will be better off and Africa's wildlife habitat more likely to endure if local people have a concrete stake in ensuring its survival. Another on integrated pest management (IPM) in African agriculture makes clear that IPM is a management concept of considerable importance in reducing over-reliance on chemical pesticides. Technical notes published in FY91 cover a variety of subjects from participation of local people in the implementation of Madagascar's environmental action plan to separate studies on the links between government policies and environmental degradation in Botswana and Uganda.

Research on the experience of various African countries in dealing with large-scale migration and resettlement is underway and will be discussed at a regional workshop in early FY92. A study is also being done to determine the magnitude of environmental changes in Africa. The information will form the basis for a monitoring system to provide quick access to accurate information on environmental conditions. Another initiative on which the Bank has continued to work during the reporting period is the Sahelian Operational Review. This seeks ways to restore ecological systems in the Sahel and introduce sustainable land-use systems through a series of studies on natural resource management systems. Lessons learned are shared through publications, conferences, the funding of consultants, and networking among technicians working in the Sahel.

Five sector reports also picked up on environmental issues during the year. For example, a report on industrial adjustment in Madagascar notes that government involvement in the preservation of the country's physical environment is warranted but warns that environmental regulations should not become obstacles to growth. A report on Nigeria's urban transport crisis says that the most immediate environmental threat posed by vehicles is dumping sump oil in the drainage system. It recommends the provision of oil recycling facilities, particularly at bus stations and repair shops for commercial vehicles.

Environmental Lending

Environmental considerations have been progressively integrated into the Bank's lending program in Africa. In FY91 they featured in a variety of free-standing projects, sector and adjustment loans, and in several project components.

A US\$12.4 million loan made to Mauritius during FY91 (Environmental Monitoring and Development Project) is tied to the country's environmental action plan. It will fund a national physical development plan and various other measures including improved land-fill practices, integrated pest management, marine conservation and a national park. An Environmental Management Project in Burkina Faso was also approved. The US\$16.5 million IDA loan will fund the first five year phase of a long-term program to assist the government stop and reverse the process of natural resource degradation in order to secure sustainable agricultural growth, to restore biodiversity, and to manage forests and wildlife sustainability. The Forestry Development Project in Kenya -- worth some US\$20 million -- is designed to conserve and protect forest resources, and soil and water. It will improve the management of existing indigenous forests and industrial plantations, enhance the effectiveness of the government's forest department, and fund the preparation of a forestry master plan.

In all, some 37 projects approved in the Africa region during FY91 have a significant environmental component (see Annex I). Several have multiple environmental goals. These include education, health, population control, conservation of wildlife, energy conservation, forest and soil conservation, pollution and pest control, improved agricultural practices and livestock management, environmental planning and administration, sewage and waste treatment techniques, and water resource management methods. More than a third of the projects aim to improve water resource management and sewage treatment practices. For example, a public works and employment project in Niger will upgrade the drainage system, develop small scale sanitation plants and promote soil and water conservation. Almost a third of the projects target agriculture. Environmental components focus on curbing soil erosion and the harmful effects of pesticides and fertilizers. An agricultural rehabilitation and development project in Mozambique aims to teach farmers how to deal with soil erosion and deforestation. A number of projects deal with health. A loan to Mali will provide safe water to 180,000 people through the construction of 385 rural water points. A health sector improvement project in Madagascar includes measures to prevent water-borne diseases, such as malaria and typhoid. It also encourages the prudent use of pesticides.

A number of sector loans and adjustment programs deal with the environment. Some examples: an education sector project in Rwanda (First Education Sector Project) includes the environment in a new national curriculum; a petroleum sector loan to Tanzania (Petroleum Sector Rehabilitation Project) introduces measures to reduce the risk of oil spillage and pollution. An agricultural sector loan to Uganda (Agricultural Sector Adjustment Credit) will fund research on land-use, and forest and wildlife conservation. Meanwhile, a structural adjustment program in Togo (Fourth Structural Adjustment Credit) instigates a rural development strategy which emphasizes the role of local communities in rehabilitating the environment.

<u>Global Facilities</u> There was a rapid increase in staff time and effort devoted to the preparation of projects for funding under the new Global Environment Facility and the Montreal Protocol (for a general description see Chapter VIII). Participating parties are considering funding projects in Congo (wildlands protection and management), Kenya (preservation of the Tana river primate reserve), Mauritius (bagasse energy), and Uganda (forest gorilla reserve). Two regional programs are also under consideration. The first aims to conserve biological diversity in East Africa; the second to protect wildlife in Western and Central Africa. In addition, a first set of projects to help borrowers to comply with the Montreal Protocol, which provides for the phasing out of ozone-destroying substances, are planned in Ghana, Nigeria, and Kenya.

ASIA

Introduction

The Bank's Asia region stretches from India to the Pacific Ocean. High population growth, widespread poverty, rapid urbanization and fast industrialization have produced extensive environmental degradation. The region's population is projected to double over the next 40 years - from 2.5 billion to 5 billion - despite a rapid drop in the birthrate. It counts over half the world's mega-cities; those with 10 million people and more. Meanwhile, the number of its "large" cities (four million people plus) is set to increase from 20 to 50 by 2025. The rate of economic growth in some countries has reached 8 percent a year and the region as a whole is projected to maintain its economic momentum during the 1990s. Nevertheless, about 750 million people live in absolute poverty - more than the total number of poor in Africa and Latin America combined.

The statistics translate into a litany of environmental problems. Soil degradation is accelerating as pressure on marginal land grows. Some 50 percent of India's arable land is degraded through erosion, compaction (by animals and people) and salinization (because of poor irrigation practices). More people demanding more food means that by the end of the century, Asia will account for three-quarters of the increase in consumption of chemical fertilizers, adding considerably to the pollution of soil and water. Forests are disappearing at a rate of almost five million hectares a year. Competition for water resources is increasing while water quality declines. Access to safe drinking water is a major problem. Some 70 percent of China's rivers are polluted and industry is shut down in some parts of Indonesia during the dry season for lack of clean water. Air quality, too, is becoming progressively bad. Big cities are worst affected. Children in Bangkok, for example, show increasing levels of lead in their blood because of their exposure to automobile emissions. Meanwhile emissions of sulphur dioxide and carbon dioxide from thermal power plants are likely to increase by 50 percent over the next 10 years, making Asia a major contributor to acid rain and global warming.

The Bank's activities during FY91 addressed many of these problems. Work began on a report which will look at what lies behind the region's environmental problems and provide the basis for a comprehensive strategy to deal with them. The report will draw on a substantial body of region-wide research on environmental issues done by the Bank. A \$2.5 billion program on urban and industrial pollution control in Asia's major cities (see box on page ___) intensified its activities. Major initiatives were approved to control industrial pollution in India and improve natural resource management in the Philippines. The environment also figured as a component in a number of new investments and in the Bank's policy discussions with borrowing countries.

Environmental Strategy

Work began on a study covering the full gamut of Asia's environmental concerns. It will lay the groundwork for a major new regional environment initiative for Asia. The hope is to take advantage of the 1992 UN Conference on Environment and Development (UNCED) to focus greater attention, and financial resources, on Asia's environmental problems. Some of the analytical work for the initiative has already been done in the form of environmental action plans and issues papers completed in past years for most countries in the region. To add a broader dimension to this country-specific work, a number of background studies on region-wide environmental issues have been undertaken.

A strategy paper on forest policy paints a bleak picture of deforestation in Asia. Figures from the United Nations Food and Agriculture Organization (FAO) indicate that during the 1980s deforestation in the 15 countries of the region reached 4.7m hectares a year. Fuelwood is increasingly scarce. Loss of biodiversity has reached unprecedented proportions. Malaysia and Thailand, once major timber exporters, now have severe shortages. Within ten years, Asia's forests will cover only half of their original area. The paper emphasizes that deforestation is often due to misguided or narrowly focused government policies. It points to what it describes as a crisis of confidence in the management ability of existing forest institutions. International agencies, including the World Bank, have not improved the situation and need to review their approach, the paper says. It suggests that this poor performance stems from the fact that institutions responsible for forests are designed to extract surplus from the land and keep people away. Little attention is paid to the broader value forest resources represent to society as a whole.

The paper recommends that the Bank shift its support away from public sector institutions and promote an increased role for the private sector. The latter is largely responsible for logging and is unlikely to act in an environmentally benign manner unless it has a longer-term stake in prudent management. The paper also emphasized the need to better understand how policies (land tenure, for example) and investments (access roads and so on) outside the forest sector have a direct impact on it. Meanwhile, it says, more must be done to halt the encroachment of agriculture. Unless these issues are addressed seriously, the paper concludes, the region's remaining forests, complete with all their goods and services, are endangered.

Asia has a rich endowment of biological diversity but it is likely to lose more of it over the coming decades than any other region, according to a strategy paper on biodiversity in Asia to be completed in FY92. Setting up well-managed parks and protected areas is regarded as the most practical way to do the job. However, many of the region's parks and protected areas exist only on paper. A large number are almost totally degraded. One reason for this is the inappropriate system of administration most have adopted. This is based on the twin pillars of exclusion of local communities and enforcement of the law; a model which is not practical in face of acute population and economic pressures. Management is likely to be more effective if local communities and non-governmental organizations are involved. While increased funding is required to preserve biodiversity, absorptive capacity is low, and additional funds should be made available gradually. At the same time "perverse policies" which actually encourage the loss of biodiversity - through low stumpage fees, resettlement in forest areas and so on - must be addressed. It is recommended that the Bank place highest priority on countries with the greatest diversity - Indonesia, China, India, Malaysia, Papua New Guinea, and the Philippines. But almost every country in the region has significant biodiversity under threat and well thought-out programs would make sense in practically all of them. Only those which reconcile peoples' needs with conservation should receive priority attention.

Recognition that environment is considerably affected by macroeconomic policy is found in a study on trade policy and resource allocation in Indian agriculture. The study deals with the extent to which environmental externalities might modify the findings of the apparent comparative advantage of the major Indian crops. For example, cotton appears to be a low cost crop with excellent export prospects, but this conclusion is moderated by the extent of the adverse environmental effects on other crops of pest immunity resulting from the spraying of cotton. The study also recognizes the problems of waterlogging and salinity associated with irrigation, especially of rice and sugar cane in arid areas.

Work also began during the reporting period on a regional strategy to control emissions into the atmosphere. The focus is on acid rain and greenhouse gases. The former is responsible for the destruction of forests and the acidification of lakes. The long-term impact of greenhouse gases is not yet well understood but there is growing evidence that they contribute to global climate change. The industrialized world is responsible for the most of the emissions. But developing countries will contribute an increasing share of atmospheric pollution in the years ahead. For example, Asia currently contributes just over 20 percent of the world's greenhouse emissions. But it will provide about half of the world's new sources of these gases. The challenge is to design cost-effective programs and to provide financial mechanisms to support emission reduction programs in Asian countries. Acid rain and global warming are different problems but, often, have common sources. Thus, measures ranging from energy pricing to endof-pipe pollution abatement can, if well designed, have an impact on both.

While the problem of sulphur dioxide emissions - the main source of acid rain - is high on the agenda in Western Europe and North America, their reduction in the Asia region (and in other parts of the developing world) is more complicated. Emissions regulations are lax and mitigation measures costly. This, combined with the increased emphasis on coal for energy production in countries like China, India, Indonesia, Thailand and Korea means that the problem is likely to get worse. Technologies for dealing with emissions which cause acid rain exist but they are expensive. As the benefits are shared, it makes sense to share the costs of the solution. In other words, the "polluter pays" principle needs to be supplemented with special financial instruments when countries are poor and emissions cross boundaries.

Reducing greenhouse gases is more complicated and will require major interventions in the agriculture, forest and energy sectors. New cleaner energy technologies have an important role to play. But the overriding long-term challenge is to delink the relationship between economic development and energy use. For this to happen, the price of energy must include the full costs to society of harmful emissions. This prescription is echoed in a report on the environmental impact of coal use in China. It calls for action to mitigate the environmental effects of coal use through price reforms (for coal and gas), higher tariffs for electric power, and controls on air pollution.

Efforts continued during the year to assist virtually all countries in the region to develop wide-ranging environmental strategies. For example a study on how Indonesia manages its forests, land and water (and how it might manage them better in the future) was published in FY91. The premise is that sustainable development depends on the recognition that natural resources are finite and that their wasteful use today will cause an unnecessary sacrifice of income and wealth in the future. The report says that policy-makers in Indonesia are aware of their obligations in this respect, but that the country's abundant resources of forest, land, and water are under increasing pressure from a growing population and the fast pace of industrialization and urbanization. It is, therefore, essential to use resources more efficiently. The tools for doing this are proper pricing and improved management. About a million hectares of forest are destroyed each year as loggers seek to cut down as much as they can of what is treated as a virtually free resource. Loss of ground cover in turn gives rise to soil erosion and the loss of fertile land. The problem is particularly acute in Java where urban sprawl is consuming more and more prime agricultural land.

Water for irrigation is provided at little or no cost to farmers. The resulting excessive use reduces the amount available to competing urban and industrial users. The poor performance of many public utilities in supplying piped water has led to the overuse of groundwater and the intrusion of salt into aquifers. Untreated sewage and municipal waste are rapidly becoming a serious threat to water quality. The report concludes that where resources are scarce, sustainable development will depend on their intensive and efficient use. It also recommends clarifying institutional responsibilities for the environment and decentralizing decision-making.

Also underway is the preparation of a major environmental strategy paper for China. To be completed in FY92, preparatory work involves a review of the major problems such as pollution, agricultural land and water degradation, and loss of natural ecosystems. It addresses the magnitude and cost of their impacts and their underlying causes, and recommends strategies for dealing with them. It will also propose a Bank program of environmental assistance in China.

Metropolitan Environment Improvement Program (BOX)

Asian cities have grown rapidly over the last 30 years and this growth continues to accelerate. Based on current trends, 1.7 billion people (40% of Asia's projected population) will live in them by 2025. This is leading to the equally rapid degradation of air, water, and land which undermines development and imposes a heavy burden, particularly on the poor. Governments are concerned and are starting to invest in sewerage, solid waste disposal, and slum improvement; to establish and enforce environmental standards; and to use planning and impact assessment

procedures to guide urban development. However, most countries need to do more to strengthen environmental management.

The Metropolitan Environmental Improvement Program (MEIP) was established to fill this gap in late 1989 by the United Nations Development Programme (UNDP) and the World Bank. Its focus is on how better management can help reverse the process of urban environmental decline in Asia's largest and fastest growing cities: Beijing, Bombay, Colombo, Jakarta, and Manila. MEIP helps each participating city develop a work-program which takes into account broader regional concerns about urban management. Components include:

- * Preparation of an Environmental Management Strategy (EMS) and a set of Action Plans for each sector.
- * strengthening the management and industrial pollution control (IPC) capabilities of the agencies involved in urban/industrial environmental management.
- * feasibility and investment studies for emerging high-priority environmental management and pollution control projects.
- * intercountry research and workshops on important urban environmental management issues.
- * country-based research and demonstration projects undertaken by local research organizations and NGO's.
- * study visits, workshops, and information sharing networks among MEIP cities.

MEIP is administered by the World Bank. UNDP provides policy guidance and funding for program administration, intercountry workshops, and research. So far, UNDP has provided seed funding worth \$2.5 million. An additional \$3.0 million has been raised from bilateral and multilateral donor agencies and various national environmental trust funds. Another \$4.0 million is sought to implement projects in each of the five cities.

Environment Lending

The environment figured in an increasing number of projects and programs funded by the Bank in FY91. They include projects whose main objective is to improve the environment and others which incorporate environmental concerns as part of a regular project or adjustment loan. India's efforts to promote environmentally sound industrial development were bolstered during FY91 by a US\$124 million loan and a credit of US\$31.6 million for the Industrial Pollution control Project. It is the first Bank-supported project in Asia devoted exclusively to pollution control. India will use the loan to finance a program designed to reduce industrial pollution caused by chemical industries in the states of Gujarat, Maharastra, Tamil Nadu, and Uttar Pradesh. Producers of dyes, fertilizers, pharmaceutical, pesticides and petrochemicals are among India's worst polluters, discharging waste into rivers and other bodies of water.

A number of smaller industries have violated environmental codes because they are unable to meet the costs and technical requirements of installing safe systems. Many of these industries are located in industrial estates, where shared waste-water treatment facilities could be used. But even in areas where waste treatment facilities are available, effluents are often discharged untreated because there is insufficient enforcement of laws on waste disposal. The Bank's loan will help the government strengthen the capacity of monitoring agencies to ensure compliance with environmental laws. It also includes funds for building waste-treatment facilities in industrial parks to be used by small and medium sized industries which could not afford to do so on their own. India's industrial pollution problems have persisted partly because the country's protective trade regime and pricing policies have unintentionally encouraged wasteful use of raw materials. High tariffs have shielded smaller industries -- which operate at environmental standards well below world levels -- from competition. The success of the loan will depend in part on the commitment of the government to increase the costs of noncompliance with environmental regulations and, more important, on its ability to convince industrialists that their own long-term interests lie in pollution control.

Disaster Relief in Bangladesh (Box)

Bangladesh has been battered by cyclones and floods since time immemorial. Of the ten most disastrous storms of the century, seven struck Bangladesh. The series of cyclones that struck during April and May 1991 are estimated to have taken some 140,000 lives and caused extensive damage to infrastructure, factories, agriculture, and marine equipment and facilities. Immediately following the cyclones, the World Bank dispatched several field missions to study the extent of damage. Upon their assessment of the situation, the Bank will reallocate funds from existing IDA credits and will consider a free-standing rehabilitation credit if additional assistance is needed. Support for construction of cyclone shelters is also being considered.

As another major recovery program gets under way, questions are again being raised about the wisdom of current practices which place greater emphasis on relief than prevention. This is the subject of a recent Bank report, *Managing the Environment and Natural Disasters*, which places a good deal of responsibility for the consequences of natural disasters on human beings. A cyclone or an earthquake does not constitute a disaster until it affects lives or damages property. Many natural disasters could be prevented by thoughtful land-use management and effective environmental practices. This proactive approach is better by far, the report says, than restoring the country to its pre-disaster status and waiting for history to repeat itself.

The Bank also approved a US\$23 million loan and a US\$130 million IDA credit to the Dam Safety project in India. Institutional strengthening is a major objective. The project will also provide assistance in applying improved procedures to reassess the flood handling capability of about 940 large dams in four states, and fund remedial efforts where necessary. It is the first time the Bank has sponsored a dam safety project and it is hoped that the project will serve as a prototype for others.

A US\$158 million sector adjustment loan approved in FY91 is designed to enhance management of the Philippines' natural resources which are currently under severe threat. Only one million hectares of old growth forest still remain; a fraction of the total standing a generation ago. Shifting cultivation has led to severe soil erosion and changes in the hydrological regime. Meanwhile, overfishing, combined with the destruction of mangroves and coral reefs, has led to the depletion of inshore waters.

These problems, which were analyzed in depth in the Environment and Natural Resource Management Study completed in the previous fiscal year, are linked in two ways. First, they involve what are supposedly publicly owned and managed resources which are exploited without restraint by private companies and individuals. Second, they affect the livelihood of the country's neglected and impoverished rural population. The loan includes provision for improved enforcement of logging rights, the introduction of secure tenure for people working the land, and training in new agricultural techniques for farmers in upland areas where the most severe environmental degradation is taking place. The loan promises to put in place a sound institutional basis to sustain the Philippines' forests and upland agricultural areas. The risks come mainly from possible delays in legislative action, weak management -- something the loan is designed to address -- and a reluctance on the part of people living in rural areas to change their ways.

China's problems of urban pollution are writ large in the capital Beijing. Work went ahead during FY91 on the preparation of a major stand-alone environment project designed to address them. The loan will go the Board in FY92. China will use the loan to establish a comprehensive environmental protection program focusing on the city's policy and institutional framework. The focus will be improving air and water quality, and dealing with solid waste generated by households and industry. In addition to reinforcing the city government's ability to manage the environment and develop long-term strategies to deal with the most pressing environmental problems, the project will provide finance to renovate or close-down Beijing's dirtiest industrial plants, to improve the sewer system, to build central heating facilities to replace large numbers of small boilers, and to dispose of hazardous waste.

More than 30 projects approved in the Asia region during FY91 included environmental components (see Annex II); several had more than one environmental goal. About a third of them were for soil, forest and water conservation. For example, the Fourth Rural Credit Project in China will help to establish a sustainable rangeland management system; facilitate development of fisheries; improve rural water supply and drainage networks, and encourage tree planting to contain soil erosion. In India, the Tamil Nadu Agricultural Development Project will also finance a range of activities designed to protect rainfed areas under ecological stress.

Pollution control is featured in several projects; the Indonesian Fertilizer Restructuring Project will finance studies to assess the environmental impact and standards of the fertilizer industry, including long-term objectives and preparation of an environmental management program for the industry nation-wide. Also in Indonesia, the Third Jabotabek Urban Development Project contains a wide range of provisions for improving pollution control in the most populous region of the country.

The vulnerability of the region to natural disasters is also reflected in the lending program. In addition to the response to the Bangladesh emergency (see Box), the Andhra Pradesh Cyclone Emergency Reconstruction loan to India aims at strengthening institutional capability in cyclone preparedness as it relates to irrigation and drainage, water supply, and flood protection. The Philippines Earthquake Reconstruction Project provides for reconstruction of infrastructure as well as institutional development. In general, institution building, aimed at improving the administration of environmental policy, with special reference to monitoring and regulation, environmental assessment capability, and training, is a feature of most environmental lending activities in the region.

Project Implementation

Overseeing existing projects to ensure that environmental safeguards are respected has received increasing attention during the year. In India, for example, the Bank continued to work with the governments of Maharashtra and Madhya Pradesh to improve resettlement planning for people displaced by the Narmada River Development Scheme - the Sardar Sarovar Dam and Power Project. It is encouraging local authorities to establish a dialogue with displaced people and to address opponents' grievances. A committee of resettlement officers and non-governmental organizations has been created to assist landless poor and tribal people during the resettlement process. In addition, the Bank has recently commissioned an independent review of the project's resettlement and environmental aspects. The review committee will be chaired by a former Administrator of the United Nations Development Program. The committee's findings and recommendations are expected early in 1992.

The resettlement of more than 5,000 families displaced in 20 villages by the Kedung Ombo Multipurpose Dam and Irrigation Project in Java, Indonesia has been a difficult and complex task. Construction of the dam is now complete and substantial progress has been made on a revised resettlement plan. During the year more than 1500 families moved to the areas designated for resettlement near the reservoir or transmigrated. They all received houses and land, and have access to a range of community facilities. Efforts still continue to resettle the last 558 families who remain on the greenbelt -- the five-meter zone above the reservoir which must be evacuated as a safety precaution. Although the clock cannot be turned back for the displaced families of Kedung Ombo, a number of lessons emerge. Many problems could have been avoided if the original resettlement plan had been more flexible and provided options for people to choose from. Resettlement plans for future projects involving involuntary settlement should be framed with the participation of the affected families.

Efforts also continue to address the change of environmental problems associated with development of the Singrauli region of India. The Bank has launched a series of studies to see how best to handle pollution, forest management and watershed protection, and industrial land reclamation. In addition, an environmental assessment of the entire region has identified priority problems. A more ambitious development and environment study is now proposed. Currently under consideration by the Indian government, the study would outline a comprehensive development strategy, including provisions to strengthen local institutions and create a tax base for environmental and development programs. Most important, development priorities will be established in cooperation with all people interested in the region's future.

<u>Global Financing Facilities</u> Six investment projects in the Asia region were presented to countries participating in the Global Environment Facility at the first meeting of Participating Parties in May 1991. They are located in Bhutan (trust fund for environment conservation), China (coal-bed methane pilot project; ports waste disposal); Lao PDR (wildlife and protected areas management); Philippines (management of protected areas; geo-thermal energy). Projects are also planned in Bangladesh, China, Malaysia, Philippines, Sri Lanka and Thailand to assist these countries in complying with the terms of the Montreal Protocol which calls on developing signatories to phase-out ozone-destroying substances by 2010.

EUROPE, MIDDLE EAST & NORTH AFRICA

Introduction

The Bank's Europe, Middle East and North Africa region (EMENA) includes 29 countries, which are at various stages of development. Despite their economic and cultural diversity, most have common environmental problems whose roots are found in inappropriate economic policies, such as subsidized prices for energy or water, and weak regulatory systems. They also share a number of region-wide environmental concerns which lend themselves in some instances to region-wide solutions.

The year saw a notable increase in the Bank's analytical work in the form of issues papers, policy briefs, and sector reports. There were also an array of new investments. Intensity of activity in Eastern Europe remained particularly high and tended to dominate environment activities in the region. An example was the new regional environment initiative in the Baltic Sea. Meanwhile, a similar multilateral program in the Mediterranean was consolidated. In addition, an ambitious overview of water shortages in the EMENA region was launched, a major environment loan to Pakistan was approved, and progress was made in the preparation of a new initiative in Egypt.

Eastern Europe

<u>Environmental Strategy</u> Eastern Europe's environmental problems remain daunting. But progress has been made in dealing with them by making the environment part of the process of economic reform. Political change has created high expectations throughout Eastern Europe. The environment has acted as a rallying point for many people dissatisfied with the previous regimes, and progress in bringing about improvements is an important criteria against which the performance of the new governments is judged.

The magnitude of the pollution problems in Eastern Europe is becoming increasingly apparent. For example, although initial estimates of the losses caused by environmental degradation may have been exaggerated, it now appears that Poland has been losing (largely through ill-health) about 5 percent of its annual Gross Domestic Product due to environmental degradation. This is two or three times higher than in the OECD countries. The challenge now is to open up the economies of Eastern Europe and expose them to the sorts of pressures -- both in the form of regulations and the market place -- that have produced environmental improvements in many other parts of the industrialized world over recent decades.

Environmental and economic development issues are closely intertwined in Eastern Europe. Bank efforts to address environment explicitly recognize this. For example a joint team made up of experts from the European Community, the US Agency for International Development, and the US Environmental Protection Agency, in addition to World Bank staff, spent several weeks in Czechoslovakia during FY91 working with the government and its constituent Czech and Slovak Republics on a joint environmental study. Their report, issued in June 1991, says that the quickest returns to the environment will come from the removal of subsidies and other general price and market distortions. Once resources are more efficiently allocated, policies to improve environmental quality are likely to be more effective. They should include incentives to reduce pollution, to assume environmental costs and to move towards more sustainable use of resources. Reforms should include realistic pollution standards, a rational structure of charges, fines and fees, and effective monitoring, inspection and enforcement. A number of projects in the study are identified as candidates for Bank funding as part of a three-year action plan.

In addition a series of specifically environmental studies that have been conducted in Poland, Hungary, Bulgaria and Romania. Environmental concerns also feature heavily in economic and sector work being carried out in these countries. A major inter agency study of the USSR economy (see below) also pays special attention to environment. Bank studies of environmental issues in these countries indicate that in general, fundamental changes are required, namely:

- <u>Market Clearing Prices</u>. Highest priority must go to increasing the price of energy and other natural resources to reflect scarcity values. The goal is to establish efficiency as the criteria by which to judge performance.
- <u>Investments</u>. Large investments are needed to support industrial restructuring and to overhaul the energy sector; particularly to control particulate emissions and modernize the domestic heating system. Improving water quality is also a priority.
- <u>Laws and Regulations</u>. Realistic regulations on effluent and emissions standards to prevent any further deterioration in water and air quality. Fees and fines must be high enough to deter polluters.
- <u>Shared Responsibility</u>. Decentralization to regional and provincial authorities to achieve better environmental management, but with a mix of responsibilities between the center (regulatory framework) and regional levels (monitoring, enforcement, fine-tuning of regulations).

Regional Energy Plan (BOX)

The energy sector bears major responsibility for environmental problems in eastern Europe, according to a number of recent Bank studies. Subsidized prices, soft budgetary constraints and the widely-accepted principle that environmental pollution was cost-free, led to massive over consumption of energy. Environmental degradation of all sorts was the inevitable corollary. In response to this region-wide problem, the Bank has proposed a three year Regional Energy Program. The first step would be to raise prices to reflect production and environmental costs, improve competition and promote conservation. Then it would set about tackling uncertainties about supplies of natural gas and oil from the Soviet Union by diversifying sources of supply. The program would also stiffen pollution controls, investigate alternative energy sources and review safety in the region's nuclear power facilities.

Environmental problems originating in Eastern Europe have also contributed to the degradation of the Baltic. An attempt to restore ecological balance to the sea was launched at a summit conference of Northern European governments meeting at Ronneby, Sweden in September 1990. A task force was established charged with drawing-up an action plan to resolve the Baltic's pollution crisis. The World Bank, the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD), and the Nordic Investment Bank are working on the plan with governments. The task force plans to finalize its work program by the end of FY92. Each of the development banks is responsible for a number of studies on the worst affected areas of the Baltic. In addition to looking at causes, they will propose solutions in the form of investments and policy reform. The World Bank, in co-operation with EBRD, is taking the lead in the preparation of studies in Czechoslovakia (The Oder and Vistula River basins) and Poland. It is coordinating efforts on the German portion of the Oder river basin with the EIB. The Bank's work on the Soviet part of the Vistula River basin is also being done with EIB.

Meanwhile, the environment figured in the study of the USSR economy undertaken jointly by the World Bank, the IMF, the OECD and the European Bank for Reconstruction and Development. The study, commissioned by the Group of Seven at the Houston summit in July 1990, said that environmental reform in the USSR must be closely integrated with the transition to a market-based economy. However, economic reform is not sufficient on its own, the report says. Pollution charges, environmental information and monitoring systems, environmental impact assessments, and international cooperation are also important. The report recommends that at first the emphasis should be on least-cost methods of increasing efficiency and reducing waste and pollution. Only later will it be possible to invest in the kind of modern, clean technologies which promise substantial gains in productivity and for the environment.

<u>Environmental Lending</u> During the year four loans to Eastern Europe contained significant environmental components: a free-standing environment project to improve the heating system in Poland; an emergency recovery project in Romania; and structural adjustment loans to Poland and Czechoslovakia.

The \$340 million Heat Supply Restructuring Project in Poland focuses on the country's inefficient domestic heating system. At present households have very little incentive to save energy because heating is provided to whole districts rather than to individual homes. Most people open and close their windows to regulate the temperature in their homes. The new loan will attempt to eliminate this inefficient practice by modernizing the district heating networks and providing equipment to deal with air pollution.

Fast track procedures were used to push through a \$180 million emergency loan to help Romania cover the foreign exchange costs of vital imports and to provide technical assistance in putting together a program of economic reform. The Romania Technical Assistance/Critical Imports loan includes provisions with a central environmental focus in the form of sectoral studies on irrigation, agro-industries, and petroleum, power, and industry.

Meanwhile, a \$300 million structural adjustment loan to support Poland's move towards the privatization and restructuring of state enterprises has a central environmental purpose: all enterprises that benefit from the loan will be obliged to operate in accordance with strict environmental standards. A structural adjustment loan to Czechoslovakia approved in FY91 requires the introduction of pollution charges and environmental assessments for all new investments.

A number of projects with environmental objectives reached advanced stages of preparation during the year. These include a project targetting coal mining and the chemical industry in Poland as candidates for environmentally-sound restructuring. In addition, work is underway on a major loan to finance Poland's financial sector. The rapid pace of economic reforms can only be sustained if financial institutions can mobilize savings, evaluate risk, and allocate resources efficiently. The loan is key to the success of the government's long term aim of achieving macro-economic stability, restructuring the least efficient (and most polluting) sectors of the economy, and laying the foundations for sustainable growth.

In Czechoslovakia, work continued during FY91 on the preparation of two loans related to the environment. An energy sector project will include substantial investments in the reduction of air pollution from thermal power plants. The disposal of various kinds of waste, mine-site reclamation and the clean-up of the highly polluted Ostrava region in the north of the country all feature in a free-standing environment project now being prepared.

A Bank study of Hungary encourages a shift away from subsidised energy towards more effective demand management and economic pricing. This perscription features in two projects currently being prepared: the first covers the energy sector; the second deals with industrial restructuring.

A Bank technical cooperation team visited Bulgaria early in the fiscal year and found serious environmental degradation in some places -- although the overall situation is not as bad as in Poland or Czechoslovakia. The Bank is now working on structural adjustment measures and a technical assistance loan which will incorporate many of the team's proposals into the economic reform program. Bulgaria is also drawing up separate strategy papers on energy and the environment.

Southern Europe, Middle East and North Africa

<u>Strategy</u> A study of the main environment problems faced by Egypt began during the fiscal year. It is the first stage in formulating a strategy to deal with them. Most of Egypt's environment problems arise from competing demands on limited resources of water, land, and energy by a fast growing population. Integrating environmental concerns into the country's economic framework is a now a central thrust of the Bank's work. As part of this process, a round table conference was held in Cairo in June 1991. During the session agreement was reached on a national framework to assist in identifying and mitigating Egypt's environmental black spots. In addition, a structural adjustment loan approved during FY91 incorporated various components affecting the environment. They include energy conservation and industrial pollution abatement, and the improved management of rangelands and groundwater.

The Mediterranean Environmental Technical Assistance Program (METAP), launched in spring 1990, is now well underway. The program supports the development of environmental projects, the strengthening of institutional capacity and the definition of environmentally-sound policy, and is jointly funded by the Commission of the European Communities, the United Nations Development Program, the EIB and the World Bank. Activities are concentrated on the Mediterranean's southern and eastern rim where the need for action is most acute.

Although slowed down somewhat by the Gulf war, METAP was externally active during the year and is now implementing some 66 actions in ten countries (Algeria, Cyprus, Egypt, Greece, Israel, Malta, Spain, Tunisia, Turkey and Yugoslavia). To increase the level of environmental lending in the region, METAP's primary function at present is to identify and prepare environment projects and to develop an investment program. Priority goes to four activities: integrated water resource management; management of solid and hazardous wastes; prevention of marine pollution caused by oil and chemicals; and containing damage in coastal waters.

- Integrated water resource management is concentrated in the Maghreb countries, where lack of water represents a major constraint on development. METAP activities in Tunisia, for example, include a project to examine the use of sludge for agricultural purposes.

Requests for support in dealing with hazardous waste have been received from Algeria, Cyprus, Israel, Malta and Tunisia. An example is Algeria's proposal to study technological and financial alternatives in waste management.

Marine oil and chemical prevention control is important in what is one of the world's most heavily travelled bodies of water. Support for Turkey's maritime pollution prevention measures in the Sea of Marmara, the Dardannelles and the Bosphorus is an example of METAP's activities in this area.

Coastal zone management focuses on institutional and regulatory issues, infrastructure and urban environmental quality, biodiversity and cultural property. In Yugoslavia, for example, a management plan is being drawn up to protect historic buildings and biodiversity on the islands of Cres and Losinj.

Policy work advanced during FY91 with various studies on financing mechanisms for pollution abatement. A study was also completed on coastal development in Turkey. Institutional strengthening was furthered through the launch of the Mediterranean Protected Areas Network (MEDPAN) which brings together managers of protected areas from throughout the region. A number of training courses were organized and support continued for the United Nations Environment Program's pollution monitoring and research program (MEDPOL).

Throughout most of the region, water is scarce, expensive, increasingly polluted and poorly managed. The resulting conflicts and inefficiencies put a brake on growth, strain public finances and damage the environment. A region-wide Bank study of the management of water resources launched in FY91 is an attempt to take stock of the deteriorating situation and formulate a more comprehensive approach. The scale of the problem warrants concern. Of the 11 countries in the arid areas of North Africa and the Middle East, seven are categorized as experiencing "absolute water scarcity" and in need of significant adjustment to meet demand. Another three are in "water stress", requiring major investments to keep up with demand. Meanwhile Iraq, Iran, Pakistan and Yugoslavia are classified as having "water management problems".

Getting prices right and adjusting fiscal incentives would do much to promote more efficient use of water. But there are a host of cultural, social and political issues at stake that must be taken into account if they are not to undermine market mechanisms. In the absence of new technologies, the emphasis must be on strengthening water authorities, rationalizing policy, reforming incentive structures and improving planning, according to the Bank's research proposal. This means involving all water-users in the management process and obliging them to face up to a complicated series of trade-offs between urban areas and the country-side; between agriculture and industry; and among a variety of development objectives.

In many parts of the region the process is made more complicated by the fact that rivers and aquifers cross international borders. The headwaters of the Nile, the only source of water for Egypt, are controlled by Ethiopia and Sudan. Israel, Syria, and Jordan share the River Jordan. Turkey, Syria, and Iraq all draw on the Tigris and Euphrates rivers. And most of North Africa depends on water from the same regional aquifer. In all these cases, continued use of shared water resources is vital to economic security and growth. Long-term sharing arrangements are thus vital to regional security and economic development. But they are only likely to be worked out as part of a broader approach to water management which addresses the full set of risks and uncertainties that determine a country's willingness to share so vital a resource.

The first stage of the study (FY91-93) - coordinated by EMENA's regional environment division - focuses on countries with the most pressing problems: severe shortages; rising costs; declining water quality and fierce competition from a variety of users. The aim is to improve water sector operations and to lay the technical groundwork for a comprehensive set of policy proposals. The study will include case-studies, seminars and discussions with governments. The resulting papers, reports, recommendations and guidelines will be used directly in World Bank lending activities and policy discussions with borrowing countries.

The Pakistan Environment Protection and Resource Environmental Lending Conservation Project, funded by IDA, is the first attempt at dealing comprehensively with that country's deteriorating environment. This US\$47.4 million free-standing environment project is an integral part of IDA's strategy for the agricultural sector. In order to safeguard substantial investments already made or planned in dams and irrigation systems, emphasis is placed on upgrading management of rangelands and watersheds, rehabilitation of coastal areas and wild-life habitats, and the stabilization of sand dunes. Rapid environmental degradation in Pakistan is made worse by fast population growth (3.1 percent a year) which places increasing strains on finite land resources. The evidence is found in declining crop yields and productivity, loss of forest cover, over-grazing, soil erosion, salinization of irrigated areas, water pollution and the loss of natural habitats, plants and animal species. The focus of the loan is strengthening central and provincial environment agencies. This includes the introduction of sophisticated environmental monitoring techniques and training to build up a local cadre of environmental assessors. A mass communications effort to bring the environmental message home to the poorest peasant is also part of the program.

In addition, several loans to countries outside Eastern Europe approved during FY91 contained environmental components. Examples include a loan to Morocco for port modernization which contains environmental provisions for the disposal of dredging materials and other debris; a project to restructure Tunisia's hospital system which deals with the handling of surgical waste; Turkey's technology development project which funds for studies on energy conservation and introduces safeguards for disposing of dangerous waste from laboratory tests; and a project for training secondary school teachers in Yemen to develop a curriculum and text books on environmental science.

Global Facilities for EMENA

Opportunities for securing concessional finance from the new Global Environment Facility and the Montreal Protocol Interim Fund gave rise to intense activity during the fiscal year. Four projects in the EMENA region were presented to the GEF's Participating Parties at their meeting in Washington DC in May 1991. All three are in the area of biodiversity, and include conservation of national parks (Algeria), screwworm control (North Africa regional), and forest protection (Poland). A regional project for Environmental Management in the Danube River Basin was also presented. Projects in Egypt, Jordan, Tunisia aimed at reducing emissions of ozone-depleting substances were also readied for Montreal Protocol funding.

LATIN AMERICA AND THE CARIBBEAN

Introduction

The Latin America and Caribbean region includes 30 countries with a total population of 414 million people, growing at a little over two percent a year. Most of the countries in the region share low levels of economic growth and a complex set of environmental problems. Pollution of the air and water, deforestation on a grand scale, soil erosion, the degradation of coastal areas, and insufficient urban services have had a cumulative impact. The threat to human health steadily increases in rural areas and the fast growing cities which are now home to more than 70 precent of the region's population.

The scale and nature of the environmental problems in Latin America and the Caribbean gave a clear focus to the Bank's activities during the fiscal year. The general pattern was established by the previous year's Environmental Policy loan to Brazil. In FY91, a series of indepth country studies, aimed at strengthening environmental management capacity at the national level, and resulting in environmental sector policy lending, were in various stages of preparation. Actual lending operations included major loans to Mexico and Ecuador designed to strengthen environmental institutions in the two countries. Similar projects are being prepared in several other countries in the region. In all, more than 20 projects approved during FY91 included environmental components.

Environmental Strategies

During FY91 analytical work began on three major sets of environmental issues facing the region. First, pollution and contamination in the urban areas which now accommodate more than two-thirds of the region's population; second, the loss of tropical forests and the assets they represent both for the countries in which they grow and the rest of the world; and third, the region's response to global warming issues. By focusing on the region's most pressing problems the aim is to help put environmentally sound policy instruments in the hands of the Bank's borrowers.

Air and water quality are major concerns in many of the region's cities where the absorptive capacity of the environment has been affected by the unregulated growth of highly-polluting industries, the lack of such basics as sewage treatment, and unplanned urban sprawl which leaves cities choked by traffic. An already bad situation is made worse by the effects of

perverse economic incentives, such as subsidized prices for water and electricity.

The urban pollution and policy study is studying the economic costs of urban pollution. Cities to be studied include Mexico City and Santiago, Chile. Key criteria in identifying policy options are ease of implementation and impact on the overall level of pollution. The study will also deal with how pollution affects economic growth and the implications for different socioeconomic groups of the various policy alternatives. The thrust of the study is to help define an appropriate balance between policies that discourage pollution, through price and other economic incentives, and those based on regulation and control.

Tropical forests in Latin America are being rapidly destroyed. Destructive practices include opening up of new agricultural land, clear-cutting for the timber market, and constant encroachment of neighboring populations. A study entitled "The Role of Native Forests and the International Timber Market" analyzes the way in which economic policies influence the various forms of deforestation. It covers the relative importance of government policies, market forces, and public and private investment. Individual country studies will examine a variety of policy instruments to reduce degradation. The role of the market in providing incentives for more rational resource use gets special attention. The study identifies two orders of benefits from forest protection. The first are local and national; the second are global and derive from the role of forest cover in fixing atmospheric carbon and providing a habitat for many varieties of plants and animals. An important objective is to work out the additional costs of policies and investments necessary to obtain global benefits.

Pilot Program to Protect Brazil's Rainforests (Box)

The Bank is working with the government of Brazil and the Commission of European Communities on an innovative effort to save Brazil's Amazon and Atlantic forests. The pilot program was proposed by the Group of Seven, made up of the world's seven leading industrialized nations, at the Houston Economic Summit in July 1990. The objective is to maximize the environmental benefits of Brazil's rainforests in line with the country's development goals. By reducing the rate of deforestation, the project should demonstrate the viability of the concept of sustainable development, help preserve the huge genetic resources of the rainforests, reduce the Amazon's contribution to global carbon emissions, and show the importance of cooperation between developed and developing countries on global environmental issues.

A \$250-million Rainforest Fund has been created to finance the five-year program. The fund will be used to provide grants and low-interest loans, and to underwrite debt-for-nature swaps. Disbursements will begin in spring 1992. Funding will be available for scientific research on ways to harness the forests' resources. Educational programs aimed at improving public awareness of the costs and benefits of rainforest protection will also be eligible for support. The fund will be used to strengthen public accountability and the enforcement of environmental regulations. Separate windows will be established for governmental agencies and non-governmental organizations to sponsor demonstration projects to manage the forests' biological wealth.

Another study of global environment issues as they relate to Latin America is being

conducted. This study addresses the costs of reducing emissions of greenhouse gases, examining possible policy approaches and target emissions levels; the effects on growth, welfare, and macro-economic balances; and the resource transfers required to offset them. The study will pay particular attention to changes in broad sectoral policies (such as the elimination of subsidies on energy and fertilizers, and trade reform) which may have a significant effect on greenhouse gas emissions.

A number of sector and economic reports completed during the year also include environmental concerns. An example is a report on economic stabilization in Brazil which recommends a swift reduction in the supply of subsidized credit in rural areas and more government support for the kind of agricultural services (research, training and so on) that will most benefit the private sector. A sector report on adult health, also in Brazil, proposes measures to improve environmental quality. And a public sector expenditure review in Columbia makes the case for lowering energy subsidies.

Participation of affected people in the development process continues to be a major concern. In January 1991, with funds from the Swedish International Development Agency (SIDA), a special program was established in the Latin America and Caribbean region to promote participation of local communities and non-governmental organizations in Bank-funded projects dealing with environmental protection and the management of natural resources. During the first six months of 1991 the program funded some 12 initiatives. These included several which drew on the knowledge of indigenous peoples in the management of fragile lands and resources. Future plans include support for a training workshop in Bolivia on the management in Brazil, and a film about community participation in rural resettlement projects in Mexico.

Property rights are an important determinant of the way natural resources are used. This is clearly the case in Amazonia. However, the precise nature of the relationship is not well understood. To find out more, a research project entitled "Property Rights and Net Loss of Tropical Forest Land in the Brazilian Amazon" is underway. The research seeks to establish how existing property rights contribute to the destruction of tropical forests and how they might be changed to encourage better maintenance and management.

The Bank has been working closely with government of Ecuador to minimize the environmental and social impacts of oil production in the Amazon. These issues were first identified during the preparation of the proposed Oil Development Project, whose objectives are to help Ecuador develop its oil resources in an environmentally sound manner. Although preparation is still at an early stage for the loan, the Environment Technical Assistance Project - which contains measures to safeguard the rainforest and tribal peoples from the impacts of oil production -- is expected to go to the Board for approval in FY92.

The challenge posed by Bank operations in the region amazon of Ecuador is to allow the country to exploit its oil resources while protecting its rainforest and tribal communities. An environmental assessment is underway to evaluate appropriate measures to protect the

environment and safeguard land rights of indigenous populations. A comprehensive environmental management plan for the oil sector was recently completed and will be complemented under the Environment Technical Assistance Loan. The plan includes a series of proposed environmental regulations and contingency plans for oil spills. As recommended in the plan, a new environmental unit has been created in the Ministry of Energy to monitor the performance of oil companies.

Environmental Lending

During FY91 the Bank assisted several Latin American countries prepare comprehensive environmental projects. These have a variety of objectives, from arresting various types of environmental degradation to protecting biodiversity, and controlling air and water pollution. The projects not only finance specific investments but also heavily emphasize nation-wide institution building, training, and policy reform. Two specifically environmental projects were approved by the Bank's Board during the fiscal year. They are designed to bolster national environment agencies in Ecuador and Mexico. Similar efforts are being prepared in Bolivia, Chile, the Caribbean region, Paraguay and Venezuela.

The Ecuador project (Environmental Technical Assistance Loan) will assist the central government establish the institutional capacity to deal with environmental issues in all sectors. In addition it provides for the preparation of environmental laws and regulations, and the means to enforce them. It should enable the country to deal with a range of intricate problems such as the environmental impact of oil exploration in some of the country's most ecologically-fragile areas. The Ecuador project will try to reverse some of the negative effects which resulted from the clearing of coastal mangroves to make way for agriculture and shrimp farming. In addition, the project will address the question of land-tenure in the oil producing areas of Ecuadoran Amazonia. Moreover, it will support the government's efforts to comply with the Montreal Protocol stipulations to phase out substances damaging the ozone layer.

The loan to Mexico (Decentralization and Regional Development Project for the Disadvantaged States) provides for improved management at the Secretariat for Urban Development and Ecology (SEDUE). It aims to increase the government's capacity to protect the environment and manage natural resources and to strengthen the institutional and policy framework. In doing so, the project supports the government's strategy of transforming SEDUE into a small, highly qualified organization to supervise and co-ordinate environmental work carried out by other levels of government or the private sector. More specifically, the project will protect natural reserve areas; strengthen institutional capacity to improve project assessment techniques and formulate environmental policies; and restorate selected archeological sites. It contains small-scale forestation programs; watershed protection; plant and animal disease control; and rural water supply and sewerage components.

The Bank also approved a number of loans during FY91 which are not directed exclusively at improving the environment but contain environmental components. In all, some

20 projects approved during FY91 have significant environmental components. Indeed many have more than one environmental goal (see Annex II). Such projects include the Mexico Water Supply and Sanitation Sector project, which provides for studies of medium and long-term water pollution strategies, involving consideration of effluent charges, standards and fees; the strengthening of environmental assessment capability; and a pilot water pollution control program. Environmental aspects of land management are addressed in the Agricultural Technology Development project in Bolivia which establishes a research program for pasture management and crop production to prevent wind erosion problems in the Altiplano. It also finances research aimed at reducing the dependence on chemical pesticides. A loan to Colombia for Industrial Restructuring and Development provides technical assistance to industrial enterprises to improve pollution control measures and to support a national environmental pollution control program. The range of lending operations which feature environment is further illustrated by the Public Enterprise Reform Adjustment Loan to Argentina. This will facilitate improvement in environmental management by public enterprises. Overall, about half of the projects with environmental components are intended to upgrade environmental administration and environmental assessment capability.

Project Implementation

Implementation of projects with important environmental components or consequences continues to be a matter of great concern throughout the Bank. Nowhere is this more evident than in Latin America and the Caribbean. Important lessons have been gained from the experience of a number of projects in the Brazilian Amazon, notably the Polonoroeste and Carajas projects. Based in part upon this experience, and to provide an analytical framework for future projects, the Bank conducted a study in FY91 on the causes and nature of environmental problems in the Amazon. Three key policy recommendations emerge. First, the study recommends eliminating economic incentives that promote environmental degradation. Second, it urges limiting access to new land as a way of making sustainable agricultural practices more tenable. And finally, it suggests increasing protection for parks and reserves, and resolving the vexed question of land tenure. The study's findings are now an integral part of several new initiatives. Two natural resource management projects still in the pipeline in the states of Rondonia and Mato Grosso focus on environmental policy reforms and rural development based on agro-ecological zoning -- a planning technique which differentiates land according to its most appropriate use. An industrial pollution project currently under preparation for all of Brazil will support several pilot programs in the Carajas region. In addition, a study of alternative energy options for the Carajas region is under discussion with the government. Meanwhile, the Group of Seven's Pilot Program for the Amazon will support projects to preserve vital areas of the ecosystem and sustainable economic development (see box).

Implementation of the Mexican Forestry Development Project (approved in FY89) has been delayed. The project, in the northern states of Chihuahua and Durango, aims to increase productivity of the forestry sector while reducing the negative environmental impacts caused by traditional forestry practices. It includes provisions to ensure protection of endangered species and the preservation of intact forest. The delay is due to slow progress on the environmental baseline study which must be completed before implementation can begin. The Bank worked closely with the Mexican authorities on this during FY91 and the study should be finalized by the end of 1991.

<u>Global Facilities</u> Projects in Brazil (biodiversity conservation units), Mexico (biodiversity), are under consideration for GEF funding. In addition, technical assistance projects have been proposed in Brazil (Conservation and Sustainable Management of Natural Resources in the Amazon), Columbia (Conservation of Biodiversity), and Guyana (Sustainable Tropical Forestry). A first set of projects to assist borrowers comply with the Montreal Protocol are also planned in Brazil, Chile, Ecuador, Mexico, Trinidad and Tobago, and Venezuela.

IV. GENERAL OPERATIONAL ISSUES

The Process of Integration

Continued progress in integrating environment into the Bank's operations is illustrated by the number and significance of projects with environmental components or objectives approved during the reporting period. (See Table 1). [Note that this year a project will be deemed to have a "significant" environmental element if either environmental costs or benefits exceed 50 percent of total project costs or benefits. Last year 10 percent was used. Obviously, estimates are going to be somewhat subjective]. In FY91, some ______ such loans were approved. This represents _____ percent of total projects approved during the year. Of these, eight loans had solely environmental objectives with a total value of US\$ _____. In FY90, eleven free-standing loans were approved (see the World Bank's First Annual Report on the Environment) for a total amount of US\$405 million.

In addition, four structural adjustment loans and one sector adjustment loan approved in FY91 addressed environmental objectives. This compares with four and five, respectively, in FY90. Sectors in which more than half the projects had an explicitly environmental orientation were energy, industry, agriculture, and population. Of the eight free-standing projects approved during the year, three were in the Africa region, namely Mauritius Environment Monitoring and Development; Burkina Faso Environmental Management; and the Kenya Forestry Development projects. The free-standing projects in Asia were both in India, i.e., the Dam Safety and Industrial Pollution Control projects. Other were the Pakistan Environmental Protection and Resource Conservation project in EMENA, and, in Latin America, the Ecuador Environmental Technical Assistance loan and the Mexican Decentralization and Regional Development project.

Sector	Number of loans	Loans with environmental components	Percentage of loans with environmental components
Agriculture and rural			
development	48		
Forestry	1		
Irrigation and drainage	10		
Area development	9		
Research and extension	7		
Agroindustry	2		
Other	19		
Fransport	18		
Education	24		
Energy	21		
Oil, gas, and coal	12		
Power	9		
Population, health, and nutrition	26		
Urbanization	16		
Water supply and sewerage	10		
Nonproject	27		
Structural adjustment	22		
Other	5		
Technical assistance	14		
Development finance	24	6	
Industry	8		
Small-scale enterprises	4		
Public sector management	4		
Telecommunications	3		
Total	247		

Table 1. Loans with Environmental Elements, by Sector, Fiscal 1991

NOTE: Sector adjustment loans are included in the appropriate sector category.

As already noted, integration of environmental concerns into overall development policy is also proceeding rapidly, and becoming prominent in macroeconomic and sector work and adjustment lending. Integration of environment into the policy dialogue with borrowers and incorporation of the results into country lending strategies is an essential prerequisite for these activities. This has been recognized by the IDA donors, who have urged that recipient countries complete environmental action plans by the end of the IDA-9 period (June 30, 1993). This activity would provide a framework for integrating environmental considerations into a nation's overall economic and social development plans and would help promote a comprehensive national environment policy. The plans showed normally include (a) a summary of the country's economic development strategy; (b) a description of the salient features of a country's environmental setting; (c) identification and analysis of key environmental issues and their principal causes; (d) recommendations for specific actions for policy, legislative, and institutional change; (e) categories of investments and technical assistance needed to address priority environmental problems; and (f) recommended development strategy and requested actions by donors.

In fact, most countries are currently preparing environmental strategies or environmental action plans as part of the preparatory process for the 1992 UN Conference on Environment and Development (UNCED), and even prior to this many such exercises were already under way, sometimes conducted by the countries alone, but usually assisted by bilateral and international agencies. As the foregoing review of its operational activities shows, the Bank has assisted member countries in this area in a variety of ways. It has collaborated with a number of African countries in the formulation of National Environmental Action Plans, several of which have identified and resulted in project lending. In other regions as well, the Bank is increasingly carrying out in-depth analysis of selected environmental problems on a country-wide basis, using this work as a basis for making environmental policy loans.

Preparation of country environmental action plans are of course the responsibility of the concerned government. The process of preparation and form of presentation with, therefore, vary from country to country, as will the level of Bank support. The Bank maintains its dialogue with governments on environmental issues and use the findings and recommendations of the UNCED reports and other sources to develop its own country-by-country environmental strategy. This effort, for all IDA countries, will be completed within the timeframe prescribed by the IDA donors.

Environmental Assessments

Of the _____ projects approved in FY91, _____ were placed in category A, requiring a full environmental assessment and another _____ classified as B, in need of less intensive scrutiny. By region ______ category A projects were in Africa, _____ in Asia, _____ in EMENA, and ______ in Latin America and the Caribbean. Category A projects were to be found in the following sectors: [DESCRIBE]

<u>Environmental Assessment Review</u> A review of the first twelve projects with assessments yields some useful findings. Many EA measures are being incorporated into engineering specifications, rather than into a separate "environmental component". This has the advantage of pushing them far upstream in the project cycle. For example, standard engineering specifications for road building cover such environmental issues as: drainage, landscape quality, protection of trees, and disposition of topsoil removal for road bed. Many environmental measures enter project design under the rubric of engineering safety specifications; for example blowout prevention of offshore oil rigs (Oso Condensate, Nigeria), and enlarging a power channel beyond the size originally planned so as to serve as a spillway to relieve pressure on a 40-year old dam whose safety factor is low by today's standards and whose failure would be environmentally as well as economically damaging (Uganda - Power Project III).

In addition, however, projects have been modified as a result of the EA, for example, by rerouting a road to avoid archaeological sites (Botswana Tuli Block Roads); redesigning floodways to avoid disruption of a lagoon (Ecuador - Guayas, see box); and estimating the carrying capacity of rangelands before augmenting cattle herds (Uganda - Livestock) - as a result of controlling the cattle infected by the tsetse fly.

Even the mere requirement of an EA influences project design. Components that would require a category "A" are being dropped because of the extra work involved in preparing a detailed EA. One project that has undergone major design changes following an environmental assessment is the Pak Mun Hydropower Project in Thailand. Of the three dams originally planned, one has been dropped altogether; the second has been lowered to reduce resettlement from 20,000 people to about 1,000; and the third is to be relocated to conserve a scenic waterfall and to avoid a National Park.

Lower Guayas Flood Control Project

The Bank's new environmental assessment procedures should help avoid the kinds of difficulties that have sometimes been encountered in the past. An example of how an EA can help identify and mitigate negative environmental consequences is provided by the Lower Guayas Flood Control Project in Ecuador. This is one of the Bank's first projects to incorporate the findings of a full-fledged environmental assessment (EA). The primary objective of the project is to control flooding and increase agricultural productivity in the Guayas River basin, but environmental considerations are an important part of the loan. The team conducting the EA found that the delicate ecology of the El Churute Reserve -- an area containing the threatened Horned Screamer bird and the last of western Ecuador's tropical dry forest -- would be put at risk if flood waters were channeled through it as was initially planned. They were also concerned about the reserve's poor administration and lack of financial resources. In its report, the team proposed rerouting a flood control channel away from El Churute's lagoon into a seasonal wetland, which would remove sediments and contaminants from the waters before they entered the mangroves and river network. It also recommended environmental education for the people living in the area and the hiring of local families as park guards. In addition, the team recommended funding a comprehensive management plan for the reserve and providing increased resources for the branch office of the forestry agency.

Another concern was the risk of pesticide contamination. The team estimated that with better flood control, agricultural activity -- and the use of pesticides -- would increase. To reduce the risk, the EA team proposed an integrated pest management program for the Guayas basin and enforcement of regulations banning the use of prohibited pesticides. Both proposals were incorporated into the project. Finally, the EA team said that problems encountered during implementation could be better identified and remedied if local environmental groups and scientists who had been members of the EA team participated in project supervision. The Bank and government of Ecuador agreed, with the latter providing logistical support to make project supervision more effective.

<u>Environmental Assessment Sourcebook</u> An "Environmental Assessment Sourcebook" was completed toward the end of the fiscal year. This 1000-page reference manual, the product of a major Bank-wide effort, is to be published in two volumes in the World Bank Technical Papers series. The manual codifies all the Bank's environmental policies and guidelines into one source. The Sourcebook amplifies the EAOD, disseminates "best practice" on EA, and provides standard terms of reference and checklists for EA in all sectors. Copies of the manual and of the EAOD itself are available free on request from the Bank's Environment Department.

The manual is aimed primarily for the borrower's EA teams. They need to know how to implement the Bank's EA policies, and how the Bank expects the 12 to 24 month EA process to be conducted. Bank project officers will also find the manual useful in understanding what the EA teams are engaged in, and how to expedite the EA process from the Bank's side.

All relevant sectors and all types of projects with the potential for major environmental impacts -- and some minor impacts -- are addressed, with emphasis on large infrastructure projects. Impacts are outlined in energy, agriculture, industry, transportation, urban development, and water supply and sewerage projects. While no new policies are made by this book, the Bank's position on several controversial issues is clarified. For example, statements are included on asbestos, nuclear energy and tobacco.

The newest and most innovative section is on public participation and community involvement in projects. The EAOD specifies that the Bank must obtain the informed views of the people who may be affected by the proposed project. This is relatively new for the Bank, and we have little successful precedent so far. The book amplifies experience to date. Although the draft has been widely used in-country and for training Bank staff over the last year, it is a pilot edition and will be revised on a regular basis. User comments are actively sought.

Environmental Assessment Fine Tuning. Following the first two years of experience, the Bank is in the process of "fine tuning" the policy. Gray areas are being clarified, guidance added where needed, and the text updated in the light of experience and changing circumstances. Highlights include dropping the D category under the old system all free-standing environment projects were classified as 'D's and as such did not require assessment. It is now recognized, however, that projects aimed at achieving environmental objectives may in fact have perverse and unanticipated effects. In future all projects will be classified A, B or C, depending on their likely environmental impact rather than their environmental aspirations. The three remaining categories designate the appropriate amount of environmental work needed. 'A' projects need a detailed environmental assessment. 'B" projects need environmental analysis, but not a formal assessment. 'C' projects need no environmental work.

The biggest change in the EAOD concerns participation by people likely to be affected by a project. At the outset, the Bank asks the borrower if they are prepared to obtain the informed views of the affected people and to share all environmental assessments. If the borrower is not prepared to follow these policies, the Bank ceases further work on the project. Success in this endeavor obviously depends heavily upon local capacity. In the Africa region, for example, the Bank made considerable efforts during the year to improve its understanding of the extent to which local ability needs to be strengthened. Moreover, in Africa, as in other regions, an extensive training program on environmental assessment is in process (See Section VIII below).

Operations Evaluation

As in previous years, the Bank's Operations Evaluation Department (OED) addressed environmental issues in its review of all project completion reports and its own performance audit work. In addition, it undertook four studies on environmental questions.

World Bank Lending for Forestry To help in the preparation of a Bank-wide policy statement on forestry development(referred to in Section VIII below), a special study was conducted during this period. This study draws lessons from experience in forestry development taking into account four different levels: the projects, their components, issues during implementation and sector work. Four important findings should be noted: (i) forestry projects and programs are becoming increasingly complex as these operations have to consider a very large array of development objectives (e.g., productivity, environment, poverty alleviation, biodiversity); (ii) sector work and analysis was practically absent during more than a decade of forestry development, limiting the ability to formulate sectoral strategies and policies; (iii) forestry management components have performed very poorly creating some serious concerns in light of recent trends to increase donors' involvement in the management of forests; and (iv) intersectoral relationships between the forestry sector and the rest of the economy were found to be much larger than expected. The sector is very vulnerable to changes in sectoral or macroeconomic policies. Within this context, the study defines the type of components future forestry programs will have to consider and it lists a series of themes that have become central to policy formulation at the sector and national levels. Whenever possible, the study points out where Bank activities will be most valuable to the countries involved and where governments need to take a more active role.

Other OED special studies specifically concerned with the environment include "The World Bank and the Environment in Brazil: A review of Selected Projects"; "The Management of Renewable Resources in Agriculture"; and "Early Experience of Involuntary Resettlement in Bank Supported Energy and Agricultural Projects".

The World Bank and the Environment in Brazil Based on four case studies, this review examines how--and how well--the Bank has handled physical and human environmental issues in a sample of large projects in Brazil. Among the issues addressed or raised by those operations are industrial pollution control and urban environmental management (Sao Paulo), cross-sectoral water resource use and involuntary resettlement at the river basin level (Sao Francisco valley) and tropical deforestation, biodiversity loss and possible climate change, together with the impact of rail and road investments on Amazonian tribal and other local populations (Carajas and Polonoroeste). Several of the operations introduced pioneering environmental and Amerindian protection or forced relocation measures, while contributing directly to the formulation of Bank policies in these areas. During FY91, drafts of the case study reports and the overview document for the study as a whole were completed and sent to the Brazilian Government for its observations. All five reports will be finalized and presented to the Joint Audit Committee early in FY92.

<u>Renewable Resource Management in Agriculture</u> OED's natural resources management study is now in its second phase, of country case studies. A study of Nepal is nearly completed, and one in Bolivia was begun in the first half of 1991. It is expected to be completed in FY92. Both studies examine how the use and administration of natural resources has been treated in Bank country policy dialogue and economic and sector work, as well as the entire range of externally financed investment projects in these countries, during the past 25 years. A comparison of the two studies should provide lessons concerning the historical, cultural and socioeconomic circumstances which influence renewable resource management approaches under similar ranges of geographic and ecological conditions.

Involuntary Resettlement of Population OED is undertaking a study on early experience of involuntary resettlement in Bank-supported energy and agricultural projects. The objective of the study is to review, from the perspective of the settlers themselves, how resettlement was carried out, the impact of relocation on the affected people and the degree to which their economic livelihood has been reestablished. The study will cover sociological, environmental, legal and economic issues. Sociological issues span social welfare, production systems, survival ability and cultural identity of certain populations. Environmental aspects include impact on the watershed, farming of marginal land, health -- including exposure to water-borne diseases. Legal implications concern national legislation on the "right of eminent domain" and rights of those who have no land title but derive a living from the inundated land. economic issues comprise the degree of economic rehabilitation which has been obtained in the post settlement phase, compensation, and the impact on local labor markets. The methodology employed is impact evaluation analysis, where the central feature is specially commissioned socioeconomic surveys. The study concentrates on countries in Asia and Africa and includes successful as well as unsuccessful operations. The approach paper has been reviewed and endorsed by the Joint Audit Committee. Surveys have now been completed in Thailand and for one project in India, the remaining two are expected by fall 1991. The report is expected to be issued in FY92.

OED will continue addressing important environmental issues in its program of special studies. These may include issues related to water management in irrigation development as well as in water supply and sanitation, the assessment of environmental instruments and the environmental impacts of certain operations.

Energy Efficiency and Conservation

Increased energy consumption is a prerequisite for economic growth in the developing world. The difference between per capita energy consumption in the industrialized and developing countries is immense. For example, on average per capita electricity consumption of electricity in developing countries is one twentieth of that in the United States. Energy production and consumption, however, invariably raise important environmental issues, ranging from atmospheric pollution, global warming, local air and water pollution, flooding and resettlement problems associated with hydropower, the disposal of nuclear waste, and the tradeoffs between renewable and non-renewable energy sources and conservation. Historically, World Bank sector and lending operations have often addressed energy conservation and efficiency through efforts to bring about operational improvements, technology transfer, load management, loss reduction and interfuel substitution in its power projects. Pricing policies aimed at recovery of full economic costs of electricity consumption has always been a standard element of Bank power projects. Indeed, it is a necessary condition to achieve end-use efficiency among the various industrial, commercial and residential energy consumers. Unfortunately, the record of borrowers' compliance with loan conditions relating to tariff reform has not been good.

Energy conservation has often been a feature of industrial projects as well. Industrial modernization and rehabilitation has typically had energy conservation as a primary objective in a wide variety of industries. In the oil and gas sector, as in the power sector, interfuel substitution and rehabilitation, as well as heavy emphasis upon tariff reform have been important aspects of Bank operations. Finally, transportation projects also typically aim at increasing efficiency of travel, and therefore imply, for a given transport objective, energy savings.

The Bank has however come under criticism for not sufficiently emphasizing energy conservation in its projects, and for relying too heavily upon investments aimed at increasing consumption. In 1986 a Bank report entitled End-Use Electricity Conservation: Options for Developing Countries provided an indication of the range of policy interventions and investments to improve the efficiency of electricity utilization in developing countries. Critics claim that the recommendations in this report have not been followed adequately by the Bank.

<u>Energy Efficiency in Bank Operations FY91</u> Fifteen energy sector projects and three structural adjustment loans approved during FY91 contained provisions aimed at conserving energy and ensuring its more efficient use. They include price reforms and the phasing out of subsidies; reduction in transmission losses; improved administration of public utilities; interfuel substitution; and technical improvements in power generation to improve efficiency and reduce environmental damage.

Under Poland's structural adjustment loan, for example, the government undertook to phase out subsidies to the coal industry and increase energy prices to international levels by the end of 1992. Bangladesh, Benin, Burundi, Chad, Guinea-Bissau, Honduras, India, Morocco, Nigeria, Pakistan, Tanzania and Uganda also agreed to raise energy prices and review tariff structures as a condition for Bank lending to various energy projects and adjustment programs.

As part of its second structural adjustment program, Benin has committed itself to develop by 1992 a strategy for increasing energy efficiency and conservation. Adjusting energy prices is an important part of the package but the medium term focus is on reducing transmission losses. Chad's petroleum and power engineering credit (IDA) provides funds to strengthen the administration of the energy sector and to improve its capacity to interact with the private sector. The second rural electrification project in Morocco also contains provisions to bolster administration, planning and financial management in the power sector. A project in Nigeria (The Oso Condensate Field Development Project) has a component to assist the government harness the potential of natural gas as a substitute for liquid fuels, thus avoiding gas flaring and making more oil available for export. Interfuel substitution is also encouraged in a gas pipeline loan to Pakistan which promotes the use of gas as an alternative to higher cost petroleum products. Several loans introduce new environmentally-sound equipment and technology. A project in Bangladesh (LPG Transport and Distribution Project) establishes a program to enhance the role of women in the retail distribution of LPG cylinders and energy efficient stoves. In Tanzania, a project to rehabilitate the petroleum sector includes provisions to reduce oil spillage (and pollution) by improving storage and handling facilities. And a loan to raise efficiency at the Tata electric utility companies in India assists in mitigating sulphur dioxide emissions from power plants.

Energy efficiency also featured in five transport projects and one industrial development loan. The route to efficiency in the transport sector is mainly through incentives to encourage more economical use of fuel and improvements in road and rail networks. In Botswana, the government will raise levies on fuel (thus increasing prices to consumers) as part of the Tuli Block Roads Project. Better roads (projects in the Comoros and Sri Lanka, in addition to Botswana) also make for less congestion and lower fuel consumption. Meanwhile, Ghana's second transport rehabilitation project includes investments in new locomotives and rolling stock. This will contribute to greater efficiency in the transport system as a whole. Railway projects in Tanzania and Zimbabwe are likely to have a similar effect. In industry, there is a close correlation between modernization and energy efficiency -- and environmental improvement. A project to modernize the fertilizer industry in Indonesia includes provisions to improve energy efficiency in four fertilizer plants. This component is supported under a previous Industrial Energy Conservation Project.

Meanwhile, the Energy Sector Management Assistance Programme (ESMAP) is also involved in efforts to promote greater efficiency of energy use in the industrial sector. One of the main aims of its work in Pakistan and Columbia, for example, is to promote waste heat recovery and fuel substitution. This has a direct impact on air pollution as well as bringing about greater efficiency of energy use. Also, by targeting industries that rely heavily on fuelwood, such as brick and tile producers in Nepal, Indonesia, and Uganda, ESMAP assists countries to identify and provide a basis for sustainable management of forest resources.

In FY92, ESMAP plans a series of technical assistance activities related to energy efficiency and environment in Poland, Hungary, and Bulgaria. These will include preinvestment work on projects to reduce and control pollution in the industrial sector where profligate use of energy bears significant responsibility for environmental degradation. ESMAP also assists households and other small-scale energy users to make the transition from traditional fuels -- such as wood, charcoal, agricultural residues, and animal dung -- to more efficient and sustainable alternatives. Emphasis is placed on initiatives to improve the efficiency and sustainability of biomass supply, distribution and use, and to promote alternatives to biomass where this is economically justified.

New and renewable energy sources are explored by ESMAP where they offer the most

efficient and cost-effective means of meeting demand. Opportunities are currently limited but they could grow with technical development and further changes in costs relative to conventional forms of energy. ESMAP has focused on two promising areas: photovoltaics and co-generation with biomass residues. Because of the dramatic drop in prices over the last decade, photovoltaics has emerged from its traditional use as a power source for telecommunications to cost-competitive application for lighting, small-scale irrigation, water supply, and refrigeration of medical supplies in remote areas and islands. Cogeneration with biomass residues, such as bagasse in sugar mills and wood wastes from sawmills, often provide investment opportunities which not only improve energy efficiency in the mills but also produce excess power for export to the grid. In countries with chronic power shortages and limited public funds for expanding benefits. However, many legislative and institutional obstacles have prevented governments from capitalizing on this opportunity.

Elsewhere in the Bank work on household energy use includes a cross-country comparison of the successes and failures on various cooking stove programs. Energy use in buildings is also the subject of a review of building codes in various countries. Economic analysis for the expanded use of natural gas in the transport sector is envisaged in a number of key developing countries, with an emphasis on potential project activities.

On the supply side, the efficiency of energy use is being addressed through work on the efficiency of power generation. Developing countries aim to increase their installed power generating capacity by about 80 percent over the next decade. Although the overwhelming bulk of this capacity will be supplied by conventional thermal and hydro power, there is growing potential for the use of natural gas for thermal power generation and in industry. Provided leaks are avoided, natural gas is environmentally superior to coal, oil, or hydro sources. A major work program has been launched in this area, which includes several country studies of gas investment strategies, a study on the environmental costs and benefits of natural gas, as well as a regional study of gas resources and gas market potential in sub-Saharan Africa. Work is also in progress on the potential for adapting the more efficient combined cycle technology, especially for the case of natural gas.

<u>Energy Efficiency Task Force</u> Paralleling the various efforts to address energy efficiency and conservation in the Bank's operations, a major Bank-wide review of the topic was undertaken during the year. A Task Force comprised of policy and research as well as operations staff considered the appropriate role of energy efficiency policies in light of projected energy needs in developing countries; the feasibility of various policy and investment options; and the role of the Bank. The final report of the Task Force will be completed in FY92.

Population Operations

High fertility rates, particularly in the poorest countries, present a major obstacle to sound environmental management. Rapid population growth often forces families to cultivate marginal lands, to denude forests in search of land and fuel, to disrupt or destroy habitats of various animal and plant species, and places major stress on the capacity of urban communities to dispose adequately of waste products. Although, as noted below (Section V), much more needs to be learned about the nature of the relationship between population growth and environment, there is widespread agreement that curbing population growth is indispensable if economic development is to be sustainable.

Therefore, although not formally part of the World Bank's environmental program, its population activities form an integral part of its overall effort to address environmental concerns. Indeed, environmental arguments are increasingly used to justify investments in this sector. Research undertaken in the Bank demonstrates that rapid population growth (3% p.a.) and agricultural stagnation are the most important causes of forest degradation in Western and Central Africa. A series of country analyses of population-environment-agriculture linkages are currently under way in the region. Similarly, the demographic challenge to sustainable economic development, illustrated most clearly by the pressure on water resources, is the subject of ongoing study for the Maghreb countries (See Chapter III).

Lending for population has increased steadily in recent years; i.e., \$82 million in FY88; \$125 million in FY89; \$169 million in FY90, and \$341 million in FY91. Annual lending over the period FY92-FY95 is expected to be held at roughly the FY91 level. Population projects are sometimes free-standing, but are often combined with health lending, and may also form components of other social sector projects. See Table 2 for some details of FY91 lending for population projects or those with significant population components.

Table 2: FY91 Projects with Population Components (millions of \$US)

<u>COUNTRY</u>	PROJECT TITLE	TOTAL LOAN OR CREDIT	AMOUNT POPULATION
AFRICA			
Ghana	Health & Population II	\$27.0	\$4.9
Mali	Health, Pop & Rural Water II	26.6	3.0
Madagascar	National Health Sector	31.0	4.4
Malawi	Population, Health & Nutrition	55.5	6.3
Nigeria	National Population	78.5	78.5
Rwanda	First Population	19.6	19.6
Senegal	Human Resources Development	35.0	14.8
Togo	Pop & Health Sector Adjustment	14.2	4.3*
Zimbabwe	Family Health II	25.0	0.0**
ASIA			
Bangladesh	Fourth Population & Health	180.0	61.5
Indonesia	Population V	104.0	104.0
EMENA			
Pakistan	Family Health	45.0	13.5*
Tunisia	Population & family Health	26.0	26.0
TOTAL LEND	DING FOR POPULATION (Not Final)		\$340.8

* These projects so thoroughly integrated population and health that it was impossible to derive a specific figure for population lending. Therefore, an arbitrary proportion of 30% for population was applied to each of these total loans or credits.

** No IBRD money went directly toward family planning in this project. However, cofinanciers contributed \$17.7 million toward family planning service delivery out of a total project cost of \$116.9 million.

Note: Total does not include lending for social sector projects which may include small family planning components. A number of FY91 projects in the LAC region are in this category.

Staff Training

Staff training is an essential means of achieving the integration of environmental considerations into the Bank's operational, economic and sector work programs. Many Bank

staff members received environmental training during the past year with a view to ensuring that they were up to date on current environmental policies and guidelines. As in the previous year, a wide range of topics were covered in the training program, but the principal focus of the FY91 program was environmental assessment training. Of the twelve formal training courses offered over a total of 424 training days, eight were on environmental assessment. About 200 staff members participated. The seminars covered such topics as EA concepts and procedures, implementation and evaluation, regional and sectoral EAs, public involvement, social assessment, sustainability and cost-benefit analysis, and environmental management and finance. The seminars in FY91 continued to use case studies and stress practical guidance, such as preparation of terms of reference, monitoring and supervision, and public participation in the assessment process.

Eight two-day long seminars were organized for task managers with the assistance of the Center for Environmental Management & Planning in Aberdeen, U.K. The remaining four courses, involving about 75 people, were related to such topics as environmental literacy, environmental action plans for Africa, protected area management, and social forestry.

In addition to the above, the Operational Directive on Environmental Assessment was the subject of about 12 seminars, each attended by about 25 Bank staff. Some 24 sessions were also run on special environmental topics. Each was attended by about 20 staff. Preparation of the Environmental Assessment Sourcebook included at least one workshop each for the document's 10 chapters. Over the last three years, about a dozen Bank staff have been trained on environmental issues outside the Bank for periods ranging from one year (at Duke University), to ten months (at Harvard), and two weeks (at Aberdeen). Each of the four regions have also arranged their own environmental training activities. These vary from two-day environmental retreats to a wide variety of informal seminars and workshops.

The other major need is to hasten the process of integrating environment into the economic work of the Bank. Dissemination of the results of the Bank's research activities in this area (see Section VI) is an important part of overall staff training. This is complemented by a series of informal seminars and workshops on environmental economics, about 100 of which took place during the year, as well as the on-going formal training program for Bank staff. The latter includes courses on environmental economics for country and sector economists, and courses, primarily for project staff, on valuation of the environmental consequences of projects and policies.

V. FOREST ACTIVITIES

The World Bank has shifted its involvement in forest activities over the past decade from an emphasis on commercial ventures towards more people-oriented and environmental initiatives. This transition has meant new and often difficult problems which have been the object of increasing sector and policy analysis. In recent years the Bank's lending program has increasingly reflected concern with the integral role forests play in agriculture, in the management of watersheds and other natural resources, in protecting biological diversity, and the sequestration of atmospheric carbon. All eight free-standing forest projects approved in FY90 addressed environmental concerns through such arrangements as buffer zone development, management of nature reserves, soil conservation activities, range land improvement, plantations etc.

Despite this evolution in the Bank's approach to forests, general concern on part of the international community regarding the observed rapidity of tropical deforestation and the perceived failings of the Tropical Forestry Action Plan (discussed in last year's Annual Report) has required the Bank to review its policies in this sector. Efforts to improve the TFAP, involving donor and developing countries, international agencies, the private sector and NGO's, are on-going. Furthermore, early in the fiscal year it was agreed that there would be a moratorium on Bank lending for forestry operations until its Board of Directors had approved a new forest policy paper, which would replace the original one, prepared in 1978.

Consequently, only one forestry operation was approved by the Board in FY91, namely the Kenya Forestry Development Project (a \$19.9 million credit). Objectives of this project include conservation of indigenous forest resources, and soil and water, on forest, farm and range land; alleviation of the accelerating fuelwood deficiency; and improved efficiency of timber production. Promotion of sustainable private tree farming is a major thrust of the project, as is the creation of a framework for the sector's long term development.

Average annual lending between FY92 and FY95 is expected to be US\$438 million, compared with an annual average of US\$217 million over the period FY85-90. Sectoral policy was the subject of extensive debate and analysis by Bank staff and other development agencies and NGOs during the year. Two Board seminars were also held to discuss the issue. The remainder of this section summarizes the views expressed by the Bank in the second of these two meetings.

The Nature of the Challenge

A critical feature of the forest sector that distinguishes it from most other primary activities is that private costs and benefits usually diverge markedly from national and global costs and benefits. The existence of these externalities implies that the free interplay of market forces will not bring about socially desired outcomes. Some of these externalities are national costs (e.g., soil erosion, degradation of watersheds and threats to the cultural survival of indigenous people who traditionally live in or near the forests), but some are costs that affect the international community (e.g., loss of biological diversity and induced changes in the global climate). Because the people who cut or plant trees typically have no incentive to consider the environmental or social consequences of their actions, externalities inexorably lead to excessive deforestation and insufficient planting of new trees.

Of the various challenges that arise from this divergence between private and social interests, two stand out as deserving special attention. The first is to prevent excessive rates of deforestation, especially in the tropical moist forests (TMFs). The second is to ensure adequate planting of new trees to meet the rapidly growing demand for fuelwood in developing countries.

Deforestation

Forests in the developing countries have declined by nearly half in this century, and the rate of loss is still increasing. Recent studies using remote sensing data and extensive ground surveys have found that the rate of deforestation is currently in the range of 17-20 million hectares per year, of which the largest share is closed TMFs.

The loss of the TMFs is especially worrying because unlike other major forest types -tropical dry forests (TDFs) and temperate forests (TFs) -- they have a much greater influence on the global climate, as well as being a major repository of biological diversity. Moreover, they are the more fragile forests in the sense that their soils are easily degraded once deforested, and even if reforestation or selective felling is attempted, experience to date suggests that their initial ecosystems cannot be fully renewed or sustained.

<u>The Causes of Deforestation</u> Deforestation, including the cutting of woodlands, and scattered trees, occurs because somebody finds it to be profitable. The individuals, communities and corporations responsible for deforestation, and their primary motives for cutting trees, vary widely across regions and forest types. While in terms of global importance, fuelwood gathering accounts for the largest share (80 percent) of wood use in developing countries, its impact is concentrated in the tropical dry forests and in nonforest wooded areas. The TMFs are being lost primarily to agricultural settlement (about 60 percent of the area cleared each year) with the balance split roughly between logging and other uses (roads, urbanization, fuelwood, etc). In reality, however, deforestation seldom involves only one type of decision maker, and the actions of one can lead to subsequent interventions by others.

Incentives to cut trees have grown in recent years for four sets of reasons: (i) the pressure of population on the natural resource base has grown sharply in many countries; (ii) income opportunities in settled agricultural regions have deteriorated in some countries, leading to increased migration and encroachment on forested land; (iii) increased access to the forest frontier has been dramatic in some areas because of infrastructure development -- especially roads; and (iv) subsidies for alternative land uses and logging have been deliberately introduced

to encourage frontier settlement in a number of countries.

Deforestation can contribute to short-term economic growth and poverty alleviation, but often it does so at the expense of other environmental and social goals, some of which are incurred within the country and some are borne by the international community. If these costs were more fully reflected in the incentives facing agents who cut trees, then there would be significantly less deforestation today. This effect is often aggravated by weak property rights in many forest and wooded areas; by high private discount rates (the rate at which individuals discount future costs and benefits), especially among poor people who encroach into the forests; by inappropriate government policies that make conversion of forest land artificially profitable; and by timber concession arrangements that unnecessarily encourage "mining" of trees.

The Growing Fuelwood Crisis The second major challenge is meeting the rapidly growing demand for wood. Most of the world's future need for wood for industrial purposes can continue to be met by trees grown on a sustainable basis in the temperate forests. Of much greater concern is the market for fuelwood and poles in many of the heavily populated developing countries. Demand is growing rapidly but supplies are increasingly obtained by mining the available stock of natural trees. Nearly 3 billion people depend on wood as their main or only source of household energy, and it is especially important to rural households and to the poor. As tree stocks diminish, women and children spend much more time gathering firewood from more distant sources, and have less time to spend in other vital activities. Fuelwood gathering contributes to land degradation, especially in agricultural regions with limited wooded areas, and to deforestation and degradation in forests adjacent to densely populated areas. These effects are most severe in TDFs and nonforest areas.

<u>The Causes of Inadequate New Planting</u> Many of the same social and economic forces that induce excessive deforestation also reduce the incentive to plant trees, either for fuelwood or for timber. As with any crop, a farmer's willingness to plant trees will depend on their profitability. There are discouragements to plant because the price of wood tends to be depressed by open access and poorly defined property rights to natural forests; there has been relatively little progress in developing higher yielding and quicker growing trees for farm conditions; and high discount rates of poor farmers make it particularly unattractive to tie up scarce capital for the relatively long payoff period involved. Large-scale, industrial plantation establishment is similarly restricted by low profitability.

Strategies for Forest Development

<u>Poverty Alleviation and Population Policy</u> Encroachment on public land by poor people is a major cause of loss of forests. Policies to protect the forests or to slow deforestation seem doomed when pitted against a growing tide of poor who need land to survive. General economic development, including increased diversification of the national economy, reductions in inequality and poverty, and slower population growth, are necessary for a long-term solution to the forestry problem. But in the interim, priority needs to be given to increasing agricultural productivity in poor, densely populated areas, especially those adjacent to forested areas or those from where most forest encroaches originate, and to expanding nonfarm employment opportunities in these target areas. In the long run, even if economic development takes place, specific policies will continue to be needed to deal with externality problems.

Forest Zoning and Regulations Part of the forest will have to be protected through specific legislation and regulatory measures, especially in the TMFs. Decisions on zoning and regulations should be based on an understanding of what is expected of the land and a realistic assessment of what is technically feasible in light of local capacities and incentive structures. Given the likely limitations on resources and the desirability of increasing protected areas, countries must develop workable priority criteria for setting aside specific forest areas which will be protected from any intrusion, and for managing areas designated for different uses. This involves undertaking appropriate natural resource surveys in the forested areas and determining which areas are of special value for their ecological diversity, which are essential for protecting indigenous forest dwellers or which protect sites that are environmentally fragile (e.g., hillsides and watersheds). Available resources for protective purposes can then be focused on these priority areas.

Commercial logging can be contained through a strict policy limiting the extent of timber concessions, and allowing them only in areas that can be put under sustained timber management systems. Given the practical difficulties of achieving sustained management in tropical forests, and the related environmental costs, governments should be cautious in allowing such activities, and should give priority to the preservation of intact tropical forests. In all types of forests, high priority should also be given to reforesting degraded areas, and new timber concessions could be tied to the successful replanting of degraded lands. Because these areas may have become the source of livelihood for some communities, the interests of these people need to be considered when reforestation is undertaken.

<u>Correcting Private Incentives</u> Enforcement of zoning and other regulations are likely to be ineffective unless private incentives are also changed. In many instances government policies systematically underprice forest concessions. At the same time, government reluctance to offer long-term concessions aggravates the incentive for quick "mining" of trees. Timber concession systems can be modified to increase stumpage fees or area concession rents to reflect the real value of the trees; to allocate timber concessions (felling leases or licenses, logging rights) by competitive bidding (auction, tender), open to the private sector, NGOs, and local communities; and to make concessions long term and, with appropriate controls, transferable.

Incentives for agricultural settlers have sometimes been distorted by policies which actually encourage deforestation (e.g., subsidies for livestock ranching in the Amazon, land titling tied to land clearance). These kinds of distortions should be removed wherever they arise. Customary land rights of forest dwellers need to be formalized and respected, to protect both forest dwellers and resources against agricultural encroachment or excessive exploitation by outside interests.

<u>Public Investments</u> Access to forests needs to be carefully controlled. Many infrastructure projects, such as roads and reservoirs, inadvertently open up forest lands to settlers. Public investments need to be preceded by much more careful environmental assessments. Public investment can also be directed towards preservation. Substantial expenditures are required to strengthen forestry institutions to enhance their ability to protect designated forest areas; develop improved systems of silviculture, forest management and policy making; conduct forest research and development; and afforest and replant, especially degraded land.

Policies to Meet the Growing Need for Fuelwood

To achieve a more sustainable balance between supply and demand requires actions to reduce the demand for fuelwood and poles, as well as actions to increase the planting and husbandry of trees.

<u>Reducing Demand</u> As wood becomes increasingly scarce, more widespread and efficient markets will likely develop, and price increases will play a greater role in reducing the growth in demand. However, because of environmental externalities and inadequate property rights, market prices will generally not reflect the full social value of wood. Direct interventions to encourage conservation and use of more efficient technologies can be appropriate. These should include research and training to improve woodfuel conversion efficiency in household stoves, brick and charcoal kilns, and in other activities dependent on wood. In addition, more efficient markets for alternative fuels, such as kerosene, need to be developed. Investment subsidies may also be appropriate in the initial stages to encourage individuals to purchase the necessary equipment to convert from wood burning technologies, particularly where new and innovative technologies are involved (e.g., solar stoves).

<u>Increasing Supply</u> Most wood users in the developing countries live in rural areas, and the best way of satisfying their demand for wood is through utilization of their own underutilized labor and lands. Supply of rural wood through large-scale commercial operations is not likely to be viable on the scale required, nor is continuation of widespread wood gathering in forests sustainable or environmentally acceptable. It is increasingly recognized that wood production issues should be dealt with at the farmer level. Forest departments need to be reoriented in light of this recognition and the special activities of nongovernmental organizations concerned with poverty alleviation and environmental conservation should be mobilized to help users organize themselves for tree planting. Achieving the level of planting required will only be possible if economic incentives and abilities of farmers are also changed. This will require extension and training services, a ready supply of tree seedlings and other inputs and, in some cases, improvements in land and tree rights.

Past attempts to increase tree planting for fuelwood were based on community woodlots established on lands managed under common property tenure regimes. They often failed because

local communities were inadequately organized for collective action, and were unable to provide adequate rewards for those who provided labor. Future efforts need to be focused on smaller and more tightly defined groups of local actors, including the poor, who have a mutual interest in planting and raising trees. Recent programs based on family farm forestry and group farm forestry have proved promising.

Enhancing Forestry Institutions

Governments are increasingly recognizing that the scale of demands for conflict resolution and mediation now placed on forestry agencies was never adequately anticipated. Governments must recognize and act upon the critical need to revamp forestry institutions and introduce greater accountability and higher performance standards into the public sector. Creative uses of private sector contractors and consultants as auditors and monitors; and more rigorous intersectoral oversight by agriculture, environment, planning, finance and other relevant ministries are effective devices for improving the performance of government forestry agencies. Commitment at the highest levels of government is necessary for introducing these reforms.

The Role of the International Community

The international community must support developing countries in achieving their own national goals in managing forest resources, and in providing ways in which the value of the global externalities from forests can be better incorporated into incentive structures for local action. International legal instruments, currently discussed in various fora, demonstrate the existence of wide interest in these objectives for international action. The adoption of such instruments could facilitate the transfer of resources to promote the conservation of tropical forests. There are three major areas in which the international community can play an important role.

<u>Technical Assistance, Research and Institution Building</u> Developing countries need assistance: (i) in undertaking detailed resource inventories for establishing priority areas for forest protection; and for demarcating areas for sustainable commercial forestry or agriculture; (ii) in developing appropriate criteria for forest use plans; (iii) in providing training and specialized skills for forest management; and (iv) in strengthening local institutions in their forest planning, protection and management functions. International mechanisms for providing this assistance need to be strengthened including revamping the TFAP and reorienting the CGIAR to place greater emphasis on sustainable forestry.

<u>Financing</u> Special mechanisms may be needed to finance policy reform and investment. Market failures fall into three categories from a financing perspective: those that involve small incremental resource requirements, such as removal of perverse policies, and that will pay for themselves in reduced fiscal burdens; those involving domestic externalities and inadequate property rights that can be financed domestically or on nonconcessional terms from external sources; and finally, those, such as preservation of biological diversity or sequestration of carbon, in which the benefits accrue partly or entirely outside of the country, for which international financial transfers and concessionary terms may be appropriate.

The availability of financial support from international agencies, such as The World Bank, can reinforce the benefits of such policy adjustments. Concessional financing for supporting projects that have global benefits (e.g., debt-for-nature swaps) can also be helpful. However, such funds should be in addition to existing levels of official development assistance. The recently established Global Environment Facility represents a useful mechanism for testing innovative financing approaches. The experience gained in its operation may lead to follow-up initiatives.

International Trade Reforms Only a very small share of the wood that is cut from primary forests each year enters international trade, but the share is much larger for the high-value and rare species. Experience with other products suggests that consumers will modify their behavior substantially if they are given information on the ecological sustainability of the production process. For this reason, the international community should encourage organizations such as the ITTO to develop programs of green labelling to permit preferential market treatment for wood grown under sustainable conditions. In addition to lowering the overall demand for wood produced by unsustainable practices, such a scheme would remove the disincentive to adopt improved management practices and associated loss of competitiveness.

A more contentious issue is that of trade taxes on tropical timber. To the extent that (i) taxes (whether import or export) could be targeted to those species that are culled exclusively from primary forests, (ii) taxes would apply equally to processed wood as well as logs, and (iii) revenues raised would be returned to developing countries, to be used for forest protection activities, such taxes may be desirable. However, in the absence of such characteristics, trade taxes are likely to create additional distortions by discouraging new planting and plantation agriculture, protecting inefficient domestic wood processing industries and would place an unfair burden upon countries heavily dependent on timber exports. More research is needed on these issues before such taxes should be supported.

The Role of The World Bank

<u>Past Experience</u> Since its inception, the Bank has financed 80 projects in the forestry sector with total commitments in excess of \$2.3 billion. Lending has grown rapidly since the issuance of the 1978 Forest Policy Paper, with increasing emphasis on social forestry and, lately, environmental issues. Bank lending for other projects, particularly tree crops, agricultural settlements and infrastructure, has sometimes had an undesirable impact on forest resources.

According to the recent OED review of this ten-year experience (see chapter 5), there is a need for the Bank to strengthen its forestry sector work, and to link it more strongly to other country economic and sector work, to improve the technical performance of projects, and to design social forestry projects with a better understanding of local social dynamics and the motivations of different social actors in tree planting and management. Moreover, as the scope of forestry problems faced by developing countries has changed dramatically, and the understanding of their causes and implications has improved, a reformulation of the Bank's forestry policy is required.

<u>Principles of Future Involvement</u> Bank involvement in the forest sector will be designed as a component of a multisectoral approach. To relieve the fundamental pressures on the forest over the longer term, the Bank through its normal mechanisms will continue to support population policies, agricultural intensification, poverty alleviation and creation of employment opportunities in other sectors. The Bank will heighten its attention to and minimize the potentially negative effects of infrastructure and other land-using projects. In its efforts directly related to the forestry sector, namely aid coordination, country dialogue, sector work and lending, the Bank will focus on the following:

<u>International Cooperation</u> The Bank supports the adoption of international legal instruments conducive to sustainable forest development and conservation. The Bank will encourage international initiatives for the transfer of concessional resources to assist projects protecting globally important biological diversity. The Bank will continue to explore the feasibility of global transfers for carbon fixation in forests.

<u>Policy Reform and Institutional Strengthening</u> The Bank will assist governments in identifying and rectifying market and policy failures that encourage deforestation and inhibit sustainable land use. The Bank will assist governments in the completion of resource inventories and establishment of systems for continuous resource assessment and efforts will be made to enhance the technical performance of government forestry institutions.

<u>Resource Expansion</u> The Bank will expand its efforts to finance the creation of additional forest resources. In wood-deficit areas, the Bank will promote a continued reorientation of forestry toward people's participation in tree planting, public accountability and development. In the past, social forestry projects have had mixed results, primarily because they relied on community groups that were not adequately motivated to carry out collective actions. Greater emphasis will be given to farm-family and farm-forestry groups. Where the scope for plantations outside areas of intact forests is sound from a social, environmental and economic perspective, the Bank will assist in the establishment of plantations reducing pressure on the existing forest resource base and as a means of easing the transition to sustained yield forest management. The primary target areas for new planting will be potentially productive degraded forests, wastelands, forest fallow, shrublands and abandoned farmlands. Because there may be communities which depend on such areas, their interests will need to be considered in setting target areas.

<u>Preservation of Intact Forest Areas</u> The Bank will support initiatives to expand forest areas allocated as parks and reserves and to institute effective management and enforcement in new and existing areas. In tropical moist forests, the Bank will adopt, and will encourage

governments to adopt, a precautionary policy towards utilization. This policy is motivated by the remaining uncertainties regarding full valuation of environmental services, the inadequacy of knowledge regarding sustainable management systems and the irreversibilities associated with TMF loss. Specifically, the Bank Group will not under any circumstances finance commercial logging in primary TMFs. Financing of infrastructure projects (e.g., roads, dams, mines), which may lead to loss of TMFs, will be subject to rigorous environmental assessment as mandated by the Bank for projects that raise diverse and significant environmental issues. A careful assessment of the social issues involved will also be required. The Bank will continue to place more emphasis on supporting programs involving institutional development, forest protection measures and nonforest income-generating projects, the primary objective of which will be the preservation of TMFs. In implementing this strategy, the Bank will pay special attention to the 20 countries (accounting for 85 percent of the TMFs) whose forests are seriously threatened by encroachment and destruction. In these countries, special efforts will be made to support economic development in poor, densely populated areas around the forests, or in the origin areas of forest encroaches.

<u>Conditions for Bank Involvement</u> In all countries, and for all types of forests, lending operations in the forestry sector will distinguish between projects which are clearly environmentally protective (e.g., reforestation of degraded land), or which are small-farmeroriented (e.g., farm and social forestry), and other forestry operations (e.g., commercial plantations). The first two types will be considered on the basis of their own social, economic and environmental merits. Other forestry sector operations will be subject to government commitment to sustainable and conservation oriented forestry. Such a commitment entails the following:

- adopting policies and institutional frameworks to ensure conservation and sustainable use of existing forests and to promote more active participation of local people and the private sector (with proper incentives) in the long-term management of natural forests;
- adopting a comprehensive and environmentally sound forestry conservation and development plan, including a clear definition of the roles and rights of the government, private sector and local people (including forest dwellers);
- undertaking social, economic, and environmental assessments of the forests considered for commercial utilization;
- setting aside adequate compensatory preservation forests to maintain biodiversity and safeguard the interests of forest dwellers in terms of access rights to designated forest areas;

- establishing institutional capacity to implement and enforce the above commitments.

If these conditions are present, projects will be judged on their individual merits. If they are not present, Bank support will be restricted to operations which help countries to achieve them.

VI. POLICY AND RESEARCH

Policy and research work on environment is conducted in all of the Bank's sectors, including energy, industry, urban, infrastructure, agriculture, and population and human resources. In addition to work in these sectors, research is undertaken on environmental economics at both the national and global levels.

This section outlines the policy and research activities conducted during the fiscal year, emphasizing topics of a generic, or cross-regional nature. Most of this work is carried out in the Policy, Research and External Affairs complex. Policy and research efforts that are specific to a particular geographic region are conducted primarily by Operations staff and have been described in Section III.

Over the past few years, research and policy work on environment has evolved significantly. Initially, sector departments had emphasized exploratory environmental work to gauge the impact of environmental degradation in their field or to identify broad environmental concerns. Today, and as will be seen in the sections of this chapter, environmental issues are addressed in a more substantive manner, with increasingly specific questions and objectives as understanding of environmental issues expands. The role of the Environment Department has also evolved in line with these changes. From being primarily concerned with catalyzing preliminary work on the environment in the various sectors, the Department now largely emphasizes cross-sectoral and cross-regional work.

The policy and research activities described below are grouped under a number of often overlapping themes, from urban environmental issues and energy use to water and land resources management. Because of the obvious overlap within and between the themes, and the difficulty of compartmentalizing environmental problems, much new work emphasizes an integrated approach to environmental management. This includes activities underway in energy, in the urban sector, in transport, and in the management of water resources.

Energy and the Environment

The incorporation of environmental impacts into energy decision-making has been a prime focus of activity. An expert task force, chaired by the Bank and representing eleven international agencies, recently prepared a comprehensive overview report on options to mitigate the environmental impacts of policies and projects in the energy sector. Several more specific country case studies are underway. The environmental issues being studied include pollution resulting from fossil-fuel use, the effects of hydroelectric dams -- including social impacts, and renewable energy options. The results of this work will be used to make practical recommendations on how existing energy decision-making tools such as power system planning models and pricing methodologies, should be modified to account for environmental

considerations.

The effects of rapidly growing energy use on pollution are the subject of several activities. In Brazil, a study on energy supply options in the Carajas area evaluates the principal energy and environmental issues posed by current proposals for pig iron, steel and other industrial investments in the Greater Carajas Region. The paper will review least-cost, environmentally acceptable, alternatives to charcoal use -- which is being proposed as the major energy base for the area's industries. Funding for this study has been received from the Federal Republic of Germany and the European Community.

Preparation of a new Bank policy paper for the electric power sector is also underway. The paper will address such environmental issues as pollution, energy efficiency and energy conservation. Also in the power sector, work is underway on the possibilities for the rehabilitation of thermal power stations for greater reduction in emissions, especially sulphur particulates.

Work on a coal policy paper for the Bank has been initiated. The paper will review past and upcoming Bank activities in the area, the environmental impacts of coal use, as well as technological issues. Possible future activities include a review of the options for substitution between natural gas, hydropower and coal and of the potential for improving the efficiency of coal use and for reducing emissions associated with its use -- especially among heavily polluting small-scale users. In China's Sichuan Province, for example, current use of the locally-mined, low quality coal dominates fuel use in the region. The environmental costs are substantial because of the coal's very high sulphur content.

Indoor air pollution is a major environmental issue in both urban and rural areas. Possibilities for inter-fuel substitution -- affecting both pollution and energy efficiency -- form the subject of a recently published paper on "Inter-fuel Substitution and Changes in the Way Households Use Energy: The Case of Cooking and Lighting Behavior in Urban Java". The paper considers the cost for developing countries of moving up the fuel chain -- e.g. from wood to kerosene -- and considers the various government policies that either encourage or slow down this substitution.

A topic of increasing importance is the growing emphasis in industrialized countries on the need for "clean fuels". The consequences of this trend on refineries in developing countries are the subject of ongoing work; the implication is that lower grade fuels will be left in developing countries, with concomitant effects on local pollution.

In addition to the consequences of energy use on pollution, an important environmental issue is that of energy efficiency. Attention to the opportunities for conservation and efficiency is necessary in both the supply of and demand for energy. Through more efficient energy supply and greater conservation and efficiency in end use, it may be possible to meet the growing need for energy in developing countries and at the same time to slow the rate of growth of energy consumption. In addition to economic ramifications, this has enormous implications for national and global environment, through for example, reduced emissions of carbon dioxide and decreased deforestation for fuelwood.

On the demand side, work is ongoing on energy use in industry, in transport and at the household level. On the supply side, work is in progress on the efficiency of power generation and on the growing potential for the use of natural gas for thermal power generation and in industry. A major work program has been launched in this area, which includes a paper on the environmental benefits of natural gas. The paper discusses the opportunities presented to developing countries for increased use of natural gas, including the increasing emphasis on environmental quality and air pollution at the local, regional and global levels, and the availability of improved technology for using natural gas in an efficient way to reduce air pollution. The paper presents a quantitative valuation of the benefits of natural gas and country studies that describe government approaches to the problems of severe air pollution. The paper also explores appropriate methodologies to guide governments on choices between alternative energy investment policies.

Finally, as indicated in the previous Section, a major Bank-wide review of the actual and potential role of energy efficiency and conservation was undertaken during the fiscal year. As part of this review, a number of background activities that encompass technological, economic, and institutional issues in the pursuit of energy efficiency are underway. Also, as described above, the Energy Sector Management Assistance Programme (ESMAP) has conducted numerous studies of household energy use with a heavy emphasis on improving efficiency in both the production and use of energy.

Pollution

<u>Industrial Pollution</u> The rapid industrialization that has occurred in many developing countries since 1960 has resulted in new patterns of global industrial pollution. These emerging patterns are examined in ongoing work that reviews trends across countries and over time. This work combines historical data for both industrial and developing countries with pollution intensity estimates; the aim is to develop a detailed analysis of the evolution of industrial pollution worldwide during the period from 1960 to 1988.

Work is also underway on a projection system for industrial pollution. Industrial emissions data are extremely scarce in most developing countries, and direct measures of industrial pollution are unlikely to be available for some time. Nevertheless, pollution data in some form is necessary for a variety of reasons, including the development of effective environmental regulation. Such data is also likely to be of increasing importance to international trade and competitiveness as the General Agreement on Tariffs and Trade (GATT) has already begun discussions of the "pollution content" of traded industrial commodities, with an eye to including environmental considerations in future trade negotiations. Data on industrial pollution is also important for developing countries as they estimate the environmental consequences of changes in the structure of industry resulting from changing trade patterns. In the absence of direct emissions measures, pollution estimates are being projected from existing industry and trade data. Collaborative arrangements have been made with the US Environmental Protection Agency and the US Census Bureau for the creation of a composite database which allows emissions factors to be calculated at the plant level for a sample of approximately 20,000 enterprises. The data will also be used to analyze sources of variation in industrial pollution between countries.

A study to develop a methodology for environmental management and pollution control with community participation is at the initial stages. The proposed program is for the design of software for integrated environmental management that involves community participation. The software package would enable a quick assessment of pollution levels in a given geographical area, establish priorities for pollution control, and identify environmentally-oriented programs that are economically and financially viable and acceptable to the community. The software would be used to identify pollutants, quantify emissions, assess the effects on population, vegetation and structures, and allow government, the private sector, the scientific community and affected citizens to rely on a sound framework for decisions and strategies.

Work on regulatory and economic incentives is in progress in the area of industrial waste minimization. Industrial waste disposal practices in different countries and regions reflect differing economic and regulatory conditions. Where strict regulation makes waste disposal expensive, enterprises will generally implement pollution prevention options such as waste remarketing and recycling. The same economic pressure will be felt if critical raw materials are heavily taxed or if they are subject to high transportation costs. Although the general directions of these economic effects are predictable, their magnitudes are largely unknown, and estimates of industry responsiveness to alternative regulatory and tax policies would obviously be of interest to policy makers in many countries.

Other work on regulatory instruments includes a forthcoming paper that reviews the economics of industrial pollution control across a number of countries, and compares theoretical prescriptions with existing international practice. Evidence from a large number of industrial and developing countries is considered, with a particularly detailed treatment of ten country cases. In light of an apparently large discrepancy between theory and practice, the paper suggests a revised view of optimal regulatory policy.

<u>Air Pollution and Road Transport</u> A number of new research activities in the field of air pollution focus on the potential for pollution reduction in the transport sector. As motor vehicle ownership approaches saturation levels in North America, Western Europe and Japan, most future growth will be in developing countries. Rising incomes in many developing countries, a growing need for travel and personal mobility, combined with the increased demand for fast and reliable distribution of goods will increase individual automobile ownership, bus transport, and reliance on trucks for freight transport. In the Bank, much of the work in this area is under the rubric of a joint program with the United Nations Environment Programme (UNEP) on Transport and the Environment. The program supports decisions makers in their efforts to reconcile transport investments with sound environmental management and provides them with relevant lessons from experience as well as necessary technical information. The program includes studies, policy analyses, and technical guidelines to assist decision-makers at national and local levels. The dissemination of information and experiences through workshops and seminars on transport and environment issues is also emphasized, and includes the creation of an international network of experts on the subject.

Work in progress under this program includes a joint report with UNEP on options for the reduction of automotive air pollution. These options include the manufacture of energy efficient and environmentally clean vehicles, clean fuels, and improved traffic management. The most promising approach for developing countries is the development of a strategy that combines economic incentives such as pricing interventions with increased emphasis on regulatory and technological interventions. Administratively simple policy measures are most appropriate for many developing countries; these could include, for example, a tax on leaded gasoline combined with a rebate on the use of ethers as octane boosters. Appropriate economic policies could encourage refineries to change their products. Vehicle tax and license fees could be designed to discourage the ownership and use of polluting vehicles.

New studies to be undertaken as part of the joint Bank UNEP program include a study that investigates appropriate procedures and policies for managing urban bus and para-transit fleets to reduce pollutant emissions. Reviews of existing information and literature are also in progress on such topics as fuel substitution, cost effectiveness of various emissions control instruments and physical and socioeconomic variables that influence air pollution are envisaged. A draft report on the environmental assessment of land transport construction and maintenance has been prepared. The final report will be published and disseminated by the Bank and UNEP. More research is needed, however, on the characteristics and amount of automotive air pollution in urban areas in developing countries, and on the environmental characteristics of reformulated and substitute transportation fuels. An evaluation of vehicle inspection and maintenance programs is also needed.

On the topic of economic and fiscal incentives, work is in progress on a system of road user charges that take account of the costs imposed on society by motor vehicle accidents and air pollution. The feasibility of internalizing the costs of accidents and environmental pollution by charging road users for the damage they cause is addressed. While the estimation of accident and environmental costs caused by road users is a difficult exercise, the magnitude of these costs, as implied by certain estimates, indicates that more effort is needed to internalize them. Several instruments can be used to do this, including prices, taxes or subsidies, standards, and regulations. An array of market-based incentives and command and control mechanisms to reduce volumes of traffic, emissions per unit of fuel consumed and total emissions via cleaner vehicles and fuels, remains the most promising approach to addressing the problem of motor vehicle pollution in developing countries. Compulsory inspection and maintenance, tax allowances for new and cleaner equipment, differential fuel taxation and congestion charges are the set of instruments that, in combination, may address pollution from mobile sources in the most cost-effective manner.

Pollution and Marine Transport The environmental implications of port transport and harbors is a topic of increasing importance. A paper under preparation sets out an overview of the various environmental issues facing today's ports, particularly those in developing countries. These issues revolve around: the disposal of dredged materials, oil-spill contingency planning, the handling of hazardous cargoes, and the implementation of the International Convention for the Prevention of Pollution from Ships (MARPOL) (see below). The paper points to an emerging problem where some ship operators have withdrawn their services rather than face the insurance costs and financial risks of operating in the national waters of countries with strong legislation on the reimbursement of clean-up costs in the event of oil or chemical spills. The challenge here is to reconcile the requirement for environmental protection with the economic concerns of ship operators. Guidelines on oil spill contingency planning and response are also being prepared jointly with the International Maritime Organization (IMO).

A paper is under preparation on the elements of MARPOL, examining the objectives of the convention, the constraints it has faced, and the main issues and options it presents to developing countries. While most industrialized countries have both signed and ratified the convention, developing countries have been slower to do so. The implication of the Convention for developing countries is that they must meet the costs of providing port reception facilities, maintain and operate the facilities in an environmentally sound manner, and dispose of the collected wastes. It is this ultimate disposal problem which is the major difficulty. Where the volume of wastes to be received from ships is significant, major problems can develop. These problems are particularly acute for small island communities where the disposal of any form of waste is difficult to achieve in a sound environmental manner. The paper outlines the Bank's role in urging and assisting countries to sign and ratify the MARPOL Convention. This will not only contribute to the global improvement of the marine environment, but also to the protection and preservation of the country's own coastal zones and irreplaceable natural resources. The benefits are particularly obvious to countries that derive a substantial proportion of their revenues from tourism. The paper recommends that activities in port and harbor development and coastal zone management routinely address the building of appropriate port reception facilities and that municipal activities consider the impact of additional wastes received at adjacent ports and harbors.

Urban Environmental Issues

Urban environmental problems stem from the heavy concentration of population and economic activity in relatively confined spaces. The underlying causes of urban environmental problems are many, and range from inappropriate economic policies such as the underpricing of services -- leading to resource depletion and higher levels of pollution -- to inadequate land use controls or inappropriate land tenure systems that hinder effective land use or lead to over-regulation of land markets and force the poor to occupy marginal lands. In 1987, less than 60 percent of the urban population had access to adequate sanitation, and only one-third was

connected to sewer systems. Indoor air pollution, substandard housing, and industrialization also take their toll on the health of urban dwellers. The pressure placed on natural resources by metropolitan areas can have long-term effects that threaten not only human health and ecosystems, but also long-term development prospects. Groundwater depletion and contamination, the loss of land resources due to uncontrolled development of erosion-prone areas, coastal zones or wetlands and the unregulated disposal of hazardous industrial wastes may all affect the sustainability of cities.

The Bank's recently published paper on Urban Policy and Economic Development: an agenda for the 1990s proposes a policy framework and strategy to redefine the urban challenge in developing countries. A central recommendation is for more attention to reversing the deterioration of the urban environment in order to improve the economic performance of the urban sector in developing countries. In the long term, urban environmental problems add to global environmental problems because of the intensity of energy and resource use and the concentration of wastes and emissions. In the shorter term, congestion, air and water pollution, inadequate sanitation, erratic waste collection and disposal, and the destruction of marginal lands affect the health and productivity of individuals, households, and communities.

In line with the paper's recommendation, a new component on urban management and the environment has been added to the ongoing Urban Management Program funded by UNDP, and jointly executed by the World Bank and the United Nations Centre for Human Settlements (UNCHS-Habitat). The first stage of the program is a two-year effort to develop an analytical framework for understanding urban environmental problems and formulating responses. The framework will link the impacts of specific problems to the corresponding underlying causes, and will assist in ranking such problems in a given city and in identifying potential cures. Activities will cut across several sectors and geographic regions. Strategies to implement the recommended approaches for improving environmental conditions in cities will also be proposed.

An Urban Environmental Team has been formed at the World Bank to carry out the work with a counterpart team at UNCHS in Nairobi. The teams draw on expertise and inputs from other activities in the Bank as well as from programs in UNCHS, UNEP and other external support agencies, NGOs, and consultants and institutions in developing countries. One of the central themes of the program has been summarized in a paper entitled "Energy-Environment Linkages in the Urban Sector." This paper presents a framework for characterizing urban environmental problems related to the structure of urban energy use, assessing the magnitude of health, ecological and other impacts associated with both production and consumption of energy in cities, and identifying and costing alternative interventions. Approaches for ranking options and implementing solutions are also reviewed.

Another paper, "Alternative Approaches to Pollution Control and Waste Management: Regulatory and Economic Instruments," presents an overview of the most common strategies and regulatory and economic instruments used in industrialized and developing countries to control air and water pollution, protect ground water, and manage solid and hazardous wastes. The paper concludes that most economic instruments cannot be successfully implemented without preexisting standards and effective monitoring and enforcement systems. Moreover, among the various economic instruments, charges appear to have the most potential for contributing to the achievement of pollution control and waste management objectives in developing countries -- given adequate enforcement mechanisms.

Additional papers are being prepared on priorities for urban waste management and pollution control, and on issues related to land degradation, occupation of hazard-prone areas, and protection of cultural property. Other research activities underway in the program include a literature review of the health impacts of poor environmental conditions in urban areas; valuation of economic impacts of various urban problems; development of a framework for urban environmental data collection that defines a common set of indicators and recommends priority data collection activities in urban areas; an evaluation of remote sensing and Geographic Information Systems applications for urban environmental planning; environmental management of water resources for urban use; and financial and institutional alternatives for urban waste management. A series of six city case studies on priority environmental problems are also being prepared for Sao Paulo, Katowice, Tianjin, Accra, Jakarta, and the Singrauli Region of India. These will serve as the basis for designing environmental management strategies and action plans.

Results of the background activities described above are to be compiled into a paper that outlines the strategic options for managing the urban environment. This paper will form an input into the United Nations Conference on Environment and Development in 1992. It is also expected to lead to the preparation of a World Bank policy paper on the urban environment in 1993.

Another activity addresses the poor condition of urban sanitation in developing countries. A research team is currently developing a new way of thinking about the planning and delivery of urban sanitation services. A demand-driven approach to sanitation planning and management has been developed to promote increased equity and accountability in the institutions that supply urban services. The new approach also stresses flexibility in management and the feedback of experience. This institutional work is being developed as part of a larger World Bank/UNDP program on water and sanitation.

Work on economic policy and urban pollution control includes a paper entitled "Internalizing the Social Costs of Pollution: Overview of Current Issues in Air Pollution." The paper argues that political will is the first step needed to reverse urban environmental degradation. For the successful long-run reduction of air pollution, it is necessary for governments to set clear objectives within a regulatory and institutional framework that provides for the necessary appropriation of resources and for the monitoring of compliance with the established environmental objectives.

Work on urban issues has also focussed on the prevention and mitigation of disasters. While development is a necessary condition for mitigating the effects of disasters, the qualitative aspects of development and growth and their impact on a country's natural resource are not always positive. For development to increase countries' resilience to disaster, it must not result in destruction of the natural resource base. Ongoing activities in this area include a two-year program on Disaster Prevention and Mitigation in Metropolitan Areas, launched in FY91. The program takes the position that it is crucial to prepare more effectively for natural disasters and to design strategies to mitigate their effects; recent events in Bangladesh, Costa Rica and the Philippines support this view. The objective is to provide governments with mechanisms to improve their capacity to mitigate extreme events, and to deal with the cumulative effects of environmental degradation. The program will be based on a number of case studies, including work on vulnerability assessment in the energy sector in Costa Rica, institutional aspects of disaster management in Asia, post-earthquake recovery efforts in Nepal, and aid coordination in for flood emergency in Sudan. Additional background work is now underway for policies on technological, economic, financial, poverty, demographic and technical issues. The replicability of strategy and policy conclusions and recommendations will be emphasized.

Selected materials from a colloquium on Environment and Natural Disaster Management have recently been published under the title: *Managing Natural Disasters and the Environment*. The volume was issued in conjunction with the International Decade for Natural Disaster Reduction (IDNDR) at a time of great concern for reducing environmental degradation and preventing and mitigating disasters. The report summarizes Bank financed initiatives in reducing the negative impact of disasters. Strategic issues in disaster mitigation -- including technology transfer and risk management -- are addressed, and lessons of experience are presented through case studies on flood reconstruction and prevention, housing and earthquake reconstruction, and fire rehabilitation.

Water Resources Management

With the increasing scarcity of water in certain regions, countries have been developing a comprehensive approach to water resource management. Within the Bank, a major intersectoral program is also underway, working towards a comprehensive approach to water resource management. The aim is to address water issues not merely from the perspective of water as an input into a particular sector such as irrigation, water supply or hydropower, but to design an integrated, multi-sectoral Bank strategy towards the management of water resources. Work in the Bank's research complex is supplemented by programs underway in the various regions (see Section III). Ongoing activities review the economic, institutional, technical, environmental and social issues involved in water management in the agricultural, urban and industrial sectors. A Bank policy paper on water resource management will follow from this work. The policy paper will assess appropriate water management in areas which expect to face water scarcity in the 21st century and will identify appropriate policy and institutional reforms as well as relevant technological options.

As part of the overall water resources management program, a multi-country study on water resource policies in urban areas has been initiated. The study will demonstrated the magnitude -- in economic, financial, and environmental terms -- of potential improvements in

water management in urban areas, and will evaluate the costs and benefits of various policy instruments in a number of ecological, development and institutional settings. The bulk of the work will be based on empirical investigations.

Work on irrigation and drainage is an important aspect of overall activities on water resource management. World population is expected to grow from over five billion today to at least eight billion by 2015. Indications are that average annual growth rates in yield of over 2 percent in agriculture as a whole -- and about 3 percent in irrigated agriculture -- will be necessary to achieve food security and improve the quality of life in developing countries. Yet the benefits of irrigation -- such as increased food production, water management, and flood control -- could be offset by damage to the environment and by the social costs of resettlement of affected peoples. The construction of dams and irrigation channel networks, while providing water for irrigation and power, also affects soil moisture, changes the depth of groundwater, and alters water quality. These effects may appear in even the best-managed irrigation schemes in ways that scientists are just now beginning to understand. Other concerns include the effects of stagnant water in canals and drainage areas that lead to public health problems like bilharzia and malaria.

Lack of a clear water management policy in many developing countries has encouraged misallocation of water resources. Water-pricing polices and inadequate systems and methods for cost recovery are other problems. The challenge is to meet the world's growing needs through investment in well-conceived and environmentally sound irrigation projects. A joint program between the World Bank and the United Nations Development Programme, and supported by bilateral donors is currently underway to review options and policies in irrigation and drainage, and to create international networks for information exchange. The program will review the causes of these problems in three country case studies (Pakistan, Egypt and Mexico), and propose alternative procedures for implementing large scale irrigation schemes. In particular, it will examine the optimal timing and phasing of drainage components in such projects.

As part of the effort to find practical solutions to the growing problems of water supply, governments and international agencies are focusing more attention on the quality and quantity of basic data that is available in meteorology, surface-water hydrology and hydroecology. This data forms a vital prerequisite to the formulation of integrated water sector development planning. Work is ongoing on a Sub-Saharan Africa Hydrological Assessment; the assessment is being undertaken in collaboration with the UNDP, The African Development Bank, and various bilateral agencies. Since water resources are often shared by groups of countries, the program was designed with a regional focus. The assessment will evaluate the status of existing water resource data, identify important data gaps, and recommend means to enhance countries' capability to measure, retrieve, process and publish hydrological information.

Institutional issues are being addressed under an activity recently initiated with the UNDP for exploring options for building institutional capacity in the water sector. A paper on training, legal and regulatory issues has been completed.

A book entitled *Water Supply and Environmental Management* was completed during the year, and will be published in FY92. This volume covers integrated water resources planning, least cost solutions, and pricing policies, and emphasizes the environmental aspects of both the supply and the disposal of water in an integrated water resource management context. A preliminary report has also been completed on the linkages between water, land and environmental degradation; the report will be followed by country case studies on policies for integrated water resources management.

Forest and Land Management

A major Bank-wide activity this year was the preparation of the forest policy paper, details of which are described in the previous section. Reflecting the variety in regional circumstances, separate forest strategy papers were also prepared in the Africa and Asia Regions (See Section III).

The degradation of land and forest resources poses one of the most serious problems facing developing countries, and results from the increased pressures of population growth and various economic activities on land resources, combined with ambiguous property rights and external shocks. Work is underway on a study to value the environmental impact of forest management schemes in Madagascar. The objective of this research is to develop practical means of improving the design of projects and policies.

Work on forest conversion has concentrated in Latin America where a region-wide analysis investigated the causes of agriculture's geographic expansion, which has often occurred at the expense of forests. The analysis yielded insights into how this pressure on forest resources can be accommodated. Growth in crop and livestock yields -- associated with investment in non-land assets in the agricultural sector -- was shown to alleviate the pressure for frontier expansion that is associated with increased demand for food. The finding suggests that there are important complementarities between agricultural development and conservation of tropical forests and other natural environments in Latin America and that there is a general underestimation of the degree to which non-land inputs can be substituted for land in the production of crops and livestock. The substitution of non-land assets for land is seen as an important option for reducing pressure on forest resources.

Other work on forest conversion -- in this case in Costa Rica -- indicates that most deforestation is not the result of incursion by squatters, but is driven by commercial activities of the timber, banana, and cattle producers. The existing incentive structure is the major culprit. Work has been initiated to examine these processes in greater detail, to determine the types of land being converted, and to identify and quantify the benefits obtained from recently cleared land.

Identifying the conditions conducive to investment in woodlots by small farmers is the objective of another study, which will develop recommendations for the formulation of projects

and programs. A field survey of farmers in two districts in Kenya is currently underway, and results indicate that decisions to establish or convert woodlots are based on a number of variables. These include: the existence of a reliable market as well as economic returns for timber; the specific characteristics of the plot -- with steeper plots being more likely to be used as woodlots; the availability of viable economic alternatives; and family life-cycle considerations, i.e., future family needs and likely availability of household labor.

Drylands issues are receiving particular attention. Policy-makers are faced with a number of problems in developing strategies for the improved management of drylands. First, the physical nature and the extent of what has been termed "desertification" is not well understood, partly due to poor data. Second, the underlying causes of land degradation in drylands, which might appear clear at first sight, often become less clear when probed more deeply. Third, the impact of changes in public policy aimed at improving land management are not easy to predict and depend on both geographic location and a country's stage in economic development. A paper on "The Management of Drylands" completed during the fiscal year examines some of these difficulties, and explores the physical processes, the adaptive strategies of populations, and the economic environment within which such strategies have evolved. It also suggests some possible policy responses to achieving sustainable development.

On a related topic, the Bank is collaborating with the Commonwealth Secretariat and the Overseas Development Institute on a review of rangeland management practices in areas under communal control in Sub-Saharan Africa. The review focuses on the potential for increasing the flexibility of herd management in order to increase overall productivity. A workshop on operational priorities was held during the year. This highlighted a number of research needs. Among these is the need for better understanding of farmers' attitudes, beliefs, and decision-making processes regarding soil degradation. Another priority is for an improved understanding of the available technologies for sustainable land management. Work has been initiated on these topics, focussing in particular on the costs and benefits at the farm level of various soil management options, including a review of a range of cultivation and crop management practices.

It was also noted at the workshop that while much concern has been expressed over land management trends, relatively little has been done to assess experience in this area. With support from Overseas Development Agency (UK) and the Rockefeller Foundation, a review is underway of the changes in land management practices adopted over the past 60 years by farmers in a district in Kenya -- a district where there has been much public concern about land degradation, and where there has been a four-fold growth in population. Preliminary results emphasize the importance of the availability of economically viable land-use options for farmers. Work is also being initiated in Central America on lessons of experience from programs designed to encourage farmers to adopt sound practices for soil conservation and agroforestry. The review will be carried out in collaboration with CATIE and will stress the institutional and economic aspects of promoting sound land use.

The legal and institutional framework is a crucial determinant of land management

practices. This is reflected in on-going work on in the area of land tenure. A paper is under preparation that presents a typology of legal and tenure situations, and reviews the conditions where land titling and registration may be necessary for improved land management.

Social and Cultural Issues

<u>Health</u> Macroeconomic and sector policies affect health directly, and through environmental changes they bring about. These complex relationships are the subject of a joint review carried out by the World Health Organization (WHO) and the World Bank on the effects of development policies on health. This study, published in a book entitled *The Impact of Development Policies on Health*, reviews the impact of macroeconomic, agricultural, energy, industrial and housing policies on health. It demonstrates that the impact of such policies can be profound, and recommends that more strenuous efforts to take account of these relationships should become a feature of development planning. The need for an integrated approach to environmental health is also put forward in a technical paper entitled "Environmental Health Components for Water Supply, Sanitation, and Urban Projects" (See Box).

Over the past two years the Bank has been undertaking, with a number of collaborators, a review of priorities in the health sector. The core of the review is a series of papers on the public health significance of major clusters of diseases in the developing world and on the cost and effectiveness of currently available technologies for their prevention and case management. In addition, as part of the review, a number of cross-cutting papers provide

Environmental Health Components for Water Supply, Sanitation, and Urban Projects (Box)

The need to improve health in the face of stagnant or shrinking national budgets has prompted policymakers to search for new options to enhance health at minimum cost. In response, a practical methodology for including environmental health components in water, sanitation and urban development projects is proposed. The methodology is based on the premise that it is possible to improve the quality of life of project beneficiaries with relatively inexpensive components that rely on linkages between various sectors.

Improved understanding of these linkages has led to a reevaluation of the evolution of health improvements. In Western Europe during the nineteenth and twentieth centuries, major respiratory and diarrheal diseases had often already begun to decline in advance of medical breakthroughs. Reduction in mortality have thus not been primarily due to improvements in water supply and sanitation, as commonly postulated. Rather, they occurred as an integral part of overall economic development and improvement of living standards -- including better water supply, sanitation, housing, medical services, education and other social programs. This confirms that health improvements depend not on one but on many interrelated factors.

The paper stresses the need to build interlinkages to foster cooperation among agencies responsible for various sectors, and among governmental and non-governmental organizations. Relatively simple interventions are proposed, both to reduce costs and to encourage beneficiaries to accept programs more readily. The importance of beneficiary participation, especially of women, in campaigns to improve hygiene and dietary habits is stressed.

The paper's message is one of caution and promise: health benefits are often difficult to detect, and may be slow to mature. But health can be greatly improved with a modest investment that can reach those most in need, the urban and rural poor.

demographic background, discuss issues involved in setting priorities, and review illustrative areas of intervention. The need to improve environmental quality, and the various means of doing so is addressed.

A report on the health of adults in the developing world, edited by staff members of the Bank, WHO, Harvard University School of Public Health, and the London School of Hygiene and Tropical Medicine, has been substantially completed. The report documents the nature and extent of adult ill-health in developing countries, and identifies environmental factors as one of its key determinants.

Policy guidelines on lending for tobacco are near completion, and aim to change Bank policy on tobacco lending. In addition to the known health risks of tobacco smoking, the cultivation and processing of tobacco is also known to have potentially serious environmental consequences that may lead to soil degradation and to fuelwood depletion. With regard to soil degradation, nearly continuous cropping of tobacco on easily erodible soil is often practiced and can lead to relative exhaustion of the land. In addition, tobacco is often cured in a process that is energy demanding, with most of the energy being provided by wood fuel. One hectare of wood is required for each hectare of tobacco cured, with the result that tobacco can be an important contributor to the destruction of local timber supplies. Widespread, largely uncontrolled use of pesticides and herbicides on tobacco may pose additional health risks as well as environmental risks.

Different industrial pollutants pose varying risks to human health and ecosystems. Work is currently underway to collect and incorporate the best available risk assessments on industrial pollutants, and to combine them with raw emissions data in order to produce weighted risk indices for various industrial sectors. A database has been assembled that contains the US Environmental Protection Agency's current risk estimates for several hundred pollutants, including separate numerical assessments for human toxic risk, human carcinogenic risk, and eco-toxic risk.

Education Activities in the field of environmental education have been rather limited in the Bank, and a number of fundamental questions remain to be addressed. These include issues such as the identification of the most effective target groups for environmental education, whether environmental education should be integrated into science subjects or into technologyrelated subjects, and so on.

One of the increasingly important tasks for education is to prepare the ground in developing countries for constructive and relevant technology transfer, adaptation and development. This approach, addressed in the Bank's new Science and Technology program,

defines a new role for the institution and is of special relevance for the environment. Here, advances in science and technology will play an increasing role, directly through encouraging sound environmental management, and indirectly through determining international competitiveness of agriculture and manufacturing. Modern technology in environmental science has become increasingly relevant, necessary, and accessible in developing countries, yet the successful transfer and adaptation of high technology requires considerable local knowledge. Continually growing concern in developing countries for the environment is likely to lead to an increase in the demand for scientists with the interdisciplinary skills needed to handle the great variety of environmental issues facing most developing countries. Reliable monitoring of environmental conditions, including the effects of infrastructure projects and agricultural and industrial activities, is very demanding, both qualitatively and quantitatively, and is closely related to basic scientific research. Similarly, the design of new products and production methods with more acceptable environmental impacts is a major task for both agricultural and industrial research.

An ongoing activity is the attempt to broaden the audience for the Bank's *World Development Report 1992* on the environment to young people still at the secondary-, and perhaps even the primary-, school level. The production of this "Youth World Development Report" brings to the fore several questions regarding the most desirable direction for the Bank's focus on environmental education.

Environment, Population and Women The Bank continues to emphasize population control issues and their importance as a basic determinant of prospects in both development and the environment. Nevertheless, there is still insufficient knowledge regarding the precise relationship between rapid population growth and environmental degradation to properly guide developing country policies and Bank population lending. Exploratory work is underway on the linkages between population and environment issues, including a literature review and the identification of appropriate case studies. The eventual study should provide new insights on the effect of rapid population growth on the alleviation of poverty and on environmental management.

In the area of women and the environment, there are two general lines of work: the promotion of smaller families -- which through the population link is fundamentally an environmental issue -- and activities directed specifically to women farmers, stressing in particular extension services. Women are the major producers of food -- and increasingly, of cash crops and livestock -- in many regions; they carry the main responsibility for meeting the family's needs for household water and fuel. Thus, they are important not only as economic agents but also as managers of natural resources. At the same time, and like men, they are also polluters through their use of inappropriate technologies, inorganic fertilizers, and other agrochemicals. Yet their access to technology, advice and other inputs and services remains limited, and far from commensurate with their role as economic agents and resource managers. The need to improve women and extension in Africa, and has now been extended to cover other regions.

Thus, although there is not a specific stress on environmental issues in the Bank's program on Women in Development, the two lines of work outlined above do promote sounder environmental management through increasing women's economic productivity and earning capabilities, thereby decreasing poverty, lowering birthrates, and providing women with the option to improve their use of natural resources by lengthening their decision horizons. Indirectly, the increased options available to women will also open up access to education, credit, and other services that can only enhance environmental management.

<u>Cultural Issues</u> The development of policy on cultural heritage issues received increased attention during the year. A review of the Bank's Operational Directive on Cultural Property is now in the final stages. A study of cultural heritage issues in sub-Saharan Africa is also underway, and will be published as a handbook. A review of cultural issues in biologically diverse areas is also under preparation and regional studies to support it have been initiated. The impact of development on indigenous populations is being addressed in a paper on the effect of development on forest peoples in the rain forests of Central and West Africa.

Environmental Economics

A series of case studies in energy, forestry and water resources seek to use the tools of environmental economics and cost-benefit analysis to improve policy and project design. Where economic valuation is not feasible, other multi-criteria techniques are being explored as a practical tool to better incorporate environmental considerations into decision-making. As a first step in this process, a state-of-the-art survey paper was prepared on how environmental concerns can be integrated into economic analyses of projects and policies. The paper deals with four key issues: physical impacts of projects and policies; valuing these impacts in monetary terms; the discount rate; and issues of risk and uncertainty. The main emphasis is on methods of valuing environmental impacts. Where possible, practical examples illustrate strategies to address what have often been referred to as externalities. The paper concludes that the major need at present is not for more theory or techniques, but for application of existing methodology and approaches to concrete problems, particularly in developing countries.

Work on fiscal instruments to address environmental degradation addresses the general concern that the policy response to environmental degradation may have often been misdirected, including, for example, a heavy reliance on regulatory arrangements that are difficult to enforce or that distort behavior. Work has been initiated on developing and applying an analytical framework for evaluating the environmental effects and economic costs of alternative public finance instruments in developing countries -- with specific reference to pollution control. The project emphasizes the need to consider various alternatives that take local characteristics, such as the capacity to enforce regulations and monitor compliance, into account. Case studies will be conducted in Mexico and Indonesia. On the same topic, a paper entitled "Environmental Policy and the Public Revenue in Developing Countries" was published during the year (See Box).

Environmental Policy and the Public Revenues in Developing Countries

The range of environmental concerns continues to expands, and few sectors of economic activity remain untouched by them. Yet claims on public and private financial resources are already large. How then, can environmental policies be made more "affordable"?

The paper addresses the role of regulations and taxes in the reduction of environmental damage, and suggests that developing countries would be better served by following the tax and investment approaches to environmental policy in most situations, rather than the regulatory route that the industrial countries have followed over the past century.

While the use of regulations is self-evidently appropriate in some cases, such as the control of hazardous wastes, in the majority of cases the tax approach has significant advantages. Taxes are economically efficient and more wide-reaching in their impacts, less demanding on information, and are administratively less burdensome as they could be grafted onto existing structures of tax administration. Economists have often held most such advantages to be applicable in the industrial countries. The paper concludes that they would apply with even greater force in the developing countries.

Research has also been initiated on general issues in environmental protection, resource management and economic growth. The preliminary output expected from this activity will be an essay that reviews existing and optimal practices in various sectors such as forestry, oil and gas, and hydroelectricity and draws implications for economic growth. The view that environmentally sound policies are also economically beneficial will be examined, and policies that are compatible with sustainable development will be identified. Subsequently, the relationship between the costs of environmental control and economic growth will be examined by constructing a detailed model of these costs and their consequences in one developing country.

Most developing countries face enormous economic pressures, both international and domestic, to overexploit their natural resource base, and to undervalue environmental degradation. For economic analyses, to measure economic performance, and to direct public policy, the Bank as well as countries rely heavily on the major aggregates shown in the national income accounts, compiled in accordance with the UN System of National Accounts (SNA). The current SNA tends not to account for the consumption of natural capital. A framework is therefore needed which addresses the concerns regarding the accounting for natural resource consumption and which permits the computation of an Environmentally Adjusted Net Domestic Product and an Environmentally Adjusted Net Income. Such measures would help to better capture environmental services, account for the depreciation of both man-made and natural capital, exclude relevant categories of defensive environmental expenditures, and estimate damages as a result of economic activities.

The Bank has since 1983 encouraged the consideration of environmental issues in the

ongoing revision of the UN System of National Accounts, and has proposed as an interim measure the creation of a set of environmental satellite accounts. To assist this process, the Bank recently published a survey of the experience of industrial countries with various environmental and resource accounting approaches. The purpose was to evaluate past experience and to extract lessons that may be of value for developing countries to better deal with environmental and sustainability concerns from the accounting side. The work concluded that there is a need for a great deal more empirical work in the area of environmental accounting. Most of the efforts will be devoted to two case studies in developing countries: Mexico and Papua New Guinea. These are being carried out jointly with the United Nations Statistical Office (UNSO). The attempt will be to integrate environmental data sets with existing national accounts information while maintaining existing SNA concepts as far as possible.

Work was also completed on *Environment and Development*, a book that traces the recent evolution in environmental economics, emphasizing the shift from the traditional microeconomic or project-by-project approach to one which increasingly reflects the role of macroeconomic and sector policy. The linkages with population and poverty are explored, and the contribution of market and policy failures to environmental degradation are analyzed. International environmental policy and the global environmental issue also receive detailed treatment. The book, which will be published in FY92, contains case material to illustrate general theoretical principles.

During the past two decades, many countries have liberalized their trade regimes to some degree. The resulting patterns of industrial restructuring may have had important environmental implications. An ongoing study addresses some of the issues raised by trade liberalization and attempts to identify the conditions -- with regard to endowments of environmental resources, technology, demographic factors and income distribution -- that would lead trade policy reform to worsen environmental degradation. The development of detailed industrial emissions data will enable the estimation of pollution and of the intensity of resource use in internationally traded products with more precision than is currently possible. More generally, a survey of the literature on trade and the environment is currently under preparation.

Also on the topic of trade liberalization, activities are underway with specific reference to the agricultural sector. A paper has been prepared on "Agricultural Trade Liberalization, Price Changes and Environmental Effects", and addresses the question of whether the environmental effects of trade liberalization can be unambiguously determined. The paper concludes that while higher international prices and less price instability would lead to economic benefits for developing countries, the associated environmental effects may be negative due to more intensive resource use as well as other factors. Empirical work is needed to estimate the magnitude of the effects of trade liberalization on the environment and to identify the parameters involved.

Another activity on trade policy -- with reference to West Africa -- addresses the implications of trade liberalization on agricultural productivity and growth. The study specifically considers the changes in natural vegetation cover associated with such policies,

analyzing the importance of natural vegetation as a factor of production and studying the effects of changes in relative prices induced by trade liberalization on natural vegetation. The central hypothesis of the research is that the systems of property rights prevailing in many parts of Western Africa (namely, common property rights) lead to overexploitation of vegetation and an excessive rate of land clearing. Thus, increased agricultural prices -- as may occur with trade liberalization -- will have adverse implications for agricultural productivity because of the induced degradation of the biomass stock. The approach used to test this hypothesis was to combine household survey data with remote sensing data obtained from satellite. The research suggests that community income could in the long run increase very substantially by reducing the area under cultivation. The policy challenge is how to minimize the expansion of cultivated area in environmentally fragile areas as more liberal policies improving the overall agricultural terms of trade are implemented. A potential second-best policy -- provided that administrative capabilities are sufficient -- would be to accompany trade liberalization with complementary policies to tax land-intensive commodities that are more environmentally demanding while subsidizing labor-intensive commodities that are environmentally benign. Further case studies in other West African countries are planned under this project.

The opposite trend, namely the effect of environmental degradation on international trade is addressed in a draft paper that briefly reviews environmental policy interventions, primarily in OECD countries, in the context of the potential or actual influence they exert on trade policy. Alternative approaches are analyzed in terms of their potential impacts on trade policy, followed by a consideration of the forms that international cooperation might take to minimize trade disputes, including a brief review of what has already been done at the international level. The paper then considers the interface between GATT and the environment, with particular reference to the question of how far the GATT currently goes in providing a policy framework to deal with environment-related trade issues and in addressing trade disputes that are likely to arise in this area. The paper concludes with suggestions for appropriate responses to trade concerns induced by environmental policies. A related activity on trade and protectionism, which includes a collection and review of laws with an environmental rationale, and an analytical review of the justification of these laws, is also in progress.

It is commonly argued that the decline in world commodity prices relative to income is an indicator that there is no scarcity of natural resources. Research has therefore been initiated that addresses the implications of prevailing commodity prices for the market's perception of natural resource scarcity. The study will look at the impact of technological progress on the efficiency of natural resource use and on substitution, and at its impact on the prices of natural resources. The consequences of resource price changes on world trade patterns are also addressed, as are the effects on developing countries.

Global Environmental Issues

A number of policy and research activities have been stimulated by the growing concern

over the "global commons" environmental issues, particularly the threat to the ozone layer and the prospect of global warming. In addition to specific project activities, among the contributions the Bank made during the year to the implementation of the Montreal Protocol, was a paper on the incremental cost of substituting for ozone-depleting substances. The Ozone Fund can only be used to finance projects or activities that are designed to reduce global emission of ozone-depleting substances and that incur a net economic cost (i.e. an incremental cost) to the country concerned. The paper addresses the conceptual basis for making such estimates, and the measurement and implementation issues involved.

While relatively straightforward for the ozone issue, a similar type of calculation is required for the emission of greenhouse gases, and this will be much more difficult to establish. Cost-effectiveness tests on a global scale have to be established in order to determine the justification for the financing of projects to reduce emissions of greenhouse gases financed under the Global Environmental Facility (see Section VI below). Research on this topic is under way, and will include a number of country case studies to be completed in early FY92. These will address the incremental costs of reducing carbon dioxide emissions by energy efficiency improvements as well as by a variety of other means, including forestry activities.

Several other activities are underway on environmental issues of global importance. The significance of global externalities in potentially retarding or accelerating economic development is addressed in a paper currently under preparation. The externalities addressed include the effects of global warming on agricultural productivity, labor migration, and micro-climate change; the effects of ocean pollution on coastal fisheries; and the effects of the depletion of biodiversity on tourism and pharmaceutical industry. The research will also address the potential significance of global policy responses in slowing the development of poorer countries (such as permits under global emission limitation schemes, higher energy costs, and developing country waste disposal standards.)

A research proposal is under preparation on the various instruments within countries for carbon taxation. The proposed study will review carbon taxes and tradeable permits and draw implications for trade, industrial relocation and the transfer of resources across nations. Initially, a research program would be developed around four separate themes: the growth-retarding effect of carbon taxes on developing countries; the incidence effects of carbon taxes - will developing countries gain or lose under alternative carbon tax schemes?; the design of carbon tax schemes and comparison with alternative systems of global permits; and the design of an approach most suited for developing countries.

A theoretical paper on the same topic uses the example of carbon emissions to analyze how various countries are affected by an international agreement to limit carbon emissions depending on their income per capita. An analytical model is developed which explores optimal emissions levels under different international conditions. The model is used to show that a cooperative game with transfer payments results in the optimal outcome. The nature of the transfer between the North and the South -- e.g. cash transfers or debt forgiveness -- is a crucial factor in the viability of such an international agreement. Technology transfers play a Work is also under way on energy use and global greenhouse issues. The object of the research is to study the impact of environmental initiatives likely to be pursued worldwide in the international energy market, specifically on the global production and consumption of various forms of energy and on international energy prices.

In the area of biodiversity protection, a new generation of experimental projects attempts to link the conservation of biological diversity in protected areas with local economic and social development. These new approaches can be grouped under the heading of Integrated Conservation-Development Projects (ICDPs). ICDPs have received considerable attention among conservation organizations, international development agencies, and private foundations; nevertheless, field experience has been limited and there has been a lack of analytical work in this relatively new area.

The Bank, in collaboration with the World Wildlife Fund and the U.S. Agency for International Development, has recently completed a study of ICDPs to be published in late 1991 -- People and Parks: Linking Protected Area Management with Local Communities. The study, which will be published later this year, considers ways of translating success lessons from existing ICDPs into projects and programs to make a significant contribution to the conservation of biological diversity in protected areas. More than 20 projects from fourteen countries in Asia, Latin America and Africa were studied.

These projects aim to achieve their conservation goals by promoting development and providing local people with alternative income sources which do not threaten to deplete the flora and fauna of the protected area. The projects range considerably in scale and scope: smaller projects include biosphere reserves, multiple-use areas and buffer zones on the boundaries of national parks; larger ones include development projects with links to protected areas. All are based on the premise that protected area management must reach beyond traditional conservation activities inside park and reserve boundaries to address the needs of local communities outside. The study's conclusions emphasize the importance to conservation of a supportive legal and institutional framework, clear and explicit linkages between conservation and development components of projects, local participation, the availability of additional concessional long-term financing, and strong on-site management.

Threats to biodiversity also affect marine resources. A study of the feasibility of marine parks and their economic and social benefit to local communities is under way. This comparative analysis of several marine parks will examine ways of maintaining sustainable populations of threatened species. Paralleling the study are efforts to determine priorities for marine biodiversity conservation, and a taskforce is developing a program for the Bank in the general area of marine environments.

Conclusion

Many of the research projects described in this chapter are being prepared as background material for the 1992 World Development Report which will focus on the environment and development. Work on the report is helping to identify priorities for further study, and to lay the foundation for a long-term research program. A number of conceptual issues remain to be resolved, but the greater need is for applied, multidisciplinary research conducted on a case by case basis. This will be the thrust of the Bank's environmental work program in the years to come.

VII. THE INTERNATIONAL FINANCE CORPORATION

To strengthen its capability in dealing with environmental matters, in February 1991, The International Finance Corporation (IFC) established an Environmental Unit within the Engineering Department to be the focal point for environmental activities within the Corporation. The Unit is responsible for the environmental review and subsequent monitoring of all IFC projects. The Unit also plays the lead role in the development of IFC's environmental policies, procedures and programs, and coordinates IFC's environmental activities with the Bank and other agencies. The Unit assists the Multilateral Investment Guarantee Agency (MIGA), a member of the World Bank Group, in the environmental review of projects and represents IFC's interests in such activities as the Global Environment Facility and the 1992 United Nations Conference on Environment and Development. It also identifies and promotes investments for IFC in the production of environmental goods and services in developing countries. I F C addresses environmental issues in three broad areas: review of investment projects, advisory services, and investment initiatives.

Project Review

Given its extensive experience with private sector projects throughout the developing world, IFC brings a unique perspective to environmental issues within the context of economic development. In its work with the private sector, IFC finds that companies are paying increasing attention to environmental protection and pollution prevention measures. However, occupational health and safety issues need more attention, and progress on this front is slow. Private sector interest in environmental issues is due not only to legal requirements but also to a growing awareness of corporate responsibility, public pressure, increasing "green" consumerism, and concerns about corporate liability for industrial pollution and its consequences.

As part of project appraisal, IFC reviews all new projects for consistency with the spirit and intent of appropriate World Bank, international, and host country environmental laws and guidelines. The review covers not only environmental issues but also socioeconomic concerns, resettlement issues, occupational health and safety, major hazard analysis, and risk to life and property. While IFC procedures rely on World Bank guidelines and overall policy, the review process is adapted to the nature of IFC investments in the private sector.

The definitions of project categories are similar--but not identical-- to those used by the Bank. Category A projects require an environmental assessment (EA). Category B projects require a more limited analysis, and Category C projects, primarily those associated with the development of capital markets, require no environmental review. During fiscal year 1991, IFC conducted environmental reviews of 100 new projects in 37 countries (see Table I). (*Note: Project statistics will be updated in next draft to include final quarter results). In order to increase awareness of pollution prevention opportunities which may arise during the project appraisal process, the Environmental Unit sponsored a pollution prevention seminar for IFC's

Engineering Department staff conducted by the Pollution Table I. Prevention Office of the United States Environmental Protection Agency.

Some projects submitted to IFC do not meet established environmental criteria. Unless changes can be made so that the projects meet required environmental standards, IFC will not proceed with such projects. IFC will work with the companies concerned as appropriate to improve the project's environmental performance. However, this fiscal year a number of projects were dropped because of environmental problems.

In addition, IFC reviewed its portfolio to determine whether corrective measures or, in extreme cases, divestiture of any projects were warranted due to environmental impacts; no major problems were identified.

IFC's investments cover a wide range of industrial, forestry, fisheries, and agricultural sectors. Thus, IFC deals with a broad spectrum of environmental issues and has excellent opportunities to influence the projects in which it invests. (See Boxes 1 and 2 for examples of projects involving significant environmental issues).

Advisory Services

IFC's Environmental Unit offers advisory services to international groups, government authorities, and companies. For example, during FY91 IFC worked with the Business Council for Sustainable Development on preparations for UNCED in 1992. IFC is represented on the Trade and Environment Committee of the National Advisory Council for Environmental Policy and Technology, which reports directly to the Administrator, United States Environmental Protection Agency. The Environmental Unit made presentations on private sector opportunities in environmental goods and services at international conferences in Vancouver, Paris, Stockholm, Helsinki, New York, and Kuala Lumpur. IFC is assisting the government of Poland to set up an environmental fund in a debt-for-environment swap. It also provided municipal authorities in several countries with assistance in privatization and financing of municipal wastewater treatment systems, and provided advice to a number of companies on preparation of EAs, including terms of reference, project management activities, and technical issues.

Investment Initiatives

The worldwide market for environmental goods and services is expected to grow rapidly during the next decade, doubling from roughly US\$300 billion to US\$600 billion by the year 2000. Annual growth rates range from 5 to 25 percent. This market is still relatively new in developing countries, yet investment opportunities are emerging at a fast pace and will contribute

Category	No.
Α	5
В	47
С	48
Total	100

Box 1. IFC Project Examples

Bombay Suburban Electric Supply Limited (BSES), India

IFC is participating in the financing of a new 500 MW coal-fired thermal power plant to be built and operated by BSES. The power plant is located approximately 100 km north of Bombay. Environmental issues have been of major concern. IFC worked very closely with BSES in the preparation of a detailed environmental assessment (EA), including preparation of consultant's terms of reference, review of consultant's studies and discussions with relevant government departments. As a result of the EA and government permit requirements, BSES has agreed to install extensive air and water pollution control systems, to develop an extensive greenbelt around the plant site, and to provide training and employment opportunities to the local tribal population. The power plant will comply with World Bank and internationally accepted environmental guidelines, as well as the requirements of the Indian authorities. BSES will undertake an extensive monitoring program during plant construction and operation to ensure ongoing compliance with all environmental requirements.

Bosques y Maderas S.A. (BOMASA), Chile

BOMASA is a project to construct a plywood plant to produce quality technical plywood and laminated technical plywood for export, and acquisition of natural temperate hardwood forest to supply the project's raw materials requirements. An EA found the project to be designed with proper attention to environmental and safety measures, and its environmental impact is expected to be minimal. Selective logging will open the forest canopy and allow young trees to grow, and enrichment planting will rejuvenate the forest with only native species. This management technique, which is finding growing acceptance in Chile's forestry industry, should result in a healthy forest which will supply logs of commercial species on a long-term sustainable basis and will keep the adverse impact on the flora and fauna to a minimum. BOMASA's own and third party logging operations will be closely monitored by Chile's National Forestry Corporation (CONAF), as well as by IFC, for compliance with an approved forestry management plan and implementation of sound logging and enrichment planting policies.

Genex S.A., Bolivia

IFC is investing in a compressed natural gas project that is expected to develop a compressed natural gas market in Bolivia and contribute to a significant reduction in pollution levels. Genex SA, a Bolivian company, will utilize Bolivia's abundant, underutilized natural gas resources with the construction of four compressed natural gas filling stations in Santa Cruz de la Sierra. Genex will supply and install 3,600 conversion kits in motor vehicles (taxis and minivans) to substitute liquid gasoline with compressed natural gas. Compressed natural gas helps to reduce the emission of gases that contribute to global warming and climate change. This reduction in atmospheric pollutants occurs for several reasons: (i) compared to gasoline and diesel fuel, compressed natural gas is carbon poor and produces about one-third less carbon dioxide than gasoline; (ii) air and natural gas mix better than air and gasoline and facilitate more complete combustion. This complete combustion reduces hydrocarbon emissions by 35-50% compared to gasoline; (iii) the remaining hydrocarbon emissions from natural gas converted vehicles do not exist in Bolivia. Accordingly, as Genex develops a compressed natural gas market in this country, polluting gasoline will be displaced with cleaner burning natural gas which will positively impact the environment.

significantly to growth of the market.

In developed countries, the private sector plays a major role in the provision of

environmental goods and services. IFC has been helping to transfer this experience to developing countries. This market represents a substantial business opportunity which will also make a significant contribution to development. Therefore, in addition to acting responsibly with respect to its own investment projects, IFC is actively seeking opportunities to invest in businesses in developing countries which provide environmental goods and services.

Many factors are driving the growth of the market for environmental goods and services.. Rapid industrialization and urban growth have placed extraordinary demands upon antiquated and informal systems of waste management and water treatment. Pollution in many urban areas has reached critical proportions, leading to public outcry and demands for improvement in environmental quality. As governments respond with environmental legislation, strengthened environmental protection institutions, and increased enforcement, opportunities are being generated for private sector investments in environmental goods and services. Moreover, limited public resources to provide traditional public sector services such as wastewater treatment or solid waste collection and disposal are forcing governments to look to the private sector for help in providing such services.

Many companies, especially suppliers of pollution control equipment and environmental consulting services, are recognizing the market for environmental goods and services as an area of new business growth. Moreover, globalization of the economy and lower trade barriers are fostering an international competitive which climate mandates increased efficiency and modernization of plants and This is particularly true in industries. Central Europe and in other countries undergoing major economic transitions and privatization of state-owned industries. Many developing countries now require all new investments to meet environmental assessment requirements and stringent pollution control standards, generating opportunities for the production and sale of environmental goods and services.

Private sector opportunities also exist in areas such as renewable energy applications, energy conservation and

Box 2. FINAP Project, Paraguay

IFC transferred a 58,000 ha. parcel of undisturbed subtropical forest in Eastern Paraguay to The Nature Conservancy and Fundacion Moises Bertoni para la Conservacion de la Naturaleza, a Paraguayan environmental group. The property, which was acquired by IFC in a foreclosure in 1979, supports one of the richest ecosystems in Eastern Paraguay. Within the site more than 300 species of birds have been identified, as well as populations of river otters, giant nutria, and numerous other animal species which are in peril of extinction. IFC transferred the land to the environmental groups for US\$2 million, which is substantially below the US\$5-7 million the land would bring if sold to developers for commercial logging and agriculture. As a condition of the sale, the land must be used solely as a nature reserve, a trust must be established to defray operating expenses, and the local indigenous population must be permitted to use the land for traditional hunting and gathering.

improvement in energy efficiency, ecotourism, game ranching, and plantation forestry. Because Because little was known about the market for environmental goods and services, during the year IFC completed a number of country studies, using Trust Funds, aimed at assessing the role of the private sector in the provision of environmental goods and services and at identifying specific market and project opportunities. The studies focused primarily on the waste management and pollution control technology aspects of the market. IFC also conducted a general assessment of investment opportunities in renewable resource related areas such as ecotourism.

Environmental markets in Chile, Mexico, Poland, Hungary, Turkey, Pakistan, Thailand, Malaysia, and Indonesia were analyzed in the country studies. IFC retained five consultants to complete the studies: Environmental Resources Limited (ERL) from the United Kingdom, Euroconsult from the Netherlands, VBB Viak from Sweden, and EKONO and Devecon from Finland. Local consultants also assisted with in-country data gathering. Financial support for the studies was provided by the Commission of the European Communities: E.C. International Investment Partners, the Swedish Agency for International Technical and Economic Cooperation, the Finnish International Development Agency, and the Minister for Foreign Trade of the Netherlands.

The general conclusion of the country studies is that the market for environmental goods and services in developing countries is still in its infancy, but is poised for rapid growth as a result of increasing public and government concern about environmental issues. Growing urbanization and rapid industrialization with little attention to the environment have created similar environmental problems in the nine countries studied:

- o Inadequate industrial and municipal wastewater treatment facilities;
- o Lack of disposal, treatment and storage systems for solid and hazardous wastes;
- o Severe air pollution caused by uncontrolled industrial and vehicular emissions; and
- o Pressures on water supplies, both in quantity and quality.

These problems present opportunities for private sector provision of environmental goods and services such as the manufacture and installation of pollution control equipment; design, construction, and operation of infrastructure and utilities; and consulting services. Additional business opportunities may be found in areas such as ecotourism and in sustainable forestry, fisheries, and agriculture projects. The largest markets are water and wastewater treatment and solid and hazardous waste management. The fastest growing markets are air pollution control, air quality monitoring and consulting services.

Most of the countries studied have functioning environmental laws and regulations, although some are more comprehensive than others. Chile and Poland are currently undergoing extensive revision of their environmental laws. Weak enforcement is a universal problem, but this situation is improving in most countries studied due to increased public and international pressure.

Severity of environmental problems is raising public concern in all of the countries. Government agencies and responsible private sector companies are increasingly conscious of their environmental obligations, especially in southeast Asia, and are taking the initiative. The "green" movement appears to be a more significant political factor in Turkey, Chile, Thailand, and Hungary. In Mexico the "green" movement is growing, but still fragmented.

There is increasing pressure for international harmonization of environmental standards and enforcement practices. Turkey is strongly influenced by its ambition to join the European Community and by the resulting need for consistent environmental standards and enforcement practices among member nations. The same is true of Mexico with respect to the planned United States/Canada free trade group. Major exporting countries such as Malaysia, Thailand, and Indonesia are under increasing pressure from export market countries, which are becoming intolerant of competitive advantages gained through lax environmental standards and enforcement. In most of the countries studied, environmental impact assessments and pollution control systems are now required for all new investments.

A lack of public resources--both financial and human--makes it difficult for the public sector in these countries to provide services for which it has traditionally been responsible, creating private sector opportunities in areas such as wastewater treatment and solid waste disposal. Privatization programs in Mexico, Malaysia, Poland, and Hungary are expected to have a positive long-term impact on the market as competition and plant modernizations create demand for clean, process-integrated technology.

These forces will result in increasing numbers of environmental projects in developing countries in which the private sector can and should invest. The nine country studies identified over 200 potential environmental projects, representing only a small sample of opportunities available in the developing world.

The Role of IFC

IFC is in a unique position to work with the private sector to develop and support the market for environmental goods and services in developing countries. IFC's special strengths include its extensive experience in structuring projects and companies throughout the developing world, ability to find joint venture partners, willingness to fund projects in higher risk environments, access to advanced technologies and experience in technology transfer, ability to mobilize financing from other sources, and willingness to partially support up-front costs which are often higher for these types of projects, such as pre-feasibility studies. IFC can also advise member governments on how to create an appropriate legal and investment framework and establish environmental services within the private sector.

IFC believes that the market for environmental goods and services in developing countries is a substantial business opportunity which can make a significant contribution to development. Thus, in addition to ensuring that its investment projects meet appropriate environmental standards, IFC encourages and supports the development of private sector capability to provide environmental goods and services in developing countries.

VIII. THE WORLD BANK AND THE INTERNATIONAL COMMUNITY

Outreach Activities

The Bank's outreach activities increased significantly during the fiscal year. They included the launch of the Global Environment facility (with UNDP and UNEP) and work on implementing the Montreal Protocol; co-operation with nongovernmental organizations on an array of environmental issues; and an expanding program of external training run by the Bank's Economic Development Institute. Environmental objectives to which the Bank subscribes also benefitted from other financing mechanisms, including technical assistance and debt-for-nature swaps.

In addition, the Bank has played an active role in preparations for the United Nations Conference on the Environment and Development (UNCED) which will take place in Rio de Janeiro, Brazil, in June 1992. The Bank's main contribution to the conference will be the World Development Report which will examine in considerable detail the links between the environment and development. The report will be published in April 1992. The Bank has also worked with the World Health Organization, United Nations Industrial Development Organization, and other agencies in their preparations for the Rio conference.

Co-operation with the rest of the UN family took a number of forms. The Bank participated in the Twelfth Annual Meeting of the Committee of International Development Institutions on the Environment (CIDIE) which met in Washington DC in April/May 1991. Topics covered included relations with nongovernmental organizations; the UNCED conference; and the Global Environment Facility (GEF). The Bank also continued to work closely with other development banks and international economic institutions. It undertook a joint study of the economy of the USSR with the International Monetary Fund, the European Bank for Reconstruction and Development (EBRD), and the OECD. The Bank also worked with the European Investment Bank (EIB), the Nordic Investment Bank and EBRD on the new Baltic Sea clean-up program. Bank staff were regular participants in OECD meetings on issues related to environmental economics and the global commons. In addition to project co-financing, close co-operation was maintained with the regional development banks on policy issues. A conference on rainforests in west and central Africa was co-sponsored with the African Development Bank, and staff worked with the Asia Development Bank on a review of economic policies for sustainable development in Asia.

Bank officials also participated in numerous international conferences and seminars during the year in which the environment featured prominently. The President of the Bank played an active role in this respect. Speaking at The Observer newspaper conference on the environment held in London in March 1991, he said "environmental success and failure has already yielded one invaluable truth: that development and environmental protection are mutually dependent". In his address to the summit meeting of the Organization of African Unity in Abuja, Nigeria, in June 1991, he pledged Bank support to Africa's quest for economic progress matched by environmental betterment; he noted that broad based environmental action plans were required, and that the linkages between agriculture, population and environment needed to be recognized, and appropriate actions taken to preserve Africa's patrimony.

Another important international conference at which the Bank was represented was the Environment for Europe Conference held in Prague in June, 1991. The Environment Department continued publication of its quarterly Environment Bulletin, providing a regular update on the Bank's environmental research and lending to some 12,000 subscribers around the world. And the joint Bank/International Monetary Fund publication, Finance and Development, increased its in-depth coverage of environment issues.

Global Environmental Facility and Montreal Protocol

The fiscal year was marked by the creation of the Global Environmental Facility (GEF). It was established by representatives of a group of industrialized and developing countries in Paris in November 1990. At a Board meeting on March 14, 1991 the Executive Directors reviewed and endorsed the agreement to establish the Facility.

The GEF is a three-year pilot program providing grants and low interest loans to developing countries to assist them in carrying out programs to address global environmental problems in four areas:

* reducing the emission of greenhouse gases which cause global warming;

* preserving biological diversity and maintaining natural habitats;

* arresting the pollution of international waters; and

* protecting the ozone layer from further depletion.

The GEF consists of the "core" trust fund (GET) thus permitting various cofinancing arrangements. Funds will be committed over a three year period. The GEF's ozone protection role will be coordinated with that of the Montreal Protocol on substances that deplete the ozone layer, which already has its own interim multilateral trust fund. Under the Montreal Protocol, US\$240 million has been pledged to help developing countries move away from the use of ozone-depleting substances. The link between the GEF and the Montreal Protocol is important not only because of the technological relationships involved (chlorofluorocarbons are a major contributor to the "greenhouse effect") but also because the two initiatives together reinforce the principle of collective insurance against severe global environmental damage.

Some 25 countries have contributed to the GEF through direct contributions to the GEF's trust fund and, in the case of three countries, through joint financing schemes. The Bank also

made a direct contribution to the trust fund of SDR 27 million (\$ equivalent) as a transfer from its net income.

The GEF is co-managed by the Bank, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). The bank chairs the GEF; administers the Facility's trust fund; prepares and disseminates policy and strategy papers on issues of direct and substantive interest to the GEF; and identifies, appraises and supervises GEF-funded investment projects. UNEP provides scientific and technological guidance and has convened a Scientific and Technical Panel (STAP) to provide advice on broad scientific and technical issues. UNDP coordinates and manages pre-investment and technical assistance activities. Through its resident representative offices in over one hundred countries, UNDP plays a role in identifying projects and communicating with recipient governments. UNDP will also manage a small grants window for local NGOs.

During the year, GEF donors (called Participants) met twice. In addition to the Paris meeting where the establishment of the Facility was approved, the donors met in Washington to review overall progress in setting up the Facility, to determine the operational modalities, and to review the work program for the first group of GEF projects. A number of policy issues were also discussed.

By the end of FY91, some 26 projects had been presented for review to the participants. They included fifteen investment projects with an estimated total cost of \$214 million. They are expected to be approved by Bank management by the end of calendar year 1991. Of these, eleven are biodiversity projects (averaging \$15 million each); three are global warming reduction projects (averaging \$15 million); and one international waters project. The other eleven projects are technical assistance projects managed by UNDP. Their total cost is estimated at \$59 million.

From the outset, the Participants have stressed the need for the GEF to move as rapidly as possible to an operational mode. Four broad principles have been adopted to achieve this objective: (i) that no new GEF structure would be created; (ii) that modest modifications to existing institutions and organizational structures of the implementing agencies would be made; (iii) that emphasis would be placed on consensus building and informal working arrangements; and (iv) processes for ensuring the technical and scientific integrity of proposed GEF activities would build upon outside expert scrutiny. The Chairman of the GEF plays an important role in fostering the collaboration and cooperation needed between the implementing agencies and the Participants. Important policy issues may, at the Chairman's discretion, be submitted to the Heads of the implementing agencies at their regular meetings. At the working level, meetings between the agencies will play a key role in reaching consensus on program and policy matters. The STAP will provide an independent view of the validity of the scientific underpinnings of the GEF and technical review procedures have been established to ensure scrutiny by outside experts.

The GEF has moved rapidly into its operational phase. The first investment project (s) was/were approved on However, the GEF represents more than simply a portfolio of

Collaboration with Nongovernmental Organizations

Over recent years the Bank has tried to expand interaction with many different kinds of NGOs, from community associations to private voluntary organizations, and environmental organizations. Social and environmental aspects of development have dominated the dialogue which covers both projects and policies. Sub-Saharan Africa has historically had the largest share of NGO-associated projects, but Asia and Latin America and the Caribbean, are catching up. The bulk of projects have been in agriculture and rural development. Recent years, however, have seen a growing NGO involvement in Bank-supported "social-dimensions-of-adjustment" work and environmental projects. Today, nearly 80 percent of NGO-associated projects involve either indigenous intermediary NGOs or grassroots groups.

The Bank expects its borrowers to take full account of the views of affected groups and local NGOs in project design and implementation, and, in particular, in the preparation of environmental assessment reports. To keep NGOs informed, some 250 of them around the world receive the Bank's Monthly Operational Summary which in 1990 began to categorize planned projects in terms of their likely environmental impact. A list of upcoming Bank-supported operations in which Bank staff see potential for NGO involvement is also published.

The rapid expansion of NGO involvement and interest in Bank-financed operations has occurred against a backdrop of intensified discussion between NGOs and the Bank on policy issues related to the environmental and social aspects of development. A growing number of NGOs have attend the annual meetings of the Bank and the International Monetary Fund, where special seminars on Bank policies are now a regular feature. Topics covered during the annual meetings in September 1990 included environmental assessment, the Global Environment Facility, and forest policy. In April 1991, the Bank organized consultation for NGOs to pursue discussion on forest policy. Some 65 representatives of environmental groups and development NGOs, including 25 from developing countries, participated in the meeting. This was the first time the Bank has involved NGOs in the development of an operational policy document.

NGOs have also played a role in the Global Environment Facility (GEF). From the outset, NGOs have provided specialized scientific and technical knowledge in project identification, review and preparation. In addition to providing project services for government-sponsored projects, NGOs have access to a US\$5 million Small Grants Window for biodiversity projects. NGOs also engaged in dialogue with the implementing agencies on broader questions on GEF and policy and strategy. As part of this process, the implementing agencies are to hold a special forum for NGOs on the day before each biannual meeting of GEF participants.

The NGO-World Bank Committee, formed in 1982, provides a formal, international

forum for policy discussions between senior Bank managers and NGO leaders from around the world. At its tenth annual meeting in Washington in November 1990, a session was devoted to environmental assessment and related issues. At a meeting in Senegal, in March 1991, the steering committee of the NGO-Bank Committee met with the head of the Bank team charged with writing the *World Development Report 1992* which will focus on the environment and development.

Popular participation in development decision-making has been discussed frequently in the NGO-Bank Committee over recent years. This dialogue helped set the stage for the launch in fiscal 1991 of a three-year Bank-wide program which will focus on how the Bank may need to modify its operational policies to encourage broader popular participation.

External Training - Economic Development Institute (EDI)

EDI continued to give high priority to environment in its program for FY91. Environmental Assessment training for developing country project managers and administrators was of particular importance. During the year EDI continued the series of national EA seminars started in early 1990. Six took place in the Latin America and Caribbean region (Argentina, Bolivia (2), Chile, Paraguay, and Uruguay) and one in Egypt. EDI also contributed to a seminar in Botswana managed by the African Region's Environment Division (AFTEN). In addition, and jointly with AFTEN and the University College (Dublin), EDI conducted a seminar in Ireland where a number of countries from the Africa region presented and compared experiences with the preparation and use of National Environmental Action Plans.

EDI also initiated collaboration with the Amazon Cooperation Treaty Secretariat through its support of the meetings of three of the six Special Committees responsible for forming an integrated strategy for the sustainable development of Amazonia and the 25 million people who live in the Amazon Basin (which extends to eight countries). EDI supported the meetings on Science and Technology, Transport and Health (which linked closely with other meetings on the Environment), and Indigenous Peoples and Tourism.

An EDI seminar on the Environmental Management of Water Resources was held in Malaysia in June 1991. It follows on from a similar seminar on Water Resources and the Environment held in Thailand a year earlier. On the same topic, EDI is contributing to, and assisting in the management of, a Bank International Workshop on Comprehensive Water Resources Management Policies to be held in Washington D.C., also in June 1991.

EDI conducted a major seminar on energy investments and the environment, in Washington D.C. in October 1990. A similar seminar in French will be held in France in June 1991. An African francophone seminar on energy policy and planning, which included attention to the environment was held in Senegal, during the year.

In addition to the training materials developed for each of the above activities, the

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following generic and model material was produced in FY91:

- A model curriculum for a seminar on EA with recommended readings for each session (to be included in the EDI Review for October 1991).
- The design of a training program on Environmental Assessment; with supporting training material and list of references.
- Guidelines for Trainers to accompany the World Bank Environmental Assessment Sourcebook. This is designed initially for the training of Bank staff, but will later be used for training others.

Other Financing Mechanisms

<u>Technical Assistance</u> Over the last few of years, increasing amounts of grant money from bilateral donors have been made available - through the Bank - to help developing countries design better environmental projects and policies. A major objective of the technical assistance grants program is to facilitate project preparation, which until recently has been a major obstacle to the development of environmental projects. When the technical assistance program was set up in 1989, it was expected to become a multilateral program underwritten by several donors. Japan has been the main contributor and in FY91 made two additional grants totalling some US\$25 million. ______ and ______ also contributed to the program during the year, in the amounts of US\$_____ and US\$_____ respectively.

During the year the program financed a wide range of project preparation and other preinvestment activities. They include a grant of \$241,000 to Egypt for the preparation of an agriculture project and US\$900,000 to Paraguay for a land-use plan, forest and watershed management, and environmental training. Another grant to Cote d'Ivoire is being used to establish a national natural resource management and land use plan. Another is being used for the preparation of an industrial pollution control project in Thailand. In Yugoslavia, the program is assisting in the preparation of the Sava River Environmental Project designed to reduce water pollution in the upper Sava River Basin. The Mexico City Transport and Air Quality Management Project, aimed at reducing pollution caused by the transport sector, also received a grant from the program.

<u>Debt-for-Nature Swaps</u> To date, non-governmental organizations have helped arrange 16 debt-for-nature transactions in several countries, including Bolivia, Costa Rica, Dominican Republic, Ecuador, Madagascar, the Philippines, Poland and Zambia. Funding has come from the NGOs themselves, donor governments, and a commercial bank. The face value of the debt involved in these swaps has been about US\$97 million.

The debt-for-nature swap mechanism as it has developed is not directly applicable to the Bank as an institution which lends to governments. The Bank neither purchases debt from commercial banks nor lends to NGOs for that purpose. Adjustment loans may, however, contain environmental components. In IBRD countries where there is a program for debt and debtservice reduction, a portion of such adjustment loans may be set aside for debt repurchase or exchange, within the guidelines for such operations. Local currency resources thereby released could then be available to finance environmental activities. In the case of IDA-only countries, finance for debt and debt-service reduction could be provided through the Debt Reduction Facility, though funds allocated to the facility are limited. In addition, the Bank has facilitated debt-for-nature transactions by bringing concerned parties together and by helping to create the institutional capacity for such assistance to be absorbed efficiently. It will continue to seek opportunities to assist the international environmental community in this way.

IX. FUTURE DIRECTIONS

As the preceding sections indicate, the World Bank has continued over the last year to step up its environmental activity. This has been exemplified in its use of the various instruments it has at its disposal, ranging from research to lending operations. Two major aspects of the Bank's environmental work - forestry and energy efficiency - have been extensively reviewed during the year, and more pro-active environmental approaches are being developed in each area. The work of the team preparing for the 1992 World Development Report has done much to stimulate thinking throughout the Bank about environmental issues, and will help lay the foundation for its future program of research.

The last several years have witnessed a rapid evolution in both the perception and the reality of the environmental problems facing the planet. Of major significance has been the growing recognition that partnership between industrialized and developing countries is indispensable if sound environmental management on a global scale is to be achieved. This principle has become evident in many ways; by a shifting of priorities by governments and international and bilateral development agencies, and by innovative financing mechanisms such as debt-for-nature swaps.

Most significant of all however has been the major international co-operative effort which resulted in the Montreal Protocol and the establishment of the Global Environmental Facility. Establishment of the GEF and the Ozone Fund recognizes that developing countries require compensation for the incremental costs they bear in addressing "global commons" issues, particularly since the industrialized countries are primarily responsible for the problems occurring in the first place. The GEF and Ozone Funds established a precedent of immense importance; it will be a major test for the international community in general, and the Bank, UNEP and UNDP in particular to demonstrate the full potential of this type of funding mechanism over the next two or three years. This requires inter alia that eligibility criteria will be satisfactorily determined, and a substantial and innovative program of investments and policy reform addressing key global concerns will emerge.

Experience gained during fiscal 1991 has reinforced a number of principles that had guided the Bank's environmental work in the preceding years. The importance of institutional capacity-building; the multidisciplinary nature of issues; the necessity of public participation; and the role of economic instruments has been illustrated repeatedly in Bank operations. Also illustrated, perhaps most dramatically in the case of Eastern Europe, is the fact that market liberalization, in general, is a necessary condition for sound environmental - as well as economic - management. If prices do not reflect real costs there is no incentive to use resources efficiently and avoid waste. However, experience has also shown that a free market is not a sufficient condition for environmental improvement. Where external costs arise, public intervention, and the consequent need for capacity-building, must be developed.

Moreover, since conflict tends to be characteristic of environmental problems, market liberalization must be accompanied by political liberalization. Those adversely affected by environmental degradation must be able to articulate their concerns, and stimulate the appropriate remedial action. If the environmental consequences of projects or policies are to be handled properly, participation of affected people must be ensured. This will continue to be a major Bank objective in its future lending operations as a complement to economic reform. NATIONAL TO THE OTHER CLEMESE. TRADELINE OF ALL PROCESS

Developing and industrialized countries alike continue to be concerned about the cost of environmental protection, and the trade-offs between short term economic growth and long term Clearly, such trade-offs exist, but there also remain many sustainable development. opportunities for policy reform and investment which meet both economic and environmental criteria. The Bank will continue to give priority to projects and policies which satisfy both objectives. Reduction in rates of population growth and technical progress are key elements of Population and human resource development work will, therefore, any long term strategy. continue to be integral to the Bank's overall environmental program.

A major thrust of the Bank's environmental work in the last few years has been to been to complement its concern for individual projects with greater attention to overall policy measures which influence environmental behavior. Research projects to better understand the relationships between trade and fiscal policy on environment are under way; numerous environmental action plans and sector-specific analyses of environmental issues are being completed; and environmental policy loans, and adjustment loans with an environmental focus are also being made. This represents a major change in approach in recent years, but more still needs to be done. Applied research, accompanied by training on environmental issues for country economists, will continue to be an important feature of the Bank's environmental work program in the coming year.

Annex I. World Bank Organization Chart

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Annex II. Projects with Environmental Components or Objectives Fiscal 1991

This annex provides details on ______ of the _____ projects approved in fiscal 1991 that had environmental components. These projects cover countries from all four regions of the Bank: Africa, Asia, Latin America and the Caribbean, and Europe, Middle East, and North Africa. The list illustrates the range of environmental components included in Bank projects.

[NOTE: This preliminary list clearly does not conform to the 50 percent criteria referred to in Section IV. The Annex will be completed when a decision is made about whether or not the 10 percent or 50 percent indicator will be used].

Country	Project	Environmental components
AFRICA		
Benin	Second Structural Adjustment Program	Introduce policies to give rural population the responsibility of managing natural resources (e.g., increased security of land tenure; preparation of land tenure code); preparation of an Environmental Action Plan to develop a national capacity for identifying, studying and formulating action plans, and defining national policies on environmental protection and natural resource management.
Botswana	Tuli Block Roads Project	Construction phase of project to address environmental protection issues (e.g., stripping of vegetation, storage of topsoil, protection of trees within road reserve); archaeological surveys to preserve national resources and archaeological sites.
Burkina Faso	Education IV	Training programs for teachers to integrate environmental education into teaching methodology; Project to support the IDA Environmental Management Project by providing education infrastructure and services required by beneficiary communities.
	Environmental Management Project	Provide support to about 120 communities in designing and implementing Terroir Management Plans and forest protection program; technical support for existing

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Country	Project	Environmental components
		natural resources management operations in 18 provinces; establish national environmental and project impact monitoring systems.
Burundi	Energy Sector Rehabilitation Project	Improved energy efficiency through reforms in charcoal, wood pricing and woodfuels consumption; training to improve charcoal production techniques; improved stoves program.
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Central African Republic	Enterprise Rehabilitation and Development Project (ERDP)	Subloans to be granted under the project are required to make an environmenta assessment of any significant environmenta impacts; training programs under the project to cover environmental issues including occupational health and safety standards.
Chad	Petroleum and Power Engineering Credit	Technical assistance to addres environmental issues related to project preparation of an environmental assessment
Comoros	Highway Maintenance Project	Repair of road drainage to reduce erosion and flooding risks; technical assistance to develop local capacity to evaluate environmental impacts of road works.
Congo	National Agricultural Extension and Adaptive Research Project	Adaptive research on fertility managemen (e.g., legume fallow/cover crop rotation mulching techniques, alley cropping training on soil/moisture conservation an plant protection.
Cote D'Ivoire	Women in Development Pilot Support Project	Rural programs to include primary heal care, potable water, conservation of fish improved stoves for fuelwood efficiency crop rotation, and agro-forestry technique
Djibouti	Second Urban Development Project	Rehabilitation/construction of drainagenetworks and storm water collectors prevent flooding in low-lying areas; wat supply and a sewerage systems.
Equatorial Guinea	Crop Diversification and Agricultural Services	Introduction of cropping systems improved land use and soil conservation

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Country	Project	Environmental components
	Project	practices (e.g., alley cropping systems).
hana, Republic of	Agricultural Diversification Project	Technical advise to farmers on site selection to prevent soil erosion; agreements not to use toxic agrochemicals and compliance with IDA's Environmental Guidelines; construction of an effluent treatment facility near palm oil/rubber processing mills.
	Second Health and Population Project	Improvement in the quality and coverage of the primary health care; immunization program.
	Second Transport Rehabilitation Project	Support of community-sponsored activities to improve, well-water supply and the environment through involvement of local NGOs; drainage facilities to avoid erosion and siltation; increased road traffic safety.
	Structural Adjustment Program II (Supplement)	To study the environmental consequences of rapid population growth and expansion of food production.
Guinea-Bissau	Energy Project	Petroleum barge to be provided with fire protection equipment and facilities for cleaning accidental oil spills; personne training in the prevention of oi spillage;installation of oil-water separator and incinerator to dispose of waste oil and fuel and prevent contamination of the wate table.
Kenya	Export Development Project	Water supply and sewerage/industrial wast treatment facilities; preserve "greenbelts around industrial site to safeguard woodland and wildlife; implement land zoning to preserve wildlife access to Nairobi Nationa Park.
	Forestry Development Project	Conservation/protection of indigenous fores resources, soil and water on forest, farm and range land; technical assistance in farm forestry extension and agroforestry preparation of land use plans for rational use of forest land; improvement of forestry infrastructure, forestry research (throug upgrading facilities and staff proficiency)

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Country	Project	Environmental components
		forestry education (i.e., develop curricula on farm forestry and forest management), and forest extension services; preparation of a forestry development master plan; strengthen planning and implementation capacities of forestry agencies.
	Second Agricultural Sector Adjustment Operation	Policy analysis component to strengthen the process for environmental, natural resource conservation and land use planning; soil testing in various agroecological zones to make the use of fertilizers environmentally sound.
	Second National Agricultural Extension Project	Develop natural resource conservation prototypes arid/semi arid areas; technology dissemination to assist farmers in soil and water conservation; integrated pest management.
Madagascar	Health Sector Improvement Project	Integrated disease control programs for communicable diseases; primary health care services and sanitation programs; training in safe application of pesticides (e.g., DDT for the control of malaria).
Malawi	Financial Sector and Enterprise Development Project	Evaluation of Industrial Sites Component to determine potential adverse environmental effects; subproject design to include measures to minimize adverse environmental impacts; subprojects with environmental effects that cannot be mitigated would not be eligible for financing from the IDA credit funds.
×	Fisheries Development Project	Research activities to conserve Malawi's natural resource base of water bodies (e.g., assessment of fish stocks; pilot lake conservation and management programs; fish farming models to integrate aquaculture into farming systems in different ecologic zones; quatic weeds control etc.
Mali	Agricultural Services Project	Adaptive research programs to cover soil and water conservation, cropping systems and ecologic zones, and soil fertility;

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Country	Project	Environmental components
		national extension program to strengthen relations between crop, livestock and environmental services; forestry development programs.
	Second Health, Population and Rural Water Supply Project	Immunization programs; rural water supply to benefit 180,000 people.
Mauritius	Environmental Monitoring and Development Project	Preparation of a National Physical Development Plan to guide the Spatial development of Mauritius (e.g., land use control, infrastructure investment and environmental management at local levels) establishment of environmental laboratories; site selection and design for an industrial park including roads, water supply, drainage, etc; national solid waste management plan; research on integrated pest management; marine conservation.
Mozambique	Agricultural Rehabilitation and Development Project	Development of sound integrated pest management practices; National Irrigation Development Master Plan to deal with water resource management studies for major river basins in the country; irrigation development.
Niger	Public Works and Employment Project	Drainage network cleaning, including small sanitation works, water and soil conservation, garbage collection, planting and park works, etc.
Nigeria	Oso Condensate Field Development Project	Project design to prevent environmental damage: e.g., drilling operations to be subject to current international regulations and practices regarding blow-out prevention as well as instituting fire and tubular of latest metallurgical alloys to inhibit corrosion; use of corrugated plate interceptor and induced gas flotation unit to process oily waters before discharge into the sea.
	National Water Rehabilitation Project	Develop policy guidelines for design and maintenance of water supply systems, water

Country	Project	Environmental components
		quality standards, and standards for water treatment chemicals, establish and maintain a water resources and water quality data base for surface and groundwater sources used for domestic and industrial purposes special studies on pollution and water quality; agreement to formulate dam and reservoir maintenance programs to ensure that their operation would not constitute a risk to environmental health.
Rwanda	First Education Sector Project	Reform primary education curricular to include subjects on environment.
Tanzania	Agricultural Adjustment Program	Use of fertilizer products to be reviewed to determine if they properly address environmental issues; proposed closure of fertilizer factory to reduce environmenta damage to land, shore and groundwater.
	Petroleum Sector Rehabilitation Project	Measures to reduce oil pollution and spillage/leakages: e.g., energy conservation pollution control and rehabilitation of refinery and pipeline facilities; construction of new depots to include fire and safet equipment as well as pollution control equipment.
Togo	Fourth Structural Adjustment Program	New Rural Development Strategy to include protection and rehabilitation of the environment with active participation from local communities; formulate a rural your settlement policy to deal with land tenural cropgrowing, stockraising and reforestation integrated strategy of som conservation.Population and Health Sector Adjustment Infections disease prevention improving environmental sanitation.
Uganda	Agricultural Sector Adjustment Credit	Land Policy Research Program (e., promote rational land use/managemen protect forest and wildlife research; develor policies for accessing communal grazin lands); agreement that procurement pesticides and other agrochemicals to me Bank guidelines.

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Project	Environmental components	
First Urban Project	Improvement of urban services: e.g., provision of water facilities rehabilitation of solid waste collection and disposal system, upgrading of urban markets, maintenance of urban roads and storm drains.	
Livestock Services Project	National animal disease control; forage development; training and technical assistance.	
Education Sector Rehabilitation Project	Introduction of environment themes in school curricula, with participation by World Wildlife Fund.	
Pilot Feeder Roads Project	Monitoring and evaluation of the project's environment impacts; repair of road drainage system; technical assistants to develop local capacity to evaluate environment impacts of road works and design remedies.	
Social Sector Project	Development of new policies on population and environment with special attention to public health and human ecology; operational support to the expanded program of immunization; technical support for preparing a National Environment Action Plan; technical assistance for sanitation in urban areas, pest management, and introduction of new techniques for	
Economic Recovery Program	environmental protection. Support to basic health and sanitation service.	
Agricultural Support Services Project	Technical assistance to support the technology transfer, involving better use of water resources and evaluate environmental issues; promote the use of green manure; advise farmers on the optimal use of pesticides and promote integrated pest management techniques; Subject Matter Specialists would receive specific overseas	
	ProjectFirst Urban ProjectLivestock Services ProjectEducation Sector Rehabilitation ProjectPilot Feeder Roads ProjectSocial Sector ProjectEconomic Recovery ProgramAgricultural Support	

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Country	Project	Environmental components
		training in environmental planning and protection.
	Shallow Tubewell and Low Lift Pump Irrigation Project	Irrigation development; nationwide environmental monitoring system to identify the effects of irrigation on resource base (e.g., groundwater pollution, potable water supplies, fisheries).
	Third Inland Water Transport Project	Create an environmental map of the waterway system to identify specific environmentally sensitive areas; provide test facilities for dredge materials/bottom sediments and training of personnel in the use of equipment; technical assistance to the department of shipping to develop regulations for the protection of inland waters.
China	Fourth Rural Credit Project	Introduction of a mandatory Area Management Plan to achieve sustainable rangeland livestock production system; fishery development; water supply and drainage networks (to prevent fish pond water contaminating other bodies of water); investment in fruit trees would reduce soil erosion.
	Jiangsu Provincial Transport Project	Rehabilitation of the Grand Canal at Danyang to improve water quality and to eliminate erosion; environmental and resettlement plans were reviewed by the Bank and found satisfactory.
×	Key Studies Development Project	Research and training to address environmental issues; establish state laboratories in environmental geochemistry and geo-engineering; research areas to include atmospheric physics, river mouth sedimentation, natural disaster, etc.
	Liaoning Urban Infrastructure Project	Technical assistance for institutional development in water supply, water conservation, water pollution control (e.g., develop effective methods for industrial wastewater treatment) and for strengthening environmental protection laws/regulations;

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Country	Project	Environmental components
		procurement of equipment for environmental pollution monitoring.
	Medium-Sized Cities Development Project	Provide pollution monitoring equipment to Environmental Protection Bureaus; improve city-wide compliance with national industrial wastewater discharge standards.
	Mid-Yangtze Agricultural Development Project	Irrigation development; contour terracing; green manuring to improve soil fertility; system for monitoring disposal of agricultural wastes and the safe use of agrochemicals.
	Rural Industrial Technology (Spark) Project	Technology development for mitigating adverse environmental impacts of rural industrialization; Environmental Protection Bureaus to prepare land use planning map and to enforce strict zoning regulations for potentially polluting industries; agreement that all activities to be supported by Project should fully comply with national/local regulations for environmental protection.
	Shanghai Industrial Development Project	Install sewer interceptor and collection systems to reduce organic pollution loads into Suzhou Creek; adequate expenditure allotted for controlling environmental pollution.
	Industrial Pollution Control Project	Promote effective enforcement of existing legislation on environmental protection regarding industrial sources; support assessments, extension services and research in waste minimization, resource recovery and pollution abatement in industry; focus on the chemical and related industries.
	Maharashtra Rural Water Supply and Environmental Sanitation Project	Expanding access to potable rural water supply systems and environmental sanitation facilities; strengthen the institutional capacity to promote improved environmental sanitation.
	Private Power Utilities (TEC) Project for the Tata Electric Companies	Control sulphur dioxide emissions from coal and oil fired power plants (e.g., use of flue gas desulplurrization; plant design to meet

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Country	Project	Environmental components
		Government standards.
	Andhra Pradesh Cyclone Emergency Reconstruction Project	Cyclone reconstruction operations and programs for mitigation of future similar disasters strengthen institutional capabilities in cyclone preparedness and mitigation; irrigation and drainage; rural water supply; tidal and flood protection embankments; technical assistance to develop a plan for water management in delta upland river areas.
	Agricultural Development Project - Tamil Nadu	Protection of rainfed areas under ecological stress; agriculture extension (e.g., soil/water management, fodder development and tree farming); technical support for watershed development, livestock development; forestry development; rural water supply; staff training on use and handling of pesticides.
	Maharashtra Rural Water Supply and Environmental Sanitation Project	Upgrade water supply and drainage schemes (e.g., construction of piped water supply schemes, main line drains, cross drains and disposal pits); development and implementation of an environmental sanitation strategy (e.g., programs to increase latrine usage, improved solid wastes management, etc.); health communications program to increase community awareness of the caused problems and need for a clean environment.
	Second Technician Education Project	Curriculum development to incorporate environmental concerns into existing curricula or prepare new ones on the environment.
	Second Petrochemicals Development Project	Agreements to design and operate project facilities to meet national/local environmental discharge standards for liquid, gaseous and solid wastes, as well as health and safety standards.
Indonesia	Agricultural Financing Project	Staff training for participating banks to better understand risks of agricultural/agribusiness operations,
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Country	Project	Environmental components
		requirements of environmental regulations, and environmental impacts of activities to be supported by Project, and to mitigate possible adverse effects on the environment.
	Fertilizer Restructuring Project	Studies to assess the environmental impact and standards of the fertilizer industry, including identification of long-term objectives for environmental improvement and preparation of an environmental management program.
	Provincial Irrigated Agriculture Development Project	Irrigation works including minor canal and drainage systems; flood protection works; environmental protection including forest surveys and erosion control; survey of land use in catchment areas of project schemes.
	Second Higher Education Development Project	Assistance to 12 Environmental Study Centers in developing environmental expertise and advising local, regional, and national government agencies, and private businesses on complex environmental problems; provide funds for management training, staff development, research and equipment as these relate to environmental planning and management.
÷	Third Jabotabek Urban Development Project (JUDP III)	Strengthen pollution control and environmental protection in the Jabotabek region (e.g., preparation of a natural resources inventory; provision of water supply and drainage services; solid waste management); feasibility studies to prepare environmental projects dealing with industrial wastes treatment.
	Urban Development Project in the Provinces of East Java and Bali	Improve infrastructure development covering water distribution system, solid waste management, drainage and sanitation; institutional development to strengthen local government capacity to handle community participation in environmental management.
	Yogyakarta Upland Area Development Project	Improve upland productivity via soil conservation measures and soil stabilization

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Country	Project	Environmental components
	(Bangun Desa II)	with microwatersheds; on-farm technology displays covering vegetative conservation (e.g., fodder legumes to stabilize slopes), alley-cropping, etc. to strengthen technical basis for intensive microwatershed development in the uplands.
Lao People's Democratic Republic	Highway Improvement Project	Road design to include measures to prevent downstream erosion and siltation.
Nepal	Urban Water Supply and Sanitation Rehabilitation	Water supply rehabilitation (e.g., repairs of service reservoirs, repair/replacement of chlorination plants, etc.); groundwater treatment plants (for iron, ammonia and manganese); rehabilitation of sewer system and sanitation (e.g., provide over 15,000 toilets in unsewered areas).
Papua New Guinea	Public Sector Training Project	Overseas fellowship to be award in the following areas: policy relating to natural resource management, and environment and conservation; fellowship to cover the Department of Agriculture and Livestock, Minerals and Energy, Fisheries and Marine resources, Forest, etc.
	Special Interventions Project	Drainage improvement on national roads; technical assistance for expansion of urban services (e.g., water supply, sewerage, waste disposal, etc.).
Philippines	Cottage Enterprise Finance Project	Pollution-abatement assistance to cottage enterprises; technical advice on waste minimization and waste treatment for firms in electroplating, leather tanning, and food processing.
	Earthquake Reconstruction Project	Reconstruct essential infrastructure including damaged irrigation system; technical assistance to mitigate earthquake damage in the future, including the provision of training in geology and seismology and the procurement of equipment for seismological studies.
	Industrial Restructuring	Strengthen the institutional framework for

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Country	Project	Environmental components
	Project	environmental protection through training and technical assistance; investments in energy conservation and pollution control support to Environmental Managemen Bureau to carry out industrial environmenta audits and develop generic environmenta impact assessments.
	Second Communal Irrigation Development Project (CIDP II)	Construction of new (10,000 ha) and rehabilitation of existing (15,000 ha) communal irrigation systems; erosion and pest management control; soil and water conservation; technical assistance to strengthen National Irrigation Administration capacity to manage communal irrigation system and improve its ability to assess micro-catchment hydrology.
Sri Lanka	Third Roads Project	Rehabilitation/construction of drains and cross-drainage structures damaged by flood to prevent pollution of water courses and groundwater.
	Poverty Alleviation Project	Rural works program, including watershea protection and soil conservation/soi forestry, irrigation maintenance and rehabilitation, water supply, and villag sanitation.
Thailand	Second Land Titling Project	Grant secure documented tenure to rura landholders that would serve as an incentive to invest in land improvements, reduce encroachment into forest reserves and minimize shifting cultivation practices.
Vanuatu	Housing Project	Land development component to includ piped municipal water supply, roads wit drainage, and on-site sanitary systems (e.g septic tanks, latrines).

EUROPE, MIDDLE EAST AND NORTH AFRICA

Iran

Earthquake Recovery

Develop long-term measures for seismic risk

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Country	Project	Environmental components
	Project	prevention and mitigation; improve seismic design standards in the reconstruction of housing.
Jordan	Emergency Recovery Project	Develop long-term measures for seismic risk prevention and mitigation; improve seismic design standards in the reconstruction of housing.
Morocco	Port Sector Project	Technical assistance to strengther environmental capabilities and raise environmental awareness in the por subsector; study to develop criteria for environmentally sound disposal of dredging materials; agreement that sub-projects would be designed according to acceptable environmental health and safety standards.
Pakistan	Microenterprise Project	Assessment of the adequacy o environmental protection measures in leas contracts; compliance by leasing companie to environmental guidelines issued by Bank
	Sui Northern Gas Pipelines Limited (SNGPL)	New purification plant would remove hydrogen sulphide and carbon dioxide from Sui gas; flare stack to be designed in compliance to Bank's emission guidelines installation of an air quality monitoring system at plant and personnel training to operate the system.
	Environment Protection and Resource Conservation	Will upgrade management of rangelands and watersheds, and rehabilitate coasts areas and wildlife habitants. Strengthenir of environmental agencies at central an provincial levels.
Poland	Structural Adjustment Loan	Government to review and revise curre system of laws and regulations affectin environmental management; adoption of ne and adequate environmental standards b industrial enterprises.
Tunisia	Hospital Restructuring Support Project	Study to assess the handling of medic wastes, and training fellowships for managerial hospital staff in charge

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Country	Project	Environmental components
		environmental hazard protection.
urkey	Technology Development Project	Strategic studies on energy conservation technology relating to needs of the Turkish industry; applied research laboratories i environmental/chemical information technology; introduce environmental safeguards in disposal of liquid and solid wastes from laboratory tests.
emen	Secondary Teacher Training Project	Establish Science Resource Centers to improve environmental education; curriculum and textbook development in environmental science; review of the environmental component in the science education program.
	Multi-Mode Transport Project	Construction of side drains, cross drainage structures and retaining walls to protect
		areas adjacent to road from erosion.
ATIN AMERICA AND TI		areas adjacent to road from erosion.
		areas adjacent to road from erosion. Proposal to establishing norms and regulations for an adequate control of the environmental consequences of public enterprise operations.
	HE CARIBBEAN Public Enterprise Reform	Proposal to establishing norms and regulations for an adequate control of the environmental consequences of public
ATIN AMERICA AND TI	HE CARIBBEAN Public Enterprise Reform Adjustment Loan Agricultural Services and Institutional Development	Proposal to establishing norms and regulations for an adequate control of the environmental consequences of public enterprise operations. Animal health and phytosanitary components to provide mechanisms to control diseases, pests and amount of chemical residues in foodstuffs; program to monitor fisheries resources and determine maximum sustainable catches; research to improve

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Country	Project	Environmental components
		increase efficiency of water use, reduce wastage and amount of sewage disposal develop regulatory framework to encourage private sector in provision of water an sanitation services; develop institutions capabilities to assess the environmental impacts of sector projects.
Bolivia	Agricultural Technology Development Project	Establish a research program for pastur management and crop production to prever wind erosion problems in the Altipland research on varietal resistance and biologic control of pests and diseases to obviate nee for heavy use of toxic agrochemicals.
	Major Cities Water and Sewerage Rehabilitation Project	Expand water distribution and sewerage networks to benefit a population of about one million; improve the institution capacities of central agencies for overseeing the water sector.
Brazil	Science Research and Training Project	Support for environmental science complement the recently approve Environment Project which focuses of strengthening the capacity of governme environmental agencies to deal wi environmental problems.
Colombia	Industrial Restructuring and Development Project	Technical assistance to industrial enterprise to improve their pollution control measure investments to help reduce hazardo emissions; technical assistance to support Environmental Pollution Control Program the National Planning Department; sta- training.
	Rural Development Investment Program	Cofinance watershed management as environmental protection projects in the Andean zone: investments to protect so and vegetation in critical catchment areas increased sustainability of agriculture production through agroforestry as applications of soil conservation techniques training and community organization programs in support of watershift management and environmental protection projects.

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Country	Project	Environmental components
Ecuador	Lower Guayas Flood Control Project	Construction of bypass (flood relief) channels to rivers that cause most of the floods; drainage improvement works to benefit an area of about 61,000 ha; support for land titling to encourage farmers' willingness to invest in on-farm improvements; specific interventions to improve the ecology of the Guayas Basin (e.g., institutional strengthening, master plan development, integrated pest management, mangrove management and exploitation, and environmental monitoring).
	Environmental Technical Assistance	Improved institutional and policy framework; protection of natural areas, encouragement of small scale forestation programs; watershed protection.
	Municipal Development and Urban Infrastructure Project	Construction and rehabilitation of public infrastructure (e.g., water, sewerage, storm drainage, solid waste collection and disposal), and parks; program to help municipalities develop the capacity to do environmental impact assessment of infrastructure investments.
Haiti	Economic and Social Fund Project	Health components (e.g., immunization program and epidemic control); construction of small water supply and sewerage systems
Honduras	Social Investment Fund Project	Provide support to government's socia programs (e.g., construction and rehabilitation of water and sewerag systems, drainage and irrigation canals rehabilitations of ruins to protect cultura heritage and ethnic minorities; reforestation)
	Structural Adjustment Credit	Complement the proposed Agriculture Secto Adjustment Loan which would deal wit forest management issues and land tenur policies.
Jamaica	Road Infrastructure Planning and Maintenance Project	Develop a format for environmental analysi of all proposed investments by the Ministr of construction (works) to allow inclusion of mitigating measures in the project design

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Country	Project	Environmental components
		staff training in environmental issues related to highway design, construction and maintenance.
Mexico	Export Sector Loan	Environmental impact analysis of upgrading or expanding productive capacity of expor firms.
	Basic Health Care Project	Prepare guidelines for environmental impact studies and waste disposal analyses related to the expansion and rehabilitation of health facilities to ensure that these civil work would not have negative environmental consequences.
	Decentralization and Regional Development Project for the Disadvantaged States	Environment and cultural site protection component (e.g., protect natural reserve areas; strengthen institutional capacity to improve project assessment techniques and environmental policies formulation restoration of selected archeological sites) agriculture component (e.g., small-scal forestation programs; watershed protection plant and animal disease control; drainage) rural infrastructure component (e.g. construction and rehabilitation of wate supply ad sewerage system to benefit about two million people).
	Water Supply and Sanitation Sector Project	Construction and maintenance of wate supply and sewerage systems; specialize studies to define medium and long-tern water pollution strategies and policies (e.g waste minimization and reuse strategies effluent regulations, standards and fees implement a pilot water pollution contro program to test national water pollution control policies; strengthen environment assessment capability.
Venezuela	Social Development Project	Improve basic health services (e.g immunization programs; control an prevention of infectious diseases).

ANNEX III. ENERGY CONSERVATION AND EFFICIENCY LENDING FY91

AFRICA

Benin: Second Structural Adjustment Program

- Project will develop an overall strategy for increasing the efficiency of energy use and conserve energy (e.g., medium-term will focus on reduction of transmission losses). Introduce efficient pricing of electric power by tariff increases.

Botswana: Tuli Block Roads Project

- Project provides for resources to recover costs from road users (to include levies and duties on fuel); Government has recently increased fuel taxes.

Burundi: Energy Sector Rehabilitation Project

- Improve the efficiency in the use of energy resources through reforms in the pricing structure of electricity, petroleum products and woodfuels;
- Expand the access of the population to electricity;
- Reduce negative environmental effects of the use of energy through the execution of charcoal efficiency and improved stoves programs;
- Training to improve reforms in charcoal production techniques.

Chad: Petroleum and Power Engineering Credit

- Ensure that the petroleum and electric power pricing, institutional and environmental issues concerning the main project are addressed and resolved before the main project investment is undertaken in earnest;
- Ensure that Republic of Chad's administration of the energy sector is adequately strengthened so it can manage the sector effectively and improve its ability to interact with private investors.

Ghana: Second Transport Rehabilitation Project

- <u>Railway</u> Include systemwide investments in locomotives, and rolling stock to replace existing worn-out equipment. This contributes to a more efficient and effective transport system.
 - Road Rehabilitation and maintenance: main benefits are reduction in vehicle operating costs.

Guinea-Bissau: Energy Project

- Rehabilitation and expand existing electricity generation and petroleum storage/handling facilities with a view to improving their efficiency, reliability and safety in operation;
- Technical assistance and training to strengthen the institutions in the energy sector (e.g., training in the prevention of oil spillage);
- Provide an incinerator for the bissau power plant to assist in recycling waste oil and fuel, and eliminate the possibility of contamination of the water table.

Nigeria : Oso Condensate Field Development Project

Assists process of increasing energy prices to reflect economic costs. also assists Nigerian National Petroleum Corporation preventive maintenance and rehabilitation of assets; enhancing the utilization and efficiency of its existing refineries; and monitoring and controlling environmental pollution.

Tanzania: Petroleum Sector Rehabilitation Project

- Reduce the haulage cost of petroleum (e.g., replacing long-distance road transport with improved rail system using dedicated block trains for bulk movement of petroleum products; increase use of sea transport for supply);
- Reduce oil pollution and the threat to the environment from spillage and leakages due to deteriorated condition of storage and handling facilities;
- Implement and sustain an appropriate petroleum pricing policy designed to encourage and support private sector investments in petroleum supply and distribution.

Togo: Power Rehabilitation and Extension Project

Uganda: Third Power Project

Establishment of realistic electricity tariffs is immediate project objective, with provision for series of tariff increases in subsequent years.

Zimbabwe: Second Railways Project

- Fleet modernization (e.g., procurement of main line locomotives; repowering of shunting locomotives; procurement of passenger coaches; this will result in:
 - (a) reductions in variable operating costs and

(b) diversion of incremental traffic from by road to by rail, would relieve congestion in roads.

ASIA

Bangladesh: LPG Transport and Distribution Project

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- Technical assistance training component: to establish a program to enhance the role of women in the retail distribution of LPG cylinders and energy efficient stoves; to train commercial agents in development and promotion of energy-efficient cooking stoves will help to introduce economically efficient LPG pricing.

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Bangladesh: Third Inland Water Transport Project

Project benefits include savings in vessel time, vessel operating costs, and passenger time. Such benefits are associated with the aids to navigation components (e.g., upgrade of waterways; installation of shore lights) and repair/maintenance of inland pontoon facilities to facilitate passenger and cargo movements.

China: Ertan Hydroelectric Project

- Provide additional generation capacity to the power system in Sichuan province in order to alleviate an acute electricity shortage;
- Provide technical assistance in project design and implementation;
- Studies of power pricing and power plant and reservoir operation.

India: Private Power Utilities (TEC) Project for the TATA Electric Companies

- Mitigate the sulphur dioxide emissions from the coal and oil fired power plant (e.g., use of flue gas desulplurrization; plant design to meet Government standards);
- Support increased private sector participation in the supply of power;
- Encourage improved tariff structures and load management procedures for TEC's direct consumers.

India: Private Power Utilities Project (BSES) for Bombay Suburban Electric Supply Limited

- Provide additional generation, transmission and distribution capacity to meet increasing electricity demand in the Bombay area.;
- Assist BSES in its transformation from a distribution company to an integrated power utility which operates generation, transmission and distribution facilities.

India: Gas Flaring Reduction Project

- Eliminate the flaring of associated gas in the Bombay High Oil field and improve the management of the Bombay High reservoir.
- Reduce energy shortages and improve the efficiency of energy use in India's Western Region;
- Support the Oil and Natural Gas Commission's (ONGC's) efforts to improve the safety of its offshore operations and reduce the risks to the environment form these operations.

Indonesia: Power Transmission Project

 Expand, strengthen and upgrade the transmission facilities for the Java-Bali system to supply electricity to new consumers, and to meet increases in electricity demand arising from existing and new consumers.

Indonesia: Fertilizer Restructuring Plant

Construction of new Ammonia/Urea plant to be based on proven energy-efficient technologies. Project will assist general modernization of the industry, specifically aimed at energy savings, energy and raw materials efficiency, capacity and productivity gains and pollution control improvements.

EUROPE, MIDDLE EAST & NORTH AFRICA

Morocco: Second Rural Electrification Project

- Expand electricity supply to the rural areas;
- Strengthen the administrative, planning and financial capabilities in the power subsector;
- Encourage further reforms in the electricity tariff structure;
- Contribute to the Government's policy of improving the efficiency of energy consumption (e.g., promotion of energy conservation through price measures and non-price measures; encouragement of economically profitable interfuel substitution);
- Recommended changing the structure of petroleum product and coal prices in order to encourage increased economic efficiency.

Pakistan: Sui Northern Gas Pipelines Limited (SNGPL) Corporate Restructuring and System Expansion Project

- Promotes the substitution of gas for higher value petroleum products in the northern part of the country;

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Pakistan: Sui Northern Gas Pipelines Limited (SNGPL) Corporate Restructuring and System Expansion Project

Promotes the substitution of gas for higher value petroleum products in the northern part of the country;

Assists rationalization of consumption and supply of gas through pricing and demand management.

Poland: Structural Adjustment Loan

Government to phase out subsidies (to coal mines) and export tax on coal during 1991-92 to allow the domestic price to adjust to international level. Agreement to adjust prices of other energy (fuel oil, gas, electricity, lignite) to reach international levels.

LATIN AMERICA & CARIBBEAN

Honduras: Structural Adjustment Credit

An <u>Energy SECAL</u> is under preparation to complement the SAL; initial actions already taken include an increase in electricity tariffs. Focus of SECAL will be improvement in power company's financial situation and less reliance on fiscal resources.

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The World Bank/IFC/MIGA OFFICE MEMORANDUM

DATE: 25-Jun-1991 02:20pm

TO: Geoffrey B. Lamb

FROM: Jeremy Warford, ENVDR

(GEOFFREY B. LAMB)

(JEREMY WARFORD)

EXT.: 33299

SUBJECT: Annual Report on Environment

Geoff

Thanks very much for arranging for us to avoid the PRE meeting.

Some areas that PRE Committee members might be asked to focus on are as follows:

This report, unlike last year's, divides the operations section into Regions. Members might like to consider whether the whole chapter hangs together - is the approach to each region consistent, but at the time sufficiently indicative of the different way in which regional strategies are evolving?

The Development Committee required that special attention should be given to what the Bank has done in the forestry and energy efficiency fields during the FY. In fact, the record is not that impressive, largely (in the case of forestry at least) because we have used the time to reconsider our general policy stance. The two sections nevertheless take up a lot of space; does this represent an appropriate balance given the size of the rest of the report?

Description of operational; instruments, procedures etc is very sketchy. Much of the ground has been covered in earlier reports that are referred to, ie last years Annual report, and the Development Committee papers. Does this warrant more elaboration?

Generally, particularly with regard to operations, we are keen to obtain advice about key environmental operations strategy work, EAPs, projects - that may have been omitted, and which members would like to have highlighted.

I hope this of some help to you.

Jerry

CC: Mohamed T. El-Ashry

(MOHAMED T. EL-ASHRY)

THE WORLD BANK/IFC/MIGA OFFICE MEMORANDUM

813-145

DATE: June 24, 1991

TO: To Distribution

FROM:

OM: J. Warford, ENVDR

EXTENSION: 33299

SUBJECT: Annual Report on Environment, FY91

Attached for your consideration is a draft of the above report. I would be particularly grateful if you could identify areas (projects, research topics etc.) where you feel we have not done justice to the work that has been done in the Bank during the year. (You will observe that, since we are not at the end of the fiscal year yet, project descriptions and lists are incomplete.)

I apologise for the short notice, but would be most grateful for any comments you might have by c.o.b. July 1st.

Distribution:

Messrs./Mmes.

Isenman, Pouliquen, Petit, Churchill, A. Hamilton, D.C. Rao, Linn, Steer, Shakow, Golan, Rovani, Wyss, Seth, Gloria Davis, Christoffersen, Birdsall, Arrhenius, Kavalsky, V. Hitchcock, Ofosu-Amaah, Riddle, Yap, R. Harris, Gafsi

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cc. w/o attachment: Messrs./Mmes. Rajagopalan, Colaco, El Ashry, Munasinghe, Koch-Weser, Partow, van Praag, Johnson, Goodland

JWarford:nm

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V. Rajagopalan		C. Michalopoulos	
L. Summers		G. Lamb	x
P. Isenman		R. Liebenthal	
A. Shakow		R. Woodford	
G. Ingram		R. Voight	
K. Jay		J. Holsen	
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Wilfried P. Thalwitz

Ext.

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(WILFRIED P. THALWITZ)

(GEOFFREY B. LAMB)

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The World Bank/IFC/MIGA OFFICE MEMORANDUM

- 24-Jun-1991 11:34am DATE:
- TO: Wilfried Thalwitz
- Geoffrey B. Lamb, PRDPD FROM:
- EXT.: 32544

SUBJECT: Annual Report on the Environment

This paper is due to you in the next couple of days.

I propose that we circulate it for comment to PREC members rather than hold a meeting on it. [The PREC meeting, for which this would be the only item, will otherwise be on July 3.]

If you think we should have a meeting -- because of general sensitivity, GEF issues, or other reasons -- please let me know, and we'll set it up.

Paul Isenman CC:

(PAUL ISENMAN) (LYNETTE ALEMAR)

CC: Lynette Alemar

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CC: Paul Isenman CC: Lynette Alemar

(PAUL ISENMAN) (LYNETTE ALEMAR)