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PROJECT PERFORMANCE ASSESSMENT REPORT

PEOPLE'S REPUBLIC OF CHINA

**ENVIRONMENTAL TECHNICAL ASSISTANCE PROJECT
IDA-25220**

June 30, 2007

*Sector Thematic and Global Evaluations Division
Independent Evaluation Group (World Bank)*

Currency Equivalents (annual averages)

Currency Unit = Chinese Yuan Renminbi (CNY)

1993	US\$1.00	CNY 5.76	2000	US\$1.00	CNY 8.28
1994	US\$1.00	CNY 8.62	2001	US\$1.00	CNY 8.28
1995	US\$1.00	CNY 8.35	2002	US\$1.00	CNY 8.28
1996	US\$1.00	CNY 8.31	2003	US\$1.00	CNY 8.28
1997	US\$1.00	CNY 8.29	2004	US\$1.00	CNY 8.28
1998	US\$1.00	CNY 8.28	2005	US\$1.00	CNY 8.19
1999	US\$1.00	CNY 8.28	2006	US\$1.00	CNY 7.99

Abbreviations and Acronyms

AAA	Analytical and Advisory Assistance
BRIM	Biodiversity Research and Information Management Program
CASc	Chinese Academy of Sciences
CBIS	Chinese Biodiversity Information System
CCICED	China Council For International Cooperation on Environment and Development
CERN	Chinese Ecosystem Research Network
CP	Cleaner Production
EA	Environmental Assessment
EIC	Environmental Information Centers
EPB	Environmental Protection Bureaus (provincial level)
ESSD	Environmentally and Socially Sustainable Development
GEMS	Global Environmental Monitoring System
HDN	Human Development Network
ICR	Implementation Completion Report
IEG	Independent Evaluation Group
IEGWB	Independent Evaluation Group (World Bank)
INF	Infrastructure
MOF	Ministry of Finance
NEPA	National Environment Protection Agency
PPAR	Project Performance Assessment Report
PRCEE	Policy Research Center for Environment and Economics
PREM	Poverty Reduction and Economic Management
SEPA	State Environmental Protection Agency
T/TA	Training and Technical Assistance

Fiscal Year

Government: January 1 December 31

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IEGWB Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Independent Evaluation Group assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEGWB annually assesses about 25 percent of the Bank's lending operations through field work. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEGWB staff examine project files and other documents, interview operational staff, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, and interview Bank staff and other donor agency staff both at headquarters and in local offices as appropriate.

Each PPAR is subject to internal IEGWB peer review, Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible Bank department. IEGWB incorporates the comments as relevant. The completed PPAR is then sent to the borrower for review; the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the IEGWB Rating System

IEGWB's use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEGWB evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEGWB website: <http://worldbank.org/ieg>).

Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension generally is not applied to adjustment operations. *Possible ratings for Outcome:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for Risk to Development Outcome:* High Significant, Moderate, Negligible to Low, Not Evaluable.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes. The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for Bank Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for Borrower Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

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This report was prepared by Fernando Manibog, who assessed the project in October, 2006, and Ramachandra Jammi. The report was edited by William B. Hurlbut and Marie Charles provided administrative support.

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Principal Ratings

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Highly Satisfactory	Satisfactory	Satisfactory
Institutional Development Impact**	Substantial	Substantial	———
Risk to Development Outcome	———	———	Low
Sustainability***	Highly Likely	Highly Likely	———
Bank Performance	Highly Satisfactory	Highly Satisfactory	Highly Satisfactory
Borrower Performance	Highly Satisfactory	Highly Satisfactory	Highly Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEGWB product that seeks to independently verify the findings of the ICR.

**As of July 1, 2006, Institutional Development Impact is assessed as part of the Outcome rating.

***As of July 1, 2006, Sustainability has been replaced by Risk to Development Outcome. As the scales are different, the ratings are not directly comparable.

Key Staff Responsible

<i>Project</i>	<i>Task Manager/Leader</i>	<i>Division Chief/ Sector Director</i>	<i>Country Director</i>
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Preface

This is the Project Performance Assessment Report (PPAR) prepared by IEG for the China: Environmental Technical Assistance Project (IDA Credit -25220). The credit was approved on June 22, 1993 for an amount of US\$50.0 million equivalent. The Chinese Government was to provide an additional US\$26.0 million equivalent. The borrower was the Chinese Government, and the implementing agencies were the State Environmental Protection Administration (SEPA) and the Chinese Academy of Sciences (CASc). The date of credit effectiveness was November 11, 1993, and the credit was closed on December 30, 2002, four years after the originally scheduled date of December 31, 1998, with US\$48.9 million of the funds disbursed.

The project was chosen for assessment to serve as a key input, among other country case studies, for the Environmental Effectiveness Evaluation Study for the World Bank Group being carried out by IEG. Also, it was the only Bank credit focusing exclusively on institutional development for environmental management in China, and only one of a few such projects funded by the Bank worldwide.

IEG prepared this report based on an examination of the relevant Memorandum & Recommendation of the President, Implementation Completion Report (ICR), legal agreements, project files and archives, as well as other relevant reports, memoranda, and working papers. Discussions were also held with a number of existing and former Bank staff in Washington DC, as well as in China. An IEG mission visited China in October 2006, conducted site visits, and discussed both the project and the effectiveness of Bank assistance with government officials and stakeholders. Their kind assistance is greatly appreciated.

Following standard IEG procedures, copies of the PPAR were sent to relevant government officials and agencies for their review and comments, but none were received.

Summary

The *Environmental Technical Assistance Project (ETAP)* was approved by the World Bank in 1993. ETAP was the only IDA credit focusing exclusively on institutional development for environmental management in China, and only one of a few such projects funded by the Bank worldwide. The project focuses on one of the main pillars of the Bank's Country Assistance Strategies for China during 1990-2006, namely, the strengthening of environmental management. The actual project cost was US\$67.30 million compared to the appraisal estimate of US\$76 million. The project was completed in 2002 instead of 1998 as planned, following an extension of four years after the Bank agreed to the request of the Government of China to restructure the project in response its a new initiative on a large-scale regional development program for the "Great Opening Up of the West".

ETAP sought to strengthen the capacities and programs of two institutions of national importance for environmental management in China, namely: (i) the State Environmental Protection Agency (SEPA); and (ii) the Chinese Academy of Sciences (CAsC). The five specific objectives of the project were:

- (a) improve coordination of environmental monitoring and ecological research;
- (b) promote cleaner industrial production, pollution prevention and waste minimization technologies;
- (c) enhance economic policy instruments for pollution control, especially the pollution levy system;
- (d) strengthen the Chinese system of environmental assessments (EA); and
- (e) strengthen inter-agency and inter-ministerial coordination for improved environmental management.

The Outcome of the project is rated *Satisfactory*. All the objectives were substantially achieved except the last objective relating to inter-agency and inter-ministerial coordination which was modestly achieved. ETAP improved coordination between SEPA and CAsC, helped link 95 databases and 18 websites, and established the Chinese Biodiversity Information System (CBIS). The project helped introduce several pieces of new legislation, guidelines, institutions and policies through its subprojects, including the adoption of the State Cleaner Production Act promoting national and local cleaner production centers, and phasing out lead in gasoline. The national pollution levy structure was revised. Study tours provided senior researchers as well as younger scientists with valuable exposure to international experience in environmental management and environmental assessment, and helped establish important contacts with professional counterparts that yielded further training opportunities. Attempts to improve inter-agency and inter-ministerial coordination met with mixed success.

The Ministry of Finance practice (which is also prevalent in other TA projects in China) of passing on Bank and IDA funds as loans (rather than grants) to "knowledge institutions" encouraged them to place emphasis on revenue-earning activities, irrespective of their contribution to knowledge management. On another count, computer equipment that

was ordered under the project was out-dated by the time the Bank's time-consuming procurement procedures had been complied with.

The Risk to Development Outcome is rated *low*. GOC and the implementing agencies SEPA and CASc showed generally strong and consistent commitment and participation right from the project preparation stage. GOC, SEPA and CASc have made budgetary arrangements to ensure the sustainability of the institutions and processes developed by the project.

The Bank's Performance is rated *Highly Satisfactory*. Project preparation was conducted by the same team that produced the first China Environment Strategy Paper (1992), thus giving ETAP strong analytical underpinnings. While resources above the norm were committed to project supervision, a high level continuity was achieved through extended association of the same task managers and principal consultants. Discussions with CASc and SEPA suggest that the Bank added value through its ability to: (i) facilitate access to international experience and expertise in various aspects of environmental management; (ii) promote improvements in project design and appraisal procedures; (iii) facilitate the consultation and participation of various stakeholders; and (iv) foresee issues and broker an agenda for addressing these problems.

The Borrower's Performance is also rated *Highly Satisfactory*. GOC, as well as SEPA and CASc, participated actively in the project design and preparation stage, demonstrated flexibility throughout implementation, showed openness to new ideas, and made satisfactory budgetary provisions for sustaining the gains from the project.

Important lessons from the project are:

- In large TA projects, a programmatic approach may be preferred, with general agreement on overall objectives and a first year work-plan followed by iterative development of subsequent stages based on experience and changing circumstances.
- Active involvement of functional or line departments can greatly raise the quality of outputs and development impacts of TA subprojects.
- In designing environmental capacity-building projects, the strengthening of sub-national environmental institutions—which often exercise enforcement authority—is equally if not more important than that of the apex environmental agency.
- Passing-on IDA credits as a loan rather than as a grant to non-revenue-generating entities creates distortions in priorities and work programs, as these entities shift their focus to seeking payments for services rather than conducting independent research, data-monitoring and information dissemination.

This assessment notes important challenges that China faces in managing its worsening environment problems, where the Bank can potentially play a useful role in the future:

- Helping to improve SEPA's effectiveness in implementing national environment policies, which is presently limited by the poor quality of administrative decentralization, the priority given by local governments to growth and employment

over environmental management, vertical and horizontal fiscal imbalances, and the absence of clear accountability for environmental conditions.

- Improve compliance and enforcement of the legal provisions for the environment, which would require strengthening of provincial-level Environmental Protection Bureaus
- Address the limitations of the long-standing Pollution Levy System through the “greening of the tax structure”.
- Address critical areas such as deteriorating water quality (in the context of broader Integrated River Basin Management or IRBM); biodiversity conservation; and hazardous wastes including intermediate e-wastes.

Vinod Thomas
Director-General
Evaluation

1. Background and Context

Environmental Issues in China

1.1 With a population of 1.3 billion, China--the world's fourth largest economy and the third largest trading nation--has succeeded in reducing poverty by almost one-third between 2001 and 2004. Even so, China remains a developing country, with GDP per capita about \$1,740 and more than 135 million people living on less than \$1 a day. With sound macroeconomic management, China can potentially maintain a growth rate of 9.0% through 2006-10, and beyond. But it also faces daunting challenges in maintaining such rapid growth: addressing the resulting inequalities in income and opportunity; and managing the resource demands and environmental consequences of growth.

1.2 China faces serious environmental problems on many fronts, including air and water pollution (especially in urban areas), land degradation, loss of biodiversity, and unsustainable use of natural resources. Record rates of economic growth, urbanization and industrialization in recent years have generated environmental impacts and accelerated many adverse trends. Plausible estimates of environmental costs made during the late 1990s and early 2000s, vary from 3 percent to 15 percent of China's GDP. Because of China's size, some of the effects, such as greenhouse gas emissions, are also worldwide.

1.3 From the 1990s, the Government of China (GoC) has paid increased attention to the environment, spurred by widely publicized international reports, and by negative environmental events in China. For instance, widespread illness in 1994 among users of the Huai River in China's industrial Northern Plain was a turning point, resulting in the closure of over 75,000 small, but highly polluting town and village enterprises (TVE) nationwide. Floods in 1997 and 1998 prompted the introduction of a logging ban in sensitive areas. GoC has taken several measures over the years, including more open environmental reporting, price incentives, and new laws and regulations to address environmental problems. In 2005, a cross-border environmental crisis was created by a chemical pollution spill in Northeast China which Russia's Amur river from China's Songhua River. Leaders regularly address environmental issues in major speeches and China has adopted "sustainable development" as a guiding principle for its 11th Five-Year Plan (2006-2010). As a result of these policy shifts, China has had some successes in reversing or containing some forms of environmental degradation, though serious problems remain and future trends are uncertain.

The World Bank's Environmental Assistance

1.4 China is the largest IBRD¹ borrower and second largest recipient of IDA² credits, though Bank lending accounts for only a small share of China's resource flows. The Bank has not relied on conditionality or the direct impact of lending to achieve its

¹ International Bank for Reconstruction and Development, of the World Bank Group

² International Development Association

objectives. Rather, it has pursued a dual track approach of building a relationship through long-term involvement in lending while promoting policy reform through technical assistance (TA), Analytical and Advisory Assistance (AAA), and the demonstration effect of successful projects that have introduced new technologies, management methods, or policy reforms.

1.5 While this PPAR focuses on one (and the Bank's only) environmental institutions capacity-building project in China, it is important to appreciate the full extent and overall scorecard for the Bank's assistance for the environment in China. This capacity-building project has played a critical role given the vast scope of the Bank's environment lending in China. There continues to be a significant need to strengthen environmental institutions in China, particularly at the provincial level, given the Bank's emphasis on infrastructure lending to provinces, the strong incidence of environmental issues across the infrastructure sub-sectors, the susceptibility of the Bank's portfolio to Category A environmental assessments, the need to reform incentive systems to enhance compliance, and the worsening overall environmental conditions as China's rapid growth overtakes gains from past and ongoing efforts at environmental management. (These points are discussed below and in Section 5). To cite a specific example, a recent PPAR³ prepared in conjunction with IEG's Environmental Effectiveness Evaluation Study found that the institutional capacity of Zhejiang's EPB was far lower than the potential capacity measured by its financial resources and staffing. The PPAR also notes the prevailing incentive for EPBs to continue to extract payments (informal or explicit fines) from transgressors rather than close down or fix polluting enterprises. At the same time, it must be kept in mind that the scale of interventions required to address capacity-building of environmental institutions in China is daunting and complex, given the country's size, and the large number of EPBs. Generally speaking, the Bank's efforts need to be seen in this perspective, and leveraged for maximum impact.

1.6 ***The Bank has accorded great importance to environmental lending in China.*** During FY1990-2006, the Bank approved 198 projects for China, of which 118 projects contained environmental components⁴. Of the 118 projects, 70 were closed (completed) as of December 2006, while the remaining 48 were active. The largest number of these projects with environment components lies in the Bank's rural development sector lending program, followed by the water, energy, transport, and urban sectors, and finally by the urban environment sector. The low number of projects (5) exclusively in the "Environment" category is due to the Bank's strategy of mainstreaming environmental

³ IEG. 2007. Zhejiang Multicities Development Project (Cr.2475); Tianjin Urban Development and Environment Project (Cr.2387); Shanghai Environment Project (Ln.3711). Project Performance Assessment Report. Report No.: 39298

⁴ All IBRD/IDA projects are characterized by up to 5 sectors and 5 themes. A percentage of project lending is attributed to each sector/theme (all sectors and all themes separately add to 100%). A project is considered an "environment project" if it contains any of the themes under the Environment and Natural Resources Management cluster (Theme Codes 80-86: Biodiversity, Climate Change, Environmental Policies and Institutions; Land Administration and Management; Pollution Management and Environmental Health; Other Environment and Natural Resources Management). The resulting list of environment projects was cross checked against selected codes under sector code cluster that have a clear link with the environment: Agriculture, Fishing and Forestry; Energy and Mining; Transportation; Water, Sanitation and Flood Protection, and Industry and Trade.

lending in other sectors. After China lost access to concessional IDA financing in 2002, about 13% of the FY00-05 portfolio by volume (compared to 44% by volume in 1990-94) continue to support rural development, especially watershed, forest, and grassland management.

Sector	Completed	Active	Total, number of projects	Number of Projects, by Sectors, %	% of Total Lending devoted to Environment
Education		1	1	1	26
Energy	6	14	20	17	46
Environment	1	4	5	4	92
Private Sector Development	1	1	2	2	14
Rural Development	10	27	37	31	54
Transport	11	9	20	17	26
Urban and Water	19	14	33	28	122
Total	48	70	118	100%	51

1.7 ***The strengthening of environmental institutions has been a major area of thematic emphasis***, although the Bank has financed only one capacity-building project. Across the distribution of different environmental objectives among environment projects, institutional and capacity building objectives (93) occurred most frequently, followed by pollution management including health issues (59), water resources management (27), poverty-environment linkages (28), land and forestry (25), climate change (37), and biodiversity issues (3).

1.8 ***Projects with environmental components perform relatively better than other projects***. Based on the portfolio review that was carried out for the China Environment Country Case Study under the World Bank Group Environmental Effectiveness Evaluation Study, the percentage of projects in China with acceptable levels of performance in terms of Outcome and Sustainability was significantly higher for projects with environment components compared to "Other" projects, but significantly lower for Institutional Development, as shown in Table 2 below.

	No. of Projects Rated	Outcome (% Moderately Satisfactory or better)	Institutional Development (% Substantial or better)	Sustainability (% Likely or better)
Environment Projects	67	92	73	91
Other Projects	58	84	83	84
TOTAL	125	176	156	175

1.9 *But the performance of the environmental components was less satisfactory than the overall project outcomes.* Within environment projects, the percentage of projects for which the outcomes of the environment components alone can be considered be “moderately satisfactory or better” was significantly less compared to overall project outcomes, as shown in Table 3 below.

Sector Board	No. of Projects Rated	No. of Projects with Outcome “Moderately Satisfactory” or better	No. of Projects with Environment Component “Moderately Satisfactory of better ⁵
Education	1	0	0
Energy	13	13	8
Environment	4	2	2
Private Sector	1	0	0
Rural Development	25	25	21
Transport	9	9	9
Urban and Water	14	12	10
Grand Total	67	61 (91%)	50 (82%)

1.10 The Bank and the Global Environmental Facility (GEF) are also supporting environment projects with global sustainability objectives. Apart from Bank projects, there were 11 GEF projects covering Biodiversity Conservation (Closed:1; Active:1), Climate Change Mitigation (Closed:3; Active:3), Pollution Management (Closed:0; Active:2); Water Resources Management (Close:0; Active:1).

1.11 Environmental safeguards are triggered to a significant extent. The Bank’s lending portfolio in China is dominated by infrastructure (including energy, mining and telecommunications; transport; urban development; water and sanitation), which

⁵ This rating is arrived at as follows: Project outcomes/outputs relating to each environment theme are reviewed against corresponding project objectives/sub-objectives and give a simple binary rating – “Moderately Satisfactory or better (+)” or “Moderately Unsatisfactory or better (-)”. A majority or (+) ratings for a project results in a “Moderately Satisfactory or better” for the project in respect of the environment component.

accounted for 62% of lending to China during FY1990-2006. This large share of infrastructure projects has increased the likelihood of falling under Category A for Environmental Assessment (EA). Thus, nearly 50% of all projects are Category A projects, compared to 8% Bank-wide, as shown in Table 4 below.

Network	No. of Projects	US\$ million	Category A Projects as % of All Projects	% Share of Total Lending
ESSD	53	9170	21	28
FSE	5	365	0	1
HDN	23	2234	0	7
INF	109	20279	73	62
PREM	7	433	14	1
PSDN	1	5	0	0
Grand Total	198	32486	46	100

2. Project Objectives and Design

Objectives

2.1 The project sought to strengthen the capacities and selected policies and programs of two institutions of national importance to China's environment through technical assistance (TA), namely: (i) the National Environmental Protection Agency or NEPA, later upgraded to State Environmental Protection Agency or SEPA⁶; and (ii) the Chinese Academy of Sciences (CASc). Specifically, the project supported the following objectives:

- (a) improve coordination of environmental monitoring and ecological research;
- (b) promote cleaner industrial production, pollution prevention and waste minimization technologies;
- (c) enhance economic policy instruments for pollution control, especially the pollution levy system;
- (d) strengthen the Chinese system of environmental assessments (EA); and
- (e) strengthen interagency and inter-ministerial coordination for improved environmental management.

⁶ SEPA was set up as a ministry at the end of March 1998 when the National Environmental Protection Agency (NEPA) was upgraded from a sub-ministry to a ministry and re-named.

Components

2.2 At appraisal, the project consisted of three main components:

- (a) CASc ecological research and monitoring (which began in 1989) to design a Chinese Ecosystem Research Network (CERN) to strengthen long-term ecological research in China and to generate scientifically valid ecological information that could be used for sustainable natural resource management and agricultural development;
- (b) NEPA (later upgraded to SEPA) technical assistance program; and
- (c) environmental impact assessment system.

2.3 The revised project components--after expansion of project scope in 1998--are stated in the ICR as follows:

CASc Component (US\$33.20 million, actual cost). The objective of this component was to improve the knowledge and understanding of China's biological resources and ecological environment by upgrading long-term research, improving data collection and management systems for monitoring environmental changes, and linking research results to the policy-making process. This objective was to have been achieved through investments in two programs being implemented by the Academy:

- Chinese Ecosystem Research Network (CERN)
- Biodiversity Research and Information Management (BRIM)

SEPA Component (US\$34.10 million, actual cost). The SEPA component comprised a large number of sub-projects within five main categories of work:

- (a) Institutional Management and Capacity Building
- (b) Environmental Monitoring and Information Systems
- (c) Cleaner Industrial Production and Pollution Prevention
- (d) Environment and Ecological Studies
- (e) Environmental Impact Assessment Systems

2.4 In response to the Government's request to expand ETAP's objectives to support its "Great Opening up of the West" regional development program, the Bank agreed in 1998 to restructure ETAP in order to strengthen the administrative, management and environmental monitoring capacity of research institutes and monitoring networks located in the central and western regions of China. Accordingly, the closing date was extended from December 31, 1998, as originally appraised, to September 30, 2002 (later extended to December 31, 2002 to complete equipment delivery). No cost reallocations were involved for this purpose.

Quality At Entry

2.5 ETAP's design and preparation is rated *satisfactory*. The project benefited greatly from the fact that the Bank team had also been previously involved with preparing the China Environmental Strategy Paper and had established a good relationship and dialogue with SEPA and CASc. Through bilateral trust funds, the Bank arranged analytical support from a wide range of international consultants. By the time of project

approval, the detailed terms of reference, work plans and budgets for almost all of the sub-projects were already in place. The Bank also organized workshops on Bank procurement and disbursement procedures early on. However, it took too long to get Board approval, i.e., almost 3 years from identification to Board presentation. In part, this is due to the one year that it took to map out the various subprojects under each of the project components.

Implementation Experience

COSTS

2.6 The actual project cost was US\$67.30 million as against the appraisal estimate of US\$76 million. After the project's scope was expanded in 1998, the closing date of the IDA credit was extended to December 2002, four years after the original closing date of 1998. GOC expenditures were US\$18.40 million against US\$26 million at appraisal.

2.7 In June, 2003, the IDA Board agreed to reallocate approximately SDR0.8 million (US\$1.01 million) of undisbursed funds from the project to permit an emergency response to the Severe Acute Respiratory Syndrome (SARS) public health emergency in China. This activity was under implementation in 2006, and is not covered by this report.

PROCUREMENT

2.8 In addition to workshops on procurement and disbursement at project entry, additional workshops were held during implementation. An international consultant on the procurement of information systems was commissioned to provide a training workshop for CASc and SEPA staff. But these two agencies, the Bank team, and the consultant as well all found themselves constrained by the prevailing Bank procurement procedures. Meanwhile, the Bank's Beijing office was stepping up its assistance in these two areas as local Bank staff numbers increased. However, the timely provision of feedback to CASc and SEPA when they submitted terms of reference and subsequent draft and final reports for comment remained a frequent problem, since the Bank staff with the requisite expertise were either unavailable or considered such reviews a lower priority in their respective work programs.

2.9 In terms of the overall project experience, both the CASc and SEPA counterparts were particularly critical of Bank procurement procedures, which they felt were too time-consuming. For instance, computer equipment that was ordered under the project was out-dated by the time Bank's procurement procedures had been complied with. In general, the Bank's procurement procedures may be too slow and complex for the requirements of scientific institutions, pointing to the need for greater flexibility and decentralization in such cases.

MONITORING AND EVALUATION

2.10 One of the ETAP's key objectives is precisely to improve ecological data collection, strengthen systems for monitoring environmental changes, and link results to policy-making. Consequently, the design, implementation and utilization of the M & E system for the project is discussed under Section 3 on "Results".

3. Results (by Objective)

3.1 The ETAP's overall objectives of strengthening CASc and SEPA were *substantially achieved*. The project was well integrated into the core operations of both CASc and SEPA, and was an integral part of larger and substantive development programs to which the government was consistently committed. The CASc and SEPA components supported five major objectives, for which the specific achievements are assessed below.

Objective (a): Improve coordination of environmental monitoring and ecological research – Substantially Achieved.

3.2 This objective was sought to be achieved by investing in BRIM and CERN programs that were being implemented by CASc. BRIM's goal was to enhance the ability of CASc to generate, manage and disseminate information on biodiversity conservation and sustainable management of biological resources. CERN intended to upgrade the long-term research capability of CASc, and ETAP was designed to support the first five years of a 25-year development program for this purpose. Policy studies and training programs exceeded expectations in building awareness and capacity for research (through the Chinese Research Academy of Environmental Sciences or CRAES) and regulation (SEPA).

3.3 BRIM. The BRIM program enhanced the research capacity of the participating institutes for carrying out biodiversity-related research, linked biodiversity information kept at various CASc institutes, popularized biodiversity concepts, and provided relevant information to government policy makers, while attracting international funding for research. Specific achievements included the publication of 1,800 scientific papers, and the establishment of the Chinese Biodiversity Information System (CBIS) with 95 linked databases and 18 websites. These achievements appear financially sustainable due to committed funding from CASc and other sources.

3.4 CERN. The scope, capacity and quality of CERN's research activities expanded opportunities for Chinese officials for research and training overseas; helped diversify sources of funding; and improved capacity to influence government policy. These outcomes appear financially sustainable due to expanding access to CASc and non-CASc funding. However, sustainability of the CERN information system under this subcomponent appears less likely unless current problems in design and implementation--top-down planning and excessive centralization--are addressed. CERN needs to strengthen its management arrangements and rationalize parallel operational and advisory functions being performed by other parts of the bureaucracy.

3.5 Environmental Information Centers (EICs). EICs were created in all provincial EPBs. The upgrading of China's Global Environmental Monitoring System (GEMS) led to it being rated as among the best in the world by the mid-1990s. The subcomponent for strengthening the reliability of environmental monitoring and measurement of standards succeeded in developing and testing standardized reference materials for environmental

laboratories throughout China. The study on setting up a national ecological monitoring network produced four main sub-reports but evidence of significant follow-up remains to be seen.

3.6 Component in support of the “Great Opening Up of the West”. This additional component was reported as having been implemented well. Most of the residual funds were used to purchase advanced equipment for automated real-time air and water quality monitoring stations in 20 cities of 12 western provinces, and to strengthen lake water quality monitoring system relating to nine major lakes in Yunnan province.

Objective (b): Promote cleaner industrial production, pollution prevention and waste minimization technologies – Substantially Achieved.

3.7 The State Clean Production Act and Clean Production (CP) Centers. This Act was introduced with inputs from ETAP. Specific achievements included the establishment of 54 CP centers nationwide, production and sale of 10,000 copies of guidelines on CP, training of about 1,000 persons including 20 CP auditors who form the core expertise in the now independently funded National Cleaner Production Center. Of the 29 firms that undertook pilot CP audits, 17 continued to realize economic and environmental benefits from follow-up changes in their production processes. However, five pilot CP industrial investments were unable to achieve overall viability. The study on reducing pollution from town and village enterprises did not break much new ground in its recommendations. A report on CP for the chemical industry produced by the Environmental Protection Research Institute was not followed up due to reorganization involving the Ministry of Chemical Industry and limited involvement of SEPA.

3.8 Pollution Control in the Transport Sector. The motor vehicle pollution control study raised awareness and capacity for research and policy-making in this area, though it was difficult to assess the impacts of vehicle testing and data collection. Following the study, there was a national phase-out of leaded gasoline, Euro1⁷ vehicle emissions standards were introduced in the country in 1999, and Beijing in particular was poised to move to Euro 3 standards. The study focusing on development policy for ecological agriculture was of low utility due to methodological and administrative issues as well as limited involvement of SEPA.

Objective (c): Enhance economic policy instruments for pollution control, especially the pollution levy system – Substantially Achieved.

3.9 ETAP helped to enhance economic policy instruments for pollution control, especially the pollution levy system. A pollution levy study by CRAES paved the way for subsequent national law and regulations on the subject, consistent with GOC's overall financial and fiscal reform program of the late 1990s. The issue of pollution control instruments and the need to reform the system of incentives are discussed in detail in Section 5 on “Conclusions and Lessons Learned”.

⁷ European emission standards are sets of requirements defining the acceptable limits for exhaust emissions of new vehicles sold in EU member states. The emission standards are defined in a series of European Union directives (Euro 1, 2, etc., staging the progressive introduction of increasingly stringent standards.

Objective (d): Strengthen the Chinese system of environmental assessments (EA – Substantially Achieved.

3.10 Case studies of sector and regional EAs produced a few excellent reports but follow-up activities encountered difficulties mainly arising from SEPA's practice of on-lending project funds for participating Chinese institutions (e.g., the provincial-level Environmental Protection Bureaus), combined with limited SEPA involvement after loan approval. Training on EA appears to have been partially successful in terms of numbers trained and quality of training, though feedback from Bank staff suggests that costs per trainee seemed higher than for comparable training. Training has resulted in more effective use of human resources in SEPA and the EPBs. At project closing, however, a cutback in the number of officials in SEPA's personnel department, which was part of a larger administrative action, may have reduced the impact of the training. As a result of ETAP, CASc scientists were able to participate in national and international projects. Younger scientists grew into new and more senior roles, and were promoted to leadership positions in CASc and other institutes.

Objective (e) Improve interagency and inter-ministerial coordination for improved environmental management – Modestly Achieved.

3.11 Attempts to improve inter-agency and inter-ministerial coordination for better environmental management met with mixed success. The BRIM program did succeed in providing relevant information to government policy makers, while attracting international funding for research. But despite substantial achievements relating to publication of scientific papers, and the establishment of the CBIS, direct links to policy-making bodies were not fully developed.

3.12 The Policy Research Center for Environmental Economics (PRCEE) operates as a loose framework of individual contract researchers, and their contribution to institutional capacity is not clear.

4. Ratings

Outcome

4.1 Based on the ratings for relevance, efficacy, and efficiency discussed immediately below, the outcome of the ETAP is rated *satisfactory*. The project objectives were achieved with a mix of satisfactory and highly satisfactory ratings, with some shortcomings of varying magnitude. The human resource development aspects of the project have been particularly successful in introducing new environmental management approaches, facilitating the exchange of international learning experiences, and adapting that knowledge to Chinese conditions. Moreover, several new pieces of environmental policies, legislation, guidelines, and institutions resulted from the subprojects, including the State Clean Production Act, national or local CP centers, revisions in China's pollution levy structure, and the phase-out of lead in gasoline.

4.2 *Environmental policies are in place in China, but governance is still weak.*

Post-ETAP, the main challenge particularly for SEPA will be to make environmental policies fully operational by integrating them into day-to-day environmental management decisions and applications. The remaining issue for SEPA, however, is that it is not a prime mover in the environmental policy arena. SEPA is involved, but from the side. It generates a lot of studies and TA, and monitors a lot of data, but decisions are made at a higher level and SEPA is “carried along” whether it is proactive or not. Inter-ministerial coordination (vertical and horizontal) can still be much improved. SEPA just established SEPA-managed regional offices, which is a step in the right direction.

RELEVANCE

4.2 The relevance of the ETAP is *high*. The project’s capacity-building activities targeted the two institutions with the most important mandates and sets of responsibilities for environmental management in China. Moreover, its well chosen objectives focused on addressing the key weaknesses in environmental management in China at the time of preparation and appraisal, which were to: (i) strengthen the Chinese EA system; (ii) enhance the effectiveness of pollution management instruments; (iii) prevent pollution and minimize waste in the first place; (iv) coordinate among the various agencies and ministries that were (or should be) involved in environmental management; and (v) monitor ecological information in order to link research results to policy-making and improve natural resource management.

4.3 The strengthening of environmental management is one of the main pillars in all of the Bank’s Country Assistance Strategies for China during 1990-2006. In the Bank’s strategy documents, the need for strong environmental institutions has accompanied other key themes of market-based growth, poverty reduction, infrastructure development and rural development. There have been some shifts in emphases across the three CASs, as ground conditions and priorities have changed over the years. The 1995 Country Assistance Strategy focused specifically on China’s regulatory framework for the environment, and the capacity of the then- NEPA to implement the National Environmental Action Plan. The 1997 Country Assistance Strategy addressed the application of instruments for improved environmental management. In its sector work, the project’s objectives also had high relevance. In the Air, Land and Water document (ALW, 2001), it was recognized that:

- China’s environmental agenda was becoming too complex for SEPA alone, and would require more cross-ministry and agency coordination and involvement;
- Systemic fiscal and budgetary problems result in lack of sufficient resources for environmental institutions; and
- GoC should go beyond a "one-size-fits-all" approach and diversify its environmental tools to better fit the variety of environmental problems being experienced in different parts of the country.

4.4 The project closed in 2002 but its capacity-building objectives remain as, if not more, relevant today. The 2003 Country Assistance Strategy addressed more broadly the strengthening and effectiveness of environmental institutions. This set the stage for addressing priorities identified in the 2006 Country Partnership Strategy, including the

promotion of more efficient water and energy supply systems, and the identification of policy options to reduce energy consumption. More recently, some of ALW's recommendations were incorporated into China's 11th FYP (2006-2010). Among these are the institutional development objectives of:⁸

- increasing the rule of law and the role of courts, as well as public awareness and participation; and
- establishing a central government agency with the specific mandate of pursuing biodiversity protection, as well as addressing biodiversity loss and grassland desertification, particularly in poor and vulnerable areas.

EFFICACY

4.5 The efficacy of ETAP is rated *high*. As discussed on the foregoing Section 3 on "Results", the project's objectives were achieved albeit with some shortcomings:

- The capacity-building interventions had relatively less impact on SEPA itself
- The MOF's policy of passing the Bank and IDA funds to the EPS as loans rather than grants undermined the incentive for better performance.
- Computer equipment that was ordered under the project was out of date by the time the Bank's procurement procedures were complied with. In general, the Bank's procurement procedures may be too slow and complex for the requirements of scientific institutions, pointing to the need for greater flexibility and decentralization in such cases.
- Some pilot CP industrial investments were not viable. The study on reducing pollution from small enterprises produced recommendations that were already known. Follow-up was weak in some activities, e.g., the sub-reports produced for the national ecological monitoring network. The study on ecological agriculture had little support from SEPA and ran into procedural issues.

EFFICIENCY

4.6 As a technical assistance project, an economic internal rate of return is not applicable and was not calculated, hence ETAP's efficiency is *not rated*. Some cost-effectiveness measures, however, can be cited. The cost of each trainee for Environmental Assessments appeared high compared to similar training in other countries.

Risk to Development Outcome

4.7 The risk to ETAP's development outcome is rated *low*. The BRIM program for biodiversity-related research and the CBIS appear financially sustainable due to committed funding from CASc and other sources. CERN's research activities also appear to be financially sustainable due to expanding access to CASc and non-CASc funding.

⁸ The other goals include: (i) re-orienting natural resources development policies to promote production levels consistent with the long-term maintenance of the resources; and (ii) improving the effectiveness of investments in ecological conservation by placing more emphasis on addressing the underlying social and economic causes of degradation rather than the symptoms alone.

However, the top-down planning and excessive centralization built into the project's design needs to be addressed in order to enhance the sustainability of the CERN information system.

4.8 As a further evidence of sustainability, the CERN component of ETAP has spun off the Chinese National Ecosystem Observation and Research Network (CNEORN). It has 55 stations (of which 33 were the original CERN stations) and a synthesis center. It is funded and operated by the Ministry of Science and Technology (MOST), to which CASc provides regular advice on environmental matters. MOST is a younger institution than CASc, and many of MOST ministers came from CASc. Other CNEORN partners include the State Forestry Administration, the Ministry of Agriculture, and the Ministry of Education.

Bank Performance

4.9 The Bank's performance was *highly satisfactory*. The Bank helped CASc and SEPA establish rigorous progress reporting procedures. The Bank supervision teams visited the field at regular six-month intervals and had the right mix of technical and other skills. Unlike many Bank projects that IEG has evaluated, continuity was good: there were only two Task Managers over the nine-year implementation period, and two consultants remained engaged from preparation to closure. The Bank missions benefited from a smooth and effective working relationship with both CASc and SEPA. The project files and IEG interviews reveal a consistent and excellent level of cooperation among the project implementation units and the participating institutions. This helped resolve implementation problems in a frank and constructive manner. Cost effectiveness-wise, ETAP's supervision was highly staff-intensive and exceeded the Bank's norms. On the other hand, the high quality of the Bank's supervision performance was endorsed by CASc and SEPA at the ICR workshop.

4.10 One issue is the Bank's reluctance to reallocate savings, which may have impacted on project performance. Project records show that the Bank's management often rejected borrower requests to reallocate savings, despite the flexibility of project team members. Even small reallocation requests were turned down. According to field interviews, as a result of this rigidity, from one-fourth to one-third of SEPA's activities under the project did not reach satisfactory levels of performance.

Borrower Performance

STRONG COMMITMENT OF THE GOVERNMENT AND IMPLEMENTING AGENCIES

4.11 The performance of the Borrower and the implementing agencies is rated *highly satisfactory*. During implementation, MOF and other parts of the Government gave broad support to SEPA and CASc, including budget allocations and endorsements of environmental policy. These laid the basis for the satisfactory outcomes of project activities and minimized risks to development outcome. From senior management to working levels alike, CASc and SEPA demonstrated considerable capacity and strong commitment to implement and learn from the project. CASc and SEPA were able to resolve the initial problems associated with trying to prepare a large number of subprojects and coordinating many participating institutions. The upper management

levels of both institutions provided strong support and ready access for working level staff, thus greatly enhancing their ability to resolve problems expeditiously. SEPA's project implementation unit became a very capable and professional supervisory and management unit for ETAP and subsequent foreign-financed projects.

4.12 There were three shortcomings. First, the quality of supervision by the functional departments and divisions in SEPA was uneven, particularly with respect to reviewing the progress and quality of interim outputs and the quality of final outputs. The more involved the responsible SEPA department is, the greater the success and results of the subproject. Second, with respect to the CAsC component, the decisions related to equipment and information system design could have been more decentralized, and a better assessment of needs assessments could have been done at the research institute level or at the site during the design phase. Third, MOF's on-lending policy for the IDA proceeds that were passed on to SEPA resulted in multiple problems, as discussed separately below.

ONLENDING ISSUE

4.13 The Chinese Government's on-lending policy for TA funds had distortionary effects on the project. The Bank was aware that the Ministry of Finance would on-lend to SEPA its portion of the IDA credit in the form of a low-interest loan. However, the Bank was not informed until after project approval that, in turn, SEPA would on-lend most of the funds to the participating institutions such as the provincial-level Environmental Protection Bureaus (EPBs), despite the fact that ETAP's products cannot be expected to generate revenues. This lack of information prevented the Bank from discussing the shortcomings of this arrangement with SEPA and the Ministry of Finance (MOF). This was an important disadvantage for the project, since the Bank had already learned from experiences under earlier TA projects that this on-lending approach had multiple distorting effects on (i) the selection of project participants and (ii) the mix of training versus equipment procurement. This issue, which was not unique to ETAP but was (and remains) generic to the China lending program, has been the subject of discussion with the MOF for many years. The MOF is cognizant of the problem but remains convinced that the drive for high levels of financial accountability offsets the negative effects of the on-lending policy.

5. Conclusions and Lessons

5.1 For projects of the scope and size such as ETAP, longer implementation periods should be provided upfront, to allow a more logical relationship between Training/Technical Assistance (T/TA) and procurement. A desirable sequence in this regard would be: T/TA, review of institute programs, identification of equipment needs, and procurement of equipment. Also, the subprojects with the highest quality outputs and development impacts were most often those in which the functional or line departments of SEPA were actively involved and in which the training components were the most

effectively implemented (e.g. GEMS monitoring⁹, EPB training programs, pollution levy system and motor vehicle pollution control) as against those with less active involvement (e.g. national environment information system, review of environmental education, regional and sectoral impact assessments). Consequently, the main lessons that can be drawn from the project are:

- In large TA projects, a programmatic approach may be preferred, with general agreement on overall objectives and a first year work-plan followed by iterative development of subsequent stages based on experience and changing circumstances.
- Active involvement of functional or line departments can greatly raise the quality of outputs and development impacts of TA subprojects.
- In designing environmental capacity-building projects, the strengthening of sub-national environmental institutions—which often exercise enforcement authority—is equally if not more important than that of the apex environmental agency.
- Passing-on IDA credits as a loan (rather than as a grant) to essentially non-revenue-generating entities creates distortions in their priorities and work programs, as these entities shift their focus more towards revenue-generating activities that may not always address the core knowledge management tasks of conducting independent research, data-monitoring and information dissemination.

The following section assesses--based on ETAP's experience--the broader issues and challenges facing the Government in terms of further strengthening environmental institutions in China, and the prospects for partnership with the Bank in this area.

CHALLENGES AT THE SUBNATIONAL LEVEL

5.2 Structurally, SEPA's ability to implement comprehensive national environment policies has been limited by the high degree of administrative decentralization, local prioritization of investment and employment, vertical and horizontal fiscal imbalance, and absence of clear accountability for environmental conditions. Grass-roots implementation of environmental policies is the responsibility of over 100,000 employees of provincial and local Environmental Protection Bureaus (EPB), who are nominally under SEPA supervision but whose salaries are paid by the local administrations, creating a potential conflict of loyalties. Local governments are usually more concerned with economic growth and employment than they are with adhering to national environmental mandates. It is important to note that the legal system for compliance and enforcement is used sparingly, although it is slowly increasing, with actions brought by the victims of pollution receiving press attention.

5.3 *Policy implementation relies on sub-national institutions.* Relative to the Bank's counterparts in the major infrastructure sectors (e.g., energy, transport, and water resources), SEPA lacks the financial resources that could attract greater cooperation from

⁹ The United Nations Environment Programme Global Environment Monitoring System (GEMS)

the provinces in implementing environmental policies. While SEPA draws its authority from the active support of the apex State Council, the policy implementation depends heavily on the commitment of local officials and leaders, such as governors and mayors, though public opinion is becoming an increasingly important factor.

5.4 *But institutional weaknesses at the level of the EPBs constitute a major constraint in effective supervision and monitoring of compliance with environmental regulations.* As mentioned above, while EPBs are nominally under SEPA supervision, they are paid by the local administrations, creating the potential for a conflict of EPB loyalties between the national and local levels, and possible leniency in imposing pollution levies on local polluters. For instance, the pollution levy collected in 2006 for all polluting substances was \$1.2 billion, even though the expected collections from SO₂ emissions alone should have exceeded this amount. Wastewater is another example of institutional weakness. The State Council and the National Development and Reform Council (NDRC) have mandated that end-users should pay for sewage treatment, while leaving it to the local/municipal governments to decide on the criteria and level of tariffs. The local/municipal governments have been setting tariffs based on "affordability" rather than full cost recovery, thus raising major issues about the financial viability of these sewage treatment utilities.

5.5 Technical capacity and resources made available to EPBs, particularly at the lower levels such as counties and townships, need to be significantly increased. At the same time, more effort is required to clarify horizontal and vertical relationships of authority and responsibilities at all levels – national, provincial/municipal; and for improving provisions for performance audits and public reporting. EPBs need to maintain their focus on pollution management and control, while being selective in identifying their role in expanding into green or eco-environmental agenda.

REFORMING INCENTIVES TO IMPROVE ENVIRONMENTAL PERFORMANCE

5.6 An effective system of incentives for environmental management is still lacking, and requires Government commitment and further TA to firmly put it in place, particularly at the sub-national level.

5.7 *SEPA's resources are inadequate compared to the task of addressing China's environmental challenges.* SEPA has the environment mandate, supported by a good legal framework and comprehensive policies, but few resources. As the lead environmental agency, SEPA has broad responsibilities for policy formulation, but only has a small staff of about 220 professionals. SEPA's authority is derived from the support of the apex State Council, but policy implementation depends heavily on the commitment of mayors and local government leaders to environmental management, and increasingly, public opinion.

5.8 It should be highlighted, however, that one of the strongest elements of SEPA's environmental strategy has been its work on promoting public participation, public dissemination of environmental information, and environmental education at all levels. This work now needs to extend beyond wealthier urban areas in the east.

5.9 ***There are important limitations to the long-standing Pollution Levy System that need to be addressed.*** Pollution levies are often not sufficiently high to encourage users to reduce pollution. This is partly due to strong local political interests at play, with many EPBs being captive to local governments, and -- with many sewage and wastewater treatment facilities linked to/owned by local governments -- so that EPB's become resigned toward keeping the status quo. The end result is that poor environmental quality persists. The central government needs to play a stronger and more direct role in using fiscal (taxation) policy in a balanced manner, to supplement the large amounts of investments being made in pollution management.

TAPPING MISSED OPPORTUNITIES

5.10 Although effective in promoting stewardship of the environment, the Bank in moving forward may not be sufficiently strategic, particularly with respect to (i) scaling-up the successes achieved at the municipal and individual project levels; (ii) addressing critical but relatively new areas for the Bank such as hazardous wastes including intermediate e-wastes, treatment of highly contaminated sludge, and clean-up of contaminated water bodies, and (iii) improving portfolio quality and performance by adopting Integrated River Basin Management approaches.

5.11 ***Two important future roles for the Bank consist of strengthening the EPBs and helping improve the incentive framework for pollution management.*** There seems to be a continuing role for the Bank in strengthening monitoring and enforcement at the provincial level, and a strong desire for a second technical assistance project targeted to provincial Environmental Protection Bureaus. The incentive system for pollution control (specifically the pollution levy system that has been in place for about 20 years) was criticized as ineffective, and there also appears to be an important role for the Bank in analytical work and institutional-strengthening related to broader environmental fiscal reforms, such as the "greening of the tax structure"¹⁰.

5.12 ***In particular, Integrated River Basin Management (IRBM) and biodiversity conservation appear to be "missed opportunities" for the Bank.*** River Basins are being "managed" with little or no regard for economic principles. Water quality is a particularly difficult problem to tackle, as there are virtually no basin-wide institutions to manage water allocation or quality. IRBM requires greater GOC commitment and willingness to address institutional weaknesses and strong political economies at the sub-national level. In addition to IRBM, other serious deficiencies remain in key areas requiring environmental stewardship, such as biodiversity conservation. The Bank-GEF support for biodiversity protection is more repetitive than innovative.

5.13 ***Much work remains to integrate environmental concerns into the China country strategy and macroeconomic dialogue, and to link them more logically with lending assistance.*** Bank environment policy and country strategies have addressed a

¹⁰ Generally speaking, "Greening the tax system" refers to a shift in the general tax system from taxing labor etc. to environment-based taxes. The revenue of the environmental taxes is not earmarked for environmental expenses but accrue to the general budget. The taxes do however contribute to the internalization of external costs and do have bigger or smaller environmental effects, depending on behavioral changes of consumers and companies because of the price rise.

wide range of issues, and they could be cited as support for almost any action. In practice, the Bank's strategy took a largely-client-centered approach, responding to and cooperating with China's lead environment agency (SEPA) and sector counterpart ministries. Bank environment interests, appropriately defined, did not necessarily coincide with sector ministry priorities. Thus, there is no clear sequence from environmental analytical work leading to Bank policies, strategy, programs and projects in China. Specifically, there is no clearly discernible causal chain from environmental ESW/AAA to Bank policies to China CASs, and from CASs to lending operations. Environmental linkages identified in ESW/AAA appear to have been only exploited on an ad-hoc basis. However, the *de facto* approach did produce many positive results and responded to client needs, as discussed below.

DEFINING THE BANK'S CONTRIBUTION

5.14 When there is a convergence of interests, the Bank and China have productive working relationships, but Bank-China environmental objectives do not always coincide, as illustrated by ETAP's experience. ETAP was the only Bank-financed project in China that directly sought to strengthen stewardship across all aspects of the environment. The Bank-SEPA relationship demonstrated a more general theme, i.e., when there is a confluence of interests, the Bank and China can have cooperative and productive working relationships, extending to upstream policy work. In the 10-year course of ETAP, and more generally its environment-related work with China, the Bank placed its technical and policy support to SEPA at the core of its strategy. The Bank initially graduated from monitoring safeguards and reviewing EIAs, to a much wider role of championing environmental stewardship. Subsequently it expanded its efforts to the mainstreaming of environmental issues in sector projects. The small size of SEPA (220 professional staff) in relation to the big sector ministries and to the Bank's equally small environment sector units made close cooperation feasible. Upstream environmental policy dialogue between SEPA and EASES was not always the result of management oversight or direction from the Bank, as many initiatives were originated by the Chinese counterparts.

5.15 IEG mission discussions with CASc and SEPA suggest that the Bank's value-added consists of the following specific contributions:

- The Bank provides access to global experience and expertise, especially those related to good environmental management practices.
- The Bank's project design and appraisal procedures are rigorous and able to show the project's true worth in comparison with other alternatives.
- The Bank is able to solicit different views from various project stakeholders.
- The Bank can anticipate environmental issues by drawing upon its expertise and cross-country experience, and has the credibility and convening power to broker an agenda for addressing these problems.

However, the Bank is seen by its clients as relatively inflexible and procedures-oriented. It needs to learn how to listen more, particularly to sophisticated Borrowers that have strong local capacity, like China.

5.16 Even prior to the Bank's involvement, China had a comprehensive set of laws, a developed institutional framework for administering, monitoring and enforcing environmental policies, and a mix of command-and-control and economic incentive approaches, and had already begun to tackle some of its environmental issues. The human resource development aspects of the project have been particularly successful in introducing new management approaches, facilitating international learning experience and adapting the learning to Chinese conditions.

5.17 Promoting environmental stewardship at the sectoral and sub-national levels remains an important challenge. Although cooperation with SEPA was good, the Bank's objectives and prescriptions for China's environment did not necessarily coincide with the priorities of sector-level ministries and provincial governments. Consequently, ownership was mixed at sectoral and sub-national levels despite strong expressions of environmental commitment at the national level. An appropriate policy for the Bank is to play an honest broker role by working with different ministries and agencies that have sectoral expertise to manage particular environmental responsibilities, while identifying and proposing means of addressing conflicts of interest particularly at the level of provincial Environmental Protection Bureaus (EPBs). In its lending operations, the Bank should intensify efforts to address the fundamental contradiction of strengthening SEPA while leaving the EPBs to have little or no incentive, penalties, or genuine commitment to address environmental issues. This issue of the relative roles and incentives between SEPA and the provincial EPBs is discussed in more detail in the section on "Environmental Governance" in the China-Environment Country Case Study, which is an input into IEG's ongoing "Environmental Effectiveness Evaluation Study" for the World Bank Group.

Annex A. Basic Data Sheet

CHINA: ENVIRONMENTAL TECHNICAL ASSISTANCE PROJECT (IDA-25220)

Key Project Data *(amounts in US\$ million)*

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	76	67.27	89
Loan amount	50.00	48.87	98
Cofinancing	26.00	18.40	71
Cancellation	0.00		

Cumulative Estimated and Actual Disbursements

	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	TOTAL
Appraisal estimate (US\$M)	0.0	5.1	11.3	10.8	6.5	1.5	0.0	0.0	0.0	35.3
Actual (US\$M)	0.0	3.6	1.1	8.3	7.9	5.6	1.0	1.1	1.0	29.5
Actual as % of appraisal	0	70%	10%	77%	121%	371%	-	-	-	84%

Date of final disbursement:

Project Dates

	<i>Original</i>	<i>Actual</i>
Initiating memorandum	10/22/1992	10/22/1992
Negotiations	05/10/1993	05/10/1993
Board approval	06/22/1993	06/22/1993
Signing	07/16/1993	07/16/1993
Effectiveness	10/14/1993	11/11/93
Closing date	12/31/1998	12/30/2002

Staff Inputs (staff weeks)

	<i>No. Staff Weeks</i>	<i>Actual/Latest Estimate</i>	
		<i>US\$ ("000)</i>	
Preappraisal	147.0	294.7	
Appraisal/ Negotiations	39.9 b/	192.2	
Supervision	554.7 c/	1,251.7	
ICR	19.0	93.9	
Total	760.6	1,832.5 d/	

Mission Data

	<i>Date (month/year)</i>	<i>No. of Persons and Specialty</i>		<i>Performance Rating</i>	
		<i>Count</i>	<i>Specialty</i>	<i>Implementation Progress</i>	<i>Development Objective</i>
Identification / Preparation	9/91	10a/	ERS (8); BS (2)		
	4/92	6	ML (1); EcS (1); ERS (1); EE (2); ES (1)		
	12/92	14B/	ML (1); EsC (1); ERS (1); EDS (1); ES (4); IDC (3); IMS (1); EIS (2)		
Appraisal/ Negotiation	3/93	16b/	ML (1); EsC (1); ERS (2); EDS (1); ES (4); IDC (3); IMS (1); EIS (1); MIS (1); CPS (1)		
	5/93	5	ML (1); EsC (1); DO (1); LEG (1); EDS (1)		
Supervision	11/93	4	ML (1); ERC (1); CPS (1); APS (1)	S	S
	05/94	3	ML (1); ERC (1); IS (1)	S	U
	03/95	1	ML (1)	S	S
	09/95	2	ERS (1); ML/EcS (1)	S	S
	05/96	1	ML/ES (1)	S	S
		3		S	S
	11/96	3	ML/ES (1); ES (1); MIS (1)	S	S

	<i>Date (month/year)</i>	<i>No. of Persons and Specialty</i>		<i>Performance Rating</i>	
		<i>Count</i>	<i>Specialty</i>	<i>Implementation Progress</i>	<i>Development Objective</i>
	04/97	3	ML/ES (1); ERS (1); MIS (1)	S	S
	11/97	1	ML/ES (1)	S	S
	03/98	3	ML/ES (1); ERS (1); MIS (1)	S	S
	09/98	1	ML/ES (1)	S	S
	11/98	3	ML/ES (1); ERS (1); MIS (1)	S	S
	04/99	2	ML/ES (1); ES (1)	S	S
	03/00	2	ML/ES (1); ES (1)	S	S
	07/00	5	ML/ES (1); ES (2); EE (1); APS (1)	S	S
	03/01	2	ML/ES (1); ES (1)	S	S
	12/01	3	ML/ES (1); EE (1); OA (1)	S	S
	04/02	1	ML/ES (1)	S	S
Completion	12/02/02	8	ML/ES (1); EcS (1); ERS (1); ES (1); MIS (1); EE (1); IS (1); PAS (1)	S	HS

APS: Auto/Air Pollution Control Specialist; **CPS:** Computer Procurement Specialist; **EsC:** Ecology Specialist; **EE:** Environmental Specialist; **EIS:** Environmental Institutions Specialist; **ERS:** Ecological Research Specialist; **ES:** Environmental Specialist; **IS:** Institutional Specialist; **ML:** Mission Leader; **MIS:** Management and Institutions Specialist; **OA:** Operations Analyst; **PS:** Procurement Specialist; **TS:** Training Specialist; **LEG:** Legal Counsel; **EDS:** Education Specialist; **BS:** Biodiversity Specialist; **IMS:** Information Management Specialist; **IDC:** Industrial Pollution Control Specialist.

Other Project Data

Borrower/Executing Agency:

FOLLOW-ON OPERATIONS

<i>Operation</i>	<i>Credit no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
None			

Annex B. List of Persons Met

Ministry of Finance

Mr. Zou Ciyong, Director, International Department
 Mr. Wang Geng, Comprehensive Division, International Department
 Mr. Han Su, Senior Project Officer, IFI Division II, International Department

National Development and Reform Commission (NDRC)

Mr. Wang Shumao, Executive Director, Professor, Project Management Office of
 NDRC/WB/GEF China Energy Conservation Project
 Mr. Yang Tiesheng, Director, Senior Engineer, Energy Efficiency Division, Department
 of Environment & Resource Conservation, National Development & Reform
 Commission
 Mr. Yin Chongyi, Senior Project Expert, Manager of Project Phase I, Project
 Management Office of NDRC/WB/GEF China Energy Conservation Project

Ministry of Water Resources

Mr. Zhu Wei, Division Chief, Senior Engineer, Foreign Investment Management Office
 Mr. Wang Jinsu, Project Officer, Department of International Cooperation, Science and
 Technology

Chinese Academy of Sciences (CAsC)

Prof. Keping Ma, Director and Professor, Institute of Botany
 Prof. Hu Zhen'ou, Professor, Deputy Director, Office of External Financing
 Dr. Xu Liang Zhuang, Vice Director, Division of Ecology and Environment,
 Bureau of Science and Technology for Resources and Environment
 Prof. Lou Zhiping, Director of Division of Integrated Biology
 Prof. Zhao Shidong, Institute of Geographic Sciences and Natural Resources Research
 (IGSSNR); Chair, East Asia & Pacific Network of International Long-Term
 Ecological Research
 Prof. Guo Xuebing, Associate Professor, IGSSNR; Data Manager, Chinese
 Ecosystems Research Network (CERN)
 Prof. Ji Liqiang, Researcher, Institute of Zoology
 Prof. Niu Dong, Program Official, Bureau of Science and Technology for Resources
 and Environment
 Ms. Liu Jie, Bureau of International Cooperation

China State Environmental Protection Administration (SEPA)

Ms. Feng Dongfang, Ph.D., Senior Researcher, Policy Research Center for Environment
 and Economy (PRCEE)
 Mr. Tian Shan, Project Official, Project Management Division I, Foreign Economic
 Cooperation Office
 Mr. Yu Lifeng, Chief Financial Officer, Foreign Economic Cooperation Office
 Mr. Wang Xin, Deputy Division Chief, Project Management Division I, Foreign

Economic Cooperation Office
 Dr. Hu Tao, Chief Economist, Policy Research Center for Environment
 and Economy (PRCEE)
 Prof. Tian Chunxiu, Associate Professor, Division Director, Policy Research Center for
 Environment and Economy (PRCEE)
 Mr. Hong Shaoxian, Director, Associate Researcher, Environmental Official Training
 Section, Center for Environmental Education & Communications
 Mr. Jiao Zhiyan, Director, Senior Engineer, Center for Environmental Education &
 Communications

Beijing Municipality

Beijing Municipal Development and Reform Commission
 Ms. Lu Zhi-an, Executive Director, WB & ADB Loan Project Management
 Office & Environment Project Office
 Ms. Chen Ying, Project Officer

Beijing Municipal Bureau of Finance
 Mr. Zhang Guoqing, Division Chief, External Affairs Division

Beijing Municipal Environmental Protection Bureau
 Ms. Ming Dengli, Deputy Director, Science & Technology and International
 Cooperation Division

Beijing Drainage Group Co., Ltd.
 Mr. Jiang Yong, Assistant General Manager, Senior Engineer

Chongqing World Bank Project Management Office

Mr. Zhou Linjun, Director, Foreign Economic & Trade Division of Chongqing
 Development and Reform Commission

Chinese Research Academy of Environmental Sciences

Ms. Yu Xiuling, Research Fellow, China National Cleaner Production Center

Renmin University of China

Prof. Ma Zhong, Dean, Professor, School of Environment and Natural Resources
 Prof. Li Yanfang, Professor, Environmental Law

China National Environmental Monitoring Center

Mr. Ding Zhongyuan, Deputy Director
 Mr. Fu Qiang, Deputy Director, Department of Analysis Technology, and Senior Engineer

Wetlands International

Ms. Zhang Xiaohong, Deputy Director and Senior Technical Officer

Conservation International

Ms. Lu Zhi, China Country Director

IUCN-The World Conservation Union-China Liaison Office

Mr. Seth Cook, China Program Coordinator

The Energy Foundation

Mr. Fuqiang Yang, Vice President & Chief Representative

Global Environment Institute

Ms. Jiaman Jin, Executive Director

Global Village of Beijing

Mr. Yang Qiu Sha, Program Coordinator

Mr. Mao Da, International Program Coordinator

Mr. Ikeda Takeshi, Program Coordinator

Journalists**News Programming Center**

Ms. Y Aiqun, Journalist, News Coverage Department

Beijing Evening News

Ms. Shao Zehui, Reporter, Economic Department

Chinese National Geography

Ms. Zhu Tong, Editor Reporter

Beijing Youth Daily

Ms. Sun Danping, Reporter

Science & Technology Daily

Ms. Ling Hua, Reporter/Editor, International Department

Beijing News Radio

Ms. Kang Xue

World Bank Office

Mr. David Dollar, Country Director & Chief of Mission

Ms. Hsiao-Yun Elaine Sun, Operations Manager

Ms. Sari Soderstrom, Sector Coordinator, Rural Development Sector Unit

Mr. Achim Fock, Senior Economist, Rural Development Sector

Mr. Zhang Ximing, Operations Officer, Water Resources Specialist

Mr. Tom Zearley, Sector Coordinator, Urban Development Sector Unit
 Mr. Zhang Hao, Municipal Engineer, Urban Development Sector Unit
 Ms. Wang Shenhua, Sr. Infrastructure Specialist, Urban Development Sector Unit
 Mr. Andres Liebenthal, Country-Environment Sector Coordinator
 Ms. Chongwu Sun, Sr. Environment Specialist
 Mr. Liping Jiang, Senior Water Resources Specialist
 Mr. Bert Hofman, Chief, Economics Unit & Lead Economist
 Mr. Chunlin Zhang, Senior Enterprise Restructuring Specialist

Japan International Cooperation Agency (JICA) in Tokyo

Mr. Kazunori Miura, Director Office of Evaluation, Planning and Coordination
 Department
 Mr. Hiroto Mitsugi, Team Director, Forestry and Nature Conservation Team, Global
 Environment Department
 Ms. Miwa Hiasa, Environmental Management Team, Global Environment Department

Asian Development Bank (ACB) in Manila

Mr. Bruce Murray, Director General, Operations Evaluation Department (and former
 Country Director for China)
 Mr. Robert Schenck, Evaluation Specialist, Operations Evaluation Department
 Mr. C. R. Rajendran, Advisor (Safeguards and Compliance), Office of the Director
 General, South Asia Department
 Mr. Nessim J. Ahmad, Director, Environment and Social Safeguards Division, Regional
 and Sustainable Development Department
 Mr. Woo Chong Um, Director, Energy, Transport, and Water Division, Regional and
 Sustainable Development Department
 Mr. Kunhamboo Kannan, Director, Agriculture, Environment, and Natural Resources
 (AENR) Division, East Asia Department
 Mr. Bruce Carrad, Principal Project Specialist, AENR Division, East Asia Department
 Mr. Qingfeng Zhang, Environment Specialist, AENR Division, East Asia Department
 Mr. Sergei Popov, Project Specialist (Environment), Social Sectors Division, East Asia
 Department
 Mr. Anil Terway, Director, Energy Division, East Asia Department
 Mr. C.C. Yu, Senior Safeguards Specialist, Office of the Director General, Central and
 West Asia
 Ms. Barbara Palacios, Senior Evaluation Officer

Asian Development Bank (in Beijing)

Mr. Min Tang, Deputy Resident Representative/Chief Economist
 Mr. Niu Zhiming, Senior Project Officer

State Forestry Administration

Mr. Yan Xun, Deputy Director General, Department of Wildlife Conservation
 Ms. Cheng Jinghua, Senior Engineer, World Bank Loan Project Management Center
 Ms. An Lidan, Deputy Director, Department of Wildlife Conservation

Fujian Provincial Forestry Bureau Wild Fauna and Flora Conservation Management Center

Mr. Zhou Dongliang, Senior Engineer

Hubei Provincial Forestry Bureau Wild Fauna and Flora Conservation Division

Mr. Zhou Lijia, Principal Staff

Jiangxi Provincial Forestry Department Wildlife Fauna and Flora Conservation Management Bureau

Mr. Wu Yinghao, Deputy Director

Forestry Department of Shaanxi Province

Mr. Hou Lingyu, Senior Engineer, Administrative Office of Natural Reserve and Wildlife

Mr. Zhou Lingguo, Deputy Director, Conservation Division

Mr. Fong Jinxu, Director, Industry Division, Resource Bureau

Forestry Department of Yunnan Province

Mr. Guo Huijun, Vice Director-General

Ms. Zhong Mingchuan, Deputy Director, Wildlife Conservation Office

Mr. Chen Lixian, Deputy Director, Wildlife Conservation Office

Mr. Zhang Bao, Deputy Director, International Cooperation Project Office

Poyang Lake National Nature Reserve Management Bureau

Mr. Ji Wei Tao, Director and Senior Engineer

Shennongjia National Nature Reserve Management Bureau

Mr. Yu Jie, Director, Office for International and Domestic Cooperation

Taibai Nature Reserve Management Bureau

Mr. Liu Mingshi, Director