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COST EFFECTIVENESS ANALYSIS IN GEF PROJECTS

Recommended Council Decision

The Council, having reviewed GEF/C.25/11, *Cost Effectiveness Analysis in GEF Projects*, urges the Secretariat and the Implementing and Executing Agencies to continue undertaking cost-effectiveness analysis in GEF project preparation as outlined in the document, and to document their cost effectiveness analysis more clearly in the project executive summaries submitted for work program inclusion.

Executive Summary

Several Council Members have raised questions regarding how cost-effectiveness is addressed in GEF projects. This document describes the cost-effectiveness analysis of GEF projects, illustrating approaches in the biodiversity and climate change focal areas.

The Implementing/Executing Agencies take a very pragmatic approach to cost-effectiveness analysis during project preparation. Various means to achieve a stated objective are considered and evaluated with the most effective and least-cost approach being selected. The approach builds upon knowledge of lessons learned from past programming experience.

Reflecting the above understanding, the project review criteria employed by the Secretariat when reviewing projects at work program inclusion focus on alternate project approaches considered and discarded. Quantitative estimates of cost-effectiveness are required only where feasible and useful.

The Secretariat and the agencies will continue to follow the cost-effectiveness analysis approach outlined in the document. Increased attention will be paid to documentation of cost-effectiveness analysis in the project executive summary.

Table of Contents

Introduction

1. One of the key criteria against which proposals requesting GEF resources are reviewed is "cost-effectiveness." Several stakeholders, including Council Members, have raised questions regarding how this criterion is actually applied. This document is a brief description of cost-effectiveness analysis in GEF projects.

2. As a guiding principle, the issue of cost-effectiveness is reflected at various levels of GEF strategy:

(a) Instrument. The issue of cost-effectiveness is enshrined in the GEF *Instrument*:

"*The GEF shall ensure the cost-effectiveness of its activities in addressing the targeted global environmental issues…*"[1]

"The Implementing Agencies will ensure that cost-effectiveness and sustainability of their activities in addressing the targeted global environmental issues. In this context, one important feature of adhering to these principles is that the least-cost sustainable means of meeting many global environmental objectives lie in a combination of investment, technical assistance, and policy actions at the national and regional level. The experience and mandate of each Implementing Agency will contribute to bringing to light, when assessing specific project interventions, the range of possible policy, technical assistance and investment measures…"[2]

(b) Operational Strategy. Cost-effectiveness is one of the ten operational principles listed in the GEF Operational Strategy:

"*The GEF will ensure the cost-effectiveness of its activities to maximize global environmental benefits.*"[3]

What is Cost-effectiveness?

3. Cost-effectiveness analysis is as an approach to identify the cheapest way, among competing alternatives, of achieving a stated objective. Broadly speaking, there are two ways of undertaking a cost-effectiveness analysis or assessment; (i) quantitative approach; and (ii) qualitative approach.

4. In a rigorous and quantitative application of cost-effectiveness analysis, an indicator that best describes the outcome of the intended activities would be identified, and the cost of achieving a unit of that indicator for the different competing alternatives would be computed. The alternative that has the lowest cost per unit indicator would be identified as the most cost-effective means of achieving the stated outcome.

[1] Para 4, Basic Provisions, Instrument for the Establishment of the Restructured Global Environment Facility, May 2004.
[2] Para 7, Principles of Cooperation among the Implementing Agencies, Instrument for the Establishment of the Restructured Global Environment Facility, May 2004.
[3] Principle # 4, Ten Operational Principles for the Development and Implementation of GEF work programs, Operational Strategy, 1996

5. Another approach would be qualitative, nonetheless rigorous, whereby the stated outcome(s) may not have an indicator(s) that best describes it, or the outcome may not be quantifiable. Various means to achieve the outcome(s) are assessed, and the cheapest and most feasible (and pragmatic) mean identified as the most cost-effectiveness means of achieving the stated outcome.

Cost-Effectiveness Review in GEF Project Cycle

6. In all focal areas of the GEF, where the engagement, as reflected in the Operational Strategy and Operational Programs, is over the long term, there are several difficulties with the purely quantitative approach:

(a) It is difficult to identify one meaningful quantitative outcome indicator that best reflects the outcome(s) of the project;

(b) GEF projects are intended to have catalytic influences, including capacity building, policy changes, etc., which cannot be meaningfully quantified and related to a dollar amount; and

(c) Several GEF projects are co-financed with development projects, and it is not easy to attribute rigorous direct relationships between outcomes and resource applications.

7. Reflecting the above understanding, and as enshrined in the *Instrument*, the GEF Project Review Criteria entail a very pragmatic approach in their application to project proposals for cost-effectiveness. The criteria used during review of projects at work program inclusion[4] are:

(a) Estimate cost -effectiveness, if feasible.

(b) Describe alternate project approaches considered and discarded.

8. The quantitative approach is applicable only in a very limited manner in the GEF context. For example, in climate change, only under the short-term response measures (STRM)--where the stated goal is to reduce in the short-term the maximum quantity of greenhouse gases by the end of project implementation—has cost-effectiveness been estimated in dollars/ton of CO_2 equivalent and utilized as an eligibility requirement. It has led to an almost exclusive focus on STRM projects on non-CO2 gases (methane, N20, etc.) as these are the only ones consistently able to meet this criterion.

How is Cost-Effectiveness Analysis reflected in GEF Projects?

9. In GEF project preparation and review, cost-effective analysis requires that a range of alternative paths to achieve a stated objective are considered and evaluated, with the most effective and least-cost approach being selected. Such work requires knowledge of lessons learned through past programming experience. The shared body of knowledge that comprises

[4] GEF Project Review Criteria, GEF Project Cycle Update (GEF/C.22/Inf9)

the GEF's collective experience and its value as a learning institution provide much of the foundation for this work.

10. A project review sheet (GEF/C.22/Inf.9) is used as the basis for the discussion between the GEF Secretariat and the Implementing Agency. For full-sized projects, it is used at each project stage (Pipeline Entry, Work Program Inclusion, and CEO Endorsement). The project review sheet includes sections where GEF policy and procedures are assessed and discussed. Cost-effectiveness is explicitly discussed in Section 3 (Financing). At Work Program Inclusion, cost-effectiveness can be estimated in two ways: (i) a quantitative estimate; or (ii) a qualitative estimate ("describe alternate project approaches considered and discarded") as reflected in the project review criteria. In the following sections, typical approaches in the biodiversity and climate change focal areas are described to illustrate the approach to cost-effectiveness analysis in GEF projects.

Approach in Biodiversity

11. In biodiversity, quantitative estimates are generally not feasible because many of the typical project inputs (for example financing for capacity building) do not generate measurable outcomes in the immediate term that can be directly linked to the financial input. In other words, measures of cost-effectiveness (such as US$ per hectare of new protected areas) fail to capture the complex set of interventions needed to ensure sustainability and long-term results. The use of quantitative estimates therefore will not always reflect project quality at entry and could be misleading, by promoting the achievement of quick measurable results at the expense of long-term sustainability, institutional building, policy changes, etc.

12. A typical biodiversity project, therefore, relies heavily on the second alternative, qualitative estimates. World Bank projects include a specific section in the Project Appraisal Document (PAD) called "Project Alternatives Considered and Reasons for Rejection." This section is used as the basis for discussion in the project review sheet. For the other Implementing Agencies, a discussion takes place following similar lines.

13. For example, a project that has as a central objective the achievement of in-situ biodiversity conservation, would typically establish new protected areas under various degrees of use restriction (i.e., several IUCN Management Categories). Under this hypothetical example, a project would have four components: (i) Establishment of new protected areas; (ii) Development of Management Plans and Categorization (i.e., degree of human activity allowed); (iii) Institutional and Policy Strengthening; and (iv) Biological Monitoring. The project would thus finance the studies to identify the location of new protected areas, formally create them, strengthen their management, involve local people in decision-making, strengthen the policy framework and institutions in charge of managing then, monitor biological indicators, etc.

14. Such a project would trigger questions related to alternative ways to achieve the proposed conservation results. These alternatives would be explicitly discussed between the GEF Secretariat and the Implementing Agency prior to recommendation for Work Program Inclusion. Typical alternatives that could be discussed would include:

(a) Focus on non-protected areas. This option could be rejected because inherent weaknesses related to the lack of clear land-use rules and tenure, and lack of institutional enforcement capacities concerning natural resources management outside protected areas; if the project is seeking to strengthen the participation of indigenous people in management, a formal categorization may be required.

(b) Establishing protected areas only under the strictest management regimes. This alternative could be rejected because social demands (as identified in the social assessment) may require management regimes that allow flexibility in the use of natural resources. Such an alternative may also be more expensive to enforce, may involve displacement or resettlement, and may not be socially sustainable.

(c) A series of GEF mid-size grants to support activities within the conservation area. This option could be rejected because of absence of economies of scale during project implementation, and because of lack of mechanisms to allow the transfer of lessons-learned from one site to another.

(d) Management through private concessionaries. This alternative could be rejected because of lack of policy framework, lack of interested private sector actors, or because of the time required to implement such concessions may not allow for quick response to serious and immediate threats.

Approach in Climate Change

15. In the climate change focal area, by focusing on the "barrier removal" approach, the Operational Programs helped focus GEF programming on long-term cost-effectiveness that cannot be meaningfully measured using quantitative estimates. Two examples below—one from energy efficiency and one from renewable energy—serve to exemplify how both the programming framework of the GEF (ie., the Operational Programs) and the collective experience are combined through the process of evaluation of alternative designs to ensure the long-term, cost-effectiveness of GEF interventions in the climate change focal area.

16. Energy Efficiency. Although many approaches have been adopted in GEF projects to promote energy efficient products, the most effective design will undertake activities on both the supply- and the demand side. On the supply side, the following activities have been adopted by various GEF projects: (i) providing technical assistance and technology transfer to manufacturers to upgrade their product designs; (ii) supporting the development of minimum efficiency standards; (iii) facilitating voluntary agreements with manufacturers, dealers, and distributors; (iv) piloting new distribution mechanisms through retailers, dealers, or electric utilities; (v) providing financial incentives to producers and dealers; (vi) testing product quality; and (vii) providing financing for manufacturing upgrades. On the demand side, successful approaches have included: (i) educating consumers and professionals about the characteristics, costs, and benefits of energy-efficient technologies and products; (ii) reducing retail prices of energy-efficient products through rebates or subsidies; (iii) conducting bulk purchases and procurements; (iv) providing consumer financing; and (v) offering buy-back or recycling programs. A combination of both "supply push" and "demand pull" has proven to be most

effective in harnessing market forces and transforming the market for energy-efficiency technologies and products.

17. The design of a GEF project that aims to promote energy-efficient products may adopt some or many of the above elements. The project's cost-effectiveness is ensured through a process of examining alternative approaches and activities and selecting only those which are considered to be effective and least-cost. For example, in a project to promote the adoption of compact fluorescent lighting (CFLs), one approach may be to pay customers rebates to meet the incremental costs of the newer, more expensive light bulbs. A customer rebate program might set the rebate level at $1 per lamp plus $500,000 project management and supervision costs. A $3 million project would likely result in the sale of no more than 2.5 million CFLs over a five-year project life. This estimate includes sales to those CFL users that are "free-riders", who would have purchased the lamps anyway. Such a project would only result in a "net" dissemination of 2 million CFLs, at a cost of $1.5 per lamp. Because the project is built upon an up-front subsidy, the project's gains might well disappear when the subsidy comes to an end, meaning that the project demonstrates limited sustainability.

18. An alternative approach might also cost $3 million, but it would not provide incremental-cost rebates to customers. Instead, it would promote the establishment and enforcement of minimum standards for the manufacture and import of lamps; launch a consumer-awareness campaign about the benefits of CFLs; and, in collaboration with electric utilities, provides CFLs to customers who will pay for them over a two-year period financed from the energy savings in their electric bills. As a result of this program, the market for CFLs would be expected to expand significantly in the country, with as many as 10 million CFLs being sold over the five-year period. Again, assuming that 20 percent of the purchasers are by "free riders" who would have bought the lamps anyway, the $3 million program would result in the "net" dissemination of 8 million CFLs, making the cost of the program less than $0.40 per lamp. This program is not only more cost-effective than the alternative, but in the long run, it is more sustainable because the regulatory framework, consumer awareness, and financing mechanism established are permanently established and are not dependent upon the project-based subsidy.

19. Thus, the latter approach to promoting the market for compact fluorescent light bulbs would be more effective than the subsidy-based design. While a few GEF projects from the pilot-phase adopted the former approach to energy efficient lighting, more recent projects have adopted the latter approach which is built more around the concept and experience of the model of "market transformation".

20. Renewable Energy. Many GEF countries wish to introduce renewable energy capacity into their national power grids and have established targets for grid penetration by renewable energy. Not only does the achievement of such a goal require significant investments in the renewable generating facilities themselves, but it also requires confirmed knowledge of the resource availability; proper legal and regulatory frameworks for the incorporation of the renewable power into the grid; technical know-how regarding the integration of intermittent resources into the grid; solid economic analysis for the use of the resource; the capability to construct, install and operate the renewable facilities; and the capacity to finance both the baseline and the incremental costs of the renewable installation. Thus, the establishment of a viable, renewable energy generating base in a country is a complex, long-term undertaking.

21. A GEF-supported project to promote on-grid renewable energy would have to address all of the barriers mentioned above and select from among the universe of all possible activities only those activities that are the most effective and least-cost alternatives. For example, if a country has as its objective the installation of 100 MW of wind generation capacity by 2010, GEF support may be requested to support this goal using a hypothetical contribution of $5million. This GEF project might be designed to support the incremental capital costs of a 20 MW demonstration project through an up-front, capital-cost subsidy to a plant to be procured on an engineering procurement contract (EPC) basis to be run by the government-owned utility. Although such an approach has very low management and supervision costs, it will most likely not result in the achievement of the nation's 100 MW target as no mechanism has been created to ensure that more than this initial 20 MW demonstration is installed. In addition, the government-owned utility will likely have little or no skill or experience of running a wind farm on a commercial basis. Typically, such demonstration projects have demonstrated that wind energy is very expensive, and very difficult. Furthermore, up-front subsidies have been shown to be less effective at stimulating renewable energy generation than production-based subsidies. So this approach, while possible, would generally not be considered to be a cost-effective option as it is neither terribly effective nor does it provide a least-cost approach to reaching the 100 MW goal.

22. In contrast, a different approach relying more heavily on the private sector and a performance-based subsidy would demonstrate greater cost-effectiveness. A performance-based subsidy can be designed in the form of incremental tariff support for each kilowatt hour exported to the grid. Such support could be guaranteed to the winner of a bid for a long-term power purchase agreement (PPA) that would be awarded to the least-cost bidder in a tender for wind generation. The tender would award the contract to the supplier offering the most electricity from wind at the least cost. In such a case, the same size of GEF grant can lead to more than the 20 MWs of wind that would be supported in the demonstration project example. However, such an approach may still not ensure the attainment of the 100 MW target unless some effort is made to ensure that the future incremental generating costs of wind are counter-financed through the regulatory structure. Once such a framework is established—through a surcharge or renewable portfolio standard—the remaining wind capacity can be readily facilitated through continued tendering to purchase wind capacity. Thus, in most cases, it will be cost-effective to devote GEF resources not only to the investment or the production subsidy, but rather to the establishment of a sustainable renewable energy financing framework.

23. The historical GEF portfolio contains examples of support to wind projects that span the gap between the former model of GEF support and the latter, more cost-effective model. Structured learning has led to the consensus that the latter approach represents both a more effective and a more cost-effective use of the same resources. While in some rare situations, projects pursuing the former "demonstration project" model may be all that is feasible, in other instances, the level of support described in the second case may be more than is necessary. In these instances, all that may be required to stimulate the development of 100 MW of wind capacity may be detailed wind maps—now obtainable through GIS and remote sensing—and the reformulation of the power sector regulatory framework to ensure the issuance of secure power purchase agreements at favorable prices. Thus, the cost-effectiveness of an intervention will vary depending upon resource endowments, the information available and a host of other baseline conditions.

Conclusion

24. As can be seen from the description of typical current practice in preparation and review of projects requesting GEF support, developing a cost-effective project involves comparing and evaluating not only the broad approaches to reaching a stated objective but also the different activities within each approach for both their effectiveness and their cost.

25. The Secretariat and the Implementing/Executing Agencies will continue to undertake cost-effectiveness analysis in project preparation. Analysis of alternate approaches considered and discarded will be undertaken; such an analysis, while largely qualitative, may include some quantitative measures. Where possible and sensible, quantitative cost-effectiveness analysis will be attempted. Increased attention will be paid to documentation of the cost-effectiveness analysis in the project executive summary.