FUNBIO FINANCIAL AND ECONOMIC ANALYSIS GUIDELINES

OP-10/2013

Responsible Unit: PMO – Focal Point

OBJECTIVE:

These guidelines are issued to assist Funbio staff and consultants to answer the basic economic questions that need to be asked and they outline the principles upon which the economic analysis of projects should be based.

ORGANIZATIONAL SCOPE:

This Procedure applies to the entire organization.

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RELATED DOCUMENTS:

- P-21 Appraisal and Selection of Projects for FUNBIO;
- P-22 Funbio Project and Program Evaluation Policy.

Privacy:

This document contains important process information, and is only issued to individuals within Funbio. This Operational Procedures should not be issued to individuals outside Funbio nor should it be amended or altered without prior consent.

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I. INTRODUCTION

1. The Brazilian Biodiversity Fund (Funbio) is a private non-profit organization that raises funds and provides services through projects for biodiversity conservation.

2. These guidelines are issued to assist Funbio staff and consultants to answer the basic economic questions that need to be asked and they outline the principles upon which the economic analysis of projects should be based.

3. The guidelines provide the basis for quantifying and valuing project costs and benefits where all relevant data are available. However, it may not always be possible to quantify and value all the costs and benefits of a particular project.

4. Not every form of analysis contained in these guidelines will be equally applicable to every project. Projects Departments will need to take a decision in project processing about the forms of economic analysis appropriate to a particular project.

5. Deciding at the Project Concept Note stage on the form and content of the economic analysis the team will undertake during preparation, so the thinking on the form of analysis and available data has already started (and perhaps already influenced project choice and design) and so that the analysis is started earlier and can play a larger role in helping to shape the project.

6. Over and above any requirements, the goal is to use economic analysis as a tool in working with the client to better choose and define the project and improve its design. Whether or not an estimated NPV or IRR is calculated, the underlying information, in whatever form it can be gathered and provided, is by itself the most useful input for many management decisions.

II. SCOPE OF ECONOMIC ANALYSIS

7. Economic analysis is used to choose the means using the least resources for a given output. All resource inputs have an opportunity cost through which the extent and value of project items are estimated. Projects should be chosen where the resources will be used most effectively.

8. Economic viability depends upon the sustainability of projects effects. Projects are sustainable if their net benefits or positive effects endure as expected throughout the life of project. Sustainable development is concerned also with distributional issues. When looking at the distribution of project effects and judging projects

social acceptability, it is important to determine who benefits and who pays the costs. An assessment of the capacity of the project to deal with an uncertain future is another measure.

9. In some cases, project preparation does not end with the decision to accept a project. In process projects, design and appraisal are continual and go along with project implementation. This allows for greater participation by project beneficiaries in the design and testing of different options.

10. The procedure for undertaken economic analysis follows a sequence of interrelated steps:

    a) Defining project objectives and economic rationale;

    b) Forecasting effective demand for project outputs;

    c) Choosing at least-cost design for meeting demand or the most cost-effective way of attaining the project objectives;

    d) Determining whether economic benefits exceed economic costs (for a directly productive project, where the output is sold in a relatively competitive environment);

    e) Assessing whether the project's net benefits will be sustainable throughout the life of project;

    f) Testing for risks associated with the project;

    g) Identifying the distributional effects of the project; and

    h) Enumerating the unquantifiable effects of the project that may influence project design and the investment decision.

III. THE LOGICAL FRAMEWORK

11. The Logical Framework provides a conceptual framework for analyzing projects. It is particularly appropriate for project where benefits are difficult to quantify and value. It provides a framework for identifying and comparing alternative means of achieving objectives.

12. In the Logical Framework, a project is seen as being made up of a series of means-ends relationships, beginning with input-output linkages, then output-purpose linkages and, finally, purpose-goals linkages. For each foreseeable year of project implementation and operation, explicit verifiable targets are set at each level for

each objective. The Logical Framework is thus both an appraisal tool and a means by which the project can be monitored for

- Implementation efficiency - testing the input-output linkage;
- Operational effectiveness - testing the input-output-purpose linkage; and
- Impact significance - input-output-purpose-goal linkage.

13. The Logical Framework provides for the identification, quantification, and valuation of project objectives or targets for inputs, outputs, project effects and impacts. The approach adopted for economic analysis depends on the extent to which project inputs, outputs, effects and impacts can be identified, quantified and valued.

14. The application of the Logical Framework approach to project design provides an analytical framework for both the economic and social analysis of directly and indirectly productive projects.

15. Economic evaluation has clear links to the Operational Risk Assessment Framework. In doing its economic analysis, the team has to project the future, an exercise that is inherently uncertain and subject to risks. Staff should identify the most significant uncertainties they will face in doing their economic projections during project preparation and the most serious risks to achieving the project development outcome that the project is likely to face. Key parameters should be fully consistent with and drawn from the information in the Operational Risk Assessment Framework. If the key risk parameters used for sensitivity analysis done as part of the economic analysis are not identified in the Operational Risk Assessment Framework, this inconsistency should be explained and explicitly justified in project documentation.

IV. Role of the Proponent in Project Economic Analysis

16. One of the major elements in project financing is the proponent´s institutional capacity development. Experience has shown that using proponent´s systems supports capacity development. It is desirable for the proponent to produce the economic analysis for the project using its own system. In that case, since economic analysis is part of due diligence, the task team then validates the analysis and works with the proponent to strengthen it if necessary. However, often the proponent's economic analysis capacity does not exist or is weak. In those cases, good practice is to share and discuss the analysis with the client at each step. Their

insights are likely to improve the analysis and the process can contribute to capacity building.

V. FINANCIAL AND ECONOMIC ANALYSIS

17. The economic analysis of projects is similar in form to financial analysis: both appraise the profit of an investment. The concept of financial profit is not the same as economic profit. The financial analysis of a project estimates the profit resulting to the project-operating entity or to the project participants, whereas economic analysis measures the effect of the project on the national or local economy. For a project to be economically viable, it must be financially sustainable, as well as economically efficient. If a project is not financially sustainable, economic benefits will not be realized.

18. Both types of analysis are conducted in monetary terms, the major difference lying in the definition of costs and benefits. In financial analysis all expenditures incurred under the project and revenues resulting from it are taken into account. This form of analysis is necessary to

    - assess the degree to which a project will generate revenues sufficient to meet its financial obligations;
    - assess the incentives for producers, and;
    - ensure demand or output forecasts on which the economic analysis is based are consistent with financial charges or available budget resources.

19. Economic analysis attempts to assess the overall impact of a project on improving the economic welfare of the community of local concerned. It assesses a project in the context of local economy, rather than for the project participants or the project entity that implements the project. Economic analysis differs from the financial analysis in terms of both (i) the breadth of the identification and evaluation of inputs and outputs, and (ii) the measure of benefits and costs. Economic analysis include all members of society, and measures the project's positive and negative impacts in terms of willingness to pay for units of increased consumption, and to accept compensation for foregone units of consumption. Willingness to pay and willingness to accept compensation are used rather than prices actually paid or received because many of the project impacts that are to be included in the economic analysis either will be nonmarketed, for example, biodiversity preservation.

20. The benefits from a project constitute the extent to which the project contributes to increasing the value of the consumption available to society. Consumption can be defined broadly. Societal consumption may apply equally well to a society's willingness to pay for preservation of plant or animal species, as to society's willingness to pay for the consumption of agricultural produce or clean drinking water.

21. Costs reflect the degree to which consumption elsewhere in society is sacrificed by diverting the resources required by the project from other uses. The total net changes in consumption available to the society represent the net impact of the project. When the units of consumption are valued in terms of marginal willingness to pay for the units of increased consumption and marginal willingness to accept compensation for foregone units of consumption, the resulting economic net benefits from the project will reflect the summation of the changes in the net income of the society as a whole, resulting from the situation with the project compared with that without the project.

22. Economic analysis is an integral part of project development. When properly conducted, economic analytic activities should inform and guide each stage of the project preparation and beyond. While the economic analysis may take a variety of forms, its completion is expected to be comprehensive and rigorous. While project economic analysis should be tailored to the specific needs of the project, an analysis basically belongs to one of two general categories; cost benefit or cost effectiveness. (Both categories typically include discussion of cost minimization along with a quantitative risk/sensitivity analysis.)

    - **Cost-benefit analysis**. Are the benefits in the base currency of the project likely to outweigh the costs in the base currency? Cost-benefit analysis is a method for comparing the economic pros and cons of policies and programs to help policymakers identify the best or most valuable options to pursue. Cost-benefit analysis monetizes all major benefits and all costs associated with a project so that they can be directly compared with each other as well as to reasonable alternatives to the proposed project. A cost-benefit analysis is generally considered the most comprehensive approach and, in many ways, the standard.

    - **Cost-effectiveness analysis**. How does the cost of the desired project outputs under the project compare to other options for providing the same or similar results? Cost effectiveness analysis evaluates which program or policy creates the wanted results at the lowest cost. Cost-effectiveness analysis is a technique used in weighing the effectiveness of a project against its cost. It is similar to a

cost-benefit analysis in many important respects but does not attempt to monetize all anticipated benefits deriving from the project or the alternatives considered. Its applicability is constrained by the need to make comparisons across alternative approaches that deliver roughly similar bundles of outcomes and benefits.

VI. IDENTIFICATION, QUANTIFICATION AND VALUATION OF COSTS AND BENEFITS

23. There are four basic steps to analyzing the economic viability of a project:

- Identify the economic costs and benefits;
- Quantify the costs and benefits, as much as possible;
- Value the costs and benefits; and
- Compare the benefits with the costs.

24. The first two steps can generally be undertaken together. However, there will be some types of benefits, and sometimes costs, that cannot be quantified and valued for inclusion in the cost- benefit comparison. They will simply be stated alongside the results of the economic analysis.

25. To identify project costs and benefits, the situation without the project should be compared with the situation with the project. The “without-project” situation is not the same as the “before-project” situation. The “without-project” situation can sometimes be represented by the present levels of the relevant resources. However, present levels would frequently change without the project, and this should be taken into account in defining the “without-project” situation.

26. The comparison of “without-project” and “with-project” situations is at the heart of the estimation of net benefits for any project. While, in practice, appraisal reports provide a clear specification of the “with-project” situation, they frequently provide little analysis of the “without-project” situation. The “without-project” situation is often inaccurately described. The “without-project” situation is that which would prevail without the project. It is not the implementation of the next best project alternative, unless there is clear evidence to suggest that this is most likely to be the case. Similarly, the “without-project” situation is not the delayed implementation of the same project. In most cases, it is a modification of the existing circumstances. In comparing project alternatives, the “without-project”

situation follows the same scenario, and provides the basis for comparing with-project net benefit flows for each project alternative.

27. If a project is part of a larger system, then the expected benefits may not accrue unless some matching investments are made. The project boundary must include the total system investment required to achieve the benefits and, correspondingly, the total system benefits. If the total system of investments is viable, then the project can also be considered viable.

28. However, a project may require the use of facilities already in existence. The costs of such facilities are sunk costs and should not be included in the project cost, provided their use in the project involves no opportunity cost. Put another way, sunk costs are those costs that would exist both without and with tie project, and thus are not additional costs for achieving project benefits.

29. Once the costs and benefits of a project have been identified and quantified, they should be valued according to a common criteria. This allows them to be aggregated and compared. Decisions will be based on financial prices. However, to evaluate the consequences of their decisions for the national/local economy, costs and benefits need to be valued at economic prices that represent their value from the national/local economic perspective.

30. Costs and benefits should be valued in constant prices, that is, in terms of the price level prevailing in the year in which the project is appraised. Any expected change in the general price level can be ignored. However, if it is expected that there will be significant changes in relative prices over the life of the project, then this relative price change must be incorporated in the valuation of the cost or benefit item.

31. In an economic analysis, market prices are adjusted to account for the effects of government intervention and market structure. The result s shadow prices. The relevant supply or demand prices have to be adjusted for the effect of trade controls and market structures that create a difference between financial and economic values. Therefore, the shadow price of an output or input is the weighted average of its supply and demand prices adjusted for these additional factors.

VII. ECONOMIC VIABILITY - PROJECT DECISIONS

32. The preceding section outlined the principles for identification, quantification, and valuation of project costs and benefits. The resulting streams of costs and benefits

are used to make project choices. Essentially, there are three types of project decisions :

- choice of the least-cost option for achieving the same benefits,
- choice of the best among project alternatives, and
- testing the economic viability of the best option.

33. The first type of decision occurs when benefits cannot be valued for comparison with project costs. The purpose is to achieve the same benefit effect at the lowest cost. The second type of decision occurs at the early stages in all projects, when choices are being made about project location, scale, size, and other features of project design. Costs and, to some extent, benefits may differ between mutually exclusive alternatives. The purpose is to choose the best alternative from the point of view of the national/local economy. The third type of decision is the basis for agreeing to fund a project or not. The best project alternative may not be economically viable. A test is needed of the economic viability of the best alternative for a project, in short, whether a proposed project is acceptable for investment or not.

34. To make these decisions, all cost and benefit streams are discounted to present value. To determine the least-cost option or to compare project alternatives, the same discount rate should be applied to the various cost and benefit streams. The same discount rate should be used to determine if a project is economically viable.

35. Where the benefits of a project cannot be valued, they cannot be aggregated with the costs of the project. In these circumstances, a decision can be made only about which option has the lowest present value of costs for providing a given level of output. If the full costs of each alternative are laid out over the full life of the project, including any residual value at the end of the project life, then for each alternative the present value of costs can be calculated using the chosen discount rate. The best alternative is the option with the lowest present value of economic costs.

36. Where the benefits of a project and project alternatives can be valued, they can be aggregated and compared with the costs of the project or project alternatives. Three criteria are commonly used to aggregate and compare costs and benefits. However, they cannot all be used in the same way to choose from project alternatives. The benefit-cost ratio compares the present value of the cost streams with the present value of the benefit streams, each discounted at the same rate. The net present value (NPV) also compares the present value of the cost streams

with the present value of the benefit streams. However, it does so not as a ratio but by taking the cost stream away from the benefit stream to obtain the net benefit stream, which can then be discounted. In choosing between project alternatives, the alternatives can be ranked according to their NPVs, which at economic prices represent the present value of net output that will be generated in the economy over the life of the project. The third criterion for summarizing the benefit and cost effects of a project alternative is the internal rate of return (IRR). The IRR represents the rate of return in economic prices that would be achieved on all expenditures of the project. The EIRR is calculated using the net benefit stream obtained by subtracting year by year all costs from all benefits. The EIRR is the rate of discount for which the present value of the net benefit stream becomes zero. Put another way, it is the rate of discount at which the present value of the cost stream is equal to the present value of the benefit stream.

37. The ranking of project alternatives according to these three criteria may differ. The overriding purpose of the economic analysis of projects is to increase the net output measured at economic prices in the national economy. The ENPV (Economic Net Present Value) criterion measures this directly. The choice between project alternatives should be made using the ENPV criterion at the chosen rate of discount.

38. The best project alternative may not be economically viable. A test of viability needs to be applied to the chosen alternative, and to any subprojects within it. The basic test for economic viability is whether or not there are other projects in the national economy that, when estimated in the same way, would yield a greater increase in net output. In practice, not all investment opportunities are collected together and compared. The way this comparison is done is to specify a rate of discount representing the next best alternative project in the economy, and to ensure that the project being analyzed creates net benefits in present value at a rate that exceeds those of the next best alternative. This can be done using any of the three criteria discussed above.

39. At a chosen discount rate, the two main criteria can be used as follows: Net Present Value: the discounted value of economic net benefits should be positive; and Economic Internal Rate of Return: The economic internal rate of return on resources should exceed that on the next best alternative project. These two criteria are equivalent. They will lead to the same acceptance and rejection of independent projects and subprojects.

VIII. GLOSSARY

IRR - Internal rate of return
NPV - Net present value
ENPV – Economic Net present value
ORAF - Operational Risk Assessment Framework

IX. REFERENCES:

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