How-to Note

Economic and Financial Analysis

Part II: Economic and Financial Analysis Methods

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Abbreviations

BCR   Benefit-Cost-Ratio

CBA   Cost-Benefit Analysis

CEA   Cost-Effectiveness Analysis

CER   Cost-Effectiveness Ratio

EFA   Economic and Financial Analysis

ERR   Economic Rate of Return

PCM   Project Cycle Management

IRR   Internal Rate of Return

M&E   Monitoring and Evaluation

NPV   Net Present Value

SROI Social Return on Investment

ToR   Terms of Reference

Introduction

This is an interactive, step-by-step operational manual on the planning and implementation of Economic and Financial Analysis (EFA), including interfaces to Project Cycle Management (PCM) and project monitoring. This is the second part of the EFA guide providing practical guidance while part one provides a basic understanding of EFA for all SDC staff.

1. REQUIREMENTS TO MANDATE EFA

Responsibility to contract the EFA mandate

The SDC organisation unit in charge for a project has the responsibility to select the institution/person to carry out or review an EFA and establish and finance the contract for the EFA.

Options to carry out an EFA

The SDC can mandate an EFA to any competent institution or person, including:

a) the project implementing agency itself

b) consultant(s) from a local institution

c) consultant(s) from an institution that is internationally active

d) consultant(s) from one of the three consortia selected by the SDC, based on the tender offer and working under the frame contact for EFA, which needs to be specified in ESPRIT: Project ID 203937/Notice No. 1154003:

    d1) Helvetas (Creditor No 65000002)

    d2) Consortium IKAT-HAFL (Creditor No 6505306)

    d3) Vivid Economics (Creditor No 65053073)

To **avoid a conflict of interest** in case (a), the SDC can request support from any institution or person to review the EFA and advise the SDC, provided the implementing agency accepts the choice of this institution or person.

Individual contracts under the three consortia (d) fall under the frame contact for EFA and shall be awarded based on the following criteria:

- Experience

- Subject matter expertise

- Availability

- Language requirements

- Most advantageous offer

- Avoidance of **conflicts of interest** as described below

Conflict of interest

Avoiding issues of prior involvement is required in the case of a tender for a subsequent project or project phase. **An EFA in preparation for a new project or a new phase of** an ongoing project **to be tendered (ex-ante EFA) should be undertaken by a company that will not compete for the project implementation**. An EFA carried out in preparation for a new project or a new phase should be provided in the tender documents.

Selection of the institution/person to be mandated

In the case of an ongoing project, the SDC proposes to the project implementing agency an institution/person to carry out or review an EFA.

The SDC ensures that the institution/person to carry out the EFA is not an actual or potential competitor of the implementing agency as the EFA mandate can provide insights and know-how detrimental to fair competition.

An actual or potential competitor is an institution or person operating in the same or similar thematic area and targeting the same or similar project objectives.

The implementing agency can turn down the proposed contractor if it has justified reasons (e.g., a competing agency). Once the reasons are accepted by the SDC, the SDC is to propose an acceptable alternative.

The project implementing agency should agree to furnish the data required for an EFA. The data required and the scope of the EFA will be defined in the TORs of the EFA. The TORs need to be agreed by the SDC, the institution/person in charge of the EFA and the project implementing agency.

The SDC organisation unit safeguards the confidential nature of the information of the implementing agency. According to the federal act on public procurement, in particular the following information or document have to be considered as confidential (not exclusively):

- Financial details of the offer such as fees and tariffs
- Technical details of the offer such as a specific methodology developed by the implementing agency

An option to avoid providing financial details may be to furnish aggregate figures (e.g., total personnel costs).

The SDC organisation unit in charge informs the institution/person that will carry out the EFA of its obligation to handle all data as confidential according to the contract with the SDC (in particular, art. 10 General conditions of business).

2. Selecting the right method for EFA

2.1 Overview of EFA methods

Value for money considerations are increasingly important amongst international donors and project implementers. Investors need guidance on where funds are best placed to achieve maximum impact and project managers need economic and financial information to test assumptions and optimise project design. While most development project results can be shown in quantitative, monetary terms, in some cases this is not easily possible. How can you quantify benefits from saving and protecting lives, from social wellbeing such as cohesion, inclusion, and peace, or from strengthening institutions and civil societies? Therefore, different types of Economic and Financial Analysis at different stages of project implementation and for different project approaches and development domains have been tested to provide information for various objectives. This manual will guide you in choosing the right method for your purpose and project.

SELECTING THE RIGHT TYPE OF EFA METHOD

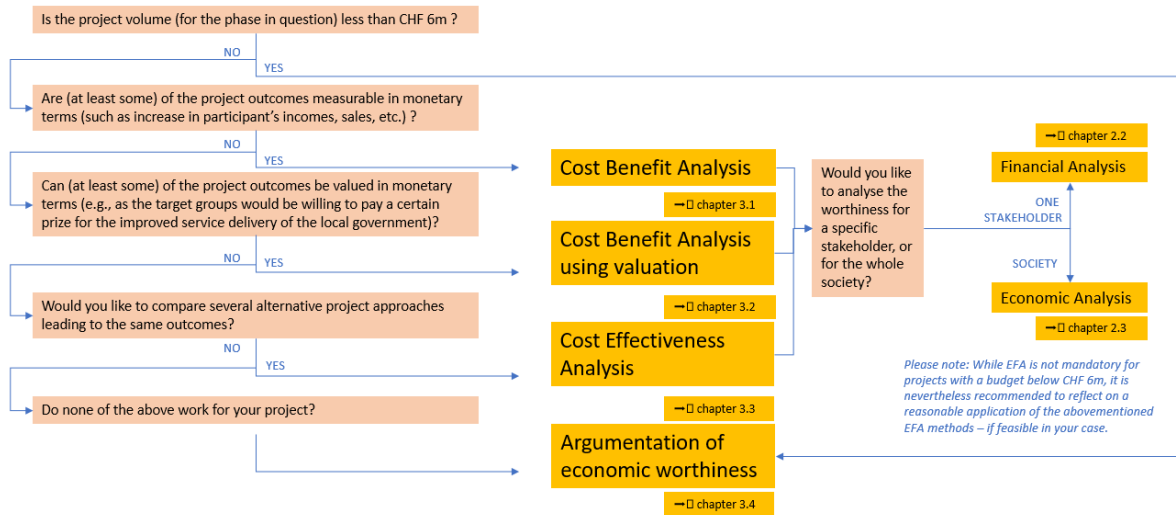### FOR ESTIMATING (EX-ANTE) THE ECONOMIC / FINANCIAL VIABILITY OF A PROJECT

Figure 1- Decision tree to select the right type of EFA method

On the right-hand side of the decision tree, you can see the choice between conducting an economic or a financial analysis.

A **financial** analysis takes the perspective of one specific actor or group of actors involved in the project, such as the producers, an unemployed person, or an entrepreneur. An **economic** analysis is concerned with the costs and benefits to *society as a whole.* In most developmental initiatives, we are interested in the whole society and population. Nevertheless, a financial analysis is required when it comes to viability and defining (financial) sustainability strategies for individuals (e.g., specific population group such as young women) and institutions targeted (e.g., what the project needs to include for specific partners to get engaged and continue the activities once the SDC project ends).

2.2 Financial Analysis for stakeholders

A **financial** analysis takes a look at *direct* monetary flows to and from an *individual* entity, thus analysing interests of specific actors (e.g., a group of project stakeholders such as training providers or a specific population group such as young women).

Financial analyses answer questions including:

- Is the project financially acceptable to a specific stakeholder or group of stakeholders?
- Does this stakeholder or group of stakeholders have a sufficiently strong financial incentive to participate in the initiative?
- What are the costs and benefits to a specific participating private investor or institution?

In addition, financial analyses may provide insights on how the returns and costs of a project are distributed among different interested parties and explain why certain stakeholders are in favour of the project while others have reservations.

Example for a Financial Analysis in Vocational Skills Development (VSD)

The Germany-Pakistan Training Initiative (GPATI), implemented by GIZ, piloted the applicability of a cooperative Vocational Education and Training approach according to the Pakistani context. In this pilot, leading Pakistani and multinational companies like Suzuki, General Tyre and Siemens provided work-based training for different occupations. In order to bring additional companies on board and respond to the often-voiced assumption that participating in Vocational Education and Training results is a loss for private companies, the project in 2019 mandated a **financial Cost Benefit Analysis**.

The analysis compared the monthly training costs incurred by the firms (direct costs) with the productive output generated by the trainees (direct benefits) and the savings on hiring and induction costs when a trainee stays with the company (downstream benefits). The CBA concluded that the five interviewed companies on average saved PKR 462,000 on recruitment costs and thus achieved a net benefit.[1]

2.3 Economic Analysis for society

An **economic** analysis is concerned with the costs and benefits to *society as a whole*, regardless of who pays and who gains. An economic analysis requires consideration of additional costs and benefits. While the financial analysis exclusively considers the costs and benefits related to the market aspects of the project, the analysis from an economic point of view defines benefits as an increase in social well-being. The costs are defined as reductions in social well-being. If you engage in an economic analysis, you will also need to account for externalities (e.g., effects on the environment) and adjust for distortions (e.g., taxes and subsidies) and adjust prices accordingly.

Example of an Economic Analysis in Vocational Skills Development (VSD)

After a successful completion of Phase I, the Building Skills for Unemployed and Underemployed Labour (B-SkillFUL) programme, financed by the SDC and implemented by Swisscontact, commenced its second phase with the aim to improve productivity and competitiveness of small and medium enterprises (SMEs) and create better jobs in the furniture making, light engineering and leather goods manufacturing sectors across six districts in Bangladesh.

During the planning of the second phase of the programme, the costs and benefits of different implementation scenarios were analysed by the implementer and discussed together with the Embassy of Switzerland in Bangladesh. With the aim of assessing the meaningfulness of the programme from the donor's perspective, an economic analysis was carried out.

The analysis compared the net income increases of employed training graduates (incomes of graduates minus incomes of non-participants) for a duration of 3 years after graduation with the overall programme costs (programme management costs, programme funds and opportunity costs for the training participation). Residual assets and expected externalities (benefits resulting from increased productivity of the skilled workforce, estimated as an additional 5% to income increases) were included as additional benefits. Depending on the scenario, the analysis came up with an Internal Rate of Return (IRR) between 27% and 35%. These results show that the project is economically worth.

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[1] C.f. Schläpfer & Troxler (2019): Return on investment or an investment without return? A cost-benefit ratio analysis of in-company training in Pakistan (https://www.dcdualvet.org/wp-content/uploads/2019_GIZ_Return-on-investment-Build4skills-Pakistan_long.pdf)

The next chapters will detail how to perform a given method of EFA.

3. Step-by-Step guides for different EFA methods

3.1 Cost-Benefit Analysis

The Cost-Benefit Analysis (CBA) assesses the **monetary value** of investments and ongoing expenses (costs) **versus expected returns** (benefits) over time and should answer the question: *Is the investment worth it?*

A CBA makes sense when monetised benefits can be compared to a project's costs. For a CBA you need to examine the 'without project' alternative, and then compare it with one or various proposed options. **The CBA needs to assess the value added** by the project. Only look at additional costs and benefits exclusively attributable to the project. Costs and benefits that might also be observed without the project should not be included.

➢ First step: Scope and boundaries
- Decide on the perspective you want to take based in the decision tree, whether a financial or economic analysis is required and if it is for the whole project or only parts of it.

➢ Second step: Design
- In the case of an ex-ante CBA, you will need plausible estimates regarding benefits that you can compare with the planned project budget. Such estimates can be taken from earlier project interventions or similar projects in comparable contexts (benchmark). Often, assumptions on outreach and expected benefits per stakeholder are already included in a new project's logical framework (indicators and targets).
- Decide if you have the necessary resources and analytical skills to carry out the CBA on your own or if you will need support from external consultants. In this case the Terms of Reference (ToR) for the consultants should clearly define the scope of the CBA and the data sources (see chapter 1 on finding and commissioning consultants). The next steps are to be undertaken by the actual economic analysts in close consultation with the project implementers and the concerned SDC staff.

➢ Third step: Modelling
- List the costs and benefits to start modelling.
- A detailed Logframe or Theory of Change with results indicators of the project is needed to answer the question of a project's planned results. For ex-ante analyses you will have to rely on assumptions, projections and estimates along with a narrative.

➢ Fourth step: Data Collection
- For ex-ante analyses plausible estimates and/or benchmarking will be needed (see step 2 above), which can then be validated and refined during implementation.
- For ex-post analysis, data must be provided through a solid monitoring and evaluation system. If the project implementer's data is incomplete,

you might need to reach out to additional stakeholders (i.e., training providers or graduates in the case of skills development) and collect monetised data directly from the beneficiaries.

- All data needs to be in monetary values (either in CHF or in the country's currency).

➢ Fifth step: Data analysis
- Develop a cash flow table.
- Define a reasonable discount rate[2] for the calculation of the project's Net Present Value (NPV) that reflects how much the project will earn and/or the Benefit-Cost-Ratio (BCR) showing discounted benefits relative to discounted costs.
- Calculate the Internal Rate of Return (IRR).
- Use a pre-defined template or develop your own format (using Excel for instance), depending on the specificities of the project[3].

➢ Sixth step: Interpretation
- Finally, the results shall be interpreted and discussed with the SDC concerned staff and project implementers, and sensitivity analyses performed (see section 3).

The first criterion derived from CBA is the NPV. Additional information is provided by the IRR and the BCR.

NB: In most projects (e.g., apprenticeship trainings), expected results such as increases of income only manifest after years, often after the end of a project phase. Therefore, it can make sense to look beyond costs and benefits for one phase and consider the entire lifetime of a project.

	Project should be rejected / revised	Project may be accepted
Net Present Value (NPV)	NPV < 0 (negative)	NPV > 0 (positive)
Internal/Economic Rate of Return (IRR or ERR)	IRR < social discount rate	IRR > social discount rate
Benefit-Cost Ratio (BCR)	BCR < 1 (costs outweigh benefits)	BCR > 1 (benefits outweigh costs)

Example of the CBA for the Gulf of Mottama Project, Myanmar[4]

The Gulf of Mottama Project's specific objective was to ensure the development of an enabling environment for the implementation of the Golf of Mottama Coastal Natural Resources Management Plan and support its implementation to result in an improved livelihood security for vulnerable women and men in targeted coastal areas.

The ex-ante cost-benefit analysis of the Gulf of Mottama Project (GoMP), in agreement with the SDC, was to examine the cost effectiveness of four specific components of the project, namely WASH sector, rice, green gram and the fishery value chain. We present here the latter only.

The analysis was done separately for each component, starting at the final level of users (farmers, fishermen) and comparing the situation with and without the project. Then the data

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[2] The discount rate depends on the economic context; it is therefore different in each country. The information on the discount rate may be provided by the central bank of a country, the World Bank local office or any other development bank. There is no formula for deriving the discount rate. The analyst will have to use judgement in choosing an appropriate rate if not available online from official sources.
[3] For some project types there are also templates available from the respective focal points (i.e., for VSD)
[4] See full report (HAFL, Helvetas, 2018)

was aggregated according to the project plans (number of farmers/fishermen involved over time) and the project administrated funds were included at this level of analysis. As a final step, the project management costs were added to assess the overall performance of the project towards the funds invested by the project and by the local stakeholders.

For the first level of analysis, the CBA was done considering individual fisherman with and without the project to take into consideration the changes incurred. The results were multiplied by the number of fishermen (according to project objectives over time), then the project costs (administrated funds) were added to the local costs. A share of the project management costs corresponding to fishery activities proportional to the share of administrated funds were included. The final CBA result was positive and acceptable with a highly positive NPV, an IRR of almost 28% and a BCR of 1.2. The sensitivity analysis showed that the model is quite sensitive to fish price fluctuations and to declining fish stock, thereby revealing important risks.

3.2 Cost-Benefit Analysis using valuation for less tangible benefits

Many development projects want to achieve results on less tangible aspects such as systemic or policy changes, improved governance, women's empowerment, and enhanced capacities. These types of results are more difficult to measure and are often not directly measurable in monetary terms. When at least some of the intended outcomes can be valued in monetary terms, a cost-benefit analysis with valuation can be performed. In all cases, we measure costs as shown in the previous section on CBA, and we value some selected benefits in monetary units. The same six steps apply as in a normal CBA, with an additional task of valuation to be included in the data collection (step 4).

A CBA with valuation can measure the results of surveys on people's willingness to pay for a good (e.g., clean air or honest government) or their willingness to accept payment of a certain amount to put up with something negative (e.g., pollution or corruption). It can aggregate the benefits of a variety of outcomes, even non-marketed costs and benefits can be valued (e.g., cost of time, carbon emissions etc.), including indirect benefits, as long as they can be translated into monetary terms.

Direct valuation and measurement:

The task is to identify the relevant outcomes produced by specific interventions and to then formulate good indicators (see example annex 6.1.2). Useful indicators could be for example: the number of ghost workers, the number of victims of corruption, the number of bribes reported, or the teacher absenteeism rates, and so on.

The next step is to translate these into monetary terms that can be measured. For example the number of bribes reported can be measured as the financial value of payments.

Indirect valuation:

Advanced valuation methods can credibly value even intangible benefits such as time, or outdoor recreation. There are two basic approaches: measuring people's stated (self-reported) preferences or drawing inferences from observing changes in their behaviour. It should be explored how well these approaches can measure the benefits expected. Rather than measuring direct prices, such methods measure 'shadow' prices. Shadow prices account for the social opportunity costs of a good or action.

Example of the CBA for the Civil Registration System Reform (CRR) Project in Tajikistan[5]

The objective of the CRR Project was to strengthen the provision of civil registration services in Tajikistan and increase public access to the system, thereby contributing to the better protection of legal rights.

An ex-ante analysis was performed to assess improved benefits in terms of (1) increased inclusion of citizens, especially children, in social, legal and economic rights; (2) better health outcomes, especially for children; (3) a decrease in polygamy and underage marriage; (4) sharply reduced actual costs for individuals; (5) a reduction in corruption; (6) improved law enforcement; (7) a decrease in statelessness; and (8) better data for government planning.

It was assessed from the beginning that the project will produce a complex mix of benefits. Some measurable in financial terms - reduced transaction costs, reduced health care costs - many, however, more difficult to measure. For instance, the benefits of improved childhood enrollment in primary school, while real, are first social; economic benefits will probably accrue after the lifespan of the project. Some benefits can be partially quantified. For instance, improvements to law enforcement and the functioning of the judicial system will bring both tangible economic benefits and less tangible (but still very real) social benefits such as an increase in closed cases, faster and fairer resolution of registry-related disputes, and so forth.

The project was able to value some of the 'less tangible' benefits. Consider the example of greater inclusion of citizens, especially children, in social, legal and economic rights. Failure or inability to register was clearly having a significant impact on many Tajik citizens, particularly children. An estimated 25% of Tajik children were not registered at birth. Many children are registered later in life, often when they are old enough for school, but an estimated 12% are never registered at all. Failure to register brings a number of disadvantages:

- Children are not eligible for school

- Unregistered adults and children cannot claim health benefits

- Unregistered adults cannot register marriages or possession of property in the cadastre

- Unregistered adults cannot obtain passports and may not be able to vote

- Unregistered adults cannot be formally employed

The social benefits of improved registration will be real and significant. However, most of the economic benefits in this category are either difficult to quantify or will not accrue until beyond the lifespan of the project. For instance, a conservative estimate is that improved registration will result in over 5,000 more children attending primary school per year across Tajikistan. Statistically speaking, these children will have significantly enhanced productivity and incomes for the rest of their lives. Ex-post evaluation (3-5 years after project ends) would be needed to correctly assess such long-term impact.

Some measurable benefits may accrue from increased access to social services, especially health and pension services, and to formal employment. The project modelled this by assuming that, beginning in year 5 of the project, a cumulative 1,000 adults per year will gain access to an additional $50 per year worth of benefits.

3.3 Cost-Effectiveness Analysis

Cost-Effectiveness Analysis (CEA) compares different alternative development approaches to reach a given planned result that is difficult to estimate in monetary terms (e.g., number of trees planted, number of teachers trained, number of children vaccinated or changes in the legal framework, improved public services, enhanced participation, etc.). Hence, CEA is a form of analysis that compares the relative costs of two or more possible intervention approaches that are intended to produce the same result. It is distinct from CBA in that it does not assign a monetary value to measure outcomes. CEA is particularly used in ex-ante

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[5] See full report (SDC, 2015)

evaluations to justify and select an approach for funding (as compared to alternatives). It is most useful when the outcome of an intervention is clearly decided and defined and there are different approaches to reaching it.

➢ First step: Scope and boundaries
  • Decide on the perspective you want to take based in the decision tree, whether a financial or economic analysis is required and if it is for the whole project or only parts of it.
  • For some projects, a mixed methods approach (e.g., combining CEA and CBA) might be suitable. For CEA, most cases are an economic analysis.

➢ Second step: Design
  • Define the different approaches that intend to produce the same result (or benchmarks from other projects to which this project should be compared).
  • Discuss from which sources you can obtain information on different options' costs leading to the expected benefits.
  • Assess if you have the necessary resources and capacities to develop the CEA by on your own or if you will need support from external consultants (see also above for CBA). The next steps are to be undertaken by the actual economic analysts in close consultation with the project implementers and the concerned SDC staff.

➢ Third step: Modelling
  • List the costs and benefits to start modelling.
  • An up-to date Theory of Change of the project (results chain or logframe) will be needed to answer the question of what results the project aims for.

➢ Fourth step: Data Collection
  • Data does not need to be in monetary values as in CBAs but should be in quantitative terms that allow for aggregation.

➢ Fifth step: Data analysis
  • The obtained data will be analysed. It is recommended to use Excel for this exercise.
  • For each alternative approach, the Cost-Effectiveness Ratio (CER) needs to be calculated by dividing total costs through the units of effectiveness (e.g., 1,000,000 CHF/400,000 people vaccinated).

➢ Sixth step: Interpretation
  • Results for the compared alternatives shall be interpreted and discussed.
  • Results need to be challenged critically by asking for sensitivity analyses (i.e., how would the results change if critical assumptions are modified).
  • Carry out a sensitivity analysis for the project using various combinations of different value estimates. (See section 3.1 above.)

Integrated CEA approaches for systemic interventions

In the case of the Golf of Mottama project, a CEA was also performed for the WASH sector. WASH interventions addressed drinking water supply, awareness raising for hygiene and waste management. The CEA allowed calculating a price per unit of drinking water produced by using alternative options and the analysis made a case for an open pond system.

For this system, the cost for 1 m3 of drinking water was 1,170 MMK per household for one month. For the villagers, the alternative was to buy water from a neighboring village. In that case they had to pay between 1,000 and 1,500 MMK/m3, which is in the same price range as

the water produced locally. From the perspective of the villagers, however, the water from the open pond is much cheaper because of the project subsidy allocated for the pond construction. They also have the control over the water, which may not be the case when depending on the neighboring village.

3.4 Argumentation of economic worthiness: the minimum standard

In many thematic areas, specific contexts, and particular situations of a project where outcomes and impact cannot be quantified (not even indirectly by measuring estimated prices or asking stakeholders how they would value the changes) EFA might not be applicable. Nevertheless, for decision-making some orientation on economic and financial effects is required. This involves collecting information to allow at least a qualitative judgment on the potential economic and financial consequences of a given project or project's component. Just as importantly, we need to know whether interventions are designed to maximise positive impacts and minimise negative impacts. An argumentation of economic worthiness should address these questions. It never provides complete answers, but it provides an informed base from which to make further arguments.

Why do we need an argumentation of economic worthiness?

- To make it more likely that we do the best things we can with the allocated resources.
- To make explicit the assumptions and analysis that underpin decisions so that those assumptions can be tested, challenged and improved, thereby promoting better decisions and designs.
- So that you can provide evidence or at least arguments to all stakeholders, including parliamentarians, civil society and the public that we use funds allocated in the most effective way possible to deliver development outcomes.

When planning an intervention, SDC staff must agree on the inputs, outputs, outcomes and impact. This requires careful use of evaluation and research evidence, as well as expert judgement.

Such argumentation can persuade colleagues to rethink poorly conceived proposals before too much time is spent on developing them. Good economic argumentation or analyses always reveals insights that inform policy design, and thereby improve value for money.

The following subsection presents a snapshot of a standard outline for an argumentation of economic worthiness - appropriate to evaluate the worthiness of projects in complex settings.

3.4.1 Standard outline for an argumentation of economic worthiness[6]

Rationale for intervention

You should provide:

- A detailed description of the problems that you are seeking to solve. Empirical evidence of the existence and severity of the problems should be presented.
- A counterfactual of what would happen at outcome and impact levels if no new intervention occurred.

Options considered for tackling the problems

Here you should present the number of options that the argumentation should consider, usually two - the proposed option and the counterfactual. The latter is usually expressed either

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[6] DFID (2009)

as the 'do nothing' option or as the 'do nothing more than is already being done' option. You should ensure that your analysis focuses only on incremental costs and benefits - that is, the changes that the proposed intervention generates over and above those of the counterfactual. This section must also summarise other options for solving the problem that were considered and the reasons why they were rejected. If no other options were considered, this should be stated, and the reasons given.

Intervention logic and evidence

For the proposed intervention, this section should make explicit the key assumptions that underpin the intervention logic (i.e., the links between inputs and outputs, outputs and outcomes, and outcomes and impact). You should comment on the strength of the evidence behind the assumptions. Much of the credibility of the economic argumentation rests on these assumptions being reasonable. This section should also identify assumptions that are particularly uncertain and are therefore the focus of the sensitivity analysis that is reported in section 4.

Incremental costs

This section should report the total incremental resource costs of inputs/activities for the intervention as a whole. You should state the contributions of all development partners and estimates of any additional resource costs incurred by the private sector and individuals. The distribution of costs over time should be made clear. A table may be the best way to present the time dimension and will allow visibility on the level of costs borne by each party.

This approach allows decision makers to transparently see the values of the resources that are being invested by each party in the intervention.

Incremental benefits/impact

The section should start by identifying the units of benefit that the argumentation is based on. This approach will push the analysis towards answering the questions "Is this intervention worth doing?" and "How can we design the intervention to maximise its positive impact on welfare?"

Evidence of links along the results chain should be strong, so the argumentation provides useful information to decision makers.

The distribution of benefits over time should be made clear. A table may be the best way to present the time dimension.

Finally, this section should list all impacts (including negative ones) that have defied credible quantification. You should add statements describing how significant each unquantified impact is likely to be.

Balance of costs and benefits

This is where you should report, where available, the best-estimate results from your argumentation. If estimating the volume of benefits at outcome and impact levels has not been possible, yet you have monetised values for the units of benefit, you should consider conducting break-even analysis. The question that this analysis answers is: "How many units of benefit would the intervention have to generate before the value of the benefits outweighs the costs?" You must also add a credible assessment of how likely the break-even point would be reached.

When your proposed intervention has significant unquantified benefits, you should include a judgement of whether hypothetical inclusion of the impacts might change conclusions about the argumentation of economic worthiness.

Sensitivity analysis

Please refer to section 4 on sensitivity analysis.

Summary and recommendations

This short section should appear in the main text of the Project Document. It should summarise all the information contained in the economic argumentation write-up and ensure that sufficient weight is given to important qualitative insights, acknowledgement of which will help decision makers avoid reaching poor conclusions.

Argumentation of economic worthiness[7]

The Local Trans Border Cooperation Programme in West Africa (with a budget of CHF 18 million for phase 2) intends to improve living conditions and access to basic infrastructure for at least 10% of the 20 million people living in the border regions addressed. For the benefits to outweigh the costs, each beneficiary must derive an average net monetary benefit of at least CHF 9 (18 million CHF / 2 million beneficiaries) from the implemented activities (primarily achieved through infrastructure measures, but also through improved capacities of the respective authorities) at the end of the programme. The number of indirect beneficiaries and the average net benefit amongst these beneficiaries are key parameters to be critically examined during implementation (sensitivity analysis). Further benefits regarding the prevention of violent extremism are difficult to quantify and attribute. In an end-of-phase evaluation, they should be examined by applying anecdotal evidence.

4. SENSITIVITY ANALYSIS

As already briefly mentioned in part I of this guide, EFA results should be challenged critically by discussing the assumptions made and, sensitivity analyses should be made for all the methods described above.

Estimating the basic cost and benefit elements of the project inevitably involves **subjective judgments** since it is built on uncertain future events. To contain these uncertainties and measure their impact on EFA results, the technique known as the sensitivity analysis helps to detect critical variables or sources of major risks for the project and, in turn, sets the basis for introducing effective mitigating measures.

The sensitivity analysis describes how a change in key parameters, prices and quantities would affect the EFA indicators. Variations, positive or negative, are likely to occur during project implementation (e.g., variation of benefits, change in costs) and affect the project's financial and/or economic performance. The most relevant question to be answered is: "How will changes in assumptions and prices affect project performance?"

The analysis is carried out by testing the effect of a realistic variation of one element at a time on the project performance. It provides grounded information to present a realistic range of project returns instead of a single estimate and test how robust the project performance is or to develop effective mitigation measures for major risk factors.

The first step is to identify major sources of uncertainty - risks but also opportunities. For each risk you should estimate some reasonable range of assumptions; this is done by modifying specific factors such as market prices of outputs and production costs.

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[7] See full example in annex 6.1.6

The next step is to examine the results and determine to what extent these events will change the profitability indicators (i.e., project performance).

A relevant point is to identify, within the range of assumptions, the cost and benefit items most influencing the project performance. The project design can thus be improved by increasing benefits and reducing costs of key items. Furthermore, this enables close monitoring of key variables. The EFA can easily identify the critical risks and better allocate resources for their mitigation.

The sensitivity analysis should be based on alternative scenarios associated with specific risks or opportunities, rather than a mechanical "xx percent change in costs." Decision makers want to understand how much values and assumptions may change for a project to continue to be considered efficient. For example, they may want to know how much costs can increase and/or how much benefits can decrease for the project to remain viable. This break-even analysis provides crucial information.

To summarise, EFA sensitivity analysis can contribute to better project design and risk assessment and can inform decision-making for the efficient allocation of project resources when designing mitigation measures. Where a reasonable change in an assumption of a parameter is critical, in the sense that it drastically changes an expected outcome, it is desirable to gather additional information. If further information suggests that there is a reasonable chance that the value could change and that this would lead to a change in the decision regarding a project, this must be stated explicitly. Decision makers then need to consider the project with this information, bearing also in mind all other non-economic factors.

5. EFA LIMITS AND GENERAL PRINCIPLES

The value of EFA as a tool for decision making depends on the quality of the data, information, and assumptions that underpin it. The more explicit a 'theory of change' is, the better it will frame and help to address these challenges. Data availability is a widespread problem for EFA analysts, who are dependent of thematic colleagues to provide or validate the necessary parameters of the analysis (e.g., volume and price of products, requested workload, enablers and barriers in value chains, power relations etc.).

In systemic interventions, the attribution of effects (outcomes and results) to a specific project is often challenging as you cannot control for many parameters, and this must also be taken into account in EFA. EFA are not the sole basis for decision making and must be complemented with other relevant methods and type of information as an exclusive focus on EFA results can be misleading.

The table below shows a set of the main key principles[8] and aspects to look for in the field when undertaking an EFA.

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[8] IFAD- Economic and Financial Analysis of rural investment projects

Key Principles	Methods of Application *(as an indication)*
Comparing different scenarios	**Sensitivity Analysis**: Test different hypotheses about the main assumptions. In all EFA, sensitivity analyses are required since most data rely on assumptions, scenarios and projections, which are by nature uncertain.
With and without project comparison	**Baseline**: To be able to compare the situation with the pre-project status, a baseline is needed. **Counterfactual**: Estimate what would have happened without the project (comparison group).
Data collection	**Main methods** are surveys, focus group discussions, and in-depth interviews with different stakeholders and key informants to estimate actual revenue and expenditure.
Discounting future benefits and costs	Discount future and previous benefits and costs back to year zero with the help of stakeholders and experts. An EFA would normally be set up for a time frame of 6 - 10 years. You will need to translate future costs and benefits into present-day values to account for the time value of money. Discounting provides a way to compare the monetary value of costs and benefits received in different time periods to present values.
Accounting for externalities	Economic analyses: Assess positive and negative externalities relying, for instance, on experts and key informants.
Adjusting for distortions	Economic analyses: Check for taxes and subsidies and adjust prices accordingly since these are transfers within the society.
Transparency	The credibility of an EFA is enhanced if the reasoning behind its conclusions is transparently communicated. A good question to ask is: "Using the evidence and assumptions that I have presented, could a decision maker reasonably be expected to work out how I have reached my conclusions?"
Analysis of CBA results	IRR / NPV / BCR should not be considered as standalone results for ultimate decision making as they can usually be incomplete as there may be other reasons for selecting an option (e.g., strategic or political reasons)

6. ANNEXES

6.1 Contextual examples[9]

6.1.1 CBA Example in an agricultural project

Imagine a very simple development project (as already introduced in part I of this guide) that uses technical assistance in vegetable farming for the inhabitants of a small village. The 4-year project has an initial investment cost of 0.5 million CHF (e.g., construction of a storage building). Yearly costs for inputs and maintenance are 1 million CHF. The production and storage start slowly; in year one, additional vegetables worth 0.75 million can be sold on the market. From the second year onwards, the increase in vegetables sold (compared to the situation before the project) is 1.5 million per year. At the end of the project, the storage building is still worth 0.2 million (residual value of investment). Based on this information, we can draw the following *cash flow table*:

	Year 0*	Year 1	Year 2	Year 3	Year 4
Investment costs	500 000				
Total additional costs		1 000 000	1 000 000	1 000 000	1 000 000
Total additional benefits		750 000	1 500 000	1 500 000	1 500 000
Residual value of investment					200 000
Net benefits	**-500 000**	**-250 000**	**500 000**	**500 000**	**700 000**

*Year 0 is a 'virtual' year when the funds are made available, so that the project can start directly in year 1.

As these costs and benefits occur over several years, they cannot be compared directly. We have to apply a *discount rate* as an adjustment factor to future values that reflect their present value. In this case, we go for 10%[10] and add an additional row to our table:

Present value of net benefits	-500 000	-227 273	413 223	375 657	478 109	**Total: 539 717**

The sum of these discounted values provides us with the *Net Present Value (NPV)*, in this case NPV= CHF 539 717. This sum reflects how much the project will generate.

Alternatively, the question could be: What discount rate would have to be used to obtain a NPV of zero? In this example, the result would be IRR= 35.2%. This rate is called *Internal Rate of Return (IRR)* for financial analyses and *Economic Rate of Return (ERR)* for economic analyses.

The *Benefit-Cost Ration (BCR)* finally is the ratio of discounted benefits relative to its discounted costs. As the result is a ratio, it allows comparing projects. In this example: BCR= 1.15.

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[9] Examples are simplified, full reports on each can be found on the sources given in each example

[10] The discount rate depends on the economic context; it is therefore different in each country. The information on the discount rate may be provided by the central bank of a country, the World Bank local office or any other development bank. There is no formula for deriving the discount rate. The analyst will have to use judgement in choosing an appropriate rate.

6.1.2 CBA with valuation example in a governance project[11]

A study of over 600 Indonesian village road projects found that increasing government audits from 4 % to 100% would reduce 'missing expenditures' by 8 percentage points. By contrast, increasing grassroots participation in monitoring had little average impact. Therefore, the CBA was done just for audits.

Costs were calculated as follows:

- Monetary cost of the audits = actual cost paid by the project per audit, including auditors' salaries
- Cost to society = increased taxes required to pay the monetary cost of the audits
- Time cost = monetary value of the additional time villagers spent at village meetings as a result of the audits, valued at average local wage rates

Benefits were calculated as follows:

- Net present value of reduced missing road expenditures = increase in the lifespan of the road
- Wages received by workers = increase in wage expenditure

Overall, the net social benefits from the audits were approximately US$ 250 per village, which implies that the benefits were more than 150 percent of the cost of the audits. This is a conservative estimate using equal-weighted net benefits, that is, calculations based on the assumption that the satisfaction in change of income is constant across individuals. If calculations assume that some benefits and costs were not equally distributed, using distribution-weighted net benefits, then net benefits are US$ 500.

A simpler way to calculate costs and benefits, one that relies on fewer assumptions and better approximates the way government agencies make decisions, would be simply to compare the reduction in corruption to the cost of the audits. This implicitly assumes that the social value of transfers to corrupt village officials (the rents) is zero. The reduction in corruption due to the audits, US$ 468 per village, is compared to the cost of the audits, $ 335 per village ($ 366 if we include villagers' time costs). With this simpler methodology, the audits once again appear cost-effective.

The costs of audits were set very high in this study, as 100 percent of projects were audited. Lowering the intensity of the audits would most likely increase the cost-benefit ratio.

6.1.3 CBA with valuation example in a WASH project

The cost-benefit analysis in the context of a programme such as that of water management was conducted within the frame of an SDC project in the Sahelian Chad.

Two systems of spreading thresholds were examined. The first was characterised by a strong agricultural activity (rainfed, recession and off-season agriculture) while the second was predominantly animal husbandry activities.

The main changes induced by the spreading thresholds in the valleys where these structures (and other erosion control structures) were built, included an expansion of the submerged area during the rainy season, a slowdown in the flow of surface water, and a reduction in water

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[11] 5547-cost-effectiveness-and-cost-benefit-analysis-of.pdf (cmi.no)

erosion. These changes induced a rise in the level of the water table and improved soil suitability for agriculture (in submerged areas), which allowed the development or intensification of agricultural and livestock activities.

The valued quantifiable benefits of the project were: a strong increase in productivity and a slight increase in the area of rainfed crops (millet and sorghum), a small increase in flood recession crops (without irrigation), and the development of off-season crops (with irrigation). The benefits for animal production were better water availability for watering livestock and increasing the availability of fodder.

The cost-benefit analysis was carried out separately for the two systems and showed encouraging results. The IRR was of 28% for the first system, with a BCR of 1.89 and of 34% for the second one with a BCR of 1.81.

See the full report on the study here.

6.1.4 CEA example in a health project

The SDC project 'Strengthening of Nursing in Bosnia and Herzegovina' was analysed with the intention to do a CBA. However, while analysing the project it became clear that benefits could not be quantified in monetary terms, therefore the analysis focused on the costs (CEA).

One important component of the project relates to providing primary healthcare services to the population at the places where they live or work, especially to people who are otherwise excluded from the healthcare system. For the analysis, unit costs have been defined as the costs per one visit of an average community nurse and the costs per patient reached. Costs included the project's investment costs, the additional costs of the education system for building the capacities of community nurses, and the 'running' costs of the established system. The analysis compared the unit costs with and without the project. Since it was not possible to quantify the final benefits for the patients, these have been described in narrative terms.

Improved training of community nurses and process improvements have significantly increased the number of beneficiaries reached in a month per nurse (from 66 to 220 patients/nurse). The costs per beneficiary reached have decreased from 14 mark (without the project) to 6 mark (at the end of the project). Thus, the authors of the CEA came to the following interpretation of the data:

"Thanks to economies of scale, significantly more people will be reached. The costs associated with the running of the community nursing system will increase the overall costs of the BiH health system in the medium term. But in the longer term, the successful provision of community nursing services is expected to lessen the burden of non-communicable diseases, leading to cost reductions in the overall healthcare system. This has positive effects not only on the direct costs of the health system but also on the overall economy by contributing to an increased economic output (through increased attendance and a higher productivity of the workforce). The substantial improvement in the health services induced by the project justifies the project investments."

See the full report on the study here.

6.1.5 CEA example in a WASH sector project

The Zimbabwe Handwashing Campaign was implemented from 2015 to 2017 with the goal of testing an innovative approach to promoting handwashing with soap at critical times among school children, caregivers and policy makers, and to disseminate the results among international actors in the WASH sector.

The economic assessment used a cost-effectiveness analysis. Costs were captured from the perspective of project implementers and local stakeholders. For benefits, the focus was put on the process outcome (improve hand hygiene behaviour), with additional measures of health impact (reduction of diarrhea) and non-health impact (reduction of school absenteeism). Costs per unit of effectiveness were measured first per direct and indirect beneficiary reached, second per person with changed handwashing behaviour.

The costs for the Zimbabwe Handwashing Campaign amounted to 677,179 USD for research and project design, 642,206 USD for general project costs (management and implementation) and an additional 133,130 USD contributed by local stakeholders and beneficiaries. The total cost was of 1,475,731 USD.

The campaign reached 68,059 direct beneficiaries at an implementation cost of 11.73 USD per direct beneficiary. The campaign further averted an estimated 50,658 cases of diarrhea (reduction of 60%) and 202,213 days of school absenteeism. The average cost lies at 15.76 USD per case of diarrhea averted and 3.95 USD/day of school absenteeism averted (excluding research costs). The campaign was able to influence national and district-level WASH and education policies to some extent and raise general awareness and improved understanding of the importance of hygiene and sanitation.

In comparison to similar studies, the Zimbabwe Handwashing Campaign had relatively high project costs but was able to achieve higher effectiveness levels at overall lower costs per behaviour changed. There were positive indicators for the sustainability of the campaign.

See the full report on the study here.

6.1.6 Argumentation of economic worthiness[12]

Introduction

The Local Trans Border Cooperation Programme in West Africa (*Programme de Coopération Transfrontalière Locale,* PCTL) covers the eight member states of the West African Economic and Monetary Union (UEMOA) and their border areas. The second phase is planned for the duration of four years (08/2020 – 07/2024).

Rationale for intervention

In West Africa, almost 50% of the population lives in cross-border areas where access to basic infrastructure and services is limited. The vulnerability of people in these areas has increased with the rise in insecurity in the region.

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[12] This example is based on a real project whose credit proposal (from August 2020) did not explicitly refer to EFA aspects. Corresponding arguments were added in this respect. Further examples and best practices will be added once EFA has been made mandatory and all new projects above a certain threshold have to present respective argumentations (or more elaborated EFA).

Options considered for tackling the problems

Since 2015, Switzerland's support to the UEMOA Council of Territorial Communities has made it possible to provide concrete and appropriate responses to the needs of the Saharan population. In phase 2, the programme will focus on supporting the consolidation of cross-border cooperation processes, the strengthening of local authorities' project management, social cohesion, and peace education.

As an alternative option, a stronger focus on the implementation of pilot projects (physical infrastructure) was considered. As such pilot measures only reach a comparatively small number of beneficiaries and considering the comparative advantage of the SDC over other donors, it was decided to focus more on 'soft' factors at the strategic level, such as capacity building for various stakeholders.

Intervention logic and evidence

Intervention logic (as described in the Credit proposal): "*If local authorities and their umbrella organisations are strengthened, if they are able to advocate to the UEMOA governing bodies, if they collaborate with civil society and private sector actors, and if they have sufficient capacity, then they will deliver basic services that meet the expectations of the population and thus contribute to the prevention of violent extremism and to sustainable development in the UEMOA space.*"

At the level of access to improved infrastructure and service delivery, the intended impacts will be clearly attributable to the interventions of the project. Overarching impacts however (such as the prevention of violent extremism) are dependent to a large extent on external factors and are therefore not taken into consideration as attributable incremental benefits.

Incremental costs

The expected costs for this phase, including contributions from the UEMOA, amount to CHF 18 million. The bulk of the costs will be spent in approximately the same amount in each of the years 2021, 2022 and 2023, with around 50% of the investment going into infrastructure measures (output 5) and the other half into capacity development of various stakeholders.

Incremental benefits/impact

Benefits refer to the final target group (indirect beneficiaries) reached by the programme interventions. Over 20 million people live in the border regions addressed by the programme. Assuming that the programme achieves increased access to socio-economic infrastructure for at least 10% (see target in logframe), we anticipate 2 million people benefitting from improved basic services, while many more might benefit from an improved legal and institutional framework and improved security.

Balance of costs and benefits

Based on the above data (CHF 18 million costs, 2 million beneficiaries) and with an assumed discount rate of 5%, it can be stated that each beneficiary must derive an average net monetary benefit of at least CHF 10 (or CHF 9 without any discounting) from the implemented activities at the end of the programme in order for the programme to reach its break-even point.

This should be assessed in an end-of-phase evaluation and taken into account in the planning of further phases. Further benefits regarding the prevention of violent extremism (beyond the beneficiaries reached by improved infrastructures), which are difficult to quantify and attribute, should also be examined by applying anecdotal evidence.

Sensitivity analysis

Key parameters that should be critically examined in the sensitivity analysis are the number of beneficiaries reached (primarily through infrastructure measures, but also through improved capacities of the respective authorities) and the net benefit per capita. For example, if the number of beneficiaries is being halved, the benefit per person must double in order for the programme to still reach its break-even point.

Summary and recommendations

The Local Trans Border Cooperation Programme in West Africa (with a budget of CHF 18 million for its phase 2) intends to reach at least 10% of the 20 million people live in the border regions addressed. For the benefits to outweigh the costs, each beneficiary must derive an average net monetary benefit of at least CHF 10 from the implemented activities (primarily achieved through infrastructure measures, but also through improved capacities of the respective authorities) at the end of the programme. The number of indirect beneficiaries and the average net benefit amongst these beneficiaries are key parameters to be critically examined during implementation (sensitivity analysis). Further benefits regarding the prevention of violent extremism are difficult to quantify and attribute. In an end-of-phase evaluation, they should be examined applying anecdotal evidence.

6.3 Glossary on terminology related to EFA

➢ Cost-Benefit Analysis CBA

Methodology that compares the evolution of monetised costs and benefits of businesses, programmes or policies over time, and assesses the profitability of the activity.

➢ Cost Efficiency Analysis CEA

Methodology that compares the costs of different options producing the same set of outcomes. CEA can be applied to businesses, programmes and policies. Cost-effectiveness analysis indicates which option produces a desired outcome at the lowest cost.

➢ Discount rate

The discount rate refers to the interest rate used to determine the present value of future cash flows. The discount rate takes into account not just the time value of money but also the risk or uncertainty of future cash flows; the greater the uncertainty of future cash flows, the higher the discount rate. High discount rates tend to penalise long-term projects, such as environmental protection, and to favour short-term projects and projects with quick benefits.

➢ Net Present Value NPV

The sum of all discounted costs and benefits is called the net present value (NPV). This sum reflects how much the project will earn. NPV is usually calculated by adding the present value of future cash flows, residual values, interest less investment costs, operational costs and future expenses. NPV is dependent on the value of the discount rate used to calculate these costs since the discount rate is used to calculate values over time. The NPV method is used for evaluating the desirability of investments or projects.

➢ Internal Rate of Return "IRR" or Economical Rate of Return ERR

IRR is the rate (similar to an internal interest rate) that is generated by a project or an enterprise. It is an indicator of the profitability of the project/enterprise. If the IRR is equal to the discount rate, then the discounted costs equal the discounted benefits; it would just break-even at that particular rate. The IRR is the discount rate at which the NPV for a project equals

zero. This rate means that the present value of the cash inflows for the project would equal the present value of its outflows.

➢ Benefit Cost Ratio

The ratio of (discounted) costs to benefits is the total discounted benefits divided by total discounted costs.

6.4 Bibliography, selected readings and references

Internal existing tools
Financial and economic analysis of development projects
Cost-Benefit Analyses (CBA) & The DCED Standard for Results Measurement
Financial and Economic Analysis of Projects with a focus on Cost-Benefit Analysis (CBA) and Cost-Effectiveness Analysis (CEA)

Other donors' methodologies
IADB Methods by sector
IFAD Guidelines on EFA: volume 1, 2, 3
Economic Analysis of investment operations
EFA JICA

Focus on CBA
Cost-Benefit Analysis for Development: A Practical Guide
Cost-Benefit Analysis in World Bank Projects: Report
Guide to Cost-Benefit Analysis of Investment Projects: Report

Focus on CEA
Cost-effectiveness and cost-benefit analysis of governance and anti-corruption activities
Cost-effectiveness analysis in humanitarian action
Cost-Efficiency Analysis of Basic Needs Programs

Alternatives methods guidelines
Assessing value for money
Guidance on measuring and maximising value for money in social transfer programmes
A strengthened approach to Economic Appraisals

In-text references
Beam exchange: Assessing value for money
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