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# Cost Analysis Guidance for USAID-Funded Education Activities

2021

Cost Analysis Guidance for USAID-Funded Education Activities

Bureau for Development, Democracy, and Innovation, Center for Education (DDI/EDU)

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

2021
Version 2.1

This document should be cited as follows:
Walls, Elena, Caitlin Tulloch, and Christine Harris-Van Keuren. 2021. *Cost Analysis Guidance for USAID-Funded Education Activities*, second edition. Washington, DC: United States Agency for International Development. https://www.edu-links.org/resources/usaid-cost-measurement

# Acknowledgments

This guidance note greatly benefited from the review and substantive input of many people. The authors are particularly grateful to the following USAID staff who supported the development of the original and the revised versions over many months: Rebecca Adams (USAID/AFR), Mitch Kirby (USAID/Asia), Barbara Knox-Seith and Nate Haight (USAID/LAC), Nathan Martinez and Joseph Spanjers (USAID/DDI/EMD). Anjuli Shivshanker, Josh Josa, Rebecca Pagel, Chris Ying, Ben Sylla (USAID/DDI/EDU), and Saku Deichsel (USAID/EP/E) reviewed drafts and provided valuable comments.

The authors would like to thank the following individuals and their respective organizations for providing substantive input in the content of this document: Brian Yates (American University), Karen Tietjen (Creative Associates), Amy Mulcahy-Dunn (EnCompass), Swetal Sindhvad (i3), Shahana Hirji (IPA), Anupama Dathan and Radhika Bhula (J-PAL), Emilie Bagby and Nancy Murrey (Mathematica), Alejandro Ome (NORC), Christine Beggs (Room to Read), Ben Piper, Tracy Brunette, and Amber Gove (RTI), Aimee Reeves and Dr. Hetal Thukral (School-to-School), and Clive Belfield (Queens College).

The authors would also like to thank Liz Brown and Katherine Johnston-Davis for substantial contributions to early drafts of this guidance note.

Finally, USAID Center for Education is grateful to the International Rescue Committee (IRC) for their extensive support for USAID's cost measurement initiative in the education sector generally, and the development of this note in particular.

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# Definitions

**Activity:** USAID ADS Chapters 200-300 define an activity as a sub-component of a project that contributes to a project purpose. Activity typically refers to an award (such as a contract or cooperative agreement), or a component of a project.

**Amortization:** The cost of an intangible asset spread out over the course of the asset's "useful life."

**Annualization:** The process of spreading out the cost of an asset over that asset's "useful life." Annualization takes into account an asset's depreciation and the interest that could have been earned on the undepreciated portion of the asset (Levin et al., 2018).

**Average Cost:** Total cost (usually of an activity) divided by the total number of participants (e.g., beneficiaries, households, classrooms, schools, etc.).

**Beneficiary:** The individual who is intended to benefit from an activity. For USAID-funded education interventions, this can typically be learners, parents/caregivers, educators, or education officials.

**Business-as-Usual:** A normal execution of operations. USAID-funded programs are frequently implemented as an add-on to the existing education delivery systems; such systems are considered "business-as-usual." Cost analyses can help estimate the *added* cost of interventions to the "business-as-usual" education delivery.

**Contributions:** Donations to activity implementation by the partner government, non-governmental entity, or private individuals. Contributions can be either in-kind (e.g., labor, tangible and intangible resources) or monetary.

**Cost:** The monetary expression of the value of resources required to develop and/or implement an intervention or produce specific goods or services, regardless of how these resources are financed. Cost is different from price, which is the monetary value exchanged in a market transaction for one unit of a good or service. Cost is specific to the site and time of the transaction.

**Cost Analysis:** The process of systematically examining the costs of developing and/or implementing an intervention, with or without additional data on intervention outputs or outcomes. Cost analysis can be retrospective or prospective. *Retrospective* cost analysis is defined as an application of cost analysis methods to actual data on cost (and results, if applicable) from interventions that have already been implemented. *Prospective* cost modeling is defined as the application of cost analysis methods to a hypothetical situation in the future, such as a scale-up, replication, or transfer of an intervention to a different implementer (e.g., the partner government).

**Cost-Benefit Analysis (CBA):** A type of analysis that systematically estimates the monetary value of all benefits produced by a program and compares this monetary value to the total costs of the program.

**Cost Capture:** A systematic way of recording the expenditures and corresponding contributions necessary to implement an activity into predefined categories corresponding to specific objectives.

**Cost Category:** A class of costs incurred to produce a particular kind of education output or outcome, such as trained teachers. *Cost Reporting Guidance for USAID-Funded Education Activities* (2021)

includes the following cost categories: 1) general operations, management, and reporting; 2) assessments and evaluations; 3) capacity strengthening of government systems; 4) capacity strengthening of local organizations; 5) pre-service educator training; 6) in-service educator training; 7) teaching and learning materials; 8) safe, inclusive spaces and infrastructure; 9) parents and community engagement; 10) private-sector engagement; 11) leadership development; 12) scholarships and cash transfers to individuals/families; and 13) other.

**Cost Driver/Mitigator:** A factor that creates or influences the cost of an input, an output, or a result.

**Cost-Economy Analysis:** A systematic examination of components of the program and cost of resources for each component over the time of the development and implementation of the intervention.

**Cost-Effectiveness Analysis (CEA):** An analysis of the amount of "effect" a program achieves for a given amount of cost incurred, or the amount of cost required to achieve a given impact.

**Cost-Efficiency Analysis:** An analysis of the costs of producing outputs. The results are frequently expressed as a unit cost for producing a particular output.

**Depreciation:** The process of distributing the cost of an asset which may last for many years over the course of its "useful life."

**Direct Cost:** Costs that can be identified directly with the implementation of a particular activity, process, project, or program (Ruth, 2008).

**Discount Rate:** A rate used to discount future costs or benefits to the present value of money. The basic idea behind "discounting" is that costs incurred in the future are less of a burden than costs incurred today. Therefore, future costs can be discounted to compare them with present costs (Levin et al. 2018).

**Donor-Associated Expenditure:** The costs that the intervention would likely not have if it were implemented by the partner government through existing systems. For example, costs of compliance with donor regulations and reporting requirements, security, transportation, human resources, and legal costs fall into this category.

**Dosage:** The amount of intervention (e.g., number of days of training, number of books per learner) a beneficiary is supposed to receive or actually receives.

**Economic Evaluation:** The process of systematically examining the total costs of producing outputs and outcomes of an intervention from a society's perspective. Costs are measured using national or local prices, including opportunity costs which may not appear as direct expenses to any organization. The objective of economic evaluation is to determine how to best allocate scarce resources to their best use from a society's point of view (Levin H., McEwan, Belfield, Bowden, & Shand, 2018). (See also Expenditure Analysis)

**Effect of an Intervention:** Effect of an intervention is defined as the change on an outcome variable of interest that can be attributed to a particular intervention, derived from an impact evaluation using an experimental or quasi-experimental methodology. (See also Incremental Effect)

**Expenditure:** The amount of money spent, as captured through an implementer's accounting system.

**Expenditure Analysis:** A systematic examination of expenditure incurred to implement an intervention and produce outputs and/or outcomes. In this category of cost analyses, non-monetary inputs into the intervention (e.g., opportunity costs, donated labor) are not included in the analysis. (See also Economic Evaluation)

**Fixed Cost:** Program costs that do not vary with the number of participants or beneficiaries served. A fixed cost is unaffected by changes in activity level. (See also Variable Costs and Total Costs)

**Full Costs:** Because the costs associated with Category 1 tasks (i.e., General Operations, Management, and Reporting) support all activity components, Category 1 costs are proportionately redistributed across the other categories to obtain the "full costs" of an individual intervention or activity.

**Impact Evaluation:** An evaluation with a rigorously defined counterfactual, usually following an experimental research design. Impact evaluations attempt to answer attribution questions relating to the outcomes of interventions (USAID 2011 Evaluation Policy).

**Implementing Partner:** The organization implementing the USAID-funded activity.

**Incremental Cost:** The cost of producing additional interventions, services, or units or adding participants to business-as-usual operations. Incremental unit costs are costs of producing one additional unit or adding one participant to the business-as-usual operations.

**Incremental Effect:** Changes in the outcome of interest which are attributed to the intervention. (See also Effect of an Intervention)

**Indirect Cost:** Costs that are not directly associated with a specific activity or program (e.g., office equipment).

**Inflation:** The increase of general prices in an economy over a period of time.

**Ingredient:** A type of resource used to develop and/or implement an intervention. Typical ingredient categories include labor, materials, rent, travel, and other elements; they can be disaggregated further into individual resources within an ingredient category (e.g., labor is an ingredients category and individuals such as project coordinators, trainers, chief of party, etc. are the ingredients within that category) (Levin et al., 2018).

**Internal Government Cost Estimate (IGCE):** The U.S. Government's own estimated cost/price of the proposed acquisition or assistance activity. It serves as a foundation for establishing a cost ceiling for a new activity.

**Market Price:** The observed cost for a unit of a resource in a particular market.

**Negotiated Indirect Cost Rate Agreement (NICRA):** An estimate of an organization's indirect cost rate (i.e. its facilities and administrative costs, and fringe benefit expenses) that has been negotiated and agreed-upon with the U.S. Government. It may enter into the expenditure report as an ingredient in all cost categories, often as "Indirect Costs."

**Nominal Prices/Costs:** Prices or costs expressed in their values before any type of inflation adjustment has been performed.

**Non-Governmental Entities:** Includes private non-profit and for-profit organizations as well as private individuals.

**Non-Recurrent Costs:** Costs typically associated with resources needed to develop and pilot the intervention model, also known as "sunk costs."

**Opportunity Cost:** The value of a good or service in its best alternative use. When a good or service is used for a specific purpose, the user "gives up" the possibility of employing it in another application (Levin and McEwan, 2001). For example, the opportunity cost of parents' time who participate in a parental engagement intervention is the value of income that could be earned by the parents in that time.

**Outcome:** A measure of an activity's impact or effectiveness, for example, scores on a standardized test. (See also Effect of the Intervention)

**Outputs:** The quantities of goods and services that an activity delivers to its beneficiaries.

**Performance Evaluation:** An evaluation that follows non-experimental methodology and does not attempt to answer attribution questions relating to the outcomes of the intervention (USAID 2011 Evaluation Policy).

**Price:** The monetary value exchanged in a market transaction for one unit of a good or service. (See also Market Price, Real Price and Shadow Price)

**Prospective Cost Modeling**: The application of cost analysis methods to a hypothetical situation in the future, such as a scale-up, replication, or transfer of a costed intervention to a different implementer (e.g., the partner government).

**Real Prices/Costs:** Prices or costs adjusted for price changes using an index of inflation.

**Replication of a Program/Intervention:** An act of implementation of an intervention in a location or with beneficiaries different from the original implementation. Replication may or may not include the transfer of the intervention to an entity or organization different from the original implementer.

**Retrospective Cost Analysis**: The application of cost analysis methods to actual data on cost (and results, if applicable) from interventions that have already been implemented.

**Scale:** Scaling is the act of expanding a tested concept, such as a pilot, to serve a larger number of beneficiaries in the same or different location(s). Scaling may or may not include the transfer of the activity to an entity or organization different from the original implementer.

**Sensitivity Analysis:** A type of analysis that looks at how sensitive the results of that analysis are to variations in certain costing parameters. Analysts carry out sensitivity analysis by varying uncertain parameters such as the discount rate, the cost of an ingredient, or the measure of effectiveness over a reasonable range such as "high," "middle," and "low" values. The goal is to see if there is any change in how cost-effectiveness ratios are ranked with each parameter change.

**Shared Costs:** Costs that support multiple tasks, interventions, or programs. For example, the cost of renting a space where staff work on different interventions or programs.

**Shadow Price:** The price estimated for a resource when the market price is unavailable. (See also Contributions)

**Social Perspective:** In economic evaluations, the perspective in which all costs are counted, regardless of who pays for them or if they are provided in-kind, and all benefits should be included, regardless of who accrues them (Levin et al, 2018).

**Stakeholder Cost Analysis:** Estimating the cost of an activity or intervention financed by different constituents that have an interest in the results of an intervention (e.g., communities, the partner-government, implementing partners, local partners, parents).

**Sunk Cost:** Costs that once committed cannot be recovered (e.g., costs of developing textbooks).

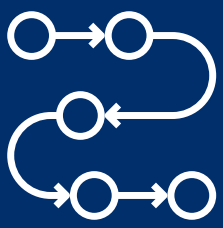
**Total Cost:** The cost after currency conversion and inflation adjustment.

**Transfer:** The act of handing over the implementation of an intervention to an entity different from the original implementing organization.

**Unit Cost:** The total expenditure incurred to produce one unit of a particular product or service.

**Variable Cost:** A cost that changes due to some function of the activity such as an increase in the number of beneficiaries being served (e.g., labor, teaching and learning materials). (See also Fixed Costs and Total Costs)

**Value-for-Money (VfM):** Spending resources in such a way that they maximize the intended outcomes. While there is no single, commonly accepted approach to establishing "the VfM" of an investment, DFID's 4E framework (economy, efficiency, effectiveness and equity) is the most widely recognized one in international development. In this guidance note, **VfM analysis** is understood as a qualitative judgment about the value of the investment against alternatives in advancing its objectives, based on cost and result data, either actual or hypothetical.



# Introduction

# 1. Introduction

## Guidance Objectives and Audience

This guidance document is produced by the USAID Center for Education (DDI/EDU) for USAID evaluation partners, implementing partners, and USAID Missions commissioning cost studies. It puts forward a common framework for analyzing costs of USAID-funded education interventions. It builds on and is complemented by the *Cost Reporting Guidance for USAID-Funded Education Activities*[1] (2018), also produced by the USAID DDI/EDU (*Cost Reporting Guidance* hereafter). The cost analysis approach presented in this note is designed to be applicable to the cost data collected following the *Cost Reporting Guidance.* Both guidance notes build on existing systems and best practices with the collection and analysis of cost data.

This guidance note is designed to help establish the process and procedures for how evaluators and cost analysts examine cost data in the education sector and set standards for reporting on findings. Adherence to this guidance will ensure comparability and transparency of cost analysis results and lay a strong foundation for continuous learning and improvement in cost-efficiency and cost-effectiveness of USAID-funded education interventions. Additionally, the guidance supports the implementation of the USAID ADS Chapter 201 provision that "All impact evaluations must include a cost analysis of the intervention or the interventions being studied."[2]

This document consists of two main parts. The opening part outlines common cost questions that USAID staff and implementing partners, partner governments, research organizations, academics, and other stakeholders may be asking, and presents an overview of analytical methods suited to answering these different questions. It also describes typical cases of cost analysis results utilization and broader applicability of findings. USAID staff, partner governments, and commissioners of cost analyses will find this part useful. The second part of this document contains a practical guide to implementing cost data analyses, with templates and resources. This part is designed for researchers, evaluators, and cost analysts. **This guide is designed to be applicable to all types of cost and expenditure analysis, with and without impact evaluation data.**

## Why Invest in Cost Measurement?

While the field of international education has made great strides in recent years in raising the number and quality of impact evaluations, their results would be more useful with associated cost data for the evaluated interventions. Policymakers and donors cannot make fully informed decisions about the best way to invest limited resources without information about the costs of achieving desired outputs and outcomes through different interventions or delivery strategies. Data on the cost of interventions is also

[1] Walls, Elena, 2018. *Cost Analysis Guidance for USAID-Funded Education Activities*. Washington, DC: United States Agency for International Development. https://www.edu-links.org/resources/usaid-cost-measurement

[2] *ADS Chapter 201. Operational Policy for the Program Cycle*, 201.3.6.4. Washington, DC: United States Agency for International Development. https://www.usaid.gov/ads/policy/200/201

critical for making responsible decisions about scaling and sustaining interventions within country systems.

There is agreement in the education development sector that we can achieve better and more sustainable results if we use cost data alongside effectiveness data to inform investment decision-making. However, despite decades of investments in education interventions, the cost of specific components of common interventions in the education sector is poorly understood. We do not know unit costs for such common interventions as educator training or the production of books, nor do we know how these costs vary in response to features of the interventions and the contexts in which they are implemented. Costs of the essential components of education delivery are frequently bundled with the cost of other components and are not readily available for examination.

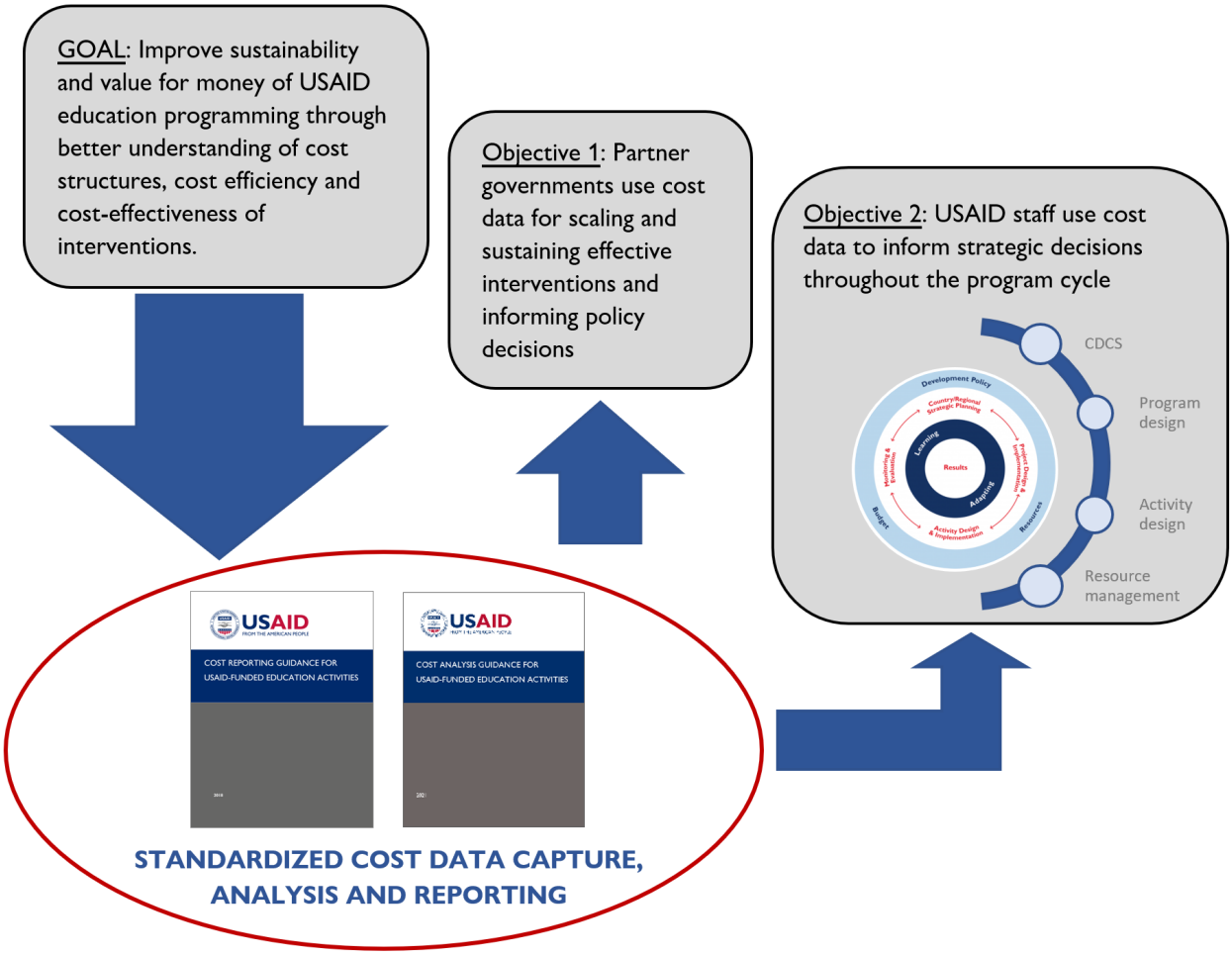
The USAID Center for Education cost measurement initiative works to address this gap by establishing systems and processes for capturing and analyzing the costs of education interventions funded by USAID. The initiative also supports linking costs to outputs and outcomes to enable value-for-money analyses, thus providing a pathway toward resource optimization across interventions and contexts. Routine cost measurement will lay the foundation for cost-sensitive development decisions as well as national and regional policy decisions. USAID Education Policy[3] emphasizes the need for collection, analysis, and use of comprehensive cost data in order to inform investment decisions in partner countries pertaining to scaling, replicating, and sustaining effective interventions. Detailed and accurate data on costs of intervention components are also necessary for intervention design, budgeting, and management.

USAID's guidance notes on cost reporting and analysis represent the first step in the routinization of cost data collection and analyses. This step is part of the ongoing efforts to strengthen the evidence base in the education sector. The overarching goal of the cost measurement initiative is to improve sustainability and overall value for money of USAID investments in the education sector, with two key objectives:

1. **Sustainability and local ownership**: ensure that effective interventions can be scaled and sustained by determining the cost of intervention components for transfer to partner governments.
2. **Improvement in planning and management of USAID education investments**: a) improve value for money of USAID investments in education by studying cost-effectiveness of comparable interventions to identify the least costly models with the greatest impact on the outcomes of interest; b) improve intervention efficiency through identification of cost drivers; and c) inform intervention design, planning, and budgeting through a better understanding of intervention cost structures in different contexts (Exhibit 1).

[3] USAID Education Policy, 2018. https://www.usaid.gov/education/policy

Exhibit 1. Cost Measurement Goal, Objectives and Approach

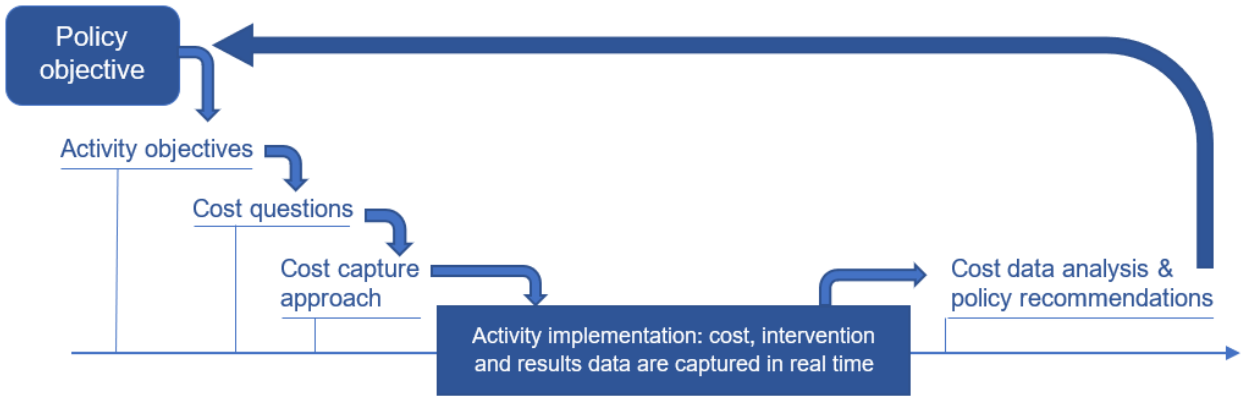



USAID's cost analysis approach is designed to answer cost analysis questions that directly support the objective of improving sustainability and the value for money of USAID investments in education, as outlined in the previous section. Cost analyses can be used for a variety of purposes. They can support government policy objectives, provide data for future USAID investment decisions, or help inform discussions with sector stakeholders. USAID Mission staff and their partners, in collaboration with the partner government and local stakeholders, can identify cost analysis objectives that will support specific strategic or operational priorities in the country.

Translating priorities and objectives into cost analysis questions requires consultations with key stakeholders early in the process to ensure consensus on the intended result of the cost measurement activities. **Cost questions should be answerable and aim to inform concrete decisions**. Early consensus on these questions is important, because different cost analysis objectives and questions will necessitate a collection of different data. To answer questions about the cost of sustaining an intervention, for instance, we need to know how much the USAID-funded activity spent on both developing and implementing this intervention. Questions about cost-effectiveness of different intervention models will require impact data and detailed cost data for each model.

Articulating cost questions early in the process will enable the collection of the most appropriate data throughout the implementation of the intervention (Exhibit 2).

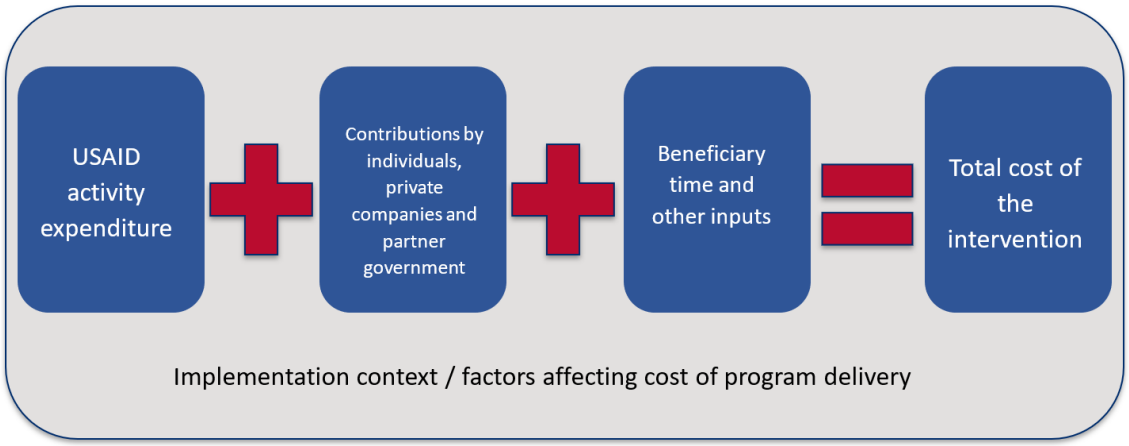
Exhibit 2. Cost Measurement Process




As Exhibit 2 illustrates, the cost questions need to be determined prior to launching the intervention so that appropriate cost data collection processes are established before the start of the intervention. It is difficult, if not impossible, to accurately estimate these costs after the activity is over.

To answer cost questions, we need to measure costs of activity components or specific interventions. **Cost measurement refers to a process of collecting, processing, analyzing, and reporting on the costs of interventions**. As outlined in *Cost Reporting Guidance*, cost data are comprised of expenditure data, private sector and government contribution data, and participant contributions of time (expressed in the analysis as the beneficiary opportunity costs). Additionally, to implement cost data analyses, we need to have data on intervention details (e.g., duration of trainings, geographic coverage of services). Exhibit 3 shows components of cost measurement that together help arrive at the total cost of an intervention. All three data components must be captured in order to accurately measure intervention costs. Data on implementation context and intervention details will help accurately contextualize findings and inform the use of results.

Exhibit 3. Intervention Cost Components



# Cost Analysis Methods

# 2. Cost Analysis Methods

## Methodological Elements of the Cost Analysis Approach

This guidance presents a cost analysis approach that is based on commonly used methods and best practices in development economics, education economics, and related fields. The purpose of all cost analysis methods is to better understand what resources were used to deliver a program and produce results (outputs and outcomes). Within that broad scope, there are different types of analysis that are suited to answering different types of questions. Based on what kinds of questions we have about the resources being used, these methods can broadly be thought of in two categories: **economic evaluation** and **expenditure analysis**.[4]

Economic evaluation (Exhibit 4) uses national or local prices and incorporates a "social perspective," meaning that it includes all costs, regardless of who paid for or donated the resources (e.g., the partner government, parents). In a traditional economic evaluation, unit prices are derived from representative surveys conducted by governments or industry associations; the prices are then adjusted for currency and inflation and the costs are amortized or depreciated if applicable. Activity costs and benefits are discounted over time (Levin et al. 2018). In contrast, our adapted approach analyzes actual expenditures incurred from interventions and adjusts for currency and inflation. We do not apply amortization or depreciation, and do not discount costs and benefits over time.

There are important reasons for these different methodological details. We use actual expenditures instead of deriving unit prices from representative price surveys because of the absence of surveys in countries where USAID operates. We do not depreciate equipment, buildings, and vehicles because we are interested in the actual costs incurred when they were incurred. Depreciation "smooths" out costs across time to determine an annual cost. Estimating an annual cost is unhelpful for our analysis because it distorts the actual costs and the time in which the costs were incurred. Another reason depreciation is not applied is because at the conclusion of an activity, USAID typically donates these resources to the partner government.

Lastly, differently from traditional economic evaluation, we do not discount benefits over time and discount cost at zero percent (which effectively means we do not discount costs, either). The idea behind "discounting" is that costs incurred in the future are less of a burden than costs incurred today, and the benefits in the future are less valuable than they are today; therefore, future costs and benefits can be discounted to compare them with present costs and benefits. Different decision-makers will use different estimation methods for discounting based upon their situation. For USAID's education sector, the opportunity cost of investment is usually zero since funds are appropriated for specific sectoral work and cannot be easily redirected to produce benefits elsewhere.[5] For this reason, this guidance uses the discount rate for costs at zero percent. With regard to discounting benefits in education, recent

[4] While there is a variety of different books, documents, reports, and studies available that discuss cost analysis methods, for simplicity's sake, we are comparing our method to the ingredients method per Levin et al. (2018).
[5] For more on the issue see: Ackerman & Heinzerling, 2001; Cowen & Parfit, 1992; Gravelle & Smith, 2001; Parsonage & Neuburger, 1992

research[6] suggests it may have a potential negative impact on education policy by erroneously exaggerating the short-term benefits of education interventions at the expense of longer-term benefits and neglecting age-sensitive nature of education delivery[7]. Following this line of argument, this guidance does not discount benefits.

Differently from methods used in economic evaluation, an expenditure analysis usually estimates costs from one specific stakeholder's perspective, using the records of expenditures actually incurred to purchase a resource, and does not include the monetized opportunity costs of donated items.[8]

In this guidance, we use a modified economic evaluation approach and, when appropriate, expenditure analysis. Exhibit 4 shows the summary of methodological elements underpinning USAID/Education cost analysis approach and highlights distinctions from the traditional economic evaluation.[9]

Exhibit 4. Methodological Elements of USAID/Education Cost Analysis Approach

| Methodological Elements | Economic Evaluation (cost-efficiency and cost-effectiveness analysis) | | Expenditure Analysis (cost-economy analysis) |
|---|---|---|---|
| | Traditional Economic Evaluation* | USAID-Adapted Approach | |
| Whose costs are counted? | All stakeholders including: Donor(s), implementing partner, partner government, non-governmental sector, private individuals | | One stakeholder/entity |
| Are contributions monetized? | Yes | | No |
| What prices or expenditures are used? | National or local prices derived from nationally representative surveys conducted by governments or industries | Actual expenditures from interventions | Actual or projected prices |
| How are costs adjusted? | Amortization/depreciation<br>Currency exchange<br>Inflation | Currency exchange<br>Inflation | Currency exchange<br>Inflation |
| Are costs discounted over time? | Yes | Yes, but discount rate is set at zero | Yes, but discount rate is set at zero |
| Are benefits discounted? | Yes | No | No |

* *Not covered in this guidance.*

Although this approach was tailored specifically for the cost data generated using USAID's *Cost Reporting Guidance*, it can be applied to the costing of other education programs as well. However, analysts and consumers of the findings should be aware of these important distinctions between our approach and economic evaluation methods typically used in developed countries.

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[6] Tal Gilead, 2015. "Should Educational Policymakers Discount Future Benefits?" Oxford Review of Education, 41, 3, 404-420
[7] Ibid.
[8] Levin et al. (2018) refers to a similar method as cost-feasibility analysis. Because this method is not the focus of the book, little is said on this topic.
[9] The authors thank A. Brooks Bowden for previous discussions about economic evaluation methods, specifically the use of the "ingredients methods" in domestic education evaluations.

# Key Terms

The following terminology is referenced throughout this document. Familiarity with these terms will facilitate understanding of the content. For a more detailed explanation please refer to the Glossary of this document and to USAID's *Cost Reporting Guidance*.

- *Contributions* are in-kind or monetary donations by the partner government, non-governmental entity, or private individuals.
- *Cost* is defined as the monetary expression of the value of resources required to develop and/or implement an intervention or produce specific goods or services, regardless of how these resources are financed. Cost is different from price, which is the monetary value exchanged in a market transaction for one unit of a good or service. Cost is specific to the site and time of the transaction.
- *Cost analysis* is defined as the process of systematically examining the costs of developing and/or implementing an intervention, with or without additional data on outputs or outcomes. Cost analysis can be retrospective or prospective. *Retrospective cost analysis* is defined as an application of cost analysis methods to actual data on cost and results, if applicable, from interventions that have already been implemented. *Prospective cost modeling* is defined as the application of cost analysis methods to a hypothetical situation in the future, such as a scale-up, replication, or transfer of an intervention to a different implementer (e.g., the partner government).
- *Cost category* is defined as a class of costs incurred to produce a particular kind of education output or outcome, such as trained teachers or teaching and learning materials.[10]
- *Dosage* refers to the amount of intervention (e.g., number of days of training, number of books per learner) a beneficiary is supposed to receive or actually receives.
- *Expenditure* is the amount of money spent, as captured through an implementer's accounting system.
- *Ingredient* is a type of resource used to develop and/or implement an intervention. Typical categories of ingredients include labor, materials, rent, and travel (Levin et al., 2018).[11]
- *Price* is the monetary value exchanged in a market transaction for one unit of a good or service.
- *Shared costs* refer to costs that support multiple tasks, interventions, or programs. For example, the cost of renting a space where project staff work on different tasks.

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[10] Cost Reporting Guidance for USAID-Funded Education Activities (2021) includes the following cost categories: 1) general operations, management, and reporting; 2) assessments and evaluations; 3) capacity strengthening of government systems; 4) capacity strengthening of local organizations; 5) pre-service educator training; 6) in-service educator training; 7) teaching and learning materials; 8) safe, inclusive spaces and infrastructure; 9) parents and community engagement; 10) private sector engagement; 11) leadership development; 12) scholarships and cash transfers to individuals/families; and 13) other.

[11] Henry Levin (1983, 2001) formalized this approach in education economic evaluations as the "ingredients method." This method "distinguishes between input quantities and prices; the product of quantities and prices yields an estimate of the total social cost of an intervention, program or policy." (Clive Belfield, A. Brooks Bowden, and Henry M. Levin, 2018. "Cost estimation in education: The ingredients method," Chapters, in: Scott Farrow (ed.), *Teaching Benefit-Cost Analysis*, chapter 16, 200-207, Edward Elgar Publishing.)

# Summary of Methods

Analysts have several options for the kinds of cost analyses they can do, each of which addresses slightly different questions and requires somewhat different data. The cost analysis objectives, questions, and intended use of results that were originally specified should determine the type of analysis performed. No single analysis type is appropriate for all questions or all intervention types. Likewise, there is no single cost analysis method that we should seek to apply to every intervention. **Attempting to apply a particular method when the necessary data are not available is likely to result in inaccurate estimates that are not useful for decision making.** It is important to note, however, that if relevant data are available, it is possible to conduct multiple types of analyses with regard to the same intervention.

In this guidance, we discuss four cost analysis methods and their application to existing interventions and programs and to hypothetical scenarios. These include cost-economy, cost-efficiency, cost-effectiveness, and cost-benefit. Exhibit 5 summarizes these methods with associated illustrative objectives, questions, and data requirements. The following subsections provide more detail on each type of analysis and include real case studies that used these analyses.

Exhibit 5. Cost Analysis Methods and Illustrative Questions

| Analysis Method[12] | What Questions Can It Answer? | What Can Cost Analysis Help Achieve? | What Data Will Analysts Need? |
|---|---|---|---|
| Cost-economy analysis | • What did it cost to deliver this intervention?<br>• How much was spent on different components? | • Help plan/budget for new activities<br>• Help manage existing activities | • Details of the intervention<br>• Expenditure and contributions reports disaggregated by cost categories and ingredients<br>• A method for allocating shared costs across cost categories |
| Cost-efficiency analysis | • What did this intervention cost per *output* delivered?<br>• How does that *compare* to other interventions to produce this output? | • Identify unit costs per output<br>• Compare unit costs across delivery methods and identify which one achieves the most outputs, within a given budget | • Details of the intervention<br>• Expenditure and contributions reports disaggregated by cost categories and ingredients<br>• A method for allocating shared costs across cost categories<br>• Output counts using a common indicator for all interventions |
| Cost-effectiveness analysis | • What did this intervention cost per *outcome* delivered?<br>• How does that *compare* to other interventions that produce this outcome? | • Identify unit costs per outcome<br>• Compare costs of outcomes across different interventions<br>• Identify the intervention that achieves the most outcome, within a given expenditure per beneficiary | • Details of the intervention<br>• Expenditure and contributions reports disaggregated by cost categories and ingredients<br>• A method for allocating shared costs across cost categories<br>• Credible estimates of the impact<br>• Credible estimates of the cost and effects of comparable interventions |

[12] The first three cost analysis methods presented here correspond to the three elements of FCDO's Value-for-Money framework that emphasizes economy, efficiency, and effectiveness (the fourth element being equity). Source: UKAIDdirect.org https://www.ukaiddirect.org/learning/value-for-money/

| Analysis Method[12] | What Questions Can It Answer? | What Can Cost Analysis Help Achieve? | What Data Will Analysts Need? |
|---|---|---|---|
| Cost-benefit analysis | • How did the costs of this intervention compare to the monetary value of all the benefits created by this intervention? | • Identify whether the studied intervention was "worth" the investment in monetary terms | • Expenditure and contributions reports disaggregated by cost categories and ingredients<br>• A method for allocating shared costs across cost categories<br>• Credible estimates of intervention's impact on all outcomes<br>• Economic valuation of the long-term benefits of the intervention |

## Prospective Cost Modeling

Each cost analysis method can be used to answer questions about the programs and interventions that have already been implemented as well as questions about hypothetical situations in the future. Such hypothetical situations can be a scale-up of the intervention, a replication of the intervention with different beneficiaries or in another context, or a transfer of the intervention to a different implementer (e.g., a transfer from a donor-funded implementation to government-supported implementation). **An application of cost analysis methods to a hypothetical situation in the future involving a scale-up, replication, or transfer of an intervention is called *prospective cost modeling*.**

Exhibit 6. Prospective Versus Retrospective Analysis



RETROSPECTIVE COST ANALYSIS
*How much did that intervention cost to develop? How much did it cost to deliver, per learner? How much did we pay for the books? How much did the intervention rely on volunteer tutors?*

PROSPECTIVE COST MODELING
*How much should we budget to deliver this intervention, per learner? How much will we need to budget for the books? How much should we budget for tutors if we can't rely on volunteers?*

Data needs of the prospective cost analyses are more extensive compared to the retrospective analyses of the existing programs. To answer questions about costs of intervention scale-up, replication or transfer, analysts would need to examine how differences in prices of inputs and implementation

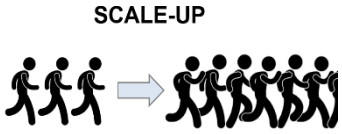
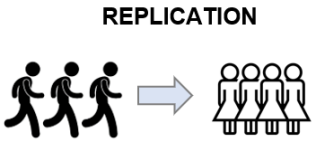
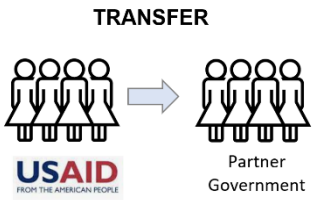
conditions will impact the costs of intervention delivery as it has been implemented thus far. It is also not uncommon that the intervention model may undergo some changes in the future scenarios. For example, an intervention may have relied on donations to support its implementation (e.g., volunteers) that may not be possible under the conditions of the future implementation. To produce as accurate estimates as possible, prospective cost modeling will need the following, at the very least:

- Detailed information about the planned intervention model, including information about beneficiaries, scale, dosage, delivery method, and sequence
- Data on the original implementation, including produced outputs and/or outcomes
- Original implementation costs disaggregated by cost categories and ingredients within each category
- A method for allocating shared costs across cost categories
- Local input price databases for the original intervention as well as the planned one
- Sensitivity analysis conducted on different scaling scenarios

For the cases of transfer of implementation to the partner government, information about the existing government cost structures and relevant unit costs would also be needed. While it may be possible to implement prospective cost modeling without these data, the analysts would need to make numerous assumptions resulting in inaccurate estimates.

Exhibit 7 summarizes different types of prospective cost modeling.

Exhibit 7. Prospective Cost Modeling Use Cases

| Use Case | Definition | |
|---|---|---|
| **Scale-up** | The act of expanding an intervention to serve a larger number of similar beneficiaries in the same or similar location(s). Scaling is the change in scale when the context stays mostly the same. |   |
| **Replication** | Replication is the act of implementation of an intervention in a location or with beneficiaries different from the original implementation. It is not uncommon that replication of an intervention is also accompanied by a change in scale and/or a change in an implementer. |   |
| **Transfer** | The act of transferring the implementation of an intervention to an entity different from the original implementing organization. It is not uncommon that transfer of an intervention is also accompanied by a change in scale. |   |

Prospective cost modeling questions are usually answered using cost-economy and cost-efficiency methods. It is not recommended to apply prospective cost modeling to cost-effectiveness questions since the effectiveness of an intervention may not be the same when it is scaled up, replicated with different beneficiaries or in another context, or transferred to another implementer. Prospective cost-effectiveness analysis questions (e.g., "How much would it cost to replicate these results at scale?") can

be more appropriately asked as cost-efficiency questions ("How much would it cost us to scale up this intervention that we know produced the desired effect?").

Finally, when reporting on the findings of a prospective cost modeling, it is essential to clearly list assumptions and describe expected changes in the intervention model. It is also helpful to note what costs may *not* be included, such as staff capacity building, oversight costs, or adjustments to internal processes that might need to take place.

### ON PERSPECTIVES

An important feature that distinguishes prospective cost modeling from retrospective cost analyses is the importance of the perspective from which the cost analysis questions are asked and the results will be used. For example, the frequently asked question "How much would it cost to scale up this intervention?" lacks clarity about who will be funding and managing the scale-up of the intervention. Is it USAID? Is it a partner government? Is it another party (e.g., a different donor)? The perspective from which the cost analysis question is asked is therefore critical in determining which data we will need to include to answer that question. Prospective cost modeling implemented from the partner government perspective will usually not need to include USAID-specific costs, such as costs of complying with USAID rules and regulations, costs of starting up and closing out an activity, or costs of routine operations. Some of the technical implementation costs may also not be necessary to include since they may already be included as part of the existing government systems.

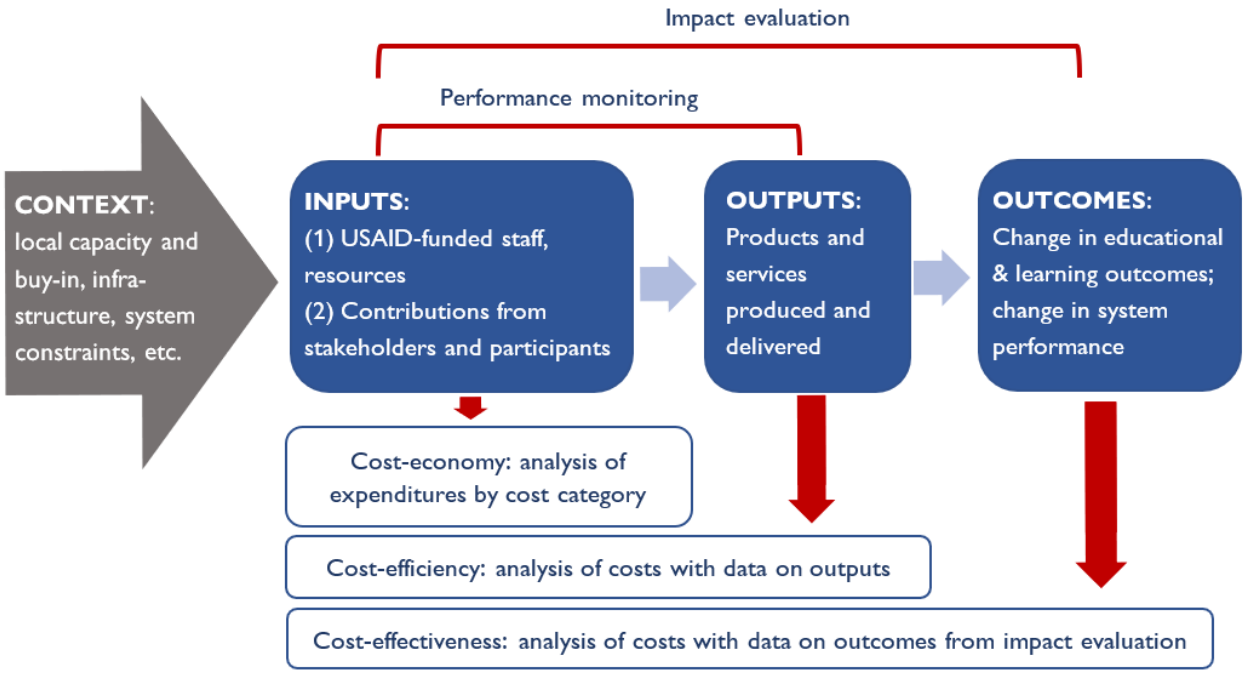
By contrast, if the same question is asked from the perspective of USAID, all these costs will need to be accounted for in the analysis. When planning a prospective cost study or reporting on results, it is crucially important to be clear on which perspective the analysis reflects. When reporting on results of retrospective cost analysis, it is equally important to indicate the limits of applicability of the findings. For example, results of a retrospective cost analysis of a USAID-funded education intervention that was implemented by an iNGO cannot be assumed to apply to the same intervention if it were implemented by the partner government.

## Alignment with Monitoring and Evaluation Activities

The successful use of the cost analysis methods depends on the availability of high quality, detailed cost data, intervention implementation data, and results data. It is important to have cost measurement integrated throughout the activity life cycle and aligned with monitoring and evaluation activities to ensure collection of all relevant intervention, cost, and results data. This is particularly important for cost-efficiency and cost-effectiveness analyses, which are not possible without output and outcome data. For example, if we need to know cost-effectiveness of educator training in improving the reading scores of second graders, the system for capturing costs should be set up to allow for isolation of the costs of such training from all other elements of the program. In addition, the activity needs to have an impact evaluation that specifically measures the impact of educator training on reading scores.

Exhibit 8 demonstrates this alignment, mapping common cost analysis methods to the logic model of an intervention and corresponding evaluations.

Exhibit 8. Intervention Logic Model, Evaluations and Cost Analyses[13]




The next four sections will describe each of these analysis methods, explain what we can learn using each method, and describe the associated data requirements. Included case studies illustrate an application of the methods to real-world development problems.

# Cost-Economy Analysis

Cost-economy analysis refers here to a family of expenditure analyses designed to examine the cost structure of the components of the intervention and its change over time. These analyses help establish the total costs and the cost ingredients for developing and implementing an intervention, as well as its potential for sustainability and the costs of scaling it up. This kind of analysis is important for understanding cost drivers, which are explored further in this guidance in the Learning from Cost Analysis Results section. Detailed information on pricing of common inputs is also very useful for planning future interventions. By separating non-recurrent[14] and donor-associated expenditures[15] from recurrent intervention implementation costs (for example, costs of developing materials, and expatriate management costs versus local management costs), cost-economy analysis can also help establish whether implementing the intervention as designed is fiscally feasible for local actors.

**What can we learn?** Cost-economy analysis can help answer a range of retrospective as well as prospective cost modeling questions. We can learn about the costs of development and implementation

[13] Exhibit 8 does not include cost-benefit analysis because of a lack of key data in contexts where USAID implements education interventions. This is not because cost-benefit analysis *per se* is not worthwhile, but because the necessary data to produce reliable cost-benefit analysis estimates in the education sector is almost never in place.
[14] Non-recurrent costs are typically associated with costs of developing and piloting the intervention model.
[15] Donor-associated expenditure are the costs that the intervention would not have if it were implemented by the government. For example, costs of compliance with donor regulations, costs of oversight from the head office, much of security, transportation, human resources, and legal costs fall into this category.

of different components of an activity, how the expenditure patterns differed across the years of implementation, what the structure of the expenditure was at the ingredient level, and what contributions from other parties (including beneficiary-level contributions) were necessary for implementing the intervention. This information can provide important insights into contextual, operational, and implementation cost drivers and barriers. An examination of the cost structure of the intervention also helps isolate costs that would need to be incurred if the intervention were sustained long-term, as well as expenditures associated with donor-supported intervention, such as donor reporting or international support travel.

Additionally, detailed data on costs of intervention components and what prices were paid for different inputs provides a basis for cost-efficiency and cost-effectiveness analyses. Cost-economy analysis is the starting point for answering sustainability-related questions, such as unit cost variations with different scale options.

**What data do we need?**[16] Cost-economy analysis is not possible without detailed cost data. First, all donor intervention-related expenditure data must be captured in real time, using cost categories that are aligned with analysis questions. Second, intervention design/development/creation (non-recurrent) costs must be separated from intervention implementation (recurrent) costs.[17] Field costs must be reported separately from foreign head office and expatriate costs. It's useful to separate management, operations and reporting costs, as well. Finally, if exploring equity implications of price differences (or other equity-related questions), capturing costs disaggregated by relevant equity dimensions (e.g., urban versus rural populations) will be necessary. For example, if an objective of the cost-economy analysis is to better understand the price difference between building a school in a relatively central location versus remote communities, the intervention will need to track costs of building remote schools separately.

### CASE STUDY: Using Cost Economy Analysis to Plan for Scaling ECD Activities

To meet the needs of caregivers displaced by the Syrian crisis, the International Rescue Committee (IRC) adapted Reach Up and Learn[18]—an early childhood home visiting program designed to support caregivers with the skills to talk, play, and interact with their children in a way that improves their children's development. Based on the Jamaica home visiting program and over 30 years of research, Reach Up provides a structured 10-day course to train community members to become home visitors, and a curriculum for home visitors to support caregivers in providing a stimulating environment that facilitates interaction and learning. The program consists of weekly or biweekly home visits that focus on play and building the caregivers' self-confidence. Activities are introduced, repeated, and scaffolded over a series of sessions to help the child learn and retain key early learning concepts and skills. Beginning in 2016, the IRC piloted the Reach Up program in several Middle Eastern countries.

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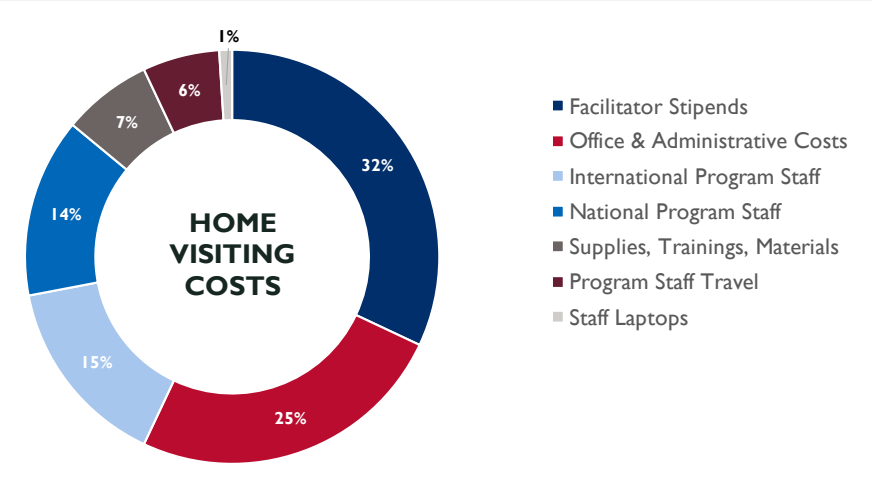
[16] Here and elsewhere in this guidance, all references to types of cost data are based on *Cost Reporting Guidance for USAID-Funded Education Activities (2018)*.
[17] Ibid.
[18] *Reach up and Learn in the Syrian Response.* IRC. https://www.rescue.org/sites/default/files/document/4803/irc-rul-reportapril27-2020.pdf

Despite their success in promoting children's cognitive outcomes, home visiting programs like Reach Up have historically been considered one of the more expensive Early Childhood Development (ECD) interventions. With a single home visitor able to visit a maximum of four to six households per day, large numbers of staff are needed for implementation across an entire community, an expense which can often overwhelm ECD budgets in humanitarian settings. As it was designing the Reach Up program, the IRC conducted a cost economy analysis of several home visiting programs to understand the key cost drivers and identify areas for potential cost reduction.

Exhibit 9. Costs of ECD Home Visiting




While the 10-day training of home visitors does represent a significant use of technical staff time ("National Program Staff" in Exhibit 9), and the supplies for toy making and printing books were perceived to be expensive at times, cost-economy analysis of the intervention revealed that home visitor stipends were the single largest cost driver across contexts. The IRC offered stipends to home visitors in every context based on the number of days they worked, local labor laws around the hiring of refugees/asylum seekers, UNHCR's negotiated incentive salary scale, and other agency salary scales in the same context. This typically came out to between $250 and $400 per month for home visitors. The cost of stipends was influenced by two factors: caseload and the degree of cost sharing with other programs. In contexts where the home visitor stipend was shared with other programs the total cost of stipends was lower.

Because home visitor stipends were a recurrent implementation cost which would continue as the program was scaled up, this finding from the cost-economy analysis helped focus programmatic attention on the design of the home visitor recruitment and management as the scale-up progressed.

## Cost-Efficiency Analysis

Achieving efficiency means achieving the greatest number of outputs from the activity (e.g., number of educators who receive one week of training) for every dollar spent, usually compared to other programs which implemented a similar activity in a similar context. Thus, cost-efficiency analysis provides a good measure of "operational" efficiency of implemented interventions, and how that compares to the operational efficiency of similar programs. However, there may be a trade-off between cost-efficiency and overall intervention quality, effectiveness, or equity. For example, an intervention can achieve a low unit cost of teacher training by reducing the duration of the training and eliminating

coaching support. This might seem cost-efficient from the point of view of unit costs of teacher training, but such training may fail to produce desired gains in learning outcomes. **As with all cost analyses, cost-efficiency results should therefore be interpreted alongside other information about the intervention being studied, including the quality of implementation and any data on results.**

**What can we learn?** Cost-efficiency analysis can help answer a variety of retrospective as well as prospective cost modeling questions. Comparing the costs of an intervention to the outputs that resulted can help us compare cost-efficiency of alternative intervention models. For instance, cost-efficiency analysis would reveal how much it costs per teacher per year to provide professional coaching through different delivery modes, or compare unit costs of printing books locally versus internationally. Cost-efficiency analysis can also help to uncover how context features (including operational environment, beneficiary characteristics, or intervention features) affect the cost per output. For instance, how does the cost per teacher-day of a training intervention change based on the remoteness of schools? How much does the cost of coaching differ when in-district coaches are used, versus paying for out-of-district experts to visit?

As these examples show, **the value of cost-efficiency analysis is that it helps us better understand how unit cost of an output is influenced by the features of the intervention or the context and enable us to plan and manage activities with this information in mind**. To implement cost-efficiency analysis, analysts need to have a very clear idea of the theory of change of the intervention and what outputs look like with sufficient detail to ensure fair comparisons can be made.

When implementing cost-efficiency comparisons of multiple interventions, the key is to use sensible judgment[19] about which interventions are actually viable alternatives for delivering some output in a given context. Some factors to consider in assessing the comparability of outputs created through alternative activities include:

- Outputs should be similar in purpose (e.g., the cost per child who received full-time classes at a non-formal learning center should not be compared to the cost per child of a program that provided remedial tutoring on a single subject).
- The intensity, or dosage, of an output should be similar (e.g., the cost of teacher training implemented over one day should not be compared with the cost of teacher training implemented over four days).

**What data do we need?** Similar to cost-economy analysis, we need detailed cost data, including expenditure data disaggregated by relevant cost categories and sometimes sub-categories (depending on the cost questions asked) as well as "ingredient" data in each category (ingredients include disaggregated labor, travel, materials, other direct costs, fees), contributions data, and details of the intervention data. This minimum data "package" will allow the analyst to compute cost-efficiency estimates for the outputs produced by the intervention. When cost-efficiency analysis is used for comparing interventions, it is particularly important that the methodology for capturing and for analyzing the cost and output data are the same for all of the compared interventions. In order to ensure that the cost-efficiency methods can be applied consistently, highly detailed cost and output data are needed.

[19] See a box on using benchmarks in Section 4 - Step 2 of this guidance when no data for comparable interventions are available.

When comparing cost-efficiency of different interventions, their outputs must be counted using the same metrics. For example, if we are conducting a cost-efficiency analysis of two teacher training interventions where one measures the cost per student reached as the main metric, while the other measures cost per teacher, the results cannot be meaningfully compared. Best practice when planning a cost-efficiency analysis is to identify analysis questions at the onset of the intervention implementation and align both cost and output data collection.

### CASE STUDY: Using Prospective Cost-Efficiency Analysis to Compute Scale-up Estimates

With an explosion of mobile phone ownership in low-income countries, donors are considering using mobile phones for education intervention delivery. But are mobile phone-based interventions indeed effective and cost-effective in improving student achievement, and should they be scaled up? In 2015/2016, USAID co-funded[20] the implementation and an impact evaluation of the Makhalidwe Athu activity (MA) to test whether using mobile phones would indeed help improve student learning. MA was a nine-month pilot intervention to improve the reading skills of 1,200 students in 2nd and 3rd grade in Zambia's Eastern Province. The activity provided reading materials in a local language and supported reading activities through SMS messaging to caregivers of children selected to participate in the pilot. MA participated in the pilot of USAID's cost reporting approach and captured costs (Exhibit 10).

Exhibit 10. Makhalidwe Athu Expenditure Data[21,22]

| Summary Expenditure Data | Amount (USD) | Percent |
|---|---|---|
| Cost Category 1: General Management and Operations | $333,913 | 39.6 |
| Cost Category 2: M&E and Reporting | $118,479 | 14.0 |
| Cost Category 4: Teaching and Learning Materials | $195,963 | 23.2 |
| *Subcategory 4: (Development)* | $92,252 | 10.9 |
| *Subcategory 4: (Promotion and Production)* | $11,191 | 1.3 |
| *Subcategory 4: (Distribution/Transmission)* | $92,520 | 11.0 |
| Cost Category 7: Parent/Community Involvement | $146,496 | 17.4 |
| *Subcategory 7: (Development)* | $5,325 | 0.6 |
| *Subcategory 7: (Implementation)* | $141,171 | 16.7 |
| Cost Category 11: Complementary Activities | $48,669 | 5.8 |
| TOTAL | $843,519 | 100.0 |

[20] The activity was funded by the All Children Reading Partners (USAID, World Vision, and the Australian Government), designed and implemented by Creative Associates, and evaluated by the National Opinion Research Center (NORC) of the University of Chicago.
[21] Actual data are provided here with a gracious permission of MA's implementer, Creative Associates.
[22] The cost categories underwent some changes between the 2017/2018 pilot and the revised guidance of December 2018.

The impact evaluation found the activity successful given the short exposure time: it achieved a 0.27 effect size increase in student reading fluency and a 0.23 effect size in reading comprehension (equivalent to an additional year of schooling) using difference-in-difference analysis of intervention and control groups' reading scores at baseline and endline. Initial cost analysis estimated the per student intervention cost to be US$700, including both development and implementation costs. Recognizing that the small scale and the pilot nature of the activity affect the unit cost, an analysis of activity costs was conducted to establish how much it would cost to scale the activity up nationally. The prospective cost modeling found:

- If scaled up, the activity would be implemented through the Ministry of Education and thus not need to have start-up, close-out, USAID compliance, reporting, and other donor-funded activity-related expenses.
- Since the intervention was already developed, development costs could be limited to a production and translation to local languages of new stories.
- With economies of scale, many per-learner costs could be reduced dramatically.

The final scale-up costs per student were estimated to be $20.10 for students in Lusaka and Eastern Province, and $21.60 for those in other parts of the country.

The evaluator highlighted several considerations regarding these estimated costs. First, MA was piloted in predominantly rural areas and cell phone ownership could be higher in urban areas. If that were the case, more learners could be reached with the same fixed costs, resulting in a lower per learner cost. It is also possible that urban areas have more access to reading materials, which may result in a lower-than-expected uptake of the intervention in urban areas. Additionally, the impact of the activity could be higher in areas where children already have better reading skills because the pilot intervention had greater impacts among higher performing students. This would increase the effectiveness of the intervention per dollar invested.[23] Finally, the analysis revealed that the major cost driver of the intervention was the Interactive Voice Response (IVR) feature which was found to be infrequently used and thus could be eliminated without materially influencing the results. Another cost driver - community mobilization activities - could be integrated into the routine school-community group meetings. The estimates of cost per child in a scale-up scenario reflect a projection of the likely costs if these changes were made, built upon the detailed cost-economy and cost-efficiency analyses conducted of the pilot intervention.

To conclude, having clear cost data in addition to impact data for this intervention provided crucial information for USAID and the government of Zambia to inform future decisions about scale-up and sustainability of the intervention. Without cost data, impact evaluation findings alone are insufficient to inform these decisions in the context of tight budgets and competing priorities.

[23] USAID Impact Evaluation of The Makhalidwe Athu Activity (Zambia), 2017. Produced by NORC at the University of Chicago. Report available at https://dec.usaid.gov/dec/home/Default.aspx.

# Cost-Effectiveness Analysis

Cost effectiveness is commonly understood as seeking to maximize the outcomes achieved (e.g., increase in student literacy, increase in job readiness) per dollar spent. Cost-effectiveness analysis uses two pieces of information: the cost of an intervention and the effectiveness of the intervention (impact per output, such as a change in employment status among trained youth). These are sometimes combined in a ratio,[24] such as the cost per increase in learning outcomes, but keeping these two components separate in the presentation of the results helps us understand the results more clearly. Two interventions with the same cost-effectiveness might have very different costs and impacts: one of them could be high-cost and high-impact, while another one could be low-cost and low-impact. The partner government, USAID, and other stakeholders usually need both pieces of information in order to make informed decisions: cost per beneficiary and cost per effect. **Cost-effectiveness analyses are conducted retrospectively, meaning they use the actual cost and impact data from interventions implemented in the past**.

**What can we learn?** Cost-effectiveness analysis places the costs of an intervention in relation to the outcomes created by that intervention. Such analysis is useful when trying to choose which intervention (or combination of intervention elements) is likely to cause the greatest change in outcomes per dollar spent. For instance, a cost-effectiveness study could compare cost and results of a paper-based reading intervention with a technology-based reading intervention. A technology-based intervention might be more costly, but the analysis can help establish whether it results in proportionately greater impact, and which intervention is ultimately more cost-effective. Cost-effectiveness analysis relies on rigorous impact estimates derived from experimental or quasi-experimental evaluations. The availability of rigorous impact estimates is the major constraint on conducting cost-effectiveness analyses. Although it may be tempting to try to conduct cost-effectiveness analysis using non-experimental[25] estimates of impact, the results will merely reflect whatever assumptions of impact were used in calculations and risk being inaccurate.

**The value of cost-effectiveness analysis comes from comparing interventions that target the same outcome: the performance of a given intervention can only be judged when compared with another intervention's costs and effects. The validity of cost-effectiveness comparisons is determined by accuracy and completeness of the cost and impact estimates.**

A cost-effectiveness analysis (CEA) helps policymakers select an intervention or program that has the largest impact for a given cost, in the specific context. To assist policymakers in making such choices, the activities and interventions being analyzed should be comparable. For example, an intervention designed to measure youth employment is incomparable to one that measures secondary school dropout rates. However, interventions that seek to improve youth employment through different approaches, such as

[24] The established approach is to standardize the results of comparisons of multiple programs by converting them to the same dollar unit (say, $100) or the same effect unit (typically, one standard deviation). However, presenting cost-effectiveness results as a ratio after such conversions has significant interpretation problems. For example, we may see analysts report an intervention producing two standard deviations of effect per $100 spent per beneficiary, while in reality this program spent $1 per beneficiary and produced 0.02 SD in effect. Obviously, the implications of such misrepresentation can be quite substantial for policymakers who are attempting to use this information to inform their decisions. Additionally, such reporting is also inaccurate since the intervention was not actually tested with $100 investment per beneficiary. In reality, with $100 of investment, the results could be vastly different from the anticipated ones.

[25] Estimates from quasi-experimental designs are acceptable for use in cost-effectiveness analysis, although randomized controlled trials will remain the preferred method for estimating the impact of an intervention.

mentorships and vocational training, are comparable (Levin et al., 2018). Additional guidance on the comparability of interventions includes:

- Rigor of the impact evaluations of compared interventions should align (e.g., a randomized control trial (RCT) should ideally be compared to another RCT, but can be compared to a quasi-experimental design if the limitations are noted).
- Intervention population sizes should be similar (e.g., an intervention with a small reach, like a pilot, should not be compared to an intervention with a large population size) unless explicit assumptions about how costs and impacts might vary with scale are added.
- Impact measures should be similar (e.g., an impact evaluation that measures reading comprehension should not be compared to one that measures mathematics).

The measurement should have sufficient power to generate statistically significant estimates of effect, if a practically meaningful effect is actually present.

**What data do we need?** Since cost-effectiveness analysis is comparative in nature, the results of comparisons of different interventions would be most accurate if both costs and impacts of different interventions are captured and analyzed using identical or very similar methodology. In order to ensure that the cost-effectiveness analysis can be applied consistently across the compared interventions, highly detailed cost and results data are needed. Additionally, both compared interventions must be rigorously evaluated with a strong counterfactual, using experimental or quasi-experimental methodology. The outcomes must be measured using the same impact indicators across the compared interventions. For example, if one intervention measures impact in percent of students who reach the benchmark of proficiency on a national reading assessment while another intervention measures impact in improvement in EGRA scores, the results cannot be meaningfully compared.[26] Best practice when planning a cost-effectiveness analysis is to use the same impact indicators across programs you hope to compare, and ensure that all programs collect and report data on cost, outputs, and outcomes. It is also very important to adhere to proper documentation of data collection and analysis steps as well as the assumptions used in the analysis. For further guidance, please see references at the end of this note.

When interpreting results of cost-effectiveness analyses, it is important to keep in mind the level of confidence we have in the data on which the analyses are based, especially when attempting comparisons of different interventions. Evans and Popova (2016) discussed how costs can vary across contexts and how extremely sensitive cost-effectiveness estimations can be. The authors state that changing just one parameter in an evaluation (e.g., the size of the community or teachers' salaries) can create substantial variation in the cost-effectiveness estimates. This means that "back of the envelope cost contextualizations may provide very imprecise results." (pg. 9)

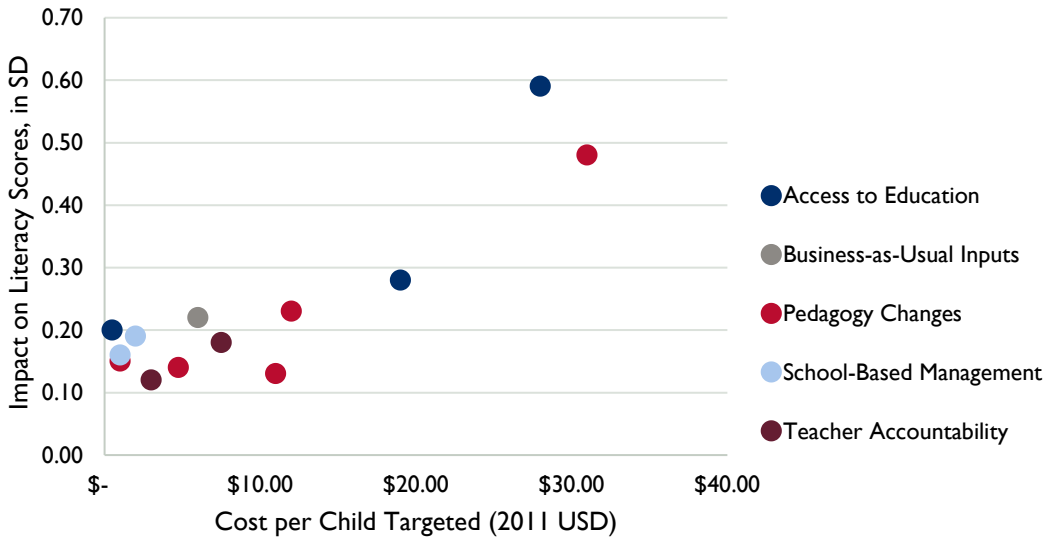
Additionally, "pilot bias" may be at play. The costs of pilot interventions are inherently more expensive than scaled-up versions due to cost savings derived from economies of scale. But pilot interventions can also demonstrate higher levels of effectiveness, due to the careful attention to implementation that may be lacking in larger at-scale interventions. Additionally, Evans and Povova (2016) discuss the insufficiency of data and the challenges with obtaining accurate estimates due to "recall bias." To help mitigate this bias, the authors suggest that cost estimates, inclusive of hard-to-track aspects such as personnel time on a task, should be gathered in real time instead of after the intervention is completed.

[26] It should be noted that even EGRA scores might not be comparable across contexts or across sub-populations.

### CASE STUDY: Using Cost and Effectiveness Data to Inform Investment Decisions[27]

Over the past two decades, a new wave of randomized evaluations has examined how developing countries can help children who are not in school gain access to education and for those in school to improve their learning. A comparative cost-effectiveness analysis by Kremer, Brannen, and Glennerster reviewed evidence on intervention impact and presents the cost per standard deviation of change in literacy test scores for 30 interventions that had been studied with impact evaluations. Exhibit 11 plots both cost and impact-per-beneficiary for each intervention.[28] The intervention with the highest impact per child is also the second-most expensive intervention. There is also little relationship between spending and impact in the $0-$10 range. How can this information be used in decision-making? We might decide that based on the data presented in this exhibit, any investment below $20 per learner is not "worth it" since it does not appear to produce a large difference from "business as usual." Therefore, we might advise policymakers to reduce the number of beneficiaries and increase the expenditure per beneficiary by targeting, for example, particular sub-populations of learners that are most in need. Alternatively, we might know that anything above $15 per child is not fiscally feasible in a particular context. Then, we might want to limit how small of an impact we are willing to accept, within that cost range. For example, we might want to forgo anything below 0.12 standard deviations if we consider the investment not worth the result.

Exhibit 11. Cost-Effectiveness of Student Learning Interventions




Note that the interpretation of these cost-effectiveness results did not focus on identifying the single intervention with the absolute highest impact per dollar and concluding that it was "the best." Nor did it discuss the role of the context, which is bound to play a significant role in driving

[27] The exhibit is based on data from Kremer, Brannen, and Glennerster (2013), presented in Tulloch (2019).
[28] In the paper, Kremer et (2013) al instead plotted impact per dollar spent.

prices up or down. Instead, **comparative cost-effectiveness information allows us to look for patterns in the results, assess what was driving high cost-effectiveness in specific contexts, and determine how reliably different models appear to produce results across contexts**. When using this information to make intervention choices in a particular context, a policymaker would still need to pair it with information about whether approaches were feasible and appropriate in that country and education system.

## Cost-Benefit Analysis

Cost-benefit analysis (CBA) belongs to a family of analyses which compare the total costs of an intervention (including costs to society) to the monetized value of the totality of intervention's benefits (including social benefits accrued to those who did not directly benefit from the intervention). In contrast to the methods described above, the costs of an intervention can be compared to the benefits of that same intervention. CBAs can be very useful when comparing interventions with different outcomes. CBA also typically includes a stakeholder analysis and generates CBA models for each major stakeholder.

**What can we learn?** Since both the cost and the benefit are expressed in monetary terms, the comparison of cost and benefit is straightforward and the conclusion of whether the intervention was "worth it" is unambiguous. As such, cost-benefit analysis is well suited for certain types of questions, for example, in cases of interventions with multiple outcomes that cannot be meaningfully captured in a single metric, or when an intervention entails a large one-time investment that could be justified by both private and public gains that accrue over a long period of time.

**What data do we need?** Conducting a cost-benefit analysis has higher data requirements than other cost analyses and necessitates assumptions about how an intervention's effects will play out over time. In addition to the impact evaluation evidence that is required for cost-effectiveness analysis, cost-benefit analysis requires impact evaluation evidence for all possible outcomes influenced by the intervention under study, and typically needs impacts measured over longer periods of time.[29] It also requires estimating the public and private direct and indirect costs. While it might be possible to calculate intervention costs and benefits using speculative estimates of impact from pre-post analyses or different contexts, this can also significantly increase the margin of error of results. However, one advantage of cost-benefit analysis is that comparative data from other interventions is not required; the results from one intervention can be interpreted by itself since cost-benefit analysis tells us whether (given our assumptions) the value of that intervention exceeded the cost.

Monetization of the totality of long-term outcomes of an intervention is a necessary step in a cost-benefit analysis. Such monetization of USAID-supported education interventions is generally not feasible at present because we do not have the necessary time series data sets. Therefore, this guidance does

[29] In cases when there is existing evidence of links between shorter-term outcomes (e.g., completion) to longer-term outcomes (e.g., employment and earnings), we can use shorter-term outcomes to estimate the cost-benefit and rate of return.

not recommend using cost-benefit analysis to achieve objectives of cost measurement articulated by USAID Center for Education. [30]

The next section will explore in-depth how to interpret cost analysis results and, in particular, associated constraints. It will examine what we can learn about different cost drivers of interventions, and dive into the question of the application of cost analysis findings in other contexts.

[30] As the international education sector develops standardized impact metrics that have demonstrated associations with economic growth, cost-benefit analysis of large education interventions will become much more feasible. One such approach is Learning Adjusted Years of Schooling (LAYS). Introduced in the 2018 World Development Report, LAYS combines both quality and quantity of schooling, and offers a way of comparing the time a particular education system takes to achieve the learning gains made in a year of schooling in a system achieving a high-performance benchmark.

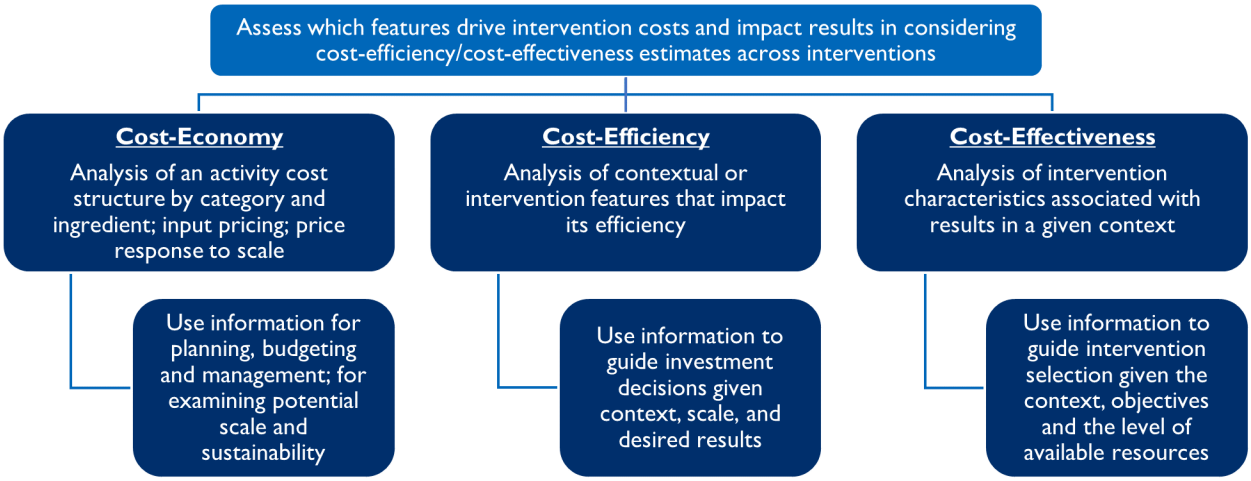
# Learning from Cost Analysis Results

# 3. Learning from Cost Analysis Results

How results from cost analyses are used is as important as how they are created; misapplication of the results about a single intervention, or a comparison of several interventions, can undermine the usefulness of cost analyses. Cost analysis is not intended to determine which intervention is "the best" or which should be scaled up or replicated universally. As with any analysis, caution should be used when trying to generalize findings or assume that findings can be easily and successfully translated from one context to another. **The value of cost analysis is in uncovering which characteristics of interventions and their contexts drive their cost or improve their value-for-money**. Knowing not just whether an intervention is cost-efficient/cost-effective, but why, is crucial. The answer to the "why" question will provide valuable information in determining overall value-for-money of the investment.

Cost analysis methods can help answer a variety of questions regarding policy and programmatic decisions. Exhibit 12 highlights distinctions between questions that different cost analysis methods can answer and practical use of these answers for USAID and its partners.

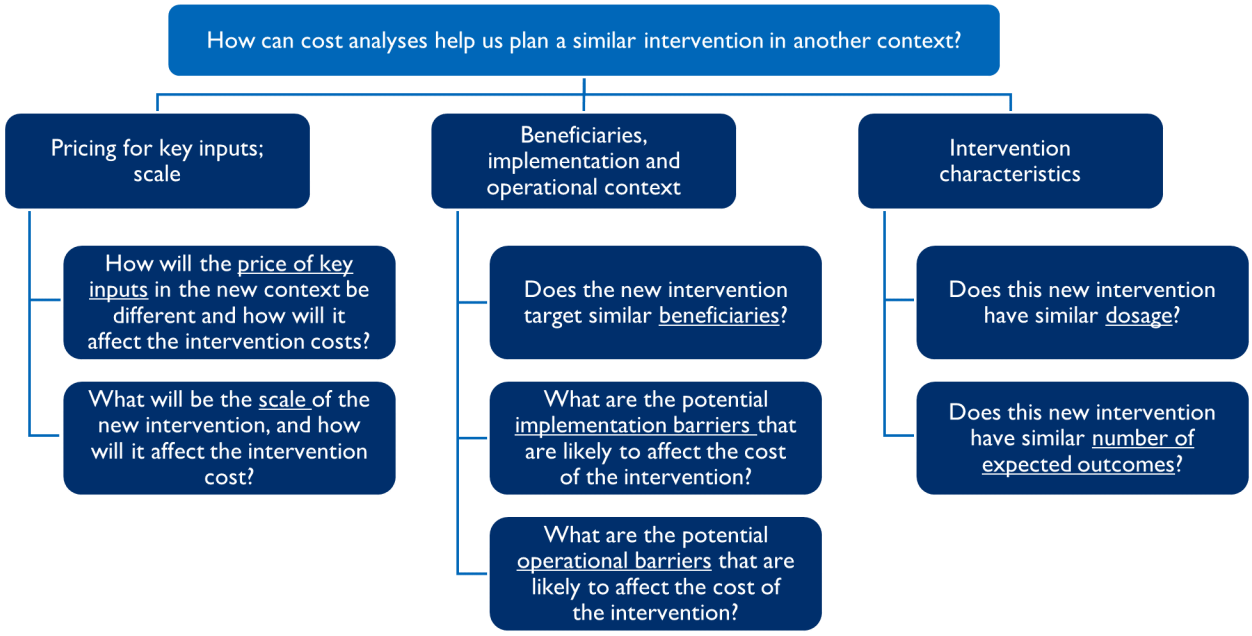
Exhibit 12. What Can We Learn from Different Cost Analyses?




One of the key objectives of many cost analyses is to understand what makes an intervention more or less cost-efficient or cost-effective, in other words, to examine its cost drivers and cost mitigators. For that, we need to know the costs of intervention components, and we also need to understand the structure of implementation: how much and what kind of labor went into delivering intervention components, what the delivery methods were, what sort of materials were used (and which ones were produced by the intervention versus were already in place), etc. Breaking down the intervention into its "ingredients" helps answer a centrally important question of external validity of results (i.e., applicability to other contexts). What can we learn from cost analyses that will "translate" to other contexts? Rather than thinking about how well a cost-efficiency/cost-effectiveness estimate will apply in another context, it is easier to break this out into two separate questions.

- **How might outputs/outcomes change?** The outputs and outcomes of any intervention result from an interaction of the intervention with the context in which it is being implemented. In other words, the context of the education system largely determines whether the intervention will "succeed" or "fail" in achieving its intended results. For example, a teacher training intervention might be very effective in a stable education system where teacher turnover is low and attendance is high, but the same intervention might fail in a system with high teacher absenteeism and turnover. An education system analysis will help determine whether the intervention's theory of change is applicable to the particular country context.[31]
- **How might intervention costs change?** It is not really a question of "if" intervention costs will change from one place to another, but how much they will change. There are a few key features that seem to drive costs across interventions; these will help us understand whether the average cost is likely to be higher or lower in a new setting than in the place the intervention was originally studied. Exhibit 13 outlines the main categories of factors that might influence the applicability of data from another context: pricing of labor and goods, beneficiary and context features, and intervention characteristics.

Exhibit 13. Applying Cost Analysis Results to Another Context




While we have to apply consistent metrics and methods when conducting cost analyses, we should not necessarily be expecting to see identical cost-efficiency and cost-effectiveness of interventions in different contexts. As comparative cost analysis becomes more routine in the education sector, a top priority should be to learn what features drive or constrain costs and effects of our interventions. Sometimes the drivers will be contextual (e.g., low population density, high security costs, absence of literate volunteers), and while they cannot be helped, data on the implications of these contextual factors for cost-efficiency and cost-effectiveness will improve planning and budgeting. In other cases, the

[31] See Bates and Glennerster, 2017 for a helpful framework to determine when results might generalize to new contexts.

drivers of value for money are changeable features of education interventions, in which case we have derived insights about how to improve our interventions in order to improve cost-effectiveness.

As discussed above, the point of comparative cost analysis is not that some analytical method will guarantee the applicability of the results to every other situation. This is simply impossible because of the differences in price levels, institutional quality, and population needs, among many other factors. Rather, **the goal of cost analysis is to understand what features of context and intervention influence the costs and results of interventions, and by how much**.

An analysis of prices, context, and intervention characteristics is useful at any stage of donor decision-making: when managing an existing intervention, when planning for sustainment of a successful intervention, and when assessing an intervention's viability in a new context. The next three sections will explore them in greater detail.

## Prices as a Cost Driver

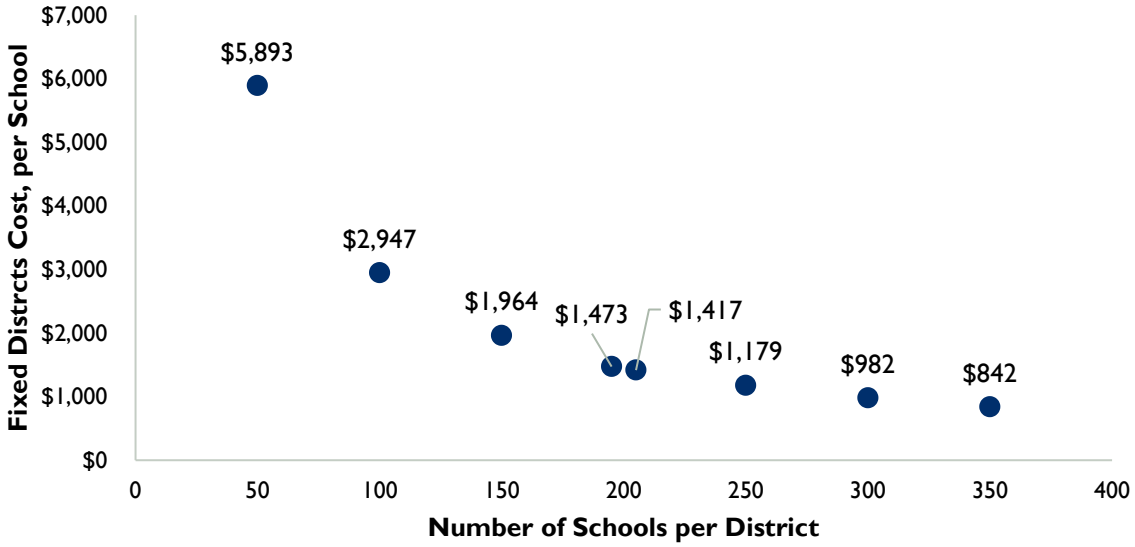
Input prices vary greatly and sometimes unexpectedly. The common cost drivers of education inputs include how well infrastructure is developed, safety of movement, accessibility/proximity of the country to major international hubs and routes, and availability of qualified labor. The latter in particular is a major cost driver of donor-funded education interventions. Lastly, intervention scale will affect prices of key inputs.

**Price of Inputs.** Price levels vary from country to country, in particular the price of goods such as workbooks, vehicles, venue rentals, etc. While it may be too difficult to figure out the exact price of every good in the place in which we are hoping to run an intervention, we can identify the top five inputs that make up most of the intervention cost (so long as we have real-time, detailed cost data) and find information on the prices of those goods in the new context. This will help assess if the cost is likely to be higher or lower than in the originally studied context. The price of labor (e.g., wages) is particularly important to consider. In some countries, especially post-conflict countries, the prices of skilled labor (e.g., master trainers, intervention managers) may be unusually high. In other countries, especially rapidly growing economies like India, the price of skilled labor may not be as high. While it may be too difficult to figure out the exact wages of every position necessary to run an intervention, we can identify the top five staff positions that make up most of the intervention cost and find information on the likely wages for those positions in a new context. This will help us assess if the cost is likely to be higher or lower than in the originally studied context.

**Intervention Scale.** The unit cost of produced outputs and outcomes (e.g., cost per unit of improvement in student learning outcome of interest, cost per trained teacher) may change quite a lot when an intervention is implemented at a small scale versus at a large scale. This is because of the start-up costs, costs for developing/piloting a new intervention, and supervision or management costs. Such costs will be incurred regardless of the scale of the intervention. When interventions reach only dozens of schools and hundreds of learners, these costs are not "spread out" over very many outputs and outcomes, and so the unit cost per output or outcome tends to be quite high. But as the number of students and schools reached increases, economies of scale allow the costs per unit to drop. Exhibit 14 illustrates this point by showing how the cost per beneficiary of the USAID-funded Pakistan Reading Project drops as the number of schools participating in the intervention per district increases. When the intervention only reached 50 schools in a district, the cost per school was nearly $6,000. However, in districts with several hundred schools, the fixed costs of district management dropped to less than

$1,000 per school.[32] This was driven by significant management costs at the district level, whose structure did not change if there were more or fewer schools in that district.

Exhibit 14. The Effect of Intervention Scale on an Intervention Cost per Beneficiary




Estimating the cost of scale-up is not straightforward in diverse contexts. Interventions are typically piloted with a small number of beneficiaries, which may not be representative of the diversity of the entire country or region. Unless the intervention was tested for effectiveness and cost-effectiveness with all sub-populations in the area to which the scale estimates are computed, we could not be certain that our pilot cost and impact estimates will apply exactly to those sub-populations. In fact, it is quite likely they will not, but having an estimate of the likely minimum costs is a better start than not having any estimate at all when planning a scale-up of an intervention.[33]

**It is typically more expensive to reach and help improve outcomes for learners who are more marginalized**, such as orphans and vulnerable children; out-of-school youth; ethnic, religious, and linguistic minorities; and learners in rural and remote areas. Understanding the cost implications of attempting to serve the most marginalized learners will result in more realistic budgeting and planning, to ensure the intervention is delivered with components and dosage necessary for achieving desired results.

Crisis and conflict can also affect the effectiveness and cost-effectiveness of interventions in unexpected and unpredictable ways. In some instances, the unit costs of intervention outputs can actually increase when taken to scale: for example, this can happen when the necessary capacity is lacking in areas where the intervention has been scaled to but was present in the pilot area. It is important that cost analysts highlight these nuances when calculating scale-up cost projections.

[32] Data for this publication are graciously provided by International Rescue Committee (IRC) and reflect cost-efficiency analysis of USAID's Pakistan Reading Intervention implemented by IRC.
[33] One way to help address the issue of precision of scale-up estimates is to test the intervention with the populations that are likely to require more resources to reach and to improve learning outcomes.

# Context as a Cost Driver

Context affects implementation costs in many ways. Economic, political, and cultural factors interact with the intervention and need to be clearly understood when planning or adapting an intervention to a new context. "Context" is not understood here as a geographic construct but rather a combination of factors in which specific populations are situated. For example, a single geographic region located within one country may have a diverse population, and different sub-populations will have different "contexts," which affects their access to and interaction with the education system. **An in-depth understanding of contextual factors affecting the intervention will help inform interpretation of cost-efficiency analysis results and evaluate how they might change if applied to a different context.**

**Characteristics of beneficiaries.** The costs and the results of an intervention will depend on the type of beneficiaries it is trying to reach. Improving learning outcomes of marginalized students, for example, could be significantly more expensive than improving learning outcomes of students who are not considered at-risk. We might be able to reach this group by tweaking the existing "mainstream" intervention slightly, while in other cases we might need to develop a new intervention specifically targeting marginalized learners. Geography, proximity to school, disability status, language, parental literacy, and socio-economic status are all important factors that could influence both the cost and the effectiveness of an education intervention in either direction.[34] Since USAID places particular emphasis on reaching the poorest and most vulnerable, it is important to collect data on beneficiaries alongside cost and output/outcome data, to ensure we clearly understand what types of beneficiaries the results of cost analyses are relevant for.

**Implementation Context.** The efficiency of conversion of inputs into outputs is largely determined by the context features. For example, if target beneficiaries' access to the intervention is restricted, it may significantly affect cost-efficiency of the intervention delivery. Barriers to education must be, therefore, considered part of the existing education system analysis. A consideration must be given to potential barriers to implementing this specific intervention with these specific beneficiaries. There may be pre-existing constraints associated with intervention implementation, such as socio-economic, political, religious, or linguistic conditions that conflict with the fundamental assumptions of the intervention. For example, implementing a mother tongue-based reading intervention in a context without an existing orthography for that mother tongue will have a much higher cost than implementing a similar intervention for a mother tongue with an established orthography. Therefore, **the implementation context is likely to affect the *content* of the intervention, and, therefore, its cost.**

**Operating Context.** Most obviously, the costs of an intervention will be influenced by the prevailing prices in that area, as described in the previous section, as well as by the capacity of the local institutions. When considering the cost drivers of the existing intervention and how the costs of an

[34] While there are some nascent methods for quantifying the value of equity in value-for-money calculations, these rely on a number of assumptions and are more complex than most donor agencies can achieve in practice. Instead of trying to quantify "equity" as part of the value-for-money metric, it is instead recommended to think about reaching marginalized and vulnerable populations as a specific sub-population, which can impact intervention costs and results. To take a concrete example, adolescent girls might face many barriers in accessing education. On one hand, some studies find higher impacts among more marginalized sub-populations (e.g., the experience with conditional cash transfers in Burkina Faso in Akresh et al, 2013 and multiple cases cited in Evans and Yuan, 2019), while on the other hand, some studies find higher impacts for the subpopulations who were initially better prepared academically (for example, Muralidharan and Sundararaman, 2011 and Dulfo et al, 2017).

intervention may change if implemented in a new context, the relationship between cost-efficiency and local capacity needs to be well-understood. We need to consider if this intervention could be applied and, if so, how the intervention design and delivery would have to be adapted for a context where capacities and systems differ from the intervention's original setting. If adaptations were required, what additional costs would this entail?

Infrastructure and input pricing, including existing capacity, are not the only operational context considerations. Other operational constraints may include partner-country political upheavals, natural crises, and economic fluctuations, among other factors. USAID-specific constraints include procurement restrictions, shifting policies and strategies that affect implementation, new reporting mandates, and unexpected allocation changes, among other factors. Ultimately, **the operating context will shape *how* the intervention is being implemented, and, therefore, its cost**.

## Intervention Delivery and Characteristics as Cost Drivers

The details of intervention delivery are critically important when analyzing an intervention's cost-effectiveness, comparing cost-effectiveness estimates of multiple interventions, and considering implementation of an intervention in a new context. Two aspects of intervention delivery are of particular importance: the dosage and the number of different outcomes the intervention is trying to influence.

**Intervention dosage.** Any intervention has an optimal dosage under which the intervention achieves the best investment-to-result ratio. If we reduce the dosage, we will not get the improvement we are looking for; if we increase the dosage, we are likely to spend more money than necessary. **Costs and impacts do not scale up and down in a linear manner, nor do they scale up and down at the same rate.** For example, if teacher coaching was found to be effective at a price point of $100 per teacher per year, then a reduced budget of $50 per teacher per year will likely not produce 50 percent of the original impact on student learning. In fact, the intervention would need to be tested again to measure the impact and cost-effectiveness given the new dosage. The issue of relationship between dosage and results requires close attention when intervention effectiveness is considered, and in particular in relation to scale and sustainability-related questions.

**Interventions with multiple outcomes.** One general challenge in comparative cost-effectiveness analysis is assessing interventions with multiple outcomes. The result of cost-efficiency and cost-effectiveness analyses of different interventions is the cost per output or outcome achieved. For instance, we might want to compare cost-effectiveness of two primary grade reading interventions, one of which trains teachers in reading while the other trains teachers in both reading and in math. The latter intervention might be more expensive per unit of outcome in reading achievement but might be less expensive if we consider outcomes in both reading and math. While the cost-effectiveness measure accurately captures the value for the money spent in terms of improving literacy outcomes, it does not capture the entire "value" of the intervention.[35]

[35] The problem of using cost analysis to assess interventions with multiple outcomes is analogous to the problem of comparing houses that we are considering purchasing. The cost per square foot is a standard, intuitive metric that can be applied to all of

The challenge of multiple-outcome interventions can be seen as an aspect of understanding cost analysis results. Cost analysis cannot and should not be used to encapsulate all information about the value of an intervention—some interventions may have benefits that are not captured in cost-efficiency or cost-effectiveness analysis, some interventions may be feasible or appropriate only in certain contexts, and so forth. **Cost analysis is not a substitute for other crucial decision-making inputs; it is a complement to them when considered in the context of specific policy or investment objectives.**

To summarize the key points of this section, cost analysis estimates should never be assumed to apply "as-is" to another context, and neither should they be dismissed as entirely irrelevant if they come from another context. An application of cost analysis results to another context is feasible when we take into account a number of considerations, including pricing, scale, context, and intervention. Regardless of how well the analysis of application of cost estimates to another context is performed, the cost-efficiency and cost-effectiveness estimates will be just projections until the intervention is fully tested and cost data are collected in a new context. We recommend using results of cost analysis alongside other considerations and being cognizant of their potential limitations.

The next section will examine the practical aspects of conducting cost analyses. Used alongside associated templates, it is designed to serve as a reference for cost analysts and evaluators. The information presented above will be used in the next section to illustrate specific analytical techniques recommended for the cost analysis of USAID-funded education interventions.

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the homes we might consider buying. But this metric hardly captures all of the relevant features we consider when buying a home: we also care about how nice the interior is, how big of a yard it has, where it is located, etc. And while we could, in theory, come up with a quality-adjusted, yard-adjusted, neighborhood-adjusted measure of cost per square foot, it will become increasingly difficult to calculate and interpret that measure. In the end, most people consider the cost per square foot *alongside* other information about quality and location, rather than trying to pack it all into a single measure.

# Practical Guide to Conducting Cost Data Analyses

# 4. Practical Guide to Conducting Cost Data Analyses

This section contains a step-by-step guide for conducting cost data analyses following each of the methods introduced in the previous section. While it draws on the information presented in the first two sections of the Guidance, cost analysts and evaluators will be able to use it as a stand-alone reference guide. This section is organized according to the six steps needed to successfully perform analysis of cost data sets (Exhibit 15), from the perspective of a cost analyst. While some of them could be (and should be) implemented by people other than a cost analyst, the analyst will need to ensure that all six steps are completed when managing a cost study. As illustrated in Exhibit 2 in Section 1, we recommend that consultations around cost study objectives be conducted early in the intervention planning to ensure necessary data are collected.

Exhibit 15. Cost Data Analysis Steps

| Step | Objectives |
|---|---|
| **Step 1.** Conduct preliminary data checks | Ascertain quality and completeness of the available data on expenditure, contributions, and intervention details. Describe and attempt to fill in data gaps. Assess comparability (when analyzing a set of activities). |
| **Step 2.** Review cost analysis objectives and questions | Ensure that there is no mismatch between objectives, cost analysis questions, and available data so that the results of cost analyses are useful for USAID's strategic and operational objectives. Ensure clarity of the perspective from which cost analysis questions are asked. |
| **Step 3.** Develop a cost analysis plan | Create a documentation trail regarding matching cost analysis questions with methods and the steps for the analysis. |
| **Step 4.** Prepare data for analysis | Produce a cost analysis data set. Ensure comparability of cost analysis results across analytical outputs. |
| **Step 5.** Implement analyses | Perform computations and produce cost analysis results that respond to the study objectives and answer the cost analysis questions. |
| **Step 6**. Report and document | Draft the report. It should provide clear answers to cost analysis questions and provide sufficient information on methodology to ensure replicability. |

As previously described, methods presented in this guidance include cost-economy (retrospective and prospective), cost-efficiency (retrospective and prospective) and cost-effectiveness (retrospective only). Exhibit 16 shows the details of six steps an analyst should follow for all of these methods. These details are important because there can be slight variations in these steps depending on the method. For example, cost-economy is an expenditure analysis and only requires analysts to list the contribution and donations instead of monetizing them as is done with the economic analysis methods of cost-efficiency and cost-effectiveness. These details are shown in the exhibit below and highlighted by their appropriateness per method.

Those steps that are applicable to a given method are highlighted in blue.

Those steps that are not applicable for a method are denoted in light gray.

Exhibit 16. Summary of Cost Data Analysis Steps and Actions, by Method

| Cost Analysis Steps | Actions | | Cost-Economy | Cost-Efficiency | Cost-Effectiveness |
|---|---|---|---|---|---|
| **1.** Conduct Preliminary Data Checks | Data Checks for Analyzing a Single Intervention | | | | |
| | Data Checks for Multiple Interventions | | | | |
| | | | | | |
| **2.** Review Cost Analysis Objectives and Questions | Clarifying Cost Analysis Objectives | | | | |
| | Review and/or Define Cost Analysis Questions | | | | |
| | Identify the Appropriate Data Sets | | | | |
| | Assess Completeness of Data | | | | |
| | Collect Missing Data | | | | |
| | Match Analysis Methods to Objectives | | | | |
| | | | | | |
| **3.** Develop a Cost Analysis Plan | Write Cost Analysis Plan | | | | |
| | | | | | |
| **4.** Prepare Data for Analysis | Assemble Appropriate Data Sets for Analysis | | | | |
| | Calculate *Total Cost* | Adjust for currency | | | |
| | | Adjust for inflation | | | |
| | | List contributions | | | |
| | | Monetize contributions | | | |
| | Calculate *Full Costs* by proportionally redistributing Category 1 across other cost categories | | | | |
| | | | | | |
| **5.** Implement Cost Analysis | Analyze distribution of costs across all cost categories, sub-categories, and over time | | | | |
| | Analyze costs of ingredients in cost categories and sub-categories, including ingredient-level pricing, if relevant | | | | |
| | Select appropriate cost categories/sub-categories for cost-efficiency analysis and/or CEA | | | | |
| | Divide the *total costs* by the unique count of beneficiaries | | | | |
| | Divide the *full costs* by the unique count of beneficiaries | | | | |
| | Pair costs with impact measures | | | | |
| | Answer research questions | | | | |
| | | | | | |
| **6.** Report and Document | Write the Cost Analysis Final Report. Note key decisions and details of assumptions and limitations. Include details of calculations in an annex. Assemble all relevant documentation for each step for submission along with the report. | | | | |

Finally, an annex to this guidance contains tools and templates to help analysts assess the completeness of data and to conduct the actual cost calculations. The tools and templates are denoted by different icons.

**Tools** are Word documents or Excel worksheets designed to help ensure that the correct method(s) and data are used in the analysis and to assess if there are any missing data.

**Templates** are Excel worksheets analysts can use to conduct the cost calculations.

These icons are located alongside the analysis step for which they can be most helpful. All tools and templates, along with short descriptions of their intended use, can be found in the Annex to this Guidance.[36]

[36] Tools and templates in MS Word and MS Excel formats can be downloaded from USAID/Education Cost Measurement website https://www.edu-links.org/resources/usaid-cost-measurement

# Tools and Templates

### Preliminary Data Checklist

This data checklist is the first step to assess the completeness of the available expenditure and contributions data, intervention details, and supporting documentation (e.g., cost reporting manuals). It can also be used to document outputs and outcomes from performance monitoring and evaluation reports, if available, and if analyzing several different interventions for comparison purposes, to establish comparability of cost and output/outcome data.

### Activity Life Cycle Calendar

To understand the overall structure and flow of the activity, it is useful to visualize the details of an activity as it progressed over time. These details can include the month and year when the activity started and ended, when intervention components occurred (e.g., when teacher training was delivered and what the contact time/dosage was, when books were distributed) and when baseline and endline assessments/evaluations were conducted (if applicable). It can also help identify when an activity moved from development to implementation. It is important to note that activities frequently continue to tweak interventions throughout implementation; those tweaks are natural and should be considered a part of implementation. This calendar also serves as a reminder to talk about any large expenditures incurred for the development of an intervention whose payments were delayed and were documented in the time after implementation had begun. Additionally, this calendar can help analysts ensure that the data submitted corresponds to the overall activity timeline.

### Scope Table (for CEAs)

This table reminds analysts that a CEA aligns the impact generated with the costs of the resources used to generate that impact.

### Logic Model

For cost-economy and cost-efficiency analysis, it can be helpful to document the program's logic model, including a brief description of the activities and resources. This information can be used to confirm with the implementing organization that all components of the program and their corresponding resources are accounted for in the submitted expenditures, contributions, and intervention details.

### Logic Model—Expanded

This expanded version of the logic model is designed for analysts conducting a cost-effectiveness analysis. It can be used to help visualize the similarities and differences in the resources used in the implementation of the treatment and comparator arms of the program being evaluated.

### Activity Implementation Map

Often it can be helpful to visualize the locations of an intervention on a map. For example, it can be helpful to see where a pilot took place and where the government is considering expanding the pilot. It can also be helpful to better understand the potential location of expanded teacher training programs in terms of location, distance, and documenting facility capacity.

### Resources and Stakeholders

The most extensive of the tools, this document details each resource used in an activity. It details if a resource was an expense or a contribution and who paid for or donated the resource. This tool can be expanded to include unit prices for prospective analysis.

### Teacher Training and Support Model

When costing teacher training models, it is often helpful to visualize the structure of the training in terms of the type of training (e.g., train the trainers, orientation, and refresher). This can be used in conjunction with the Activity Implementation Map.

### Cost Analysis Question—Method Alignment

This document can be used to ensure that the cost questions and the cost analysis methods align.

### Sourcing Prices for Contributed Resources

This list can be used to help source prices for contributions and donations for cost-efficiency and cost-effectiveness analysis.

Using these tools and templates is optional; analysts can use alternative tools and templates as long as they adhere to the Key Elements of USAID/Education Cost Analysis.

### KEY ELEMENTS OF USAID/EDUCATION COST ANALYSIS

1. Analysis uses cost data collected in real time (not budgets)
2. Analysis follows the six steps outlined in this guidance
3. Analysis adheres to the methodological elements of USAID/Education approach (Exhibit 4)
4. Analysis uses World Bank Development Indicators in currency and inflation adjustments.
5. Discount rates for costs as well as benefits are set at zero.
6. The presentation of findings is transparent and lists assumptions and limitations.

# Step 1. Preliminary Data Check

Preliminary Data Checklist

While it might be tempting to begin a cost study with a review of questions and objectives, it has been our experience that those may need to be (re)defined when data availability is ascertained. Therefore, the first step in a cost study is a preliminary data check of the analyzed intervention, activity, or set of activities, followed by the review of objectives and questions in Step 2, when a second, more detailed, data check will be conducted. The purpose of this preliminary data check is to:

- Assess completeness of the available data on expenditure, contributions, and intervention details to determine if there are any data gaps. Supporting documentation such as cost reporting manuals can be used for assessing the data.
- Review data on outputs and outcomes from performance monitoring and evaluation reports, if available.
- If analyzing several different interventions for comparison purposes, establish comparability of cost and output/outcome data.

If the cost analysis objectives and questions are already well-defined, analysts can use the preliminary data check to see if the proposed questions are answerable and to estimate the level of effort for the cost analysis. For instance, a cursory review of the in-service educator training sub-categories will help assess how detailed cost questions related to educator training can be.

This preliminary review of the data will also provide the analysts with a glimpse into how detailed the cost analysis questions can be. More detailed and disaggregated data allow for a more rigorous cost analysis. Data that are more aggregated could limit the depth, number, and type of cost analysis questions that can be answered. For instance, if spending on each ingredient has been aggregated annually, it would not be possible to answer questions about how the component cost varies throughout the year.

## Data Checks for Analyzing a Single Intervention

Collect and review the following documents produced by the activity as part of cost reporting.[37] Review the following:

- **Cost Reporting Manual.** The cost reporting manual documents the cost categories for cost reporting and describes the tasks under each category. The manual provides an overview of resources that were used in the intervention. Implementing partners develop the cost reporting manual following USAID's *Cost Reporting Guidance* and *Cost Reporting Manual Template,*[38] in consultation with USAID education staff during the activity startup. A review of the cost reporting manual provides insight into cost categories, sub-categories, and definitions the partner used in this activity.
- **Expenditure Reports.**[39] Depending on the reporting schedule of the award, expenditure reports are produced by implementing partners on a quarterly or annual basis. Analysts should check reporting frequency to ensure no reports are missing. The reports contain expenditure data disaggregated by the standard cost reporting categories, and may contain data by sub-category, as well. It is important to assess the level of detail reported, which ingredients data (labor, materials, travel, other direct costs, fees) are included, and whether line-item ingredients needed for prospective cost modeling are included.
- **Contributions Reports.** USAID contributions templates[40] help collect data on partner government and non-government contributions, cost share contributions by the implementing partner, and beneficiary contributions. Analysts will use the descriptive information provided by implementing partners to estimate the monetary value of in-kind and direct government, donor, and non-government contributions. They will also use this information to estimate the opportunity cost of beneficiary time contributed to the intervention if there is reason to believe that these contributed items, spaces, and time would need to be purchased in the event of the activity being replicated, scaled, or sustained. For expenditure analysis, analysts will simply list the donated items, spaces, and time, but not monetize them. Therefore, for all cost analyses, analysts should check for the completeness of these data in the event that monetizing contributions will be necessary.
- **Intervention Details.** Implementing partners report[41] information needed to calculate costs per output, including the selected, relevant data on outputs and dosage of education interventions (e.g., the amount of the intervention delivered expressed as hours of instruction, or hours of technology exposure, or the amount of instruction an educator might have received). Information on the unique count of beneficiaries who received the intervention should also be included. A USAID-funded education activity typically implements multiple interventions. For example, a basic education activity may implement a teacher training intervention, a parental engagement

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[37] Some activities are implemented with support from multiple partners. Typically, USAID receives cost reports from the prime holder of the award, but the reports may include specific sections with information on the tasks performed by the subs.
[38] Downloadable from https://www.edu-links.org/resources/usaid-cost-measurement
[39] Various types of awards may have different expenditure reporting templates. Data reported using different templates may be used for the analyses as long as they include "ingredient"-level reporting (labor, travel, equipment, etc.) and use USAID standard cost reporting categories.
[40] The templates are found on the USAID/Education cost measurement initiative website https://www.edu-links.org/resources/usaid-cost-measurement as well as in the Annexes to the *Cost Reporting Guidance*.
[41] Subject to award-specific reporting requirements. The reporting templates are found on the USAID/Education cost measurement initiative website https://www.edu-links.org/resources/usaid-cost-measurement as well as in the Annexes to the *Cost Reporting Guidance*.

intervention, a capacity strengthening intervention for local education authorities, and a capacity strengthening intervention for a Ministry. A typical cost study will have questions about one or more of these interventions, but rarely will it have questions about all interventions delivered by the activity. It is important to isolate which particular intervention the cost analysis questions are addressing and check availability, quality, and completeness of intervention data and their correspondence to the cost reporting categories.

- **Evaluation Reports, if available.** If the cost study includes cost-effectiveness questions, the analyst will need to include the results of an impact evaluation in the analysis. Checking the availability of evaluation data early in the process helps establish feasibility of answering questions relating to the cost-effectiveness of the intervention.
- **[For Prospective Cost Modeling Only] Description of the Expected Scale and Beneficiaries.** This should include information about how the expected beneficiaries are distributed across the targeted regions/districts, and how they are distributed across time in the process of scale-up/replication/transfer. It is also helpful to have descriptive information about the expected beneficiaries themselves—their age, learning status, gender split, etc.—to assess similarities or differences from the originally studied population.
- **[For Prospective Cost Modeling Only] Description of Expected Changes to the Intervention Model.** It is not uncommon that when an intervention is scaled up, replicated in a different context or with different beneficiaries, or transferred to a new implementer, the model changes somewhat. Having information about such changes is necessary for accuracy of prospective cost analyses. In particular, assumptions about which activities would be continued or not and by whom are essential.
- **[For Prospective Cost Modeling Only] Description of Expected Changes to the Cost Structure or Input Pricing.** When effective interventions are replicated in another context or transferred to a new implementer, it's likely that some input prices will differ. For example, necessary materials can be more expensive in the new context in a case of a replication of the intervention, or international labor will no longer be used to implement the intervention, in the case of a transfer to the partner government. Details on the changes to the cost structure at the ingredient level and changes in the input pricing are essential for accuracy of prospective cost modeling.

Feasibility of different types of cost analyses is determined by availability and quality of cost data and data on outputs/outcomes of the intervention. **If relevant data are not available and the analyst will have to make many assumptions to compensate, it may be determined that the final estimates will not be precise enough to justify the investment in doing the analysis**.

## Data Checks for Multiple Interventions

The complexity of the preliminary data check increases proportionally to the number of activities or interventions included in the analysis. When analyzing a set of activities or interventions, an analyst would need to ensure comparability of interventions on key objectives, comparability of cost categories, and comparability of outputs/outcomes of the intervention (Exhibit 17).

Exhibit 17. Preliminary Data Checks for Single and Multiple Activities

| Data Type | Data Check for a Single Activity/Intervention | Data Checks for Multiple Activities/Interventions |
|---|---|---|
| Expenditure data disaggregated by standard cost categories | Check standard categories of reporting, missing data. | Assess comparability of standard categories reported across data sets. |
| Contributions: partner government, non-government contributions, cost share, beneficiary costs | Check completeness of contributions data. | Check completeness of contributions data for each activity.<br>Assess whether the level of detail on contributions is comparable across activities. |
| Intervention details, including data on outputs | Check completeness of data on intervention details; check that the number of beneficiaries is reported. | Assess comparability of intervention objectives, beneficiaries, duration, and other critical characteristics. Check completeness of data on intervention details. |
| Measures of outcomes | Check completeness of the measures of outcomes and their alignment with activities/interventions for which cost data are collected. | Assess completeness and comparability of outcomes measures (including disaggregation levels), and their alignment with interventions for which cost data are collected. |

The key advantage of USAID's cost measurement approach is that it standardizes how implementing partners of USAID-funded education activities capture data on expenditures, contributions, and details of the interventions. As a result, standardized costs and outputs are well-defined and will be comparable across many activities. This enables methodologically consistent comparisons of unit costs across multiple contexts to help better understand contextual and intervention-related cost drivers.

Comparability will be more limited for analyses of line-item costs or of sub-categories, compared to analyses of total costs, because the *Cost Reporting Guidance* allows partners to self-define sub-categories of their activities. As a result, **more nuanced analyses of cost categories might be limited to individual activities, or require additional data collection to enable comparisons**.

# Step 2. Cost Analysis Objectives and Questions

- Activity Life Cycle Calendar
- Scope Table (for CEAs)
- Logic Model
- Logic Model—Expanded
- Activity Implementation Map
- Resources and Stakeholders
- Teacher Training and Support Model
- Cost Analysis Question—Method Alignment

Following a preliminary data check, the next step is to ensure that there is no mismatch between objectives, cost analysis questions, and available data so that the results of cost analyses are useful for the stated objectives. To accomplish this, the analyst should:

- Review existing cost analysis questions and overall objectives. If questions require prospective cost modeling, understand and document the perspective from which that analysis should be undertaken. The two most commonly used perspectives are that of USAID and that of the partner country government.

- Perform a more detailed data check of the activity cost data against the analysis questions and objectives.
- Review existing evaluation reports to determine details of outcome data (if applicable).
- Engage with key stakeholders to achieve a common understanding of cost analysis objectives and corresponding questions that can be answered given the available data.
- Finalize cost analysis questions that are aligned with objectives and available cost data and are sufficiently detailed.
- Document decisions and reasons behind them.

## Clarify Cost Analysis Objectives

To ensure alignment between objectives, cost analysis questions, and the available data, we need to first review existing objectives and associated questions against the available cost and outcome data. Is the activity looking to scale up? Transfer the intervention to the government? Are stakeholders interested in expanding the intervention to a different beneficiary group or a different context? **Objectives will drive decisions about which questions to include in cost analysis.**

Ideally, cost analysis questions are generated early in the activity and are based on the overall strategic and operational objectives of the Mission, the government, and the implementing partner. Questions can then drive the approach to cost data capture, to ensure necessary data are being collected. However, objectives typically evolve, and close alignment between objectives and data may be lost over time.

**Consulting with the key stakeholders to achieve a common understanding of the study objectives and to refine cost analysis questions is an essential step.** For example, a cost analysis question may be about costs of scaling up the intervention from a pilot to the national level. In this case, like in any case of prospective cost modeling, it is essential to ascertain the perspective from which the question is being asked. Will it be USAID funding the scale-up or will it be the partner government? Different data will be needed to estimate the costs of the scale-up if USAID funds the implementation versus the government.

Consultations with both USAID officers managing the activity and the implementing partner are generally recommended for all activity-level analyses. Such consultations will also help manage expectations regarding what questions can be answered given the available data. Analysts should clarify for stakeholders that not all cost questions may be answerable and why this is the case.

The following questions can be used to guide stakeholder discussions. A clear response to each will help make the study objectives explicit and prepare for the next step, which is to revise or draft appropriate cost analysis questions (Exhibit 18).

Exhibit 18. Clarify Cost Analysis Objectives

| What Do We Need to Know? | Why Is It Important? |
|---|---|
| • What is the study objective?<br>• Which stakeholder will be using the results?<br>• How will the results be used? | The stakeholder's perception of a problem often motivates the call for analysis. Stakeholders' cost analysis objectives need to be stated explicitly so there is no confusion about the goals and audience of the cost analysis. For instance, the problem statement "we need to know the real cost of implementing reading activities in remote communities" can be stated in more specific terms by clarifying which remote communities, which reading activities, and why we need to know the real cost—is it in order to transfer the activity to the government or to inform the follow-on USAID activity? When the objective is explicit, analysts can more easily define cost analysis questions and assess whether the data are available for the level of analysis that will be needed. |
| • Who are the study audiences? | Clarity about the audience for cost analysis results will help inform the strategy for communicating them to stakeholders, such as USAID staff, partner government, implementing partners. Other audiences may include other donors working in the country, private investors, and researchers. It can be especially useful to disaggregate government stakeholders to understand the different questions that (for instance) a Ministry of Education might have versus a Ministry of Finance, based on the roles that line ministries and Finance/Planning Ministries are assigned in that government's particular planning and budgeting processes. |
| • When does the key stakeholder/ client need to know the results of this analysis? | To be useful, cost analysis results often need to feed into defined planning and decision-making processes. These could include proposal development for future funding, government annual budgeting cycles, or longer-term planning and education policy development. Identifying the specific timing of the decisions that should be informed by the analysis helps ensure that opportunities for evidence use are not missed, and can also help to clarify the objective of the analysis further by giving details about the decision context. |

## Define Cost Analysis Questions

Defining the cost analysis questions is the most important step in preparation for analysis. The questions should be clearly linked to the objectives and the perspective from which they are asked, and be specific and answerable. Answers to cost analysis questions should provide the information needed for operational objectives. Well-defined cost analysis questions should:

- Relate directly to the stated objective of the analysis and stakeholder whose objective it is
- Provide the necessary level of details to support decision-making by stakeholders
- Be answerable using cost analysis methods and available cost data

Developing cost analysis questions begins with the strategic or operational objectives for the analysis followed by clarification of how the analysis results will be used. Information on the expected use of cost analysis results and which stakeholder will use them is centrally important for cost analysis. Answering the same question, like "What is the per unit cost for educator training?" will depend on whether the educator training will be delivered by the partner government, by a USAID-funded partner, or by a private company, and will require different data.

Let's consider, for example, a frequently asked prospective cost modeling question, "How much should the partner government budget to scale up a successful pilot activity funded by USAID?" Using detailed cost data from the pilot, the first cost question could be "What was the total cost to implement this

activity, excluding the development costs?" Since we are only interested in estimating the cost of continued implementation, we need to be able to isolate development costs from implementation costs.

The second question could be "What was the total cost to implement this pilot activity by the USAID implementing partner, and what were the components of the total cost?" Understanding the structure of the total cost of the pilot (i.e., breakdown of costs into different cost categories and by different funding sources) is very important since different parts of the total cost will change differently when scaled up. For example, a better understanding of the government contribution to the pilot will provide necessary information for the government decision-making, since every contributed resource has an opportunity cost and should not be assumed free and available for scale-up.

Once we know the structure of the total cost, the value of the partner government contributions, and the target scale parameters, we can explore the final question: "How much should the government budget to implement the intervention at scale?" To consider this, the analyst will first need to define what "scale" means in this context—will the government now saturate the district in which the pilot was run? Will they expand to new districts, but focus on the same grade level as the pilot? Are they considering expanding to other grade levels as well? Analysis may need to further disaggregate fixed and variable costs and identify any existing constraints to consider how prices and quantities will shift under different scale assumptions. A sensitivity analysis can be useful at this point to assess how much price or quantity variations of key inputs will affect total cost and incremental costs of the intervention when scaled up.

This example highlights some of the challenges of translating the utilization question "How much should the government budget to scale up a successful pilot activity?" into a set of cost analysis questions that can provide decision-relevant information and can utilize available data and cost analysis methods.

Translating a policy objective into cost analysis questions requires the analyst to consult with key stakeholders to obtain a solid understanding of the key decision problem, to think carefully about what kind of information is necessary to support the analysis, and to evaluate the data sets to be sure there is sufficient data to carry out the proposed analysis. As shown in this example, the analysis may require several questions or steps to produce the needed information.

Exhibit 19 shows examples of cost analysis questions from various workstreams of the USAID education portfolio. The provided examples illustrate cost measurement objectives corresponding to two key areas of cost measurement results: sustainability and improving value-for-money of USAID education investments through more data-driven planning and management.

Exhibit 19. Illustrative Cost Analysis Questions

| Objective | Utilization | Initial Questions | Final Questions |
|---|---|---|---|
| ***Sustainability and local ownership*** | | | |
| Transfer of the intervention to the government | Government will use cost data analysis results to budget the continued implementation of the intervention | What are the implementation costs of teacher training? | • How much should the government budget to implement an annual five-day refresher teacher training for all primary grade teachers in Provinces A, B, and C?<br>• What are the costs of labor to deliver training?<br>• What are the costs of materials for the training? |

| Objective | Utilization | Initial Questions | Final Questions |
|---|---|---|---|
| | | | • What are the costs of logistics to support the training?<br>• How will the costs differ if other provinces are added? |
| Advocate for continued funding for the intervention by other funders or USAID | USAID will use cost data analysis results to prepare a business case for continued funding of the successful intervention by other funders | What is the cost-effectiveness of continuous teacher coaching? | • What is the cost to implement a coaching program for all primary grade teachers in Provinces A, B, and C with the dosage of coaching used in the USAID activity?<br>• What is its cost per outcome, and how does that compare to alternative coaching models we could fund?<br>• What are the costs of labor to deliver coaching?<br>• What are the costs of materials?<br>• What are the costs of logistics to support coaching?<br>• How will the costs differ if scaled to other provinces? |
| ***Improving Value-for-Money of USAID Education Investments*** | | | |
| Identify the most cost-effective intervention for achieving a given outcome | Implementing partner will scale up most cost-effective intervention | Which of the two tested workforce development models is most cost-effective at generating employment? | • What was the cost of each additional youth employed compared to the control group, for each model?<br>• When implemented with $XX investment per youth beneficiary, which of the two workforce development models resulted in more youth employed six months after the end of the intervention?<br>• How will the costs vary if the intervention is scaled up to a particular number of beneficiaries in targeted locations? |
| Identify the most cost-efficient way to supply schools with materials | USAID will compare unit costs of books procured by different partners to identify the best book procurement practices | What are the costs to reprint and deliver books produced by the USAID activity? | • Using price information from USAID-funded activity, what are the costs to reprint leveled reader books?<br>• What are the costs to reprint supplemental readers?<br>• What are the costs to reprint teacher guides?<br>• What are the cost drivers, and can they be influenced through the procurement process or other means to help reduce costs? |
| Inform the follow-on programming | USAID uses cost data analysis results to develop an IGCE and output/outcome targets for the next activity | What is the cost structure of the current higher education activity? | • What proportion of resources are dedicated to USAID-specific tasks such as general management, operations, and reporting?<br>• What are the unit costs of capacity-building per institution supported through the activity?<br>• How much was spent on supporting performance-related reforms in those institutions?<br>• How much was spent on scholarships?<br>• What was the total value of the contributions leveraged through the activity? |

## Identify the Appropriate Data Sets for the Analysis

Once the objectives, cost analysis questions, and methods are clearly defined, the next step is to review available information on the intervention and data on expenditure and contributions. This review will help establish whether the available data will allow for answering the cost questions of interest.

More detailed than the preliminary data check in Step 1, this examination of the activity cost data will establish the limitations of what can be learned. **A thorough review of expenditure, contributions, and details of the intervention data, including associated evaluation data, will help clarify what questions can and cannot be answered.**

USAID takes the cost of education activities as the sum of:

- USAID activity expenditures
- The value of in-kind contributions by individuals, private companies and the partner government
- The value of in-kind user and beneficiary costs, including opportunity costs

USAID includes the value of in-kind costs when they contribute directly to the education activities' outputs. For instance, when beneficiaries receive training as a requirement of their participation in a USAID-funded education activity, USAID acknowledges the opportunity cost to beneficiaries of the time spent in training. When youth participants of a workforce development program attend workforce readiness training, the time they spend in the training is not "free" to them since they could possibly be working during this time and earning income. On the other hand, if a teacher-coaching program is implemented during school hours when teachers are already paid for being in school by the government, such time is considered already compensated for and therefore does not need to be included as part of the total cost.

Different cost analysis questions will require different types of data. For example, if we need to know the cost of sustaining an intervention, we need to know how much the USAID-funded activity spent on developing this intervention and how much was spent on its implementation. The disaggregation of labor costs by local versus international labor is also essential for estimating the cost of activities that are likely to be transferred to the partner government. Another frequently asked question is which of the two intervention models is more cost-effective in achieving the desired outcome. To answer this question, the cost analysis will need to include data on effectiveness of both models from the impact evaluation, in addition to detailed cost data.

Exhibit 20 shows the data requirements for cost analysis questions listed in Exhibit 19 above. Once the cost data requirements are clear, the next step is to select the necessary primary and secondary data sets.

Exhibit 20. Data Requirements to Answer Different Cost Analysis Questions

| Objective | Cost Analysis Questions | Cost Data Requirements |
|---|---|---|
| ***Sustainability and local ownership*** | | |
| Transfer of the intervention to the government | How much should the government budget to implement an annual five-day refresher teacher training for all primary grade teachers in Provinces A, B, and C? What are the costs of labor to deliver training? What are the costs of materials for the training? What are the costs of logistics to support the training? How will these costs vary if other provinces are added? | • Complete expenditure data for the teacher training intervention including the disaggregation of development costs and implementation costs<br>• Labor cost data disaggregated by local and international staff<br>• Costs of training, including materials, logistics, participant reimbursement, and management<br>• Details of government and non-government contributions to the teacher training<br>• Details of the intervention implementation |
| Advocate for continued funding for the intervention by other funders or USAID | What is the cost to implement a coaching program for all primary grade teachers in Provinces A, B, and C with the dosage of coaching used in the USAID-funded activity? What is its cost-effectiveness? What are the costs of labor to deliver coaching? What are the costs of materials? What are the costs of logistics to support coaching? How will these costs vary if scaled to other provinces? | • Impact evaluation results of the coaching intervention, with effect size<br>• Complete expenditure data for the intervention including the disaggregation between development costs and implementation costs<br>• Costs of coaching, including materials, logistics, participant reimbursement, and management<br>• Details of government and non-government contributions to the coaching<br>• Details of the intervention implementation |
| ***Improving Value-for-Money of USAID Education Investments*** | | |
| Identify the most cost-effective intervention | When implemented with $XX investment per youth beneficiary, which of the two workforce development models resulted in more youth employed six months after the end of the intervention? What was the cost of each additional youth employed compared to the control group, for each model? How will these costs vary if the intervention is scaled up to XXX number of beneficiaries in XXX locations? | • Employment data for the two models of workforce development, baseline and endline<br>• Complete expenditure data for both models including the disaggregation between development costs and implementation costs<br>• Costs of training, including materials, logistics, participant reimbursement, and management<br>• Details of government and non-government contributions to the coaching<br>• Details of the intervention for both models |
| Identify the most cost-efficient way to supply schools with materials | Using pricing information from the USAID-funded activity, what are the costs to reprint leveled reader books? What are the costs to reprint supplemental readers? What are the costs to reprint teacher guides? | • Details of printing order including type, quality, and number of books/readers/guides per order<br>• Details of costs of shipping and distribution |
| Inform the follow-on programming | What is the proportion expended on USAID-specific tasks such as general management, operations, and reporting? What are the unit costs of capacity-building per institute supported through the activity? How much was spent on supporting performance-related reforms in those institutions? How much was spent on scholarships? What was the total value of the contributions leveraged through the activity? | • Complete expenditure data on the entire activity, disaggregated by cost categories and ingredients<br>• Details of government and non-government contributions to the coaching<br>• Details of the intervention, including outputs |

### Primary Intervention Data

The cost analysis objective and questions will determine whether we will need primary data from a single education activity or data from multiple activities. If the objective is to map out the cost structure of a single activity, only data from that activity will be needed. However, if the objective is to estimate the average unit cost of one specific output when delivered through (for instance) three alternative delivery approaches, then data from all three of those interventions would be needed. In such cases, the analyst will need to develop specific selection criteria to guide the choice of comparison programs and their associated data.

Comparative cost analysis methods, such as cost-efficiency and cost-effectiveness, will always require a selection of appropriate comparison programs. Comparisons of intervention models are performed on the basis of two factors:

- **Similarity of the main objectives.** The costs of two or more intervention models should be compared only if they present viable alternatives for accomplishing the same objective.
- **Comparability of output/outcome metrics:** The outputs and outcomes of two or more interventions are comparable as long as they use comparable approaches[42] for measuring outputs and/or outcomes. The reports on intervention details as well as evaluation reports should contain necessary information to determine comparability.

When considering whether a program can really be considered a "viable alternative" for a particular context, the analyst may also wish to consider:

- **Target population**. The set of interventions selected for a comparative cost analysis should be related to the stakeholder's population of interest. For example, if stakeholders want to know the range of costs for education interventions designed to improve the reading fluency of primary school students, the selected data sets should pertain to primary school students, or children of a similar age. Interventions designed to have an impact on reading fluency of significantly different populations (e.g., students with disabilities versus students without disabilities) should not be considered comparable.
- **Scale**. It is challenging to interpret cost-efficiency ratios of education interventions operating at two completely different scales. For example, the unit cost of teacher training in a pilot activity may change substantially when scaled to reach a much larger population. It is not always clear if input costs will increase or decrease at scale; some prices may go up and some may go down depending on whether costs are fixed or variable. If the necessary level of detailed data is available for all interventions, then scenario modeling for scale-up, as described in Section 2, can help analysts understand costs of two interventions at comparable scale. The scale of an intervention can also affect impacts. For instance, the observed impacts of a pilot program can go down when the intervention is scaled up (Bold et. al 2013), or occasionally it can go up.
- **Dosage of the intervention**. A multi-year activity may lead to greater exposure, which may increase its effectiveness in comparison to an intervention of a much shorter duration. USAID recommends selecting interventions of comparable duration for comparison purposes.

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[42] Traditionally, analysts use a standard deviation as a measure of outcome to compare interventions. However, the effect size is not well-suited to measure change among non-normally distributed populations. Alternatively, effect sizes for quartiles of proficiency standards could be used when measuring change in subjects where such standards (e.g., standards put forth in the Global Proficiency Framework for reading and math across multiple grades) and associated test-specific benchmarks exist.

### Secondary Data on Context

To assess the value-for-money of education activities, the analyst needs to consider the context in which they were implemented. Secondary data from a variety of sources such as the World Bank, OECD, UNESCO, UNDP, and other international organizations can provide needed background to assist in interpreting variation in expenditure observed in the data across activities implemented in different contexts.[43]

Analysis of contextual factors can help determine whether the results of the cost analysis can be generalized to other contexts or settings. For example, suppose USAID has an objective to increase the net primary school enrollment rate in a country. Data show that country enrollment rates varied widely in 2015, from a low of 32 percent to a high of 100 percent among the 173 reporting districts (the median was about 93 percent). We could speculate that the cost of increasing enrollment by one percentage point in the district with the lowest-rate at baseline costs less than increasing enrollment by one percentage point in the district with 95 percent enrollment. Why? Where enrollments are low, it may be feasible to overcome barriers for many learners through specific, context-appropriate strategies. In contrast, barriers impeding enrollment where 95 percent already are enrolled may be more difficult to remove and fewer learners will be reached with the same level of resourcing.

The process of understanding context starts with identifying key features of a setting that constrain or enable the intervention.[44] Cost analysis seeks to identify those key features to not only incorporate them into the analysis, but also to provide a space among stakeholders to discuss cost drivers/mitigators (See Learning from Cost Analysis Results).

At the time of the publication of this guidance note, USAID does not have sufficient comparative data on the differences in costs across contexts to know precisely how context affects the cost of different types of interventions. Indeed, understanding that question is one of the purposes of generating more cost analyses. Secondary data are useful in assisting in interpreting observed cost differences across interventions and activities. A contextual analysis of country-level factors that may affect the cost estimate is particularly important when estimating costs to implement an intervention in a new setting or performing comparative cost analyses. Secondary sources are also useful for estimating the monetary value of contributed labor, goods, or services.

## Assess Completeness of Data

After the data sets for the analysis have been identified, it is useful to compile a data inventory to assist in reviewing data sets in preparation for the analysis. This step is particularly useful when analyzing

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[43] At present, USAID does not have a set list of variables for inclusion in cost analyses, but is encouraging analysts to explore existing datasets that contain relevant context information. For example, for information on population density, see World Bank (2019), World Development Indicators. Available at https://data.worldbank.org/indicator/EN.POP.DNST. For information on expenditures per student, see World Bank's *Education Statistics* (2019), available at https://databank.worldbank.org/reports.aspx?source=1159&series=UIS.XUNIT.USCONST.1.FSGOV. For information on water and electricity, see World Bank's *World Development Indicators* (2019), available at https://data.worldbank.org/indicator/SH.H2O.SMDW.ZS. For information on fragility, conflict, and violence, see World Bank's *Harmonized List of Fragile Situations* (2018), available at http://pubdocs.worldbank.org/en/189701503418416651/FY18FCSLIST-Final-July-2017.pdf.

[44] For more information on the complexity of context in education research, see Sobe, N. and J. Kowalczyk (2012). "The Problem of Context in Comparative Education Research." *ECPS: Journal of Educational, Cultural and Psychological Studies*. 6. 10.7358/ecps-2012-006-sobe.

multiple interventions since such a data inventory helps to systematically record and compare data availability and quality across interventions. Exhibit 21 provides some guidance on this concept.

Exhibit 21. Assessment of Data Completeness

| Source | What Data Are Available? What Data Are Missing or Incomplete? | Is There Sufficient Data to Answer Cost Analysis Questions? |
|---|---|---|
| Expenditure reports | Record reported cost categories, ingredients, whether any are missing, and their completeness. Review cost reporting manual to help assess data quality. | Is there sufficient quality of data to calculate total costs, cost per ingredient? Is there sufficient quantity of data to analyze costs over time? Is there sufficient detail in cost categories and subcategories of reporting to analyze cost economy or impact of scale (i.e., check for separate reporting of fixed and variables costs, of start-up and recurring costs, or of line items)? Is there sufficient detail on the ingredients? |
| Contributions, beneficiary costs | Record frequency and completeness of contribution data, including data on time contributed by beneficiaries. Establish if any contribution data or beneficiary contribution data are missing. | Determine which contribution will need to be monetized and what data will be used (See Step 4). |
| Intervention details | Review intervention details reports for completeness. Consult activity documentation to confirm accuracy. Document any gaps in data. Record beneficiary counts. | Based on the objectives of the analysis, assess the feasibility of reporting the number of beneficiaries and calculating cost per household or beneficiary, unit costs, incremental costs, average costs, cost per output, outcome, and cost per standard indicator. |

### ON NICRA

The Negotiated Indirect Rate Agreement (NICRA) is an estimate of an organization's indirect cost rate (i.e., its facilities and administrative costs, and fringe benefit expenses that have been agreed upon with the United States Government. It may enter into the expenditure report as an ingredient in all cost categories, often as "Indirect Costs." Since the NICRA rate and shared expense are negotiated by each organization, it is important to ask the reporting entity about what is included in its NICRA and receive guidance on its appropriate treatment in the costing. NICRA may cover only a portion of overhead costs; therefore, an organization may additionally report overhead ingredients separately from NICRA/indirect costs.

The process of analyzing cost data can be tedious and analysts can find themselves spending more time collecting, reviewing, and analyzing the data than intended. We offer two points on this. First, inevitably there will be some missing data and as a general rule, analysts should consider the following advice. Henry Levin once said, "Don't count paperclips," meaning that **analysts should invest their time estimating the costs of those resources that account for the largest percentage of the overall costs, and spend proportionately less effort on estimating the cost of those**

**resources that make up a very small percentage**.[45] For example, in general (though not always), the costs associated with personnel often make up the largest percentage of the overall cost for an activity and therefore, analysts should invest the largest percentage of their time ensuring, to the best of their ability, that estimations involving personnel are accurate.[46] As the analysis begins to take form, analysts can identify those resources that account for the bulk of the overall costs and then devote their efforts into their analyses and documentation (Levin et al., 2018). **"Don't count paperclips" is a good general rule for cost analysis studies.**

Second, some cost questions may be particularly problematic to answer. If the question seems unanswerable with the available data and gathering the necessary data would be a heavy lift on the parties involved, then dropping the question and documenting the reasons for that in the Cost Analysis Plan (described in the next step) may be the appropriate solution. The underlying principle that should be considered by all stakeholders is "Do we feel we can answer this cost question with reasonable accuracy within the available resources and time frame?" If the answer is no, it may be better to terminate the study rather than expending a lot of resources to generate inaccurate results.

## Match Analysis Methods to Objectives

After a close review of the data, the next step is to finalize which analytical methods will be used to answer cost analysis questions.

**Cost-Economy Analyses** can be used to answer "big picture" questions about total costs and cost drivers, and they also lay the foundation for answering efficiency and effectiveness questions. Cost-economy questions might involve analyzing the costs of specific interventions as well as education activities as a whole. This might include calculating total or incremental costs, disaggregating costs according to different components of the education activity, and disaggregating costs over time for multi-year programs. The selected data sets must report data at the required level of disaggregation in order to map out the cost structure of an activity. Cost-economy analysis is an appropriate choice when the objective is to estimate total or component-specific costs and to better understand the structure of those costs. Examples of cost-economy questions could include the following:

- What was the activity cost structure? How much was spent on different components? How much was spent on the overall management and operations? What were the cost ingredients within different activity components?
- What was the level of external contributions to the activity? What were the beneficiary opportunity costs?
- How much did the activity spend on procurement of different key inputs (e.g., classroom furniture, books, kits)?
- Which activity cost elements are specific to USAID-funded programming and may not be part of a government-implemented intervention?
- What were the overall costs of the activity-provided training, including participant costs?

[45] While Henry Levin was specifically referring to the ingredient method (Levin and McEwan, 2001), the general advice is applicable here.
[46] Personnel is often the largest category of costs using the ingredients method. However, given USAID's cost capture method, personnel may not be the largest category in these analyses.

**Cost-Efficiency Analysis** is useful for estimating the levels of investment needed to produce desired outputs, and calculating the unit costs of producing the same outputs across different contexts or through different delivery approaches. The selected data sets must report dosage and output metrics. This method is useful for choosing between alternative delivery models. Examples of cost-efficiency questions could include the following:

- What were the per-teacher costs to develop teaching or learning materials (e.g., a textbook, a distance learning program in a specific subject/level, or an education app)? What were the cost drivers and how they could be different across contexts?
- What were the unit costs of implementing a specific intervention (e.g., training costs per teacher per day of training, program cost per youth participating in a program, program cost per child reached with a SEL intervention)? What were the cost drivers and how they could be different across contexts or delivery approaches (e.g., large central trainings versus multiple smaller district-level trainings)? What were the differences in costs of different intervention models? What were the cost drivers and how they could be different across contexts or intervention modalities?
- What was the difference in per-person intervention costs between different location types (e.g., rural versus urban)? What were the cost drivers and how they could be different across contexts or intervention modalities?

**Cost-Effectiveness Analysis** is used to compare the impact of programs with similar objectives. It is also useful for comparing cost per impact of the same intervention implemented across different contexts to improve our understanding of the interplay between intervention characteristics, context features, and results. Cost-effectiveness analysis allows analysts to calculate the cost per attributable outcome of comparable interventions. Preferably, the measure of effectiveness represents a final outcome. If a proximal outcome is selected, it needs to be directly related to the activity's objectives. Examples of cost-effectiveness questions could include the following:

- How much did it cost to improve learning outcomes using USAID standard indicator ES.1-48, per learner? What were the cost drivers and how they could be different across contexts or intervention modalities?
- How much did it cost to improve employment outcomes using USAID standard indicator EG.6-12 measured through WORQ, per person? What were the cost drivers and how they could be different across contexts or intervention modalities?
- How much did it cost to reach target beneficiaries with the distance learning programming, as measured using USAID standard indicator ES.1-58, per person? What were the cost drivers and how they could be different across contexts or intervention modalities?

**Prospective Cost Modeling** can be used to assess the cost associated with a potential future scale-up of the intervention, its replication in a different context or with different beneficiaries, or its transfer to a new implementer or funder. Whereas the prior three types of analysis have been framed as happening retrospectively (i.e., with cost and implementation data about a program which has already been implemented), prospective cost modeling represents the application of cost-economy and cost-efficiency analysis to a hypothetical future scenario. In prospective cost modeling, the perspective of the potential payer is critical. For example, who will pay for the scale-up? Who will pay for the replication? Who is the activity being transferred to and who will pay for the resources? The answer for any prospective cost modeling question might be one entity (e.g., the partner government) or several entities (e.g., the original implementing organization may retain some of the work and the government will adopt other aspects of the activity). Examples of prospective cost modeling questions can include the following:

- How much would the partner government need to budget to scale up the intervention piloted by USAID? What are the cost drivers?
- How much would USAID need to budget to replicate an intervention in a different geographic area? What are the cost drivers?
- How much would the partner government need to budget to continue with the implementation of the intervention originally developed and implemented with USAID funding? What are the cost drivers?

## ON BENCHMARKING

Cost-efficiency and cost-effectiveness analysis are best used comparatively. They can help us select the most suitable intervention for the level of resources available as well as answer a range of questions about contextual and intervention-specific cost drivers. But what if we do not have a similar intervention to compare to the one studied? One solution may be to compare the unit cost estimate to a pre-existing benchmark. Whether it is the right solution for the situation will depend on the study objective and the nature of the benchmark.

Benchmarks can be constructed differently and can serve different purposes. Being very clear on the objective of comparison is essential. One also must be careful comparing unit costs to benchmarks when those were derived by another donor since the methodology for computing unit costs may be different. It is particularly important to show the composition of unit costs to the client when comparisons to benchmarks are made, being clear on what the unit costs would be if we include the shared costs (e.g., general operations and management from Category 1) and costs of development. It would also be important to explain to the client which parts of the unit costs are relevant for what objectives, to ensure the comparisons with the benchmark are performed correctly. Finally, it is important to remember (and remind the client) that "cheaper" does not always mean "better". Information about effectiveness and cost-effectiveness is frequently more useful than information about costs alone, since the low cost will never compensate for the absence of results.

Using benchmarks can help support different objectives. The following are the common objectives and examples of useful benchmarks:

| ***Objective: Transfer the intervention to the partner government*** | |
|---|---|
| **Benchmark** | **Explanation** |
| The level of funding that the partner government has determined they can afford | Comparing unit costs to this benchmark is useful since it provides important insights into the potential sustainability of the intervention. For the comparisons to be accurate, prospective cost-efficiency modeling should be conducted and only costs relevant for implementation by the government should be included in the unit cost estimate. |
| An existing measure of expenditure meaningful within the context of the intervention's outputs. | Comparing unit costs to this benchmark can serve as a proxy for X if X is unknown. Examples include government expenditure per learner and primary school teacher annual salary. |

| *Objective: Assess the value-for-money of USAID Education investment* | |
|---|---|
| **Benchmark** | **Explanation** |
| Unit costs of another intervention or an average across multiple interventions which target the same learning outcomes, and were implemented in a similar context and with similar beneficiaries | Unit costs of an intervention implemented in a different context or with a different type of beneficiaries are only useful in helping us better understand the structure of expenditure and the cost drivers/mitigators. When comparing unit costs across interventions, it is particularly important to ensure that a) the methodology of constructing unit costs is similar, and, if relevant, b) the unit costs are interpreted alongside information about both interventions' effectiveness at achieving the outcome(s) of interest. |
| The total amount of money spent by the donor on this intervention divided by the number of beneficiaries, also known as a "cash benchmark" | In some cases, comparing unit costs to this benchmark can be helpful in ensuring that the value of implementing an intervention is higher than simply distributing cash to beneficiaries. |

Here are some examples of when benchmarks should not be used:

- Cross-objective comparisons. For example, if unit costs used for benchmarking were computed as part of prospective cost-efficiency modeling and excluded development costs and costs of operations and management of a USAID activity (Category 1), it would be inappropriate to compare them with unit costs produced as part of retrospective cost-efficiency analysis that included full costs of the intervention.
- Unit costs produced using different methodologies. For example, unit costs produced with the assumption of a discount rate of zero should not be compared to unit costs produced with the assumption of a 10% discount rate without implementing necessary adjustments first.
- Unit cost comparisons of interventions with multiple outcomes. For example, unit costs of a teacher training program that includes multiple subjects should not be compared with the unit costs of a teacher training program with a single subject.

# Step 3. Cost Analysis Plan

Once the cost analysis questions and objectives are well-defined and matched with cost analysis methods, the next step is to create a cost analysis plan. The cost analysis plan serves two purposes. First, it is a roadmap to structure and plan the cost analysis using the cost datasets, and second, it informs the Cost Analysis Final Report generated at the conclusion of the analysis to document the findings. As shown in Exhibit 22, the cost analysis plan contains five sections. All the tools noted in the previous steps can be used as figures in the Cost Analysis Plan.

Exhibit 22. Cost Analysis Plan Sections

| Section | Title | Content | Source |
|---|---|---|---|
| 1 | Background, Context, and Stakeholders | • Describe the overall background of the activity and important contextual factors that might affect the cost analysis, such as conflict, infrastructure, and target population.<br>• Describe the stakeholders (e.g., USAID Mission, the partner government, local NGOs participating in the intervention, and other donors working in the same area) and their respective roles with regard to the activity.<br>• List the implementing organizations and their contributions to the education activity. | Key program documents and contribution reports |
| 2 | Intervention or Activity Description | • Depending on the analysis question, describe objectives of the activity or intervention associated with the analysis questions, characteristics of the beneficiaries, geographic scope, and the time frame.<br>• Describe the theory of change and content of the intervention, dosage/contact time, associated materials and supports, stakeholders involved, etc. | Key program documents and the intervention details reports |
| 3 | Cost Analysis Objectives, Utilization, and Cost Questions | • State the objectives of the cost analysis including their expected policy relevance. List detailed cost analysis questions corresponding to the objectives.<br>• Describe who will be using the findings and for what purpose. | Cost analysis study scope of work |
| 4 | Primary and Secondary Data | • Detail which costs will be counted within each dataset. For example, depending on the research question and cost analysis approach, these counted costs might include direct costs for activity inputs, staff time on implementation and support, and in-kind donations such as venues for training. Additionally, analysts should list any costs that will be deliberately excluded. For example, USAID-specific costs of implementing an activity (Category 1) might fall outside of the scope of the cost analysis and therefore might be excluded from some analyses.<br>• List the key outputs and/or outcomes that will be included in the cost analyses. | Activity cost reports and monitoring and evaluation reports. |
| 5 | Cost Analysis Methods, Assumptions, and Limitations | • List the cost analysis method to be used to address each cost analysis question.<br>• List all the assumptions used in the analyses, to inform the reader which findings are sensitive to which conditions.<br>• To avoid inappropriate use, state clearly limitations of the analyses.<br>• If some of the original cost questions were found to be unanswerable, document the question(s), what data are missing and too difficult to collect, and explain why the analysis cannot be completed with the necessary degree of confidence. | This guidance note provides guidance on methods, assumptions, and limitations. |

# Step 4. Preparation of Data for Analysis

There is a wide range of suitable spreadsheet models and worksheets that can be used to house, prepare, and analyze cost data. Because organizations vary in their software choices, we do not advocate for a standard model (e.g., we do not state that all analyses need to take place in Microsoft Excel or R). For consistency in the following description, Microsoft Excel will be used as the example.

## Assemble Appropriate Data Sets for the Analysis


Summary Worksheet

Before assembling the necessary expenditure, contribution, and intervention details for analysis, we recommend that all the original data be backed up in a separate folder and locked to avoid accidental changes. It is recommended that the original file names as given by the implementing organization be retained. Changing file names can cause confusion if the analyst needs to communicate with the implementing organization about a specific file. It may be helpful to create a codebook that would list all the files and their content in one document, for easy reference. **Since cost data are considered sensitive information, it is important to set up appropriate protections and access controls, to ensure that only authorized staff have access to the data.**

The analyst can start preparation for the calculations by creating a Summary worksheet in a new Excel workbook. The information on this page may include the country, implementing partner(s), activity or intervention, beneficiaries, and geographic scope. We also recommend including the cost analysis objectives and intended use of findings, cost questions, methods, and project years. This information serves as an easy summary for the cost analysis contained in the workbook.


Expenditure Worksheets

Depending on the reporting schedule of the award, implementing partners submit reports on expenditures, contributions, and intervention details on a quarterly or annual basis. Therefore, each expenditure output might be organized by month, quarter, or year. For example, if the activity was implemented for three full years and the expenditure output is by quarter, then there will be 12 original expenditure outputs. It is also common that activities submit expenditure reports quarterly and contributions and details of intervention reports annually.

Without adjusting the original data submissions, **copies of the original data** can be moved into a single Excel workbook, and each worksheet can be named for the month or quarter they represent. For example, the tab of expenditure data for the first quarter of 2015 might be named "Exp-Q1-2015."

This sheet should also provide a citation for the data included in the sheet. For example, if expenditure data were sent to you via email from Dora Milla, your citation might be "D. Milla, personal communication, March 23, 2018. Quarter 1 2015 Expenditure Data."

### Market Prices


Price Worksheet

A market price reflects the point at which the demand of purchasers meets the supplies of providers (Levin et al., 2018). For example, if reading devices were procured at no cost, the estimated market value per device could be obtained by gathering estimates from the supplier who contributed the original devices, new suppliers, or using the organization's existing procurement channel.[47] Each resource's market price and specifications can be listed in the Price Worksheet.

[47] Additional research is needed to estimate the market distortion prevalent in an organization's actual procurement channels or in the general market (i.e., market prices). According to Levin et al. (2018), market distortion can occur due to highly concentrated markets with less competition, information failures, and externalities. Additionally, the very existence of large USAID activities could introduce market distortions where none previously existed or could exacerbate existing inequalities. We caution analysts on this potentiality and encourage further exploration of this topic.

The price worksheet is a helpful multi-purpose reference. It can house all the unit prices for all of the resources (purchased or donated) for the activity being analyzed. For questions related to prospective cost modeling estimations (e.g., scaling, replication, or transfer), the resources can be further identified as fixed or variable costs to help with the modeling of future costs.

To list the contributed items, time, and spaces, analysts should refer to the project's completed USAID Contributions Reporting Templates.[48] For purchased resources, analysts can obtain the unit prices from the implementing partner's accounting department. For items, time, or spaces that were donated, estimations will need to be made using secondary market prices or shadow prices. [49,50]

### ON FRINGE BENEFITS

Analysts should be mindful of the role of fringe benefits in cost calculations. If this information is not included, an individual's salary will appear to be less than the actual cost of employing that person. However, adjusting the salary to include benefits may require an additional step. Fringe benefits can be incorporated into a cost analysis in two different ways.

1. Wrap the additional costs into an individual's salary—The advantage of including benefits directly into an individual's salary is that it is a more accurate estimation of the total compensation.
2. Include a separate line specifically for benefits—This is a clean way to manage fringe benefit expenditures for a large number of individuals and it serves as a visual assurance to the analyst that these additional costs have been included in the calculations.

Whichever approach the analyst selects, they should be explicit in their notations and calculations. In the absence of clear notation, it can be difficult for others to know for certain what has or has not been included.

USAID expenditure reports typically include fringe either as part of labor costs, or as a separate line item.

## Shadow Prices

Shadow prices are used when no market value readily exists for a resource (Levin et al., 2018). For example, there is no fair market price for a volunteer who spends two hours per week reading with 2nd grade students for a USAID-funded activity. Still, the volunteer's time must be included in the cost

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[48] All templates can be found at https://www.edu-links.org/resources/usaid-cost-measurement.

[49] Costing out donated items, space, and time is a critical aspect of economic evaluation. The value of the contributed resource represents its opportunity cost. While the resource may have been donated, if the activity is replicated in a new context or scaled up in the future, the same resource might need to be purchased (Dhaliwal et al., 2014). One often overlooked contribution is a beneficiary's time. Omitting the cost to beneficiaries can bias the results of a cost analysis. For example, in one study, the cost of an education activity in Madagascar dramatically increased after the parents' time attending meetings required by the education activity were included in the analysis (Dhaliwal et al., 2014). Beneficiary time and resources (e.g., travel) represent the use of scarce resources. The conventional assumption in economic evaluation is that all resources have an opportunity costs and must be included in the analysis (Levin et al., 2018). By monetizing contributions, we include the opportunity costs in the analysis for all methods except for cost-economy. Cost-economy is an expenditure analysis (as opposed to an economic evaluation) and therefore, these inputs do not need to be costed.

[50] The estimated cost of a contributed item is referred to as the resource's "opportunity cost," or what is given up by not using the resource in some other way. Market prices and shadow prices are both derived from the idea of opportunity cost. For more information on costing contributed resources and shadow prices, see Levin and McEwan (2001), Boardman et al., (2011), Dhaliwal et al., (2014), McEwan, (2012), Hollands et al., (2016), and Levin et al., (2018).

analysis since the volunteer may not be available in a different context. For cost-efficiency and cost-effectiveness analyses, analysts will need to approximate the cost of the volunteer's time using the next closest alternative use. For example, the value of the time of a volunteer tutor could be estimated using the current hourly market price of tutors.[51] To approximate a shadow price, analysts need to know those specifications that determine the price of the particular item. For example, the price of a tutor generally varies by the tutor's education level, years of experience in tutoring, as well as the setting (e.g., urban, rural, or remote), the subject matter of instruction, and age or grade of the students being tutored. Analysts will also need to know the volunteer's time commitment (e.g., how many hours per week, how many days per week, and how many weeks per year). With this information, an estimate of the volunteer's time can be generated. The Resource section of this document provides additional suggestions on where to locate the price of contributed items.

### Units

Analysts should take special care when documenting a resource's unit. **Misalignment between unit prices and the timeframe of the analysis is a common mistake and can lead to inaccurate results**. For example, if a parent volunteers one hour per month for nine months, but the analyst has obtained a per month or per year wage for tutors (i.e., the shadow price), the per month or year wage will need to be converted into an hourly wage to align with parent's actual volunteer time (i.e., the dosage of tutoring). Analysts should review all units to ensure alignment and document all the calculations to allow for verification and replication.

### Beneficiaries, Outputs, and Outcomes

Outputs and Outcomes Worksheet

The Outputs and Outcomes Worksheet is very useful for documenting the number of beneficiaries, relevant outputs, and the impact evaluation coefficients, to ensure clarity around analysis inputs and transparency of reporting. These data can be found in the activity reports on details of intervention, as well as in the activity quarterly and annual reports and monitoring and evaluation reports. Analysts should ensure that the counts of beneficiaries such as students, teachers, or even schools correspond to interventions received and to the associated costs. USAID's standard indicators allow for any individual to be listed as a beneficiary only once in a fiscal year, even though that individual may have received multiple interventions. For example, if a teacher received training on reading instruction and a separate training on how to integrate social and emotional learning in classroom instruction, that teacher will only be reported once in the activity monitoring reports, while for the purpose of cost analysis this teacher is associated with two different interventions and two different expenditures (and two different results).

Analysts should note that unless data on the fidelity of implementation are included in the analysis, USAID/Education reporting templates capture the intervention dosage *as planned* and not as implemented. The data documented on this sheet will be used in cost-efficiency and cost-effectiveness analyses.

If one of the cost research questions pertains to prospective cost modeling then the *estimated* number of beneficiaries projected under different scenarios can be documented on this worksheet as well. The

[51] For more information on methods to estimate shadow prices, see Levin and McEwan (2001), Boardman et al. (2011), McEwan (2012), Dhaliwal et al. (2014), Hollands et al. (2016), and Levin et al. (2018).

level of detail will depend on the cost question. For example, if the estimation relates to scaling teacher training, then the unique count of teachers who still need the orientation training should be documented as well as the number of teachers who will require the refresher training. Estimates might also include annual teacher attrition and teachers who transfer into those grades for which the training is relevant. More advanced analysis can be conducted if warranted.

**As with all other worksheets, it is essential to document all assumptions made and indicate the source of data included in the worksheets**. The level of detail of such documentation should be such as to allow another analyst to independently verify or replicate the resulting calculations.

### Data Quality Checks

After all the data are assembled, we recommend that analysts pause to consult with the implementing partner on any lingering questions prior to continuing with the analysis. These questions might be related to the counts of beneficiaries, expenditures that look oddly high or low, and the unit prices of donated resources if the prices were obtained from a secondary source. It is often easier to communicate the accuracy of data and assumptions at the pre-analysis stage than after the data have been adjusted for currency and inflation. Given the potential for staff turnover at the implementing partner or evaluating partner, it is often helpful to keep a dedicated worksheet of open questions, flag uncertain values in your analysis worksheets, and note the answers to the questions as they are clarified.

## Calculate Total Costs[52]

Calculating the "total cost" of a USAID-funded education activity involves three actions:


Conversions Worksheet

- currency conversion
- inflation adjustments
- listing and/or monetizing contributions and donations, depending on the cost analysis method(s) being used

Before beginning with these actions, a few words of advice might be helpful. Analysts may need to conduct currency conversions and inflationary adjustments on the expenditures provided to them. These conversions and adjustments can take place in the Expenditure Worksheets, or if there are many individual Expenditure Worksheets it might be more practical to aggregate the Expenditure Worksheets into a single Conversions Worksheet and conduct the currency conversions and inflationary adjustments on this worksheet.

Often analysts will aggregate the data by calendar year. However, analysts should be mindful of the potential difference between an organization's fiscal year and the calendar year. USAID's fiscal year runs October 1st-September 30th. Therefore, the first quarter of a USAID contract will be in one calendar year (the previous to the fiscal year) and the other three quarters will be in a different calendar year

[52] This Guidance does not recommend amortizing or depreciating assets in USAID-funded cost analyses. Amortization and depreciation "smooth out" the costs of the assets over time which is counterproductive to USAID's interest since we want to capture the actual expenditures to better understand the actual costs incurred in a given year of an activity.

(the same as the fiscal year). Analysts will need to take care to ensure that the proper quarters and years are aggregated.

### Currency Adjustment[53]

Accounting procedures often dictate that "local" expenditures are exchanged into the currency of record upon entry into the accounting system. Alternatively, if the expenditure data are expressed in something other than U.S. dollars (USD), analysts should use the exchange rates in the World Bank's World Development Indicators to convert the costs into USD. These indicators represent the official exchange rates determined by national authorities or the legally sanctioned exchange market. They express local currency units relative to USD, based on the annual average of monthly averages.[54]

All expenditures should be converted into USD for the year in which the cost was incurred. To convert a currency to USD, simply divide the amount by the World Bank Development Exchange Rate. For example, as shown in Exhibit 23, expenses incurred in 2013 Vietnamese Dong are converted into 2013 USD.[55] When reporting the cost analysis findings, analysts are required to state the method of currency conversion and cite the exchange rate source used in the analysis (see Step 6. Reporting and Documentation).

Exhibit 23. Example of Currency Conversion

| Vietnamese Dong (2013) | World Bank Development Indicators (2013 Exchange Rate) | United States Dollar (2013) |
|---|---|---|
| 1,500,000 | 20933.42 | 71.66 |

If needed, the same currency conversion can take place in the Price Worksheet. If the value of contributed resources is documented in the local currency, then the analyst should document the value of the resource in the local currency and then use the World Development Indicators to adjust it to USD.

### Inflation adjustment

Expenditure data inherently reflect the prices of the year in which the expenses were incurred. This presents two potential problems when analyzing cost data within a project and across projects. Within an activity, this is problematic because the intervention may have been implemented over many years and, as a result, the inputs were purchased in different years (e.g., some inputs were purchased in 2013 and others in 2018) and their costs reflect those differences in prices. When making comparisons across

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[53] USAID uses standard market exchange rates and does not recommend use of purchasing power parity (PPP) exchange rates. PPP exchange rates adjust somewhat for the different price levels in different countries, but since PPP is based on a standard basket of goods and services it does not completely adjust for the different relative prices of the goods and services used in a particular program across countries. Moreover, by expressing costs in terms of the equivalent prices in the US, PPP exchange rates may give an impression of higher-than-actual costs to run programs in developing countries if readers are assuming standard exchange rates. (Dhaliwal, Duflo, Glennerster, & Tulloch, 2013).

[54] The World Bank's World Development Indicators, PA.NUS.FCRF (LCU per US$, period average) https://databank.worldbank.org/data/reports.aspx?source=2&series=PA.NUS.FCRF

[55] This guidance recommends that analysts use standard market exchange rates (as opposed to using purchasing power parity—PPP). PPP represents the activity costs as though they had been implemented in the United States. Given that USAID's education activities are implemented in low- and middle-income countries, this representation overstates the financial costs of implementation. Standard market exchange rates allow analysts to communicate the results more accurately and better inform education activity strategy (IRC, 2016).

different activities, this is problematic because the activities as a whole may have been implemented at different times (e.g., one activity started in 2013 and another began in 2016).[56] To account for these potential distortions, analysts should adjust for inflation.

Take, for example, an activity that started in 2013 and concluded in 2018. The cost of inputs purchased in different years (e.g., books were purchased in 2013 and 2018) are inflated or deflated to reflect prices in a single selected year. In Exhibit 24, the selected year is 2019, the most recent year for which the World Bank GDP deflator data are available. If this adjustment is not conducted, the cost of the inputs purchased in 2018 may appear to be more expensive than the cost of the same inputs purchased in 2013. Values that are not adjusted for inflation are said to be expressed in "nominal" or "current" terms. Once values are adjusted for inflation, they are said to be expressed in "real" or "constant" terms. **This adjustment should be made using the World Bank GDP deflator**.[57,58]

To adjust for inflation, the amount in USD is multiplied by the "to" year divided by the "from" year. For example, $69.13 in nominal 2013 USD is multiplied by the 2019 GDP Deflator coefficient and then divided by the 2013 GDP Deflator coefficient.

Exhibit 24. Example of Inflation Adjustment

| Year of Purchase | USD (Nominal) | World Bank GDP Deflator ("From" Year or 2013) | World Bank GDP Deflator ("To" Year or 2019) | USD (Real 2019) |
|---|---|---|---|---|
| 2013 | 69.13 | 97.1717628 | 107.493746 | 76.47 |

While it may not make a considerable difference in the estimations, we recommend that the standard order of operations is currency conversion first and inflation adjustments second. This recommendation is to help maintain methodological consistency across the portfolio.

When reporting cost analysis findings, analysts are required to cite the GDP deflator that was used in the analysis, note the year the costs are expressed in, and report all costs in real USD. This documentation can be housed in the References and Sources Worksheet.

References and Sources Worksheet

Any additional sources or documents that were used to help estimate the prices of contributions can be documented on this sheet. Analysts should use standard APA or Chicago Manual of Style formatting by including the author or organization, publication year, name of the document or source, city, and date that the document or source was accessed, and when possible, a link to the document or source itself.

[56] Grand Bargain Cash Working Group: Value-for-Money Workstream (2019); Dhaliwal et al. (2014).
[57] The World Bank GDP deflator is available at https://data.worldbank.org/indicator/NY.GDP.DEFL.ZS
[58] In general, there are two ways to measure inflation: the consumer price index (CPI) and the GDP deflator. Because the CPI includes a fixed basket of goods and services purchased by households, economists typically use this index to calculate the cost of living. However, it is not considered to be a comprehensive measure of inflation, given its focus on household goods and services that are not representative of the inputs of an education program. To measure the rate of inflation, economists typically use the GDP deflator, which includes all final goods and services produced in a country.

### (Not) Discounting Costs and Benefits

As discussed in the earlier sections of this guidance, discounting of costs and benefits refers to a procedure for adjusting future costs and outcomes of interventions to "present value"; essentially this means adjusting for differences in the timing of costs (expenditure) compared to benefits (outputs or outcomes). Cost discounting over time is applied to reflect the fact that money spent earlier often has a higher opportunity cost than spending in the future—either because of people's individual rates of time preference, or because of the opportunity cost of capital[59]. While education is a social investment and not a private investment, ultimately, analysts should consider the origins of the funds and ask, "What is the opportunity cost of this capital?"[60] Different decision-makers will use different estimation methods based upon their situation[61]. For USAID and other donors, the opportunity cost of capital is often zero since funds are appropriated for specific sectoral work and cannot be easily redirected to produce benefits elsewhere.[62] Additionally, grantees can be penalized for *not* expending awarded funds within the specified timeframe.[63] For this reason, **USAID/Education has set its discount rate for costs at zero percent** which is essentially to say that there isn't an opportunity cost of spending now versus spending in subsequent years.

The idea of discounting benefits reflects the fact that future benefits are valued less than present benefits. Discounting benefits encounters considerable debate, and there are strong arguments for why benefits of education investments should not be discounted over time[64]. Following these arguments and because of practical considerations (fade out effects, the use of single point in time measurements such as endline results as opposed to longitudinal results, and disagreements about what discount rate is appropriate for a given benefit in a specific context), **USAID/Education does not discount benefits.**

## Calculate Full Costs of an Activity or Intervention


Full Costs Worksheet

Category 1 tasks (i.e., General Operations, Management, and Reporting) support all activity components so during the analysis we redistribute them across the other cost categories to obtain the "full costs."

To arrive at full costs, start with the total cost of the activity. For example, activity ABC that has three cost categories: a mandatory "General operations, management and reporting" category and two

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[59] https://www.adb.org/sites/default/files/publication/28360/wp094.pdf
[60] Boardman et al. 2011, Chapter 6; Levin et al. 2018
[61] For example, one approach is to use a discount rate that reflects the returns on consumer savings options (e.g., interest rates on treasury bills). Another approach is to use a discount rate that reflects the average returns on investments that are made by private sector entrepreneurs (Dhaliwal et al., 2014; Levin et al., 2018)
[62] Some donors, such as the Asian Development Bank, the World Bank, Department for International Development (DFID)/Foreign, Commonwealth & Development Office (FCDO), and the Millennium Corporate Challenge, apply discount rates to their cost analyses. The ADB uses a discount rate of 9 percent and 6 percent for projects depending on the sector with the discount rates serving as a "proxy" for the opportunity cost of capital. https://www.adb.org/sites/default/files/institutional-document/32256/economic-analysis-projects.pdf. The World Bank typically uses a discount rate between 10 and 12 percent, although the use of a discount rate varies widely across sectors. https://library.pppknowledgelab.org/d/4446/download#:~:text=Although%20the%20World%20Bank%20typically,1985%3B%20Oxera%2C%202011). DFID/FCDO states that discounting is used to account for "the opportunity cost (OC) of capital used in the project (for aid projects this is normally taken to be that of the recipient country, but the test discount rate in the donor country is also relevant, and could serve as a minimum threshold)". https://assets.publishing.service.gov.uk/media/57a08ca140f0b6497400132c/IA_Guide.pdf
MCC, though it has a different mandate, uses a discount rate of 10 percent. https://www.mcc.gov/our-impact/err
[63] USAID 2019, p. 89; USAID 2018, ADS Chapter 634, 634.3.3.5
[64] Gilead, 2015.

technical categories (in-service educator training and teaching and learning materials) (Exhibit 25). How do we compute the full costs of the activity's interventions?

Exhibit 25. Cost Category Totals

| Category | Real 2019 USD |
|---|---|
| Category 1. General Operation, Management, and Reporting | $50,000 |
| Category 6. In-Service Educator Training | $130,000 |
| Category 7. Teaching and Learning Materials | $120,000 |
| TOTAL | $300,000 |

To compute the full costs of a) in-service educator training and b) teaching and learning materials, the analyst will need to implement the following actions:

1. Using the findings from total cost, remove Category 1 and recalculate the activity total.
2. Determine the percentage each cost category and subcategory represent in the new total.
3. Apply these percentages to determine a "share" of Category 1 for each of the remaining categories and sub-categories.
4. Add the share of Category 1 to each cost category and subcategory to arrive at the full costs.
5. Check the data. The full cost of the categories/sub-categories should be the same as the total cost that included Category 1. **This is a great way to check your calculations and verify that the new grand total for full costs is the same as the original grand total for total costs**.

Exhibit 26 illustrates the application of these actions to our example. These estimations will be used when discussing cost-economy analysis further below.

Exhibit 26. Example of Full Cost Calculations—USAID Perspective

| *How to Calculate "Full Costs"* | *1. Start with the Total Costs* | *2. Remove Category 1* | *3. Compute the share of each category in the total technical costs* | *4. Apply the percentages from (3) to the Category 1* | *5. Add the share of Category 1 to each technical category/ sub-category* |
|---|---|---|---|---|---|
| **Cost Category** | **Total Costs USD** | **Technical Costs USD** | **Percent of Total Technical Costs** | **Share of Category 1 to be applied to technical costs USD** | **Full Costs USD** |
| **Category 1. General Operations, Management and Reporting** | **50,000** | | | | |
| **Category 6. In-Service Educator Training** | **130,000** | **130,000** | **52%** | **26,000** | **156,000** |
| 6.1. Development | 10,000 | 10,000 | 4% | 2,000 | 12,000 |
| 6.2. Implementation | 120,000 | 120,000 | 48% | 24,000 | 144,000 |
| **Category 7. Teaching and Learning Materials** | **120,000** | **120,000** | **48%** | **24,000** | **144,000** |
| 7.1. Development | 30,000 | 30,000 | 12% | 6,000 | 36,000 |
| 7.2. Procurement and distribution | 90,000 | 90,000 | 36% | 18,000 | 108,000 |
| **Grand Total** | **300,000** | **250,000** | **100%** | **50,000** | **300,000** |

- Aggregated Cost
- Findings

Please note that analysts will need to do this step twice if the analysis includes cost-efficiency or cost-effectiveness. Cost-efficiency and cost-effectiveness both begin from a social perspective, meaning that all resources, regardless of if they were purchased or donated, should be included in the calculations. Therefore, the calculation of activity costs and allocation of Category 1 costs would need to be done once for an expenditure analysis (i.e., from USAID's perspective), but then again with social costs included for the cost-efficiency or cost-effectiveness analysis.

In the same example from above, let's assume that there are only two contributions to this activity. The first is that the partner government donated space for the activity in the capital city, and the second is that the ministry donated the time of 10 staff members to participate in the teacher training. Assume the monetized office space allocated to this activity was estimated at $20,000 real 2019 USD and the time for 10 partner government ministry staff to participate in one five-day teacher orientation training and one two-day refresher training was estimated to be $2,100(i.e., orientation training: 10 staff * $5 per hour real 2019 USD * 6 hours per day * 5 days=$1,500; refresher training: 10 staff * $5 per hour real

2019 USD * 6 hours per day * 2 days= $600). Note how this changes the total costs and the full costs in Exhibit 27. Adding these monetized contributions increased the total costs to $322,100 from $300,000 (i.e., the difference of $22,100, or $20,000 for the donated space and $2,100 for the donated time). Including monetized contributions also changes the full cost totals for all the technical cost categories, because Category 1 increased by $20,000. If other contributions were provided, such as tablets or time of government officials, community members, or parents, we would expect the difference between the social perspective and USAID's perspective to be much larger.

The two perspectives, USAID's perspective in Exhibit 26 and the social perspective in Exhibit 27, will be used when cost-efficiency and cost-effectiveness are discussed below.

Exhibit 27. Example of Full Cost Calculations — Social Perspective

| *How to Calculate "Full Costs"* | *1. Start with the Total Costs* | *2. Remove Category 1* | *3. Compute the share of each category in the total technical costs* | *4. Apply the percentages from (3) to the Category 1* | *5. Add the share of Category 1 to each technical category/sub-category* |
|---|---|---|---|---|---|
| **Cost Category** | **Total Costs USD** | **Technical Costs USD** | **Percent of Total Technical Costs** | **Share of Category 1 to be applied to technical costs USD** | **Full Costs USD** |
| **Category 1. General Operations, Management, and Reporting** | **70,000** | | | | |
| **Category 4. In-Service Educator Training** | **132,100** | **132,100** | **52%** | **36,680** | **168,780** |
| 4.1 Development | 10,000 | 10,000 | 4% | 2,777 | 12,777 |
| 4.2 Implementation | 122,100 | 122,100 | 48% | 33,903 | 156,003 |
| **Category 5. Teaching and Learning Materials** | **120,000** | **120,000** | **48%** | **33,320** | **153,320** |
| 5.1 Development | 30,000 | 30,000 | 12% | 8,330 | 38,330 |
| 5.2 Procurement and Distribution | 90,000 | 90,000 | 36% | 24,990 | 114,990 |
| **Grand Total** | **322,100** | **252,100** | **100%** | **70,000** | **322,100** |

Throughout the analysis and the presentation of the findings, it is important to be transparent about the structure of the costs and show, whenever possible, the "share" of costs borne by USAID versus other stakeholders.

# Step 5. Implementation of Analysis

This document presents guidance for conducting cost analysis using three different methods: cost-economy, cost-efficiency, and cost-effectiveness.[65] For each method, the complexity of the analysis will increase with the complexity of the intervention or activity being analyzed and the cost questions posed.

## Method 1. Cost-Economy

The cost-economy analysis method helps us understand the "big picture" view of the activity or intervention cost structure, the costs of different activity components, how those costs change over time, and cost drivers at the ingredient level within each cost category. For example, analysts can measure the costs associated with overall activity management and operations, start-up and close out costs, overall operations costs of developing and implementing particular interventions, and what ingredients account for most expenditures in different cost categories. Typical cost-economy questions ask about expenditures in different cost categories, cost drivers in different cost categories, how much was spent on developing versus implementing interventions, and the level of contributions the activity received. To answer these questions will require computations of total expenditures by cost category, sub-category, and ingredient category.

**Data and Analysis.** As an example of a cost-economy analysis, assume that we want to know the cost structure of an activity. The hypothetical research questions might be, "What was the cost structure of ABC activity?" To conduct cost-economy analysis, the analyst will need to implement the following actions:

- Complete Steps 1 through 4.
- Analyze distribution of costs across all cost categories, sub-categories, and over time.
- Analyze costs of ingredients in cost categories and sub-categories, including ingredient-level pricing, if relevant.
- Answer research questions and prepare study report and supporting documentation.

In the presentation of cost-economy analysis findings, analysts should list the contributions and donations, including beneficiary time and other inputs, without monetizing them.

**Results.** While the results of a cost-economy analysis are generally straightforward, the same cost question can be answered from the perspective of different stakeholders. In the example of the research question "What was the cost structure of ABC activity?" the analyst can compute the costs to USAID, the costs to the partner government and other stakeholders who made in-kind donations, and the costs to the beneficiaries of the activity. Expenditures presented in Exhibit 26 represent the cost to USAID. The cost to the partner government included donated office space and ministry personnel time. Additionally, the analyst needs to document the cost to beneficiaries, in terms of invested time or other resources. When conducting cost-economy analysis, the analyst only needs to list contributions, without

[65] This guidance does not include directions on how to conduct a cost-benefit analysis. The reason is that monetization of the totality of long-term outcomes of an intervention is a necessary step in a cost-benefit analysis, and such monetization of USAID-supported interventions is frequently not feasible because it would require a large amount of long-term data as well as multiple assumptions that can have a great impact on the results. Therefore, this Guidance generally does not recommend using cost-benefit analysis to achieve objectives of cost measurement articulated by USAID/Center for Education.

monetizing them (differently from cost-efficiency or cost-effectiveness analysis, which will require monetization of contributions).

Using the expenditures shown in Exhibit 26, Exhibit 28 demonstrates the total and full costs and lists the contributions. The analyst should compute both total costs (i.e., costs that have been adjusted for currency and inflation, as needed) and full costs (where operations costs from Category 1 are proportionally "spread out" across technical cost categories). Additionally, the analyst should list which resources were donated to the activity and by whom. For example, the total cost for the development of ABC educator training and materials was $40,000 ($10,000 for 6.1 Development in Category 6. In-Service Educator Training plus $30,000 for 7.1 Procurement and Distribution in Category 7. Teaching and Learning Materials). The same math is used to generate the total cost for implementation of the training and production of the materials, which was $210,000 (6.2 Implementation at $120,000 plus 7.2 Procurement and Distribution at $90,000). The *total* costs for development and implementation of the training and materials summed up to $250,000 real 2019 USD.

The *full* costs for development and implementation are obtained in the same manner using the calculated total costs with an addition of the proportion of the Category 1. In this example, the full costs of development and implementation of training and materials, accounting for the expenditures under Category 1, amounted to $300,000 real 2019 USD. We recommend that analysts report both total and full costs and list the contributions, as a means of providing a complete answer in all cost-economy analyses.

Note that if the research question was about the development costs of *different types* of teaching and learning materials, we would not be able to answer it, because the individual costs for developing different types of teaching and learning materials are not parsed out at the sub-category level. Likewise, **to answer questions about the costs of producing specific materials, data from purchase orders and associated work plans would need to be obtained and analyzed, in addition to the cost data found in the associated cost category**. It is generally the case that the level of expenditure disaggregation will limit which research questions we can answer.

For all applicable analyses, analysts should document why some costs are included or excluded. These details should be documented in Step 6. Cost Analysis Final Report.

Exhibit 28. Reporting on Results of Cost-Economy Analysis — USAID Mission Perspective

| Cost Category and Sub-Category | | Total Costs Technical Costs Only Real 2019 USD | Full Costs Technical + Category 1 Real 2019 USD |
|---|---|---|---|
| Category 6. In-Service Educator Training | 6.1 Development and 7.1 Development | 40,000 | 48,000 |
| Category 7. Teaching and Learning Materials | 6.2 Implementation, and 7.2 Procurement and Distribution | 210,000 | 252,000 |
| | Total | 250,000 | 300,000 |
| Contributions | Partner government provided office space for the USAID-funded activity staff in the capital city. | | |
| | Ten partner government ministry staff donated time to participate in orientation and refresher teacher training sessions. | | |

## Method 2. Cost-Efficiency Analysis

Cost-efficiency analysis evaluates the cost per output of an activity. In the cost-efficiency analysis, analysts pair cost data from relevant cost categories with monitoring data on outputs. A cost-efficiency analysis generates a cost to a unit of output ratio. The mathematical expression of a cost-efficiency ratio is shown in Equation 1, where *C* is the cost and *B* is the number of beneficiaries or outputs produced over a given time period.

Exhibit 29. Cost-Efficiency Ratio

$$\textit{Cost Efficiency Ratio} = \frac{C}{B} = \textit{Cost per Output}$$

**Data and Analysis.** To begin, let's assume the USAID Mission wants to better understand the costs of teacher training implemented by ABC activity. The hypothetical research question might be, "What was the average cost to train each teacher per day of training?" To conduct the analysis, we would need details on the training approach. These details might include information about the duration of training, location of training, who the trainers were (international experts, locally hired staff or ministry employees), how much participants received in per diem, if there were lodging expenses, etc.

The mathematical calculation for a cost-efficiency analysis is, in this example, the total cost of the teacher training, divided by the number of teachers trained, multiplied by the average number of days of training each teacher received. This will tell us the unit cost of teacher training, not accounting for the overall management, operations, and other support and compliance expenditures captured in Category 1. This estimate may be helpful for assessing sustainability of the training if the partner government was interested in continuing it after the end of USAID funding. Analysts should also estimate cost-efficiency of teacher training with the *full* cost, which accounts for the overall management and operation expenditures. The cost-efficiency ratio with the full costs will be helpful to the USAID Mission for planning future activities involving teacher training.

To conduct this level of analysis, the expenditure data and the count of teachers trained must be captured, and the full training model must be documented to accurately present the results.

To conduct cost-efficiency analysis, the analyst will need to implement the following actions:

- Complete Steps 1 through 4. **Because cost-efficiency analysis is an economic evaluation method, the donated resources, spaces, and time, including beneficiary time, must be monetized and included in the cost calculations in Step 4.**
- Analyze distribution of costs across all cost categories, sub-categories, and over time.
- Analyze costs of ingredients in cost categories and sub-categories, including ingredient-level pricing, if relevant.
- Select appropriate cost categories/sub-categories for cost-efficiency analysis.
- Divide the *total* costs by the unique count of outputs.
- Divide the *full* costs by the unique count of outputs.
- Answer the research questions and explain what different cost estimates tell us and how they can be used by different stakeholders to advance various objectives. Prepare the study report and supporting documentation.

**Results.** To answer the question, "What was the average cost to train each teacher in ABC teacher training intervention per day of training?" the cost estimate of a teacher trained can be divided by the number of days of training. Using full costs and total costs for that calculation will produce different estimates: total costs of teacher training per teacher per day will be helpful for a potential transfer of the training to the partner government, while full costs of teacher training per teacher per day also includes costs of general operations, management, and other support and compliance costs, and is helpful for USAID's planning purposes.

The starting point for cost-efficiency is social perspective (i.e., all of the resources, regardless of whether they are purchased or donated, are included in the calculations). Therefore, Exhibit 30 includes expenditures and the monetized contributions from the partner government.

Exhibit 30. Reporting on Results of Cost-Efficiency Analysis—Social Perspective

| Cost Category and Sub-Category | | Total Costs* Technical Costs Only Real 2019 USD | Full Costs* Technical + Category 1 Real 2019 USD |
|---|---|---|---|
| Category 6. In-Service Educator Training | 61. Development | 10,000 | 12,777 |
| | 6.2 Implementation | 122,100 | 156,003 |
| Total | | 132,100 | 168,780 |

**Includes monetized contributions*

Because cost-efficiency analysis estimates how much it costs to produce one unit of output, we need to divide these costs by the output; in this example, the number of teachers. For both the total and full costs, Exhibit 31 shows development and implementation costs separately and then summed. The costs are then divided by the number of teachers trained to obtain the average cost per teacher trained. This analysis goes one step further and divides the average cost per teacher trained by the number of training days. In this example, there were seven training days (i.e., five days of orientation and two days of refresher training). This provides us with the average per teacher per day training cost, providing easier comparisons to the unit cost of other training sessions, which may have lasted more or fewer days.

Exhibit 31. Cost-Efficiency Results—Social Perspective

| Type of Cost | Cost Category and Sub-Category | Costs* Real 2019 USD | Teacher Trained (Unique Count) | Average Cost per Teacher Trained Real 2019 USD | Average Cost Per Day Real 2019 USD |
|---|---|---|---|---|---|
| Total Costs | Development (6.1) | 10,000 | n/a | n/a | n/a |
| | Implementation (6.2) | 122,100 | 5,000 | 24 | 3.49 |
| | Development (6.1) and Implementation (6.2) | 132,100 | 5,000 | 26 | 3.77 |
| | | | | | |
| Full Costs | Development (6.1) + portion of Category 1 | 12,777 | n/a | n/a | n/a |
| | Implementation (6.2) + portion of Category 1 | 156,003 | 5,000 | 31 | 4.46 |
| | Implementation (6.1) and Development (6.2 + portion of Category 1) | 168,780 | 5,000 | 34 | 4.82 |

**Includes monetized contributions*

This level of detail helps depict the variation in the costs and produce a more accurate answer. Often in reports to stakeholders, the answer presented is the average per teacher per day costs for implementation only. In this example, that amount is $3.49. However, this is only a partial answer. While this amount is derived from a social perspective by including all the resources used in this activity, it does not include development or operational costs. Analysts should present the findings for the total implementation cost in conjunction with other costs. For example, the average per teacher per day training costs once development costs are included is $3.77, the average per teacher per day training costs when operational costs are included is $4.46, and the average per teacher per day training costs when development and implementation costs are both included is $4.82. For this research question, all four answers are accurate and should be presented with a clear explanation of which costs each number includes or excludes.

Should analysts wish to narrow this social perspective down to that of a single stakeholder, an additional step is needed. For example, if there is an interest in computing the average cost of each teacher trained per day from a USAID Mission's perspective, then only the USAID expenditures (shown in Exhibit 26) would be used in the calculations. In this case, there is only a small difference between the social perspective (Exhibit 31) and the USAID Mission's perspective (Exhibit 32) of the average per teacher per day training costs. This is to be expected, because in this illustrative example, the only resources added were the monetized cost of two partner government contributions. If other contributions were provided, we would expect the difference between the social perspective and USAID's perspective to be much greater.

Exhibit 32. Cost-Efficiency Results—USAID Perspective

| Type of Cost | Cost Category and Sub-Category | Costs (Real 2019 USD) | Teacher Trained (Unique Count) | Cost per Teacher Trained | Cost Per Day |
|---|---|---|---|---|---|
| Total Costs | Development (6.1) | 10,000 | n/a | n/a | n/a |
| | Implementation (6.2) | 120,000 | 5,000 | 24 | 3.43 |
| | Development (6.1) and Implementation (6.2) | 130,000 | 5,000 | 26 | 3.71 |
| Full Costs | Development (6.1) + portion of Category 1 | 12,000 | n/a | n/a | n/a |
| | Implementation (6.2) + portion of Category 1 | 144,000 | 5,000 | 29 | 4.11 |
| | Implementation (6.1) and Development (6.2) + portion of Category 1 | 156,000 | 5,000 | 31 | 4.46 |

Cost-efficiency analysis results can be used prospectively for planning a scale-up, replication, or transfer of an intervention, or they can be used comparatively, to assess which intervention is most cost-efficient in producing certain outputs and why. Say, for example, we want to compare the costs of teacher training through two different approaches—one that brings all teachers to a large training in the capital city, and another that organizes multiple smaller training sessions at the province level. In this example, we would expect to see greater travel and lodging costs for the large central training, but greater costs of master trainer time when multiple decentralized training sessions take place. The development costs for both teacher training approaches might be the same; however, if per diems are high in the capital city and the targeted teachers are based in districts far from the capital city, then the centralized training approach might cost significantly more than the district-level approach.

Cost-efficiency analysis is also designed to assess *why* the costs vary. To do that, a deeper dive into the ingredients used and their corresponding prices and quantities in the implementation is necessary. In this case, the more cost-efficient approach to teacher training will depend on the balance between the costs of travel and lodging versus the wages paid to master trainers who would have to work longer to deliver decentralized trainings. In some instances, the cost drivers are entrenched and the cost-efficiency analysis merely allows for an understanding of the optimal approach, given those constraints. However, understanding the constraints and drivers can sometimes identify program design features that maximize impact per dollar (IRC 2019).

## Method 3. Cost-Effectiveness Analysis

Cost-effectiveness analysis (CEA) assesses the costs of producing specific outcomes of an intervention (or portion thereof) and uses two pieces of information: the cost of an intervention and the effectiveness of the intervention (often obtained through an impact evaluation). Because a CEA is comparative, it can help us compare interventions designed to produce similar results. It does not provide insight on the value of the intervention itself, nor can it be used to compare interventions that produce different results in different outcome areas.

**Data and Analysis.** Because a CEA estimates the total cost of generating the impact, analysts will need detailed implementation costs that align to the specific impact which is measured. The analyst will need to obtain and review key project documents to understand the theory of change (i.e., what inputs and tasks lead to what outputs and outcomes, within the contextual factors of relevance) and the intervention model (i.e., the population served, populations and sub-population characteristics, geographies, grade levels). Additionally, the analyst needs to understand the evaluation design and results (treatment and control groups, level of randomization, sample sizes, differences between the intervention's delivery model and the business-as-usual model, and outcomes measures) (Levin et al, 2018). Because CEAs begin from a social perspective, any contributed resources, such as a community donating a building for monthly youth meetings, will need to be monetized.

The underlying concept behind a CEA is "What are the costs associated with generating a given impact?" Therefore, for a CEA, it's critical that only the costs associated with creating that measured impact are estimated. Clarity of links between specific interventions and tasks, outputs produced under those tasks, and the outcomes measured through an impact evaluation, is necessary for implementing a CEA. This can be particularly challenging in situations where a single activity will be assessed using multiple impact measures. Analysts can use the tools provided in the Annex to help ensure that the correct costs are included in the analysis.

A CEA generates an effectiveness measure and a corresponding cost. We do not recommend producing a cost-effectiveness ratio.[66] Instead, we recommend reporting the results of a CEA as two numbers: (1) the actual costs incurred to produce (2) the actual effect measured. Keeping costs and effects separate is critical for in-depth analysis and decision-making.[67] For example, the average cost per youth of a vocational training program (e.g., $380 real 2019 USD per youth) should be reported separately from the effect size (e.g., effect size of 0.32 of a standard deviation). The per-beneficiary cost can be calculated by dividing the total cost by the number of beneficiaries (i.e., by estimating cost-efficiency for the full set of activities which led to the observed impact).

Because a CEA is a comparative method, analysts will need to have at least one additional comparable intervention or a benchmark to be able to interpret the findings. To conduct a cost-effectiveness analysis, the analyst will need to implement the following actions:

- Complete Steps 1 through 4. Because cost-efficiency analysis is an economic evaluation method, **the donated resources, spaces, and time must be monetized and included in the cost calculations** in Step 4.
- Analyze distribution of costs across all cost categories, sub-categories, and over time.
- Analyze costs of ingredients in cost categories and sub-categories, including ingredient-level pricing, if relevant.

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[66] A CEA ratio may be helpful in comparing the results of the analyzed intervention to the broader literature that does use ratios.

[67] In the past, analysts would pair the effectiveness measure with the associated costs to generate a cost-effectiveness ratio (CER). This is problematic for three reasons. First, CERs can be difficult to interpret since they can mathematically combine two pieces of information: cost and effect (expressed as standard deviations). Second, CERs mask critical details. For example, a high cost and high impact CER may look the same as a low cost and low impact CER. Finally, and perhaps most important, if the stakeholder has a limited budget, then the conversation must start with the cost per beneficiary. If the per beneficiary amount is beyond the stakeholder's budget, there is no purpose in discussing the effect size. For these reasons, USAID does not suggest generating CERs. Instead, the unit cost and unit of effectiveness should always be reported separately.

- Based on the description of the intervention model, select appropriate cost categories/sub-categories for the analysis.
- Compute the *total* and *full* cost of the intervention.
- Pair costs with impact measures of the intervention.
- Answer the research questions and explain what different cost estimates tell us and how they can be used by different stakeholders to advance various objectives. Prepare the study report and supporting documentation.

**Results.** Presenting the results of a CEA as actual costs spent to achieve the actual outcomes, as measured by the impact evaluation, increases the transparency of the analysis and allows for a richer and more informed conversation with stakeholders.[68] Findings should be presented for both the total costs and the full costs, as shown in Exhibit 33 below. When discussing CEA findings, analysts can state the perspective and the type of cost estimate. For example, analysts could state that considering implementation-related costs only, the average cost per learner served through a USAID-funded activity was estimated at a total cost of $105 and full costs of $126 to obtain an improved reading fluency of extra 10 correct words per minute, on average. This analysis would then be compared to a similar CEA to see which activity obtained a greater improvement in reading fluency for a lower cost within comparable or the same context and beneficiaries.[69]

Currently, it is difficult to compare CEA results of USAID education activities due to the lack of studies with transparent cost-effectiveness results. Therefore, it is difficult to say if one additionally employed youth at the cost of $380 real 2019 USD per youth is a good "value for money" or not. Or as shown in the table below, if an additional 10 correct words for $105 including implementation costs only or $126 including implementation and operational cost is a good "value for money," in this context and with these beneficiaries. As CEAs become more common and their results more transparent and available, the practical value of cost-effectiveness analyses will increase as well.[70]

[68] Grand Bargain Cash Working Group, 2019

[69] It is essential to note that all CEA estimates are highly context and beneficiary-specific. The same intervention implemented in another context or with another type of beneficiaries (e.g., marginalized vs non-marginalized learners; learners in one geographical area of the country vs learners in another geographical area). Comparisons of interventions in different areas or with different beneficiaries can, however, be very helpful in highlighting the reasons behind the differences in costs and/or outcomes.

[70] It is important to note that CEA findings are designed to be used as a tool for policymakers to select among alternatives. The average cost per learner generated in the analysis can be used as an estimate for scale-up projections, as long as the limitations are noted.

Exhibit 33. Cost-Effectiveness Results—Social Perspective

| Type of Cost | Cost Category and Sub-Category | Costs Real 2019 USD | Students Served (Unique Count) | Average Cost per Student Served 2019 USD | Correct Words per Minute |
|---|---|---|---|---|---|
| Total Costs | Development (6.1 and 7.1) | 40,000 | n/a | n/a | n/a |
| | Implementation (6.2) and Procurement and Distribution (7.2) | 210,000 | 2,000 | 105 | 10 |
| | Development (6.1 and 7.1), Implementation (6.2) and Procurement and Distribution (7.2) | 250,000 | 2,000 | 125 | 10 |
| | | | | | |
| Full Costs | Development (4.1 and 5.1) + portion of Category 1 | 48,000 | n/a | n/a | n/a |
| | Implementation (6.2) and Procurement and Distribution (7.2) + portion of Category 1 | 252,000 | 2,000 | 126 | 10 |
| | Development (6.1 and 7.1), Implementation (6.2) and Procurement and Distribution (7.2) + portion of Category 1 | 300,000 | 2,000 | 150 | 10 |

**Including monetized contributions*

## Implementing Prospective Cost-Economy and Cost-Efficiency Modeling

Prospective cost modeling is the application of cost analysis methods to a hypothetical situation in a future, such as a scale-up, cross-context replication, or transfer of an intervention to a different implementer (e.g., the partner government). Scaling is the act of expanding a tested concept, such as a pilot, to serve a larger number of beneficiaries in the same or different location(s). Scaling may or may not include the transfer of the activity to an entity or organization different from the original implementer. Replication is the act of implementation of an intervention in a location or with beneficiaries different from the original implementation. Transfer is the act of handing over the implementation of an intervention to an entity different from the original implementing organization. Transfer is about the change in the implementer and can sometimes be implemented at a different scale, as well.

It is important to note that transfer of an intervention to another implementer can (and likely will) be accompanied by changes to the original intervention design, adjustments in procurement practices among other changes, and alterations to the cost structure. Analysts should take care to understand the implications of the changes on the cost structure to ensure the final cost-economy and cost-efficiency estimates are as precise as possible.

Questions relating to scaling, replication, or transfer of effective interventions are typically answered using cost-economy or cost-efficiency methods. As discussed in Section 2 of this Guidance, cost-effectiveness questions are not appropriate for prospective cost modeling since effectiveness of any intervention will change when it is scaled, replicated in a different context or with different beneficiaries,

or transferred to the new implementer. Therefore, only cost-economy and cost-efficiency analyses should be used to answer prospective cost modeling questions. The question of whether the effectiveness of a program would stay the same when replicated or transferred can then be addressed separately.[71]

**Data and Analysis.** The USAID/Education cost capture approach requires separating expenditure reporting by development and implementation sub-categories. Development costs are generally incurred at the beginning of an activity. Implementation costs are incurred once the intervention has been designed and tested. For scale-up, replication, and transfer-related cost questions, analysts will primarily focus on those costs incurred during the implementation phase of an activity.

**Scaling** requires that the analyst address the changes in fixed and variable implementation costs. Fixed costs are those that do not continue adding up with the number of participants or beneficiaries served or units produced. Variable costs do continue accumulating as more beneficiaries are served or units of output are produced. When estimating changes in scale, most analysts focus on the changes in the variable costs. However, the changes in the fixed costs can be more complicated.

Take, for example, an in-service teacher training that was successfully implemented in three provinces. The partner government is now interested in scaling it to two additional provinces. In this situation, the variable costs, such as materials, would be adjusted based on the new quantities. For the fixed costs, the analyst will need to consider the capacity of the facilities where the original training took place. Most activities cannot expand infinitely without eventually requiring additional fixed inputs. Analysts should take care to consider any limits to the capacity of fixed assets and consider how the prices and inputs will change under scale conditions. In this in-service teacher training example, the analyst would need to ascertain the number of teachers in the additional two provinces, the number of instructors needed, and the potential change in the number of facilities.

The non-linear changes in fixed and variable costs as a program scales up can create "economies of scale" (i.e., a decline in the cost per unit of output produced as the number of units goes up). This might be something as simple as maximizing the space available in a training facility. Perhaps in the past the training facility was only used at 50% occupancy, but due to scale it can be used at 100% occupancy. As a result, the cost to rent the facility is spread over a larger number of participants.

**Replication** uses implementation expenditure data and intervention details data to generate a cost estimate by varying key ingredients or input prices. While the data may be available, analysts will need to consider the differences in context to determine if replicating the activity is appropriate. Replication is rarely as simple as picking up an activity and situating it in a different location. For replication questions, analysts should consider the effect of the new context/new beneficiaries on how the expenditures are procured and the potential change in the intervention details. If the contexts are very similar, estimating the cost to replicate an activity is straightforward.

**Transfer** questions are interested in the costs associated with implementing an intervention via a different entity. Transfer questions are generally related to implementation and can be tricky to answer as some of the costs incurred by the original implementing organization may be irrelevant to the new

[71] For more on this topic, see Walls, Elena, Tulloch, Caitlin, and Holla, Alaka. 2020. "Cost Measurement Guidance Note for Donor-Funded Education Programming." Washington, DC: United States Agency for International Development, prepared for Building Evidence in Education (BE2) and Mary Ann Bates & Rachel Glennerster, 2017, "The Generalizability Puzzle", Stanford Innovation Review.

entity. For example, an implementing organization may have been required to rent a teacher training space, but the partner government can use these same spaces at no charge. The reverse can be true, as well, when some costs of implementing via the new entity were not presented in the original implementation.

For any prospective cost modeling, analysts should bear in mind the critical questions:

- *Who* will be assuming the costs in this future scenario?
- *What* will be the conditions of implementation and *how* will they be different from the original conditions?
- *Who* will be the beneficiaries and *how* will they differ from the original beneficiaries?
- *What* will likely need to be changed in the intervention model?

To conduct transfer-related analyses, all necessary data identified in the cost analysis plan should be included in the previously discussed worksheets. These data will often be gathered from similar activities implemented by the organization or the government.

**Results.** The most important aspect of describing the results for any prospective cost modeling is documenting the assumptions and limitations. For example, using planned numbers of teachers trained instead of the actual number of teachers trained could over- or underestimate the actual costs. Consider the research question "How much would it cost for the partner government to implement the new training methods in three additional districts?" Exhibit 34 shows the estimated number of teachers by district for orientation training in year one and an annual refresher in year two.

In this example, we are assuming the number of teachers in the orientation and refresher trainings are the same. We are also assuming the partner government will be incurring the costs; the conditions of the implementation will be unchanged from the original; the beneficiaries are like those in the original model, and nothing is needed to change in the intervention model to work in these new districts.

Exhibit 34. Transfer—Partner Government Teacher Training—Number of Teachers to be Trained

| District | Year 1<br>Orientation<br>5 days | Year 2<br>Refresher<br>3 days |
|---|---|---|
| 1 | 450 | 450 |
| 2 | 750 | 750 |
| 3 | 550 | 550 |
| Total Number of Teachers | 1,750 | 1,750 |

Exhibit 35 shows the costs for the resources needed to train the teachers. We are assuming the training is taking place in government training colleges and the facilities have no direct costs. However, the cost is monetized because cost-efficiency analysis, as previously discussed, starts from a social perspective. Teacher per diem is $20 per day per teacher and the government trainers have the same per diem rate. The teacher manuals and trainer manuals that were used in the orientation training are reused in the refresher training, so these costs are only counted once. To provide orientation and refresher training

to 1,750 teachers will cost about $290,000. On average, this equates to $21 per teacher per day of training.

Should the partner government wish to know the estimated per teacher training costs without the monetized contributions, the analysis can be run a second time with those costs removed. However, we recommend beginning from a social perspective to ensure that all the resources are accounted for in the analyses.

Exhibit 35. Prospective Cost-Efficiency—Transfer of Teacher Training to Partner Government—Social Perspective

| Resources | Year 1 Real 2019 USD | Year 2 Real 2019 USD | Notes | Price Real 2019 USD | Unit |
|---|---|---|---|---|---|
| Facilities | 750 | 450 | To take place in teacher training colleges, no fee but monetize contribution of space | 150.00 | per day |
| Teacher Per Diem | 175,000 | 105,000 | Includes travel, food, and lodging per day | 20.00 | per teacher per day |
| Teacher Manual | 8,470 | - | Teacher manual used in training | 4.84 | per manual |
| Trainers | 207 | 207 | Govt trainer to teacher ratio 1:50 so 35 trainers, per diem same as teachers | 5.90 | per trainer per day |
| Trainers Manuals | 164 | - | Trainer reuse training manuals | 6.10 | per training manual |
| **Total by Training Type** | **184,591** | **105,657** | | | |
| Grand Total for Both Types of Training | 290,247 | | | | |
| Number of Teachers to be Trained | 1,750 | | | | |
| Average Cost per Teacher Trained | 166 | | | | |
| Average Cost Per Teacher Per Day | 20.73 | | | | |

If the intervention is transferred to the partner government for implementation, the government needs to have a complete list of necessary inputs and associated costs (e.g., training manuals for teachers and instructors) for planning and budgeting purposes. It is also possible that the partner government can

obtain these inputs at a lower price (See Exhibit 36), and the government may need to make adjustments to the unit costs in the original model.

Exhibit 36. Transfer—Partner Government Procuring Intervention Inputs

| Resources | Prices (Real 2019 USD) | Unit | Description | Notes | Life in Years | Picture Available |
|---|---|---|---|---|---|---|
| Teachers Manual | 4.84 | per manual | 100 pages, black and white | 1:1; printed in India | 5 | Yes |
| Trainers Manual | 5.90 | per manual | 140 pages, black and white | 1:1, printed in India | 5 | Yes |
| Student Textbook | 8.12 | per textbook | 325 pages, 4 color cover, 4 colors interior, illustrations | 1:1; printed in India | 7 | Yes |
| Student Workbook | 1.86 | per workbook | 50 pages, black and white | 1:1; printed in India | 1 | Yes |
| *School Library* | | | | | | |
| Big Books | 3.71 | per 10 big books | Oversized, black and white, 10 pages, illustrations | 1 set per library; printed in India | 5 | Yes |
| Alphabet Boards | 1.55 | per alphabet board | 4 colors, laminated, 6 feet long, 2 feet high | 1 per library: printed in Uganda | 10 | Yes |
| Leveled Readers | 5.31 | per 4 sets of 10 books | Black and white, illustrations | 1 set per library; printed in India | 5 | Yes |
| Table and Chairs | 9.08 | per set (1 table and 6 chairs) | Wooden, 3 feet high, 3 feet wide, 3 feet length, 6 wooden chairs | 1 set per library; sourced in Uganda | 10 | Yes |
| Wooden Shelves | 4.81 | per 1 bookcase | Wooden, 3 feet high, 1.5 feet deep, 3 feet long, 3 shelves | 1 per library; sourced in Uganda | 10 | Yes |
| Visually Rich Literacy Posters | 3.10 | per set of 5 posters | 3 feet by 2 feet, 4 color, laminated | 1 per library; printed in Uganda | 5 | Yes |

Finally, how an intervention like teacher training may or may not intersect with the partner government's business-as-usual practice of providing in-service teacher training could affect the costs. In short, **analysts should be mindful of all the assumptions that go into their calculations and report with as much transparency as possible.** That said, these assumptions and limitations do not need to be seen as restrictions. Instead, **noting and discussing these assumptions and limitations can lead to a richer and more pragmatic discussion with stakeholders about the cost estimates**. All assumptions and limitations relevant to the specific analysis should be included in the final report (see Step 6. Reporting and Documentation).

### ON SENSITIVITY ANALYSIS

Sensitivity analysis is a set of methods for dealing with uncertainty. For estimated values and quantities for which wide variation or uncertainty exists, the analysts should conduct a specific sensitivity analysis. To do so, the analyst generates a new cost model by changing one estimated value or quantity at a time to assess the impact of this singular change on the findings. Additional cost models can be generated by inputting different values or qualities or a combination of several assumptions. Analysts might also use sensitivity analysis to test costs and assumptions under different budget or enrollment constraints.

Here are some recommendations for conducting sensitivity analysis:

- Best and Worst Case Scenarios: Places extreme bounds on the results
- Parameter Variation: The most influential variables in the model are changed
- Monte Carlo Simulation: The distribution around the average for key variables is incorporated into the model

In general, it is useful to express cost estimates in terms of a range when communicating with stakeholders. A program's true costs are more likely within a range rather a single figure.

*See Boardman, Greenberg, Vining, and Weimer, 2006 for more detailed discussion of methods.*

# Step 6. Reporting and Documentation

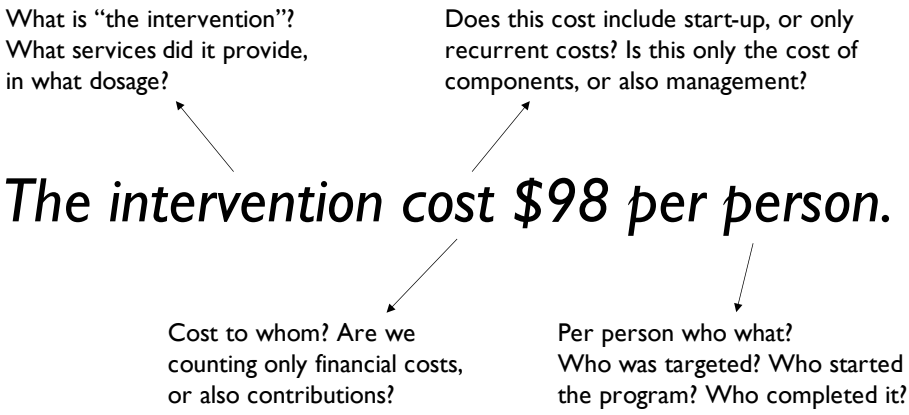
Reporting and documenting the cost analysis is the last step in a cost analysis. Reporting[72] on the findings of the cost analysis should adhere to best practices of reporting in social science research. It is important that the cost analysis report is clear on all key elements of the findings that are likely to be used in decision-making. Whether in the main narrative, in footnotes, or in Annexes, the report must provide essential details:

- Intervention(s): What is the theory of change? What is the exact implemented model? What are the details of the dosage (contact time)? What are the critical components? If sequence is important, what is it? When was it implemented and by whom? Who was the funder?
- Beneficiaries: Who are they? Mention geography, age and sex (if relevant), marginalization status, and other important details.
- What is in the cost estimates? What is included and what is not (and why)? Are recurrent costs separated from non-recurrent? Were contributions costed out and included as part of the final estimates, or listed alongside?
- Whose perspective do cost estimates reflect? If the questions are from multiple perspectives, clearly label all estimates with the perspective.
- Is the analysis implemented prospectively or retrospectively? Clearly state assumptions for prospective cost modeling and describe data limitations.

[72] USAID/Education evaluation report template may be useful for reporting on the findings of cost study analysis: https://www.edu-links.org/resources/evaluation-report-template-education-programs

- What are the major cost drivers? What factors have the greatest influence on cost estimates and do they have to do with the context in which the intervention is implemented, beneficiary characteristics, intervention features, or other factors?
- How were cost estimates computed? Include details of the assumptions and computations in an Annex.

Exhibit 37. Pitfalls of imprecise reporting




In any cost analysis reporting, it is essential to clearly identify which findings answer what analysis questions, linked to concrete objectives and specific stakeholder perspectives. For example, if one of the questions is, "How much would it cost to scale up the implementation of this intervention nationally?" the cost estimate should be accompanied by a clarification that the purpose of the question is to support the transfer of the intervention to the partner government and the estimate is calculated from the perspective of the partner government.

### ON REPORTING BEST PRACTICES

1. The Executive Summary should clearly summarize the study objectives and questions and answers to questions, with the minimum necessary background information.
2. The main body of the report should focus on results. While it is useful to provide information about context, the costed activity/intervention, and methods used in the analysis, the main bulk of the narrative should be devoted to answering the study questions.
3. The report should be written in an accessible, layperson language. If the use of technical terminology is necessary, the terms should be defined to facilitate immediate understanding. It is also helpful to define terms that may be understood differently (e.g., "cost").
4. The report must include a clear explanation of the limitations of the data, methods, and potential uses of the results. It should also note how results should not be used.
5. Visualizations should be included as appropriate as they help many users better understand findings.
6. The report should provide clear conclusions and recommendations which should be well-grounded in the data and findings.
7. Technical details and supporting documentation should be included in the Annexes.

It is rare that analysts will have all the data they want or need to answer questions with the desired precision. Assumptions will need to be made to fill in the gaps. In reporting, it is important to list all the assumptions made, who made them, and on what basis, along with all the actual data sources.

Fundamentally, **the report must contain not only all information that a decision-maker might need to correctly use the analysis findings, but also sufficient level of technical details to allow for replication of calculations**, if need be. Such technical details should be included in the Annexes or accompanying documentation. Clear documentation is the means of ensuring that the results of the analysis can be understood and used. In particular, for comparative methods like cost-efficiency and cost-effectiveness analysis, good documentation of your approach and results is critical to help future analysts understand whether and how the program you studied can be compared.

As shown in Exhibit 38, the Cost Analysis Final Report contains seven sections and at least one Annex with cost calculations. Additional annexes may include data sources, methodological details, and details of the analysis that were not included in the main report, among other things.

Exhibit 38. Cost Analysis Final Report

| Section | Title | Content |
|---|---|---|
| 1 | Executive Summary | • Include a brief summary of the intervention, location, dates, cost analysis objectives and questions, methods used, findings, and recommendations. |
| 2 | Study Objectives and Questions | • Describe the objectives of the study and how the findings will be used.<br>• Describe the stakeholders whose perspectives are reflected in the objectives.<br>• List cost analysis questions corresponding to objectives and perspectives.<br>• Include essential background details necessary for understanding the study. |
| 3 | Intervention or Activity Description | • Describe the education intervention or activity (or activities) costed.<br>• Include the intervention's theory of change and information about beneficiaries, geography, and the scale of the activity or intervention. Include intervention model and details of implementation (dosage, components, sequence, etc.)<br>• List the key partner organizations and their financial contributions to the education activity.<br>• Note the primary outcome measure for the impact evaluation, if applicable. |
| 4 | Primary and Secondary Data | • Detail which costs were counted and excluded within each dataset for each cost question. Note any data gaps and assumptions made.<br>• List the key outputs and/or outcomes relevant to the analysis. |
| 5 | Cost Analysis Methods | • Detail the cost analysis method used and specific calculations conducted.<br>• Include all assumptions that were made and any external data references.<br>• Note if the analysis is retrospective or prospective.<br>• Describe limitations. |
| 6 | Findings | • Provide cost estimates in response to cost analysis questions. Note corresponding objectives and perspectives. Note if monetized contributions are included in the cost estimates or list them.<br>• If multiple estimates are provided in response to a question, explain the reason why and the appropriate uses.<br>• List cost drivers and cost mitigators and, if possible, identify if they are context-specific, beneficiary-related, operationally determined, or a result of specific intervention features.<br>• Note all the assumptions used in the analyses, to inform the reader which findings are sensitive to what conditions. |

| Section | Title | Content |
|---|---|---|
| | | • Note appropriate use of findings and limitations with the use of findings, based on the assumptions, data quality/quantity, methods used, or other reasons.<br>• When reporting on CEA results, report actual cost and effect sizes for each intervention. |
| 7 | Conclusions and Recommendations | • Summarize overall conclusions from the findings.<br>• Provide actionable, data-driven recommendations. |
| Annex A | Cost Calculations | • Include a copy of the worksheets used to conduct the calculations and document the findings. |
| Annex B | Data Preparation | • Documents the base year, year of analysis, method of currency exchange (if relevant), and reference to the specific GDP deflator used to adjust for inflation. |

When reporting on cost analysis results and disseminating findings, it is important to balance transparency with protecting proprietary data of the organizations involved. How the findings will be reported and disseminated should be addressed early in the process and in consultation with stakeholders involved. Refer to earlier portions of this document on the appropriate and inappropriate uses of cost analysis findings.

Finally, while preparing the report, the analyst must be cognizant of the intended audience, other potential audiences, and the approved dissemination plan for the report. Analysts should ensure sensitive information is presented in an appropriate manner to minimize any risk of potential misuse or inadvertent harm to organizations and beneficiaries involved and to USAID's, partner governments', and implementing partners' reputations.

# References


Akresh, R, D. de Walque, and H. Kazianga. 2013. *Cash Transfers and Child Schooling.* Policy Research Working Paper 6340, The World Bank.

Bates, M. A., and R. Glennerster. 2017. The Generalizability Puzzle. *Stanford Social Innovation Review.*

Boardman, A.E., D.H. Greenberg, A.R. Vining, and D.L. Weimer. 2011. *Cost-benefit analysis: Concepts and practice.* 4th edition. New York, NY: Cambridge University Press.

Bold, T., M. Kimenyi, G. Mwabu, A. Ng'ang'a, and J. Sandefur. 2013. *Scaling Up What Works: Experimental Evidence on External Validity in Kenyan Education.* Working Paper.

Dhaliwal, I., E. Duflo, R. Glennerster, and C. Tulloch. 2013. "Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education." In *Education Policy in Developing Countries*, by Paul Glewwe. The University of Chicago Press.

Duflo, E., P. Dupas, and M. Kremer. 2017. *The Impact of Free Secondary Education: Experimental Evidence from Ghana.* Working Paper, Stanford University.

Evans, D., and A. Popova. 2014. *Cost-Effectiveness Measurement in Development: Accounting for Local Costs and Noisy Impacts.* Working Paper, World Bank.

Evans, D., and F. Yuan. 2019. *What We Learn about Girls' Education from Interventions that Do Not Focus on Girls.* Center for Global Development.

Gilead, T. 2015. Valuing the Future: Should Education Benefits Be Discounted? *Oxford Review of Education* 41(3):1-17.

Grand Bargain Cash Working Group: Value-for-Money Workstream. 2019. *Cost-Efficiency Analysis of Basic Needs Programs: Best Practice Guidance for Humanitarian Agencies.* Guidance Note, Grand Bargain Cash Working Group.

Hollands, F.M., M.J. Kieffer, R. Shand, Y. Pan, H. Cheng, and H.M. Levin. 2016. Cost-effectiveness analysis of early reading programs: A demonstration with recommendations for future research. *Journal of Research on Education Effectiveness* 9(1): 30-53.

International Rescue Committee. 2016, *Cost Analysis Methodology at the IRC.* Guidance Note 1, International Rescue Committee.

Kremer, M., C. Brannen, and R. Gelnnerster. 2013. *The challenge of education and learning in the developing world.* Cambridge, MA: Harvard University.

Levin, H., and P. McEwan. 2001. *Cost-Effectiveness Analysis.* 2nd edition. Thousand Oaks, CA: Sage Publications.

Levin, H., P. McEwan, C. Belfield, A.B. Bowden, and R. Shand. 2018. *Economic Evaluation in Education Cost-Effectiveness and Benefit-Cost Analysis.* Thousand Oaks, CA: Sage Publications.

McEwan, P. 2012. Cost-effectiveness analysis of education and health interventions in developing countries. *Journal of Development Effectiveness* 4(2): 189-213.

Muralidharan, K., and V. Sundararaman. 2011. *Teacher Performance Pay: Experimental Evidence from India.* NBER Working Paper No. 15323, The National Bureau of Economic Research.

Sobe, N., and J. Kowalczyk. 2012. The Problem of Context in Comparative Education Research. *Journal of Educational, Cultural, and Psychological Studies*, June 2012: 55-74.

Tulloch, C. 2019. Taking Intervention Costs Seriously: A New, Old Toolbox for Inference About Costs. *Journal of Development Effectiveness*, 11:3, 173-287.

USAID. 2011. *Evaluation Learning From Experience. USAID Evaluation Policy*. Washington, D.C.: USAID.

USAID. 2017. *Tusome External Evaluation-Midline Report.* USAID.

USAID. 2018. *ADS Chapter 634. Administrative Control of Funds.* Washington, D.C.: USAID.

USAID. 2018. *Cost Reporting Guidance for USAID-Funded Education Activities: Annexes.* Office of Education, Bureau for Economic Growth, Education, and Environment (E3), Washington, D.C.: USAID.

USAID. 2018. *USAID Impact Evaluation of the Makhalidwe Athu Activity (Zambia).* NORC at the University of Chicago.

USAID. 2019. *Agency Financial Report Fiscal Year 2019. Promoting a Path To Self-Reliance and Resilience.* Washington, D.C.: USAID.

USAID/Guatemala. 2013. *Economic Analysis of Feed the Future Investments: Rural Value Chains Project-AGEXPORT.* USAID.

Walls, E, C. Tulloch, and A. Holla. 2020. *Cost Measurement Guidance Note for Donor-Funded Education Programming.* Washington, DC: United States Agency for International Development, prepared for Building Evidence in Education (BE2).

Zhuang, J., Z. Liang, T. Lin, and F. de Guzman. 2007. *Theory and Practice in the Choice of Social Discount Rate for Cost-Benefit Analysis: A Survey.* Economics and Research Department Working Paper Series No. 94, Manila: Asian Development Bank.

# Annexes – Tools and Templates

# Annexes – Tools and Templates

*Note to Users:* This is the Word document version of the USAID/Education cost analysis tools and templates. There is also an Excel workbook version.

## Tool 1: Preliminary Data Checklist

**USAID Cost Analysis Guidance Step:** 1

**Use:** To document the data that are available, the cost categories that were reported on, and basic information about the activity.

## Tool 1. Preliminary Data Checklist

Date: _____

Analyst: _____

Contact Email: _____

Organization: _____

Data Up to Date? ☐ Yes ☐ No

**********

Implementing Partner: _____

Country: _____

Project: _____

Project Start Date: _____

Project End Date: _____

Cost Manual Completed: ☐ Yes ☐ No

M&E Plan Completed: ☐ Yes ☐ No

Evaluation Report(s) Completed: ☐ Yes ☐ No

Cost Analysis Questions Drafted: ☐ Yes ☐ No

Other Docs:

_____

_____

_____

_____

Reporting Frequency:

| | | |
|---|---|---|
| Contributions | ☐ Annually | ☐ Quarterly |
| Details and Dosage | ☐ Annually | ☐ Quarterly |
| Expenditures | ☐ Annually | ☐ Quarterly |

**Table 1. Identify Big Chunks of Missing Data**

**Instructions:** Yes=Documents were provided
No=Documents were not provided

| Fiscal Year | Quarter | Contributions | Details and Dosage | Expenditures |
|---|---|---|---|---|
| **Example: FY _____2015____** | **Q1** Oct-Dec 2014 | Yes | No | Yes |
| | **Q2** Jan-March 2015 | Yes | Yes | Yes |
| | **Q3** April-June 2015 | Yes | Yes | Yes |
| | **Q4** July-Sept 2015 | No | No | No |
| | | | | |
| **FY _____** | **Q1** | | | |
| | **Q2** | | | |
| | **Q3** | | | |
| | **Q4** | | | |
| | | | | |
| **FY _____** | **Q1** | | | |
| | **Q2** | | | |
| | **Q3** | | | |
| | **Q4** | | | |
| | | | | |
| **FY _____** | **Q1** | | | |
| | **Q2** | | | |
| | **Q3** | | | |
| | **Q4** | | | |
| | | | | |
| **FY _____** | **Q1** | | | |
| | **Q2** | | | |
| | **Q3** | | | |
| | **Q4** | | | |
| | | | | |
| **FY _____** | **Q1** | | | |
| | **Q2** | | | |
| | **Q3** | | | |
| | **Q4** | | | |

**Notes:**

**Table 2. Standard Cost Category and Sub-Category Check**

**Instructions:** Yes=Data were collected for this cost category; if yes, name the sub-categories.
No=Data were not collected for this cost category; if no, put NA.

| No. | Standard Cost Category | Data Collected for this Category? | Sub-Categories |
|---|---|---|---|
| Examples: | Pre-Service Teacher Training | No | NA |
| | In-Service Teacher Training | Yes | Development<br>Implementation |
| | | | |
| 1 | General operations, management, reporting | | |
| 2 | Assessments and evaluations | | |
| 3 | Capacity strengthening of government systems | | |
| 4 | Capacity strengthening of local organizations | | |
| 5 | Pre-service educator training | | |
| 6 | In-service educator training | | |
| 7 | Teaching and learning materials | | |
| 8 | Safe, inclusive spaces and infrastructure | | |
| 9 | Parents and community engagement | | |
| 10 | Private sector engagement | | |
| 11 | Leadership development | | |
| 12 | Scholarships and cash transfers to individuals | | |
| 13 | Other | | |
| | | | |

**Notes:**

# Tool 2: Activity Life Cycle Calendar

**USAID Cost Analysis Guidance Step:** 2

**Use:** To understand the overall structure and flow of the activity, it is useful to visualize the details of an activity as it progressed over time. These details can include the month and year of when the activity started and ended, when interventions took place (e.g., when teacher training was delivered and what the contact time/dosage was, when books were distributed) and when baseline and endline assessments/evaluations were conducted (if applicable). It can also help identify when an activity has moved from development to implementation. It is important to note that activities frequently continue to tweak interventions throughout implementation; those tweaks are natural and should be considered a part of implementation. This calendar serves as a reminder to talk about any large expenditures incurred for the development of an intervention that might have been delayed in payment and are documented in the time after implementation had begun. This calendar can also help analysts ensure that the data submitted corresponds to the overall activity timeline.

## Activity Life Cycle Calendar[73]

| Dosage Details | Actual *Calculate From FI* (Subject 1) |
|---|---|
| Weeks of Instruction Per Year | (Weeks) |
| Days per Week | (Days) |
| Minutes of Instruction per day | (Minutes) |
| **Total Instruction Time (in Hours)** | **(Total)** |

| [Program Name] | Grade at Baseline | Estimated Dosage (Hours) | (Year) | | | | | | | | | | | | (Year) | | | | | | | | | | | | (Year) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | J | F | M | A | M | J | J | A | S | O | N | D | | J | F | M | A | M | J | J | A | S | O | N | D | | J | F | M | A | M | J | J | A | S | O | N | D |
| *(Language or Arm)* | *(Grade)* | (Hours) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Key | Color or Abbreviation |
|---|---|
| Baseline | B |
| Endline | E |
| Contract Signed and Ended | $ |
| Start Up | SU |
| Fully Implemented | FI |
| Summer Activities, if Applicable | SA |
| Teacher Training Orientation | TT |
| Books Distributed | BD |
| Close Out | CO |
| Non-Applicable Months | |
| Implementation | |
| Summer- No School | |

[73] Initially developed by SALT Analytics under the Learning at Scale study. Learning at Scale is led by RTI International in partnership with the Center for Global Development, with funding by the Bill and Melinda Gates Foundation.

# Tool 3: Scope Table

**USAID Cost Analysis Guidance Step:** 2

**Use:** For Cost-Effectiveness Analysis (CEA). After documenting the activity life cycle be to understand the impact model being measured. This table will help remind the analyst that the CEA is aligns the impact generated with the costs of the resources used to generate that impact.

## Scope Table[74]

| PROGRAM& RESEARCH INFORMATION | | |
|---|---|---|
| PROGRAM | COUNTRY | |
| | PROGRAM NAME | |
| | DATES | |
| | TREATMENT ACTIVITIES | |
| | DOSAGE & FREQUENCY | |
| RESEARCH | RESEARCH QUESTION(S) | |
| | OUTPUT MEASURE | |
| | OUTCOME MEASURE | |
| | BASELINE DATES | |
| | ENDLINE DATES | |
| | RESEARCH SAMPLE SIZE | |

**NOTE:** In order to answer the identified cost questions, you will need to define the "scope" --i.e. which treatment intervention, containing which specific cost categories, in which specific schools, in which subset of districts, during which cohorts of the project, implemented by which partner--of what you want to cost.

To scope your project appropriately, you may need to distinguish the scope in terms of some or all of these distinctions. If, for instance, you were conducting a cost-effectiveness analysis and there was only one cohort of pupils assigned to the treatment or comparison group, then "cohort" would not need to appear in your scope map.

**RESEARCH PROJECT MAPPING** [EXAMPLE]

*This project map reflects a research project on 1 cohort of a NFE program that included F2F training, literacy/numeracy materials, coaching, and TLCs within a larger project that also served an additional location and provided tutoring to out-of-school children.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. Project Component | **Component 1** (Non-Formal Education) | | | | | | **Component 2** (Tutoring) | |
| 2. Cohort | **Cohort 1** | **Cohort 2** | **Cohort 3** | | | | **Cohort 4** | |
| 3. Location | | | **Nairobi** | | | | **Kawangware** | |
| 4. Cost Categories | | | **Fixed** | **F2F Training** | **Materials** | **TLCs** | **Coaching** | **Other** |
| **Final scope:** | **Excluded** | | **Included** | | | | **Excluded** | |

**RESEARCH PROJECT MAPPING** [Template, including all potential levels of scope. Remove irrelevant levels as needed]

1. Project Component
2. Implementing Partner
3. Cohort
4. Province/State
5. District
6. Schools
7. Grades
8. Cost Categories

**Final scope:**

[74] Developed by IRC International.

# Tool 4: Logic Model

**USAID Cost Analysis Guidance Step:** 2

**Use:** For cost-economy and cost-efficiency analysis, it can be helpful to document the program's logic model including a brief description of the activities and important resources. This information can be used to double check with the implementing organization that no important missing components of the program and the corresponding resources are missing from the submitted expenditure, contributions, and intervention details.

# Logic Model[75]

| Logic Model | |
|---|---|
| **Implementer** | (Name) |
| **Activity or Intervention** | (Name) |
| **Country** | (Name) |

| | | | | | |
|---|---|---|---|---|---|
| **Contract** | **Signed** | (Month and Year) | **Implementation** | **Baseline** | (Month and Year) |
| | **Close Out Date** | (Month and Year) | | **Endline** | (Month and Year) |
| | | | **Fully Implemented** | **Start** | (Month and Year) |
| | | | | **End** | (Month and Year) |

| | |
|---|---|
| **Cost Questions** | (Question) |
| | (Question) |

| No. | Inputs/Cost Category | Activities | Outputs | Outcomes |
|---|---|---|---|---|
| 1 | General operations, management, reporting | | | |
| 2 | Assessments and evaluations | | | |
| 3 | Capacity strengthening of government systems | | | |
| 4 | Capacity strengthening of local organizations | | | |
| 5 | Pre-service educator training | | | |
| 6 | In-service educator training | | | |
| 7 | Teaching and learning materials | | | |
| 8 | Safe, inclusive spaces and infrastructure | | | |
| 9 | Parents and community engagement | | | |
| 10 | Private sector engagement | | | |
| 11 | Leadership development | | | |
| 12 | Scholarships and cash transfers to individuals | | | |
| 13 | Grants and direct service delivery | | | |
| 14 | Other | | | |

[75] Initially developed by SALT Analytics under the Learning at Scale study. Learning at Scale is led by RTI International in partnership with the Center for Global Development, with funding by the Bill and Melinda Gates Foundation.

# Tool 5: Logic Model—Expanded

**USAID Cost Analysis Guidance Step:** 2

**Use:** This expanded version of the logic model is designed for analysts conducting a cost-effectiveness analysis. It can be used to help visualize the similarities and differences in the resources used in the implementation of the treatment and comparator arms of the program being evaluated.

# Logic Model-Expanded[76]

| Logic Model—Expanded | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Implementer** | (Name) | | | | | | | | |
| **Activity or Intervention** | (Name) | | | | | | | | |
| **Country** | (Name) | | | | | | | | |
| **Contract** | **Signed** | (Month and Year) | | | **Implementation** | **Baseline** | (Month and Year) | | |
| | **Close Out Date** | (Month and Year) | | | | **Endline** | (Month and Year) | | |
| | | | | | **Fully Implemented** | **Start** | (Month and Year) | | |
| | | | | | | **End** | (Month and Year) | | |
| **Research Questions** | (Question) | | | | | | | | |
| | (Question) | | | | | | | | |

| No. | Inputs/Cost Category | Treatment Activities | Comparator Activities | Outputs | Outcomes |
|---|---|---|---|---|---|
| 1 | General operations, management, reporting | | | | |
| 2 | Assessments and evaluations | | | | |
| 3 | Capacity strengthening of government systems | | | | |
| 4 | Capacity strengthening of local organizations | | | | |
| 5 | Pre-service educator training | | | | |
| 6 | In-service educator training | | | | |
| 7 | Teaching and learning materials | | | | |
| 8 | Safe, inclusive spaces and infrastructure | | | | |
| 9 | Parents and community engagement | | | | |
| 10 | Private sector engagement | | | | |
| 11 | Leadership development | | | | |
| 12 | Scholarships and cash transfers to individuals | | | | |
| 13 | Grants and direct service delivery | | | | |
| 14 | Other | | | | |

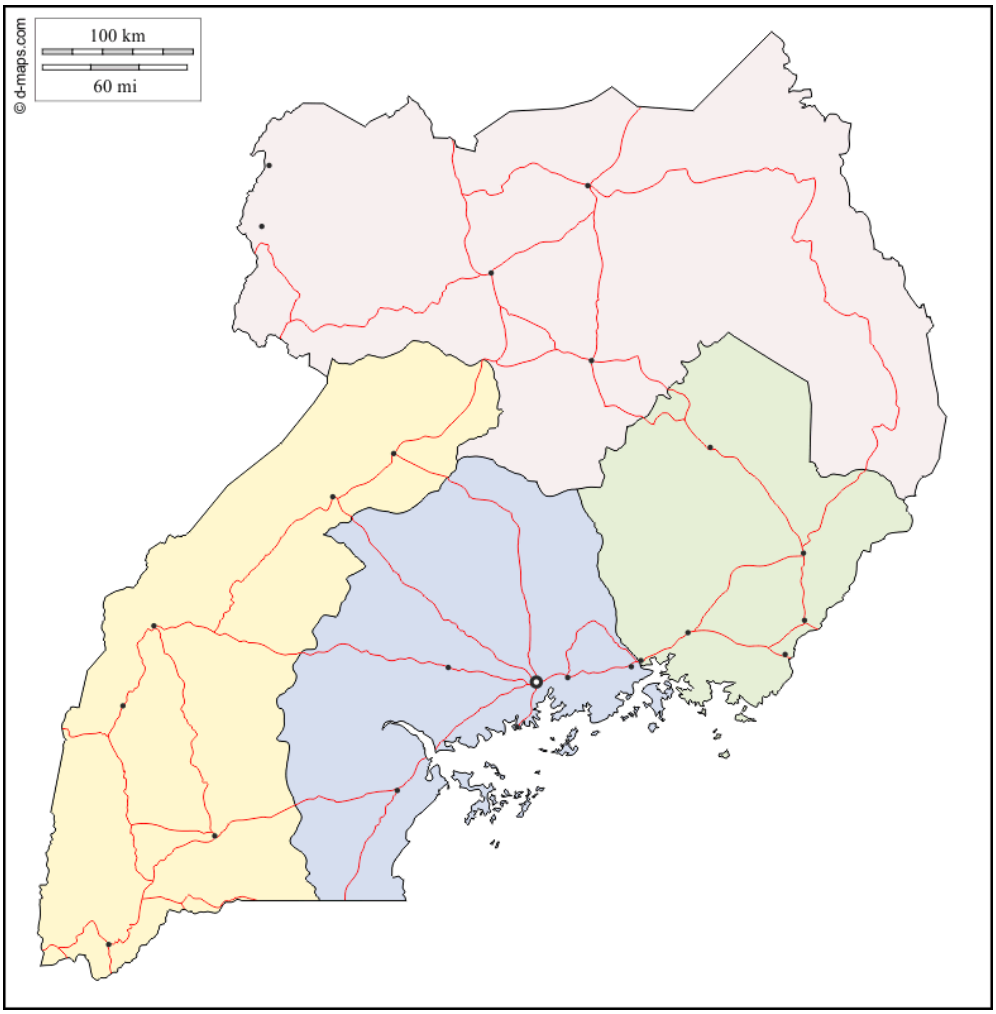
[76] Initially developed by SALT Analytics under the Learning at Scale study. Learning at Scale is led by RTI International in partnership with the Center for Global Development, with funding by the Bill and Melinda Gates Foundation.

# Tool 6: Activity Implementation Map

**USAID Cost Analysis Guidance Step:** 2

**Use:** Often it can be helpful to visualize the locations of an intervention on a map. For example, it can be helpful to see where a pilot took place and where the government is considering expanding the pilot. It can also be helpful to better understand the potential location of expanded teacher training programs in terms of location, distance, and documenting facility capacity.

**Activity Implementation Map Example**[77]




[77] Initially developed by SALT Analytics under the Learning at Scale study. Learning at Scale is led by RTI International in partnership with the Center for Global Development, with funding by the Bill and Melinda Gates Foundation.

# Tool 7: Resources and Stakeholders

**USAID Cost Analysis Guidance Step:** 2

**Use:** The most extensive of the tools, this document details each resource used in an activity. It details if the resource was an expense or a contribution and who paid or donated the resource. This tool can be expanded to include unit prices for prospective cost modeling.

# Resources and Stakeholders[78]

| Resources Worksheet and Stakeholders | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Implementer** | (Name) | | | | | | |
| **Activity or Intervention** | (Name) | | | | | | |
| **Country** | (Name) | | | | | | |
| **Contract** | **Signed** | (Month and Year) | **Implementation** | (Month and Year) | **Baseline** | (Month and Year) | |
| | **Close Out Date** | (Month and Year) | | (Month and Year) | **Endline** | (Month and Year) | |
| | | | **Fully Implemented** | (Month and Year) | **Start** | (Month and Year) | |
| | | | | (Month and Year) | **End** | (Month and Year) | |
| **Research Questions** | (Question) | | | | | | |
| | (Question) | | | | | | |

| No. | Cost Category | Illustrative Sub-Categories | Resource Group | Expense | Stakeholder | | Contribution | Stakeholder | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 1 | General Operations, Management, and Reporting | *General Operations* | | | | | | | |
| | | *General Management* | | | | | | | |
| | | *Donor Reporting* | | | | | | | |
| 2 | Assessments and Evaluations | *Learning assessments and evaluations* | | | | | | | |
| | | *Research and Learning Agendas* | | | | | | | |
| 3 | Capacity strengthening of government systems | *Policy Development* | | | | | | | |
| | | *Staff capacity strengthening* | | | | | | | |
| | | *Improvement of systems* | | | | | | | |
| 4 | Capacity strengthening of local organizations | *Policy Development* | | | | | | | |
| | | *Staff capacity strengthening* | | | | | | | |
| | | *Improvement of systems* | | | | | | | |
| 5 | Pre-service educator training | *Development* | | | | | | | |
| | | *Implementation* | | | | | | | |
| 6 | In-service educator training | *Development* | | | | | | | |
| | | *Implementation* | | | | | | | |
| 7 | Teaching and learning materials | *Development and testing* | | | | | | | |
| | | *Production and distribution* | | | | | | | |
| 8 | Safe, inclusive spaces and infrastructure | *Permanent schools/classrooms (construction, furniture, supplies)* | | | | | | | |
| | | *Temporary schools/classrooms (construction, furniture, supplies)* | | | | | | | |
| | | *School policies related to safety* | | | | | | | |
| 9 | Parents and community engagement | *Development* | | | | | | | |
| | | *Implementation* | | | | | | | |
| 10 | Private sector engagement | *Public-private partnerships* | | | | | | | |
| | | *Internships* | | | | | | | |
| | | *Labor market assessment* | | | | | | | |
| 11 | Leadership development | *Leadership development* | | | | | | | |
| | | *Peer to peer education* | | | | | | | |
| 12 | Scholarships and cash transfers to individuals | *Scholarships* | | | | | | | |
| | | *Grants to Individuals* | | | | | | | |
| | | *Cash transfers* | | | | | | | |
| 13 | Grants and direct service delivery | *To government institutions* | | | | | | | |
| | | *To non-government organizations* | | | | | | | |
| | | *Payments for Direct Service Delivery* | | | | | | | |
| 14 | Other | | | | | | | | |

[78] Initially developed by SALT Analytics under the Learning at Scale study. Learning at Scale is led by RTI International in partnership with the Center for Global Development, with funding by the Bill and Melinda Gates Foundation.

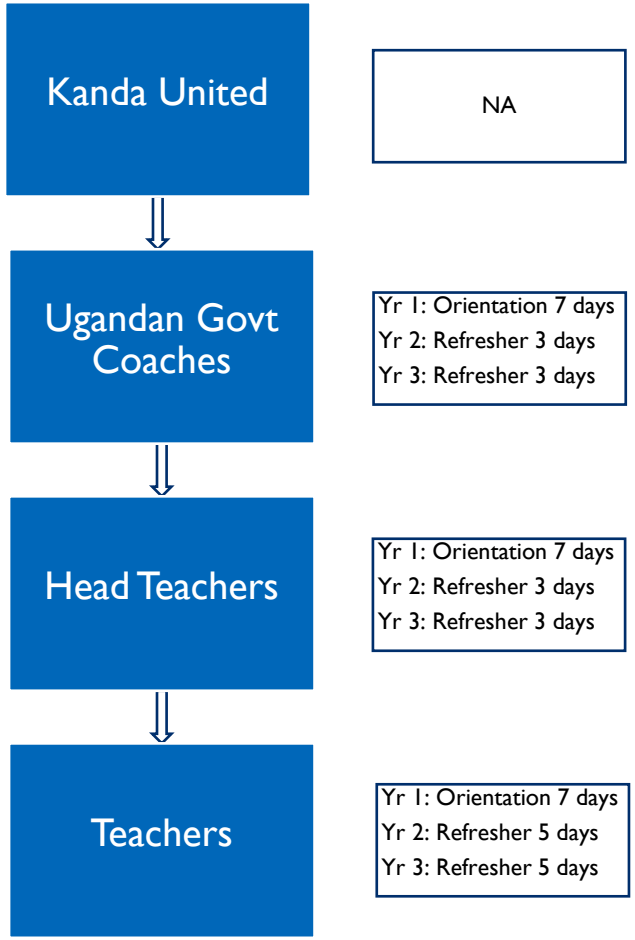
# Tool 8: Teacher Training and Support Model

**USAID Cost Analysis Guidance Step:** 2

**Use:** When costing teacher training models, it is often useful to document the structure of the training in terms of train the trainers, orientation trainings, and refresher trainings. This can be used in conjunction with the Activity Implementation Map.

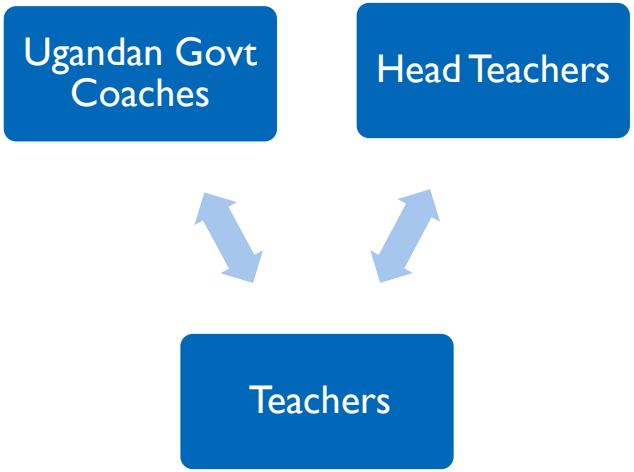
## Teacher Training and Support Model Example[79]

### Teacher Training Model




[79] Initially developed by SALT Analytics under the Learning at Scale study. Learning at Scale is led by RTI International in partnership with the Center for Global Development, with funding by the Bill and Melinda Gates Foundation.

**Support Model**



# Tool 9: Cost Analysis Question—Method Alignment

**USAID Cost Analysis Guidance Step:** 3

**Use:** This document can be used to ensure that the cost questions and the cost analysis methods align.

## Cost Analysis Question—Method Alignment

| No. | Cost Analysis Questions | Objectives | Retrospective | | | Prospective Cost Modeling | | |
|---|---|---|---|---|---|---|---|---|
| | | | Cost-Economy (✓) | Cost-Efficiency (✓) | Cost-Effectiveness (✓) | Scale-Up (✓) | Replication (✓) | Transfer (✓) |
| | | | Cost of program components and overall program costs | Cost per output | Cost per impact | Estimates future costs | | |
| 1 | (Question 1) | | | | | | | |
| 2 | (Question 2) | | | | | | | |
| 3 | (Question 3) | | | | | | | |
| 4 | (Question 4) | | | | | | | |
| 5 | (Question 5) | | | | | | | |

# Tool 10: Sourcing Prices for Contributed Resources

**USAID Cost Analysis Guidance Step:** 4

**Use:** This list can be used to help source prices for contributions and donations for cost-efficiency and cost-effectiveness analysis.

### Sourcing Prices for Contributed Resources

| Contributed Resource | Typical Costs | Information Required | Cost that Needs to Be Estimated | Sources |
|---|---|---|---|---|
| Volunteer and free labor | Income forgone from time donated (e.g., hours of volunteer time) | Skill level of the volunteer contribution (e.g., credentialed secondary school teacher, or manual laborer) | Cost of forgone income (e.g., average local wage rate for the contributed skill level or for trained teachers, the average salary of a credentialed teacher) | Evaluation reports of average household income, national labor market reports and studies. Occupational wages, (e.g. ILO Key Indicators of the Labor Market, WDR Occupational Wages Around the World) |
| Beneficiary costs | Travel and transportation costs | Travel time, and average wage to estimate forgone income; bus or car fare; or distance and transportation cost (e.g., motorbikes) | Cost of forgone income while traveling; transportation cost (e.g., bus or car fare) or cost per mile of transport (e.g., gas, time) | Beneficiary interviews, questionnaires or surveys to obtain travel time or distance<br>Public transportation fare schedules<br>Price of gas |
| | Time spent attending activities (e.g., required meetings, or trainings) | Contributed skill level, and time (e.g., average local wage rate of the targeted population or youth ages 16-24 years) | Cost of forgone income (e.g., average local wage rate for male and female youth ages 16-24 years) | Evaluation reports of average household income<br>National labor market reports and surveys<br>National education statistical programs |
| Donated goods | Learning materials (e.g., textbooks, e-readers) | Quantity and description of items used<br>Expected shelf life or years of usage | Retail purchase price of textbooks, discounted over the number of years of expected use | Survey of retail booksellers or Education Ministry for textbook prices<br>Retail prices for e-reader technology |
| Donated facilities | Classroom and office space, school facilities, government buildings used for pull-out reading instruction | Size and quality of space (e.g., number of square feet and whether heated or air-conditioned, open-air or closed)<br>Amount of time the facility was used<br>Rental rate per square foot | Cost per square foot per year of similar size and quality of space used, e.g., national average rental rate for school buildings<br>Replacement value of a "standard classroom" (e.g., depreciated value of construction costs of school buildings (land, development, furnishings)) | Education planning and management research reports<br>Education Ministry's school standards, policies, code, and design documents<br>Annual construction reports<br>Implementing partner's accounting records |