



Strengthening Economic Evaluation for
Multisectoral Strategies for Nutrition

SEEMS-Nutrition Common Approach

Guidance Document

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Glossary

For more terms and definitions, see the Global Health Cost Consortium glossary page on its website:
<https://ghcosting.org/pages/standards/glossary#E>

Activity-based micro-costing: a costing method that breaks down program activities into components to create a more comprehensive estimate of the quantity and value.

Cost: the value of resources/inputs used to produce a good or service.

- **Economic costs/Opportunity costs:** the full value of all resources utilized in producing a good or service, including financial costs (below), unpaid time, and out-of-pocket costs. Economic costs reflect “opportunity costs” since they represent resources consumed and therefore the forgone opportunity to devote those resources to another purpose.
- **Financial costs:** financial value for goods and services needed to carry out a service or intervention, similar to expenditures (below). However, in contrast to expenditure data, financial costs depreciate capital expenditures over time.
- **Expenditures:** the financial value that an agent (e.g., government, donor or individual) spends during a period of time for goods and services. Expenditures can refer to the entire sum required by specified services, or it may pertain to only those costs incurred by a subset of the organizations involved in delivering the service.
- **Start-up costs:** the one-time commitment of resources required to establish a program to the point where service delivery or implementation of the program can begin. Some of these resources may be donated or subsidized; thus, when measuring start-up costs, the financial costs may be less than the full economic costs.
- **Recurrent costs:** the value of resources/inputs with useful lives of less than one year that therefore must be repurchased on a recurring basis.

Mixed methods costing approach: the use of micro-costing, gross-costing and qualitative data gathering to estimate the total program costs.

Intervention typologies: interlinked pathways through which interventions in food systems and agriculture value chains could have an impact on diets and nutrition outcomes, i.e., demand, supply and enabling environment.

Perspective – donor or payer: The perspective, or viewpoint, of the analysis is from the donor and includes only costs incurred by the program funder.

Perspective – societal: The viewpoint of this analysis is societal and includes all costs incurred by the program funder, as well as implementers, volunteers, government partners and participants.

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SEEMS-Nutrition was a five-year initiative to strengthen evidence of the costs and benefits of multisectoral nutrition strategies. It was led by Project Director Carol Levin from the University of Washington Department of Global Health, with partners including the International Food Policy Research Institute (IFPRI), Helen Keller International (HKI), WorldFish, the International Livestock Research Institute (ILRI), and R4D. SEEMS-Nutrition was funded by the Bill & Melinda Gates Foundation.

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Introduction

HOW TO USE THIS GUIDE

This document guides analysts through **six key steps** in the economic evaluation of a multisector nutrition program. While they are presented here sequentially, the order of steps may differ in practice, depending on program context and study timeline. Ideally, this document should be reviewed prior to the start of an economic evaluation. Analysts can consult this document with questions at any point during the research design and analysis process.

Workbook boxes throughout the document illustrate real-world examples of how tools for the common approach can be modified to fit a specific program. **Toolboxes** contain hyperlinks of useful resources. Additional **Tables, Figures, and Boxes** highlight excerpts and examples from useful tools, offer tips and best-practices, and diagram key points. All resources, tools, and guides are also listed by step in the [Resources List](#) in Annex 1. Clicking on tool links will automatically download tools to your computer.

To learn more about how the SEEMS-Nutrition consortium is working to ensure the common approach responds to the needs of decision-makers, see this [resource](#) from R4D on Decision-Making in Nutrition: Areas of Opportunity to Support Greater Use of Economic Evidence.



Economic evaluations of multisectoral nutrition strategies generate valuable information for many different purposes:

- Estimating budget impact, cost, and affordability of scaled-up multisectoral nutrition programs
- Assessing the technical efficiency of specific interventions
- Supporting advocacy for investing in scaled-up, effective multisectoral nutrition approaches.
- Informing decision-makers' choices on alternative investments

However, there are many challenges to comparing the costs and effectiveness results from evaluations of multisectoral nutrition strategies (Swinnen et al. 2018, Ruel et al. 2018, and Wun et al. 2022). These interventions may have different combinations of activities and inputs, entry points, and delivery platforms, as well as different country contexts. These differences prevent funders, policymakers and program managers from making informed decisions about interventions to prioritize in resource-constrained settings.

The Strengthening Economic Evaluation for Multisectoral Strategies for Nutrition (SEEMS-Nutrition) consortium has developed a common approach to conduct costing studies that is integrated with program impact evaluations for multisector nutrition programs. This approach aims to strengthen the design and implementation of economic evaluations, with a focus on context-specific operational plans, or study protocols. It utilizes a comprehensive and fully customizable set of cost data collection tools for estimating financial and economic costs.

Box 1.1 What technical resources are needed to implement this tool?

Ideally, an economist with experience conducting cost, cost-effectiveness, or benefit cost analysis would work closely with the project implementation and evaluation team. The economist should be experienced in collecting both quantitative and qualitative information on resource use, using interview and focus group discussions. They should be comfortable with using Excel and other statistical packages, such as Stata or R.

This guidance document is a **how-to guide on the common approach for country practitioners, field researchers, evaluators, and implementors**. See the Workbook Introduction box on the next page for an overview of a scenario that will be used throughout this guidance document to illustrate how to apply costing methods.

Workbook Introduction

Malawi Early Childhood Development Program Case Study

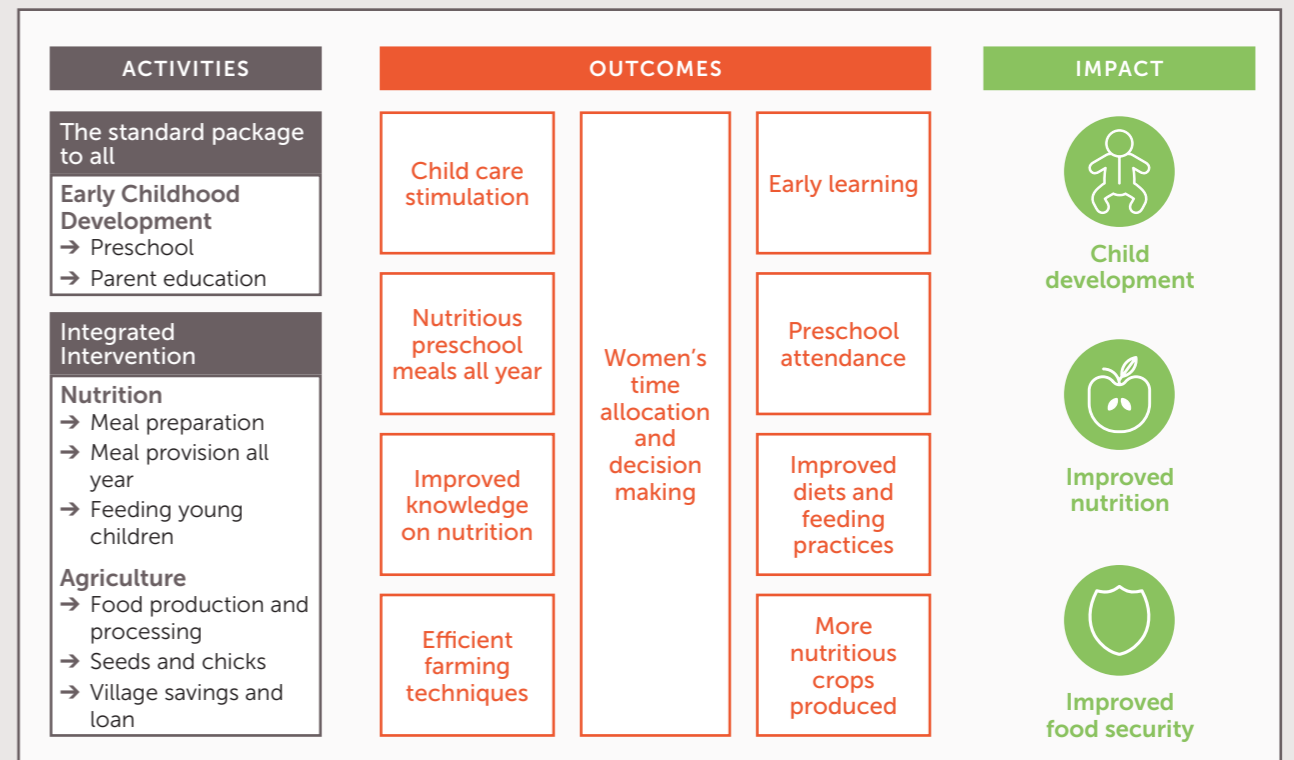
Although Malawi has experienced reductions in undernutrition over the past two decades, the country still faces high rates of child stunting (37%) and only 25% of children meet minimum dietary diversity (National Statistical Office 2017). The Government of Malawi has committed to improving nutrition through a multisectoral approach.

Part of this approach includes efforts to study how nutrition activities can be delivered effectively through the national early childhood development (ECD) program, which includes preschools (known as community-based childcare centers (CBCCs)), parenting groups, and other existing government platforms. A set of integrated nutrition and agriculture interventions—developed through Save the Children's research in Malawi and years of implementation experience—was combined with Malawi's early-childhood development program to increase community capacity to provide nutritious foods in CBCCs all year round and improve feeding practices in the Nutrition Embedded Evaluation Program (NEEP). Nutrition interventions included agricultural training on nutritious food production, community garden demonstration, production of nutritious crops like carrots, orange-fleshed sweet potatoes, beans, peas, and maize. From 2016 to 2017, the program served more than 1,000 preschool children and 900 households.

In 2017, the Nutrition Embedded Evaluation Program Impact Evaluation (NEEP-IE) provided rigorous evidence of CBCCs as an effective platform to scale-up nutrition-sensitive interventions in Malawi (Gelli et al. 2022).

Throughout this guidance document, we will use examples from the NEEP-IE evaluation to illustrate key steps in the common approach.

Figure 1.1 NEEP-IE intervention impact pathway



Source: Gelli et al. (2017, 2022).

Determine the scope of the economic evaluation

Before developing a specific operational plan for an analysis, also called a study protocol, analysts must carefully consider the broader implementation and evaluation context and map out key study characteristics to inform the economic evaluation approach.

Economic evaluations include a range of comparative methods to balance benefits and consequences. These evaluation types can be characterized by *what they measure*, in terms of costs or resources used, and the *resulting outcomes* (Table 1.1). The economic evaluation should incorporate plans for evaluation(s), which will measure the impacts of the intervention in question. The economic evaluation approach should be defined within the context of the program being evaluated and timed around these planned impact evaluations. If there is no empirical or modeled evidence of effectiveness, the ability to conduct a full economic evaluation will be limited. In this case, the economic evaluation will be constrained to a cost analysis or cost-efficiency analysis.

Identifying the key stakeholders for the economic evaluation will have implications for determining the *perspective* and *type* of analysis.

Key considerations to inform study design:

- How will effectiveness be evaluated or estimated as part of the overall monitoring and evaluation strategy?
- What is the sampling approach and sample size for the impact assessment?
- Will the impact assessment gather any information on costs (e.g., participant out-of-pocket costs or time use); if not, could one include these questions in the survey?
- Total cost to conduct the economic evaluation and budget available. (See [Annex 2](#) for rough estimates of the total cost in two scenarios)

For more on economic evaluation methods, see the [ANH Academy Technical Brief on Economic Evaluations of Multisectoral Actions for Health and Nutrition](#).¹

Table 1.1 Economic Evaluation Types

ANALYSIS TYPE	DETAIL	OUTCOME MEASUREMENT	EXAMPLE
Cost-Consequence Analysis (CCA)	→ Monetary cost and program outcomes achieved. Presented as a range of disaggregated costs and outcomes, often in a table.	Summary of monetary costs and outcomes.	Cost \$20,000 intervention cost Outcome \$120 per standard deviation increase in knowledge, attitudes and practices for infant and young child feeding.
Cost-Efficiency	→ Monetary cost to achieve program output	Measured as cost per output achieved	\$55 per household reached
Cost-Effectiveness Analysis (CEA)	→ Monetary cost to achieve one unit of the desired health effect (outcome). → The CEA often compares an intervention with another program or the status quo.	Measured as single health outcome achieved (life-years gained, disease cases averted)	\$1,300 per DALY averted
Cost-Utility Analysis (CUA)	→ Incremental cost to gain one quality-adjusted life-year (QALY) or to avert one disability-adjusted life-year (DALY). → The main benefit of CUA is that it uses a standardized metric, allowing for comparison within and across health and nutrition interventions.	Outcome measured by an index adjusted for quality of life (QALYs, DALYs)	\$0.13 per Quality Adjusted Life Year (QALY) gained
Cost-Benefit Analysis (CBA) or Benefit-Cost Analysis (BCA)	→ Measures all effects in monetary terms at the society level. → It may not be programmatically relevant for researchers or evaluators to convert the outcomes into monetary terms because the calculation of the economic value of a person's life can quickly turn into an empirical and ethical predicament.	Multiple outcomes combined using monetary units and reported as a ratio	Program achieved a cost-benefit ratio of 4:1

Source: Adapted from Levin, Masters, Gelli, et al. (2019) and Drummond, Sculpher et al. (2005).

¹ The ANH Academy brings together researchers, practitioners and policymakers working for better nutrition and health through improved agriculture and food systems.

1.1 Perspective

After defining the economic evaluation study purpose and research questions, it is important to indicate the perspective or viewpoint of the analysis.

The viewpoint can be from the implementor (such as the ministry of health or agriculture, or an international NGO), a payer (such as a bilateral or multilateral aid agency or other donor), an intervention recipient or participant, or a combination of parties. The perspective will inform whose costs and consequences to consider when evaluating, and which costs will be excluded. Analysts will need to assess the trade-off between the comprehensiveness of the chosen approach and the feasibility of a more intensive method of data collection and analysis.

SEEMS-Nutrition recommends presenting costs and benefits from both a *societal perspective*, which includes costs and consequences incurred by providers, payers, and participants, and a *payer perspective*, because organizations are often interested in the costs of multisectoral programs and implications for resource mobilization.

1.2 Economic Evaluation Matrix and Protocol

To standardize study design and planning, SEEMS-Nutrition has developed an economic evaluation matrix and a protocol template that can be used to define the scope and key parameters of an evaluation for multisectoral nutrition strategies (Toolbox 1.1). The matrix prompts analysts to consider key study characteristics like the main study objectives, types of costs to include and exclude, how costing data are collected, who will be sampled, and the evaluation timeframe. See [Workbook 1](#) for an example of how the matrix was used to define the economic evaluation scope in Malawi. Consider completing this matrix with the larger implementation and evaluation research team, to ensure a shared understanding of the economic evaluation.

Toolbox 1.1 Tools for determining the evaluation approach

-  **Economic Evaluation Matrix**
-  **Generic Protocol of Data Collection and Analysis**

Workbook 1

Using the matrix to define the economic evaluation study design – Malawi NEEP-IE

For multisectoral interventions, an established comparator or alternative intervention often does not exist, and therefore the comparator is the status quo (or a “do nothing” alternative). Program analysts can use the SEEMS-Nutrition Economic Evaluation Matrix to describe the program and specify study goals (Table 1.2). This process clarifies where the economic evaluation fits within the larger program evaluation objectives. For example, in the Malawi NEEP-IE study, the economic evaluation objective was different than the overall impact evaluation objectives (Gelli et al. 2022).

The economic evaluation objective should clearly indicate:

1. The scope of the intervention
2. What the intervention is being compared to
3. What costs and benefits are being compared



Describe intervention components

Multisectoral nutrition strategies include many program or intervention components, and they are often described in different ways, depending on context, tradition, and the preference of individuals involved in planning and implementation. This presents challenges to understanding results across contexts. Using a standard list of common terminology to talk about program components and inputs will allow analysts to compare results from vastly different interventions – an essential piece of building the evidence base. Analysts should describe each intervention component by breaking it down into activities and inputs, using common terminology (shared below). At this initial step, focus on capturing each piece of the program. A comparison of costs and benefits will come in a later step.

2.1 Identify the nutrition intervention typology

Building on previous research on the complex links between food systems, diets, nutrition, and health (Hawkes and Ruel 2011, Gelli et al. 2015), SEEMS-Nutrition has identified five interlinked typologies through which interventions could have an impact on diets and nutrition outcomes (Table 2.1). The typology groups intervention components into five broad categories that, 1) increase the demand for nutritious foods; 2) increase the supply of nutritious foods; 3) improve food affordability; 4) reduce risk of infection and acute malnutrition; and 5) strengthen the enabling environment. These typologies are general enough to capture many possible intervention activities and results, and can be applied to other sectors, such as social safety nets.

The typology proposed here is for designing, conducting and reporting economic evaluations – it is not intended to replace others in the literature.²

Table 2.1 Recommended Nutrition Intervention Typologies

TYOLOGY/CATEGORY	EXAMPLES	SECTORS COMMONLY ENGAGED
1. Increase demand for nutritious foods	Behavior change communication to improve infant and young child feeding practices, behavior change communication to increase demand for nutritious foods	Health and nutrition (if available)
2. Increase supply of nutritious foods	Village model farms, production incentives, agriculture, or poultry extension support	Agriculture, livestock and poultry production, aquaculture, forestry
3. Increase food affordability	Cash transfers	Social safety nets
4. Reduce infection and acute malnutrition	Provision of drinking water and sanitation services, community-based management of acute malnutrition (CMAM) and other nutrition treatment services	WASH, nutrition, health
5. Enabling environment	Coordination between national and local government; nutrition policies; gender empowerment; water, sanitation and hygiene (WASH)	Gender, WASH, social safety nets, private sector, governance

Source: SEEMS-Nutrition.

² For other types of classification, see the SUN Categories for Action on Nutrition and the Lancet 2013 framework.)

Table 1.2 Example of the SEEMS-Nutrition Economic Evaluation Matrix – Malawi NEEP-IE

DESCRIPTION	QUESTIONS TO CONSIDER	IMPROVING CHILD NUTRITION AND DEVELOPMENT THROUGH COMMUNITY-BASED CHILDCARE CENTERS IN MALAWI – NEEP-IE STUDY
PROGRAM		
Program goal	→ What is the primary program goal of the overarching project/intervention?	Improve the diets, feeding, health and hygiene knowledge and practices in households with infants and young children.
Program objectives	→ What are the specific program objectives of the overarching project/intervention?	<ol style="list-style-type: none"> Promote household production and consumption diversity Improve caregiver knowledge and practices related to nutrition and infant and young child feeding (IYCF) Improve diets and nutrition among preschoolers and their younger siblings
Target population	→ Where is the program implemented? → What population groups are being targeted? → What is the estimated number of participants?	60 communities within Zomba district, Southern Malawi.
Implementing partners	→ Who is the lead implementing organization? → Who are any national or international partners? Local contractors or subawards? → Are there volunteer organizations or community-based organizations (CBOs)?	Government of Malawi, Save the Children
ECONOMIC EVALUATION		
Objective	→ What type of economic evaluation will be conducted and why? → What is the specific research objective for the economic evaluation?	→ Determine the cost and cost-effectiveness of using an Early Childhood Development Center platform to implement an integrated agriculture and nutrition intervention compared to the status quo (no intervention) → Determine the benefit-cost or return on investment for scaling up NEEP-IE
Perspective	→ Donor, provider, participant, societal	Societal
Study design	Impact → How will effectiveness be evaluated? → Is this modeled using secondary data? → Will this study collect primary data? Costs → How will time-use or opportunity cost data be collected?	Impact Effectiveness is measured as the intervention impact on dietary intake and improvements in maternal and child anthropometry. It will be measured through a cluster randomized trial with primary data collection at baseline, 6m, 12m and 48m after intervention is completed. Costs Purposive sample of implementing partners and participants
Time horizon*	→ When does the project start and end?	The time horizon of the project is the full project period: a multi-year period from 2015 to 2019.

*Note: The time horizon of the project and the time horizon of the economic evaluation may not be the same. The project may run for 1, 3 or 5 years, but the time horizon of the economic evaluation should be long enough to capture all costs and effects relevant to the decision problem. This may include projecting future costs and benefits, such as improved labor productivity, as well as projections of relevant program costs.

Source: Adapted from Gelli et al. (2022).



2.2 Identify costs and benefits along the program impact pathway

Determining what costs to include in an evaluation is the next step. For example, the analysis may include all costs related to program implementation and routine monitoring activities but *exclude* all research activities related to program impact and process evaluation. These decisions are called *inclusion* and *exclusion* criteria for costs.

Ideally, analysts should use an existing project impact pathway to identify related costs and benefits. The impact pathway includes all intervention components and the expected chain of actions that leads to results. A program’s theory of change or log frame can be used when there is no formal program impact pathway. For more information on program impact pathways, please see the foundational work by [Douthwait et al. \(2003\)](#). Further discussion of theory around the impact pathway approach can be found in work by [Rawat et al. \(2013\)](#). For applications of the pathway approach, see [Olney et al. \(2013\)](#).

Workbook 2 demonstrates how the SEEMS-Nutrition intervention typologies and program impact pathways help analysts understand the activities and types of resources used in cost estimates.

2.3 Map intervention activities to common categories

The activity-tracking sheet (Toolbox 2.1) helps identify the full range of intervention activities in order to map them to a smaller set of broad SEEMS-Nutrition activity categories. Despite differences in program design and focus, there is a similar sequence and type of activities common to many multisectoral nutrition interventions. Table 2.3 describes a generic set of broad activity cost categories (and types of activities and resource use, per broad category) that have been developed, tested, and consistently applied across the SEEMS-Nutrition country case studies in Malawi, Nepal, Burkina Faso, Bangladesh and Kenya.

For example, instead of each intervention having a slightly different description or unique labeling of a program component that involves capacity building or training, all activities of this type are re-labeled as the standardized SEEMS category of “Training.” Once cost estimates are generated, it is easier to compare the percentage of total program costs related to training. For application of standardized categories to new multisectoral studies, they may need to be modified if the new studies contain activities that do not align with existing categories.

Toolbox 2.1 Tools for Defining the Program

Guidance for Activity Tracking

Generic Activity Tracking Sheet



Workbook 2

Toward unit costs – mapping costs and benefits of the Malawi NEEP-IE program

A *unit cost* is the total cost of a single item being measured (e.g., cost per preschool child reached). This example shows how the intervention typology facilitates calculation of standardized unit costs for multisectoral approaches to improve nutrition. This approach identifies the delivery platform and target population, which is likely to vary by project or program. Activities in the Malawi NEEP-IE program fell under three of the five typologies described in Table 2.1.

1. Components that increased the demand for food included behavior change communication (BCC) activities to involve parents and community caregivers in the preparation and planning of meals in the community-based childcare centers, and to promote optimal household feeding and caring practices through parenting groups.
2. Components that increased the supply of nutritious food included agricultural activities that promoted increased nutritious food production and food diversification by using community-based childcare center gardens as demonstration plots.
3. A range of activities targeted the enabling environment, including activities to strengthen childcare and parenting practices. (Gelli et al. 2022)

At this early stage, the intervention typology helps analysts think about what the ultimate unit costs will be for the intervention. In addition, it helps program planners assess the comparability of results across different settings by reporting a complex intervention using the common typology while also listing the intervention specifics.

Table 2.2 Using intervention typologies to map costs

INTERVENTION SPECIFIC: MALAWI NEEP-IE					SHARED MULTISECTORAL COSTS	OVERALL UNIT COST
Intervention typology	Intervention	Intervention details	Activities	Standard unit of direct cost (activity/output)	Standard unit cost integration/multisectoral actions	
Increase demand for nutritious food	Behavior change communication	Providing information to caregivers to produce nutritious meals for consumption	→ Develop training materials → Training of trainers → Cooking demonstrations	→ Cost per nutrition training → Cost per agricultural extension agent trained → Cost per caregiver reached	→ Cost per planning meeting → Cost per awareness-raising session	→ Cost per preschool child reached → Cost per household → Cost per child or household
Increase supply of nutritious foods	Diversification and promotion of nutritious crops	Training on improved farming practices, along with provision of inputs	→ Training package for agriculture extension workers → Seed distribution	→ Cost per training → Cost per household reached	→ Shared across interventions, no separate or additional costs	
Enabling Environment	Strengthening childcare and parenting practices	Providing information to caregivers for improved care practices	→ Develop and use training materials	→ Cost per caregiver reached → Cost per training	→ Cost per planning meeting → Cost per integration activity	→ Cost per preschool child reached

Source: Adapted from presentation, ANH Part 2 Study Typology and Mapping, June 21, 2021.



Table 2.3 Broad SEEMS-Nutrition activity categories for multisectoral nutrition programs

START-UP ACTIVITIES	
Most start-up activities and accompanying costs occur at the beginning of a project; however, some may occur later on and simultaneously with recurrent implementation activities (e.g., refresher training, sensitization).	
Planning/microplanning	Meetings, stakeholder meetings, assessments, situation analysis, program design prior to service delivery (annual planning meetings should be coded as management).
Program Installation	Establishing an office, NGO staff and frontline worker recruitment/hiring, equipment purchases/project procurement to support implementation.
Volunteer/vendor recruitment	Recruitment of vendors for market-based interventions or community volunteers for any type of intervention.
Materials development	Development of BCC and training materials for frontline workers and participants.
Training	Formal training of NGO staff and frontline workers (including community volunteers). Excludes cross-sectoral regular feedback meetings that may have a learning component. Although they are a form of in-service training, in the context of multisectoral programs, they should be categorized as "integration and coordination."
Awareness raising/sensitization	Meetings and events to raise awareness about importance of multisectoral approaches to improve nutrition and health outcomes; often combined with meetings to sensitize leaders and implementers about the specific aim and rollout of a project or program at all levels (national government, regional, local, community).
RECURRENT ACTIVITIES	
Ongoing costs incurred as part of implementation	
Management	International, local NGO and government management activities: Recurrent project team meetings on general management, financial oversight activities, and international and local NGO personnel costs for on-going management of the project.
Monitoring and evaluation	Implementer designs and implements the regular monitoring and evaluation system; does not include impact or process evaluation activities conducted by external actors.
Supervision	Supervision of front-line implementation and service delivery.
Distribution of inputs	Purchasing and distribution of inputs by volunteers, vaccinators, households, individuals (may include supply chain costs). This can also include the distribution of cash for cash transfer projects, or the distribution of staple rations with or without supplementary foods for food distribution programs.
Home visits: agriculture/aquaculture/livestock extension	Production-related extension occurring at household or farm level; includes poultry and livestock vaccination.
Home visits: household counseling	Additional behavior change communication occurring at household level (primarily nutrition and health counseling).
Health facility counseling and support	Nutrition and health counseling at the health facility level.
Community events	Demand generation at community level, may include community demonstrations, field days, celebrating life events, community activities to reinforce concepts introduced during sensitization; could include marketing or agriculture/livestock extension, but at the community level.
Establishing and running community groups	Demand generation activities to increase participation and/or groups established to increase access to inputs and/or groups established to increase knowledge and practice in agriculture, nutrition, IYCF, maternal health, WASH, credit, women's empowerment). Includes the establishment and regular running of community groups (credit groups, women's groups, etc.).
Microcredit activities	Loan disbursement and collection.
Certification	Open Defecation Free (ODF) status of communities and for vendors/traders in market-based projects.
Integration and coordination	Recurrent and regular planning/coordination/feedback meetings across all or some implementing partners/intentional cross-sectoral training; may include monthly, quarterly or annual meetings, including work planning, if done collectively across sectors and partners.
Overhead/indirect	Expenses that support the entire project rather than a specific activity; includes communication, utilities, certain types of administrative personnel time (secretarial, office building maintenance), office rent, allowances for general project purposes, organizational indirect costs. These may also include program support costs that are not related to specific implementation activities but may be field-based (logistics support, field finance and HR).

Source: Adapted from SEEMS-Nutrition Generic Activity Tracking Sheet (2022).

In addition to describing activities by sector and mapping these to a common SEEMS-Nutrition activity category, analysts should identify the timing of costs for each activity, including who is incurring these costs, what types of costs those are, and what data sources will be used to estimate those costs. An example of this process is found in Workbook 3.



Workbook 3

Mapping activities to broad SEEMS-nutrition categories - Malawi NEEP-IE

In the table below, analysts mapped activities from the NEEP-IE program to the SEEMS-Nutrition broad categories. Mapping is often a joint effort between program implementors and analysts.

Table 2.4 NEEP-IE activities mapped to SEEMS-Nutrition broad activity categories

START-UP ACTIVITIES	NEEP-IE ACTIVITIES
Planning	Planning, stakeholder, review, and close out meetings
Awareness raising	Awareness raising of the program at all levels (government, regional, community) by agricultural extension and community agents
Materials development	Training of trainers (ToT) for agricultural production, nutrition, village and savings loans
RECURRENT ACTIVITIES	NEEP-IE ACTIVITIES
Management	NGO personnel costs for ongoing project management
Monitoring and evaluation	Designing and implementing program monitoring and evaluation, does not include impact evaluation conducted by IFPRI
Distribution of inputs	Distribution of agricultural inputs for nutritious foods (seeds and vines) and chicks, preparing and serving preschool meals, managing food stocks, maintaining kitchens and canteens
Home visits: agriculture extension	Agricultural extension technical support to households
Establishing and running community groups	Caregiving of preschool children, maintaining community gardens
Integration and coordination	Integration, monitoring and evaluation, management
Community events	Agricultural production training at the community level, nutrition and food processing training, village savings and loans training

Source: Adapted from Table 1 of Margolies et al. (2021).

Once activities are described, the inputs necessary for each of those activities can also be described. Typically, for each intervention activity, the inputs will include some combination of personnel and volunteer time, supplies, equipment, vehicles, fuel maintenance, travel, per diem, communication, equipment, consultants, contracted services, and overhead (utilities, office space, shared services, etc.). In some cases, a category for mixed inputs may be relevant for costs that cannot be separated into individual input categories. This may include costs related to training workshops or community events, such as the venue, accommodation, and meals. Table 2.5 provides a description of the types of input cost categories for use in assessing multisectoral nutrition programs. Input categories may need to be removed or added to accommodate different intervention components. For example, we explicitly include "agricultural equipment." However, if sanitation is a component of the multisectoral strategy, then the relevant categories may be different, i.e., "sanitation equipment."

Table 2.5 Broad SEEMS-Nutrition input categories for multisectoral nutrition programs

INPUT CATEGORY	DESCRIPTION OF RESOURCES AND COSTS
Personnel time	Paid labor
	Volunteer labor
Agriculture supplies	Agriculture, livestock or aquaculture production inputs: plant growing including horticulture, seeds, plant diseases, poultry or fisheries inputs, pesticides, small tools, animal feedstuffs, animal husbandry, coop or pond construction supplies, signposts
Agriculture equipment	Irrigation, fencing, agriculture machines, implements and equipment, plans and equipment for food industry, processes in the food industry for food hygiene and safety, milling equipment, generator
Contracted services	Consultants, contracted services, printing services
Equipment	Computers, copying machine, office equipment
Transportation	Out-of-pocket costs for public transport
	Fuel, insurance, and maintenance, rental
	Vehicle depreciation
Travel/per diem/allowances	Per diem and travel allowances
	Communication allowances
Printing costs	Printing pamphlets, posters, training materials
Other supplies	Office supplies, stationery
	Community or school meal or food preparation inputs
	Purchased materials for meetings
	Community awards
	Celebration costs for program achievement at community level
Mixed inputs	Venue, accommodation, meals/catering for meetings and workshops; in general, this encompasses inputs that are not easy to untangle!
Overhead	Office rent, phone/internet, utilities, vehicles & fuel for administration
Other	Other recurrent inputs that may not be included in the above line items. However, as this category is not very informative, significant effort should be made to utilize existing categories as much as possible.

Source: Adapted from SEEMS-Nutrition Codebook (2022).

Understand program costs

After identifying the common activity and input categories, the analyst will need to collect data to fill in the cost categories. When calculating the cost of a given intervention or activity, analysts need to capture the full costs of a project or intervention by including both financial and economic costs. Economic costs are opportunity costs, as they represent the loss of potential resources for alternative use when utilized for the given intervention. For example, the opportunity cost of volunteer time in an intervention is the value of daily wages paid for an equivalent position in the local context. On the other hand, financial costs are the direct intervention costs for the service. For example, direct costs include NGO personnel staff costs, supply costs and equipment costs. We briefly review a variety of data collection approaches here.

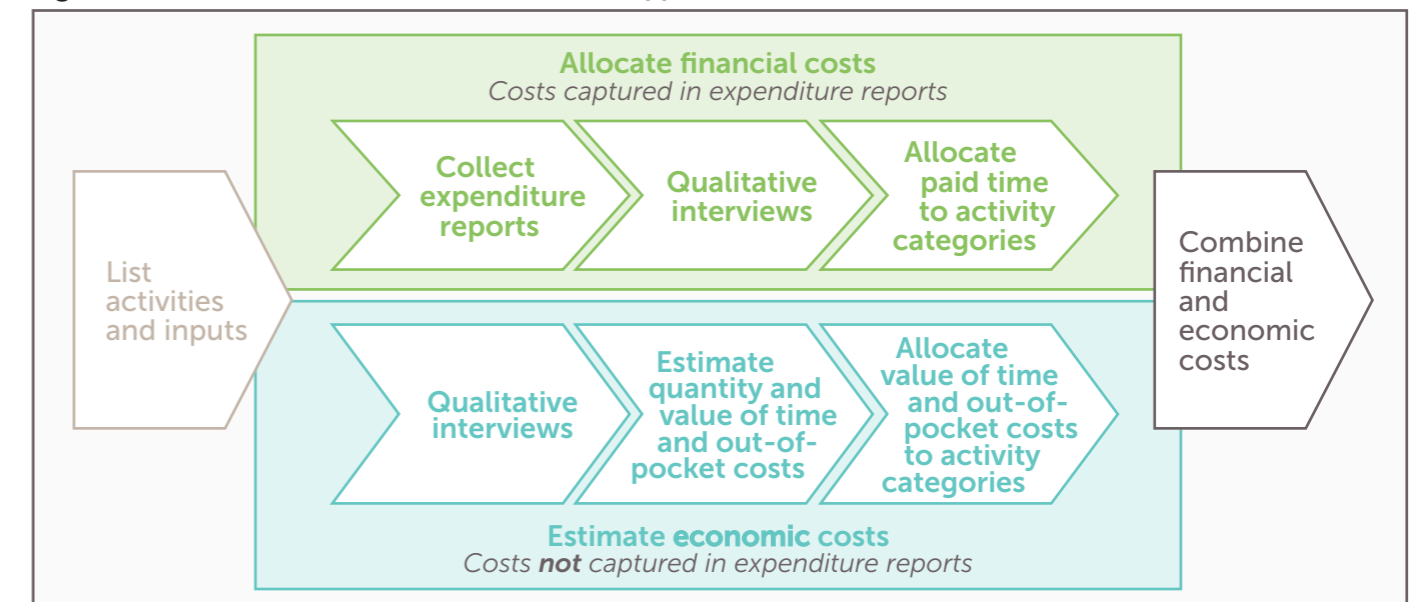
3.1 Cost Data Collection Approach

Analysts can use either a gross- or micro-costing approach. Gross-costing uses financial expenditure data and is a “top down” approach that estimates the total costs of a program from existing budgets and expense reports. Micro-costing is a comprehensive estimate of the quantity and value of each resource that is constructed from the “bottom up” by an analyst rather than being extracted from financial accounting systems. However, it is more labor intensive than gross-costing and not always possible or necessary, especially when one deals with a complex, multisectoral program delivered by more than one implementing partner.

The SEEMS-Nutrition framework recommends a pragmatic activity-based costing approach using mixed-methods. This approach combines available financial expense report data with cost estimates derived from micro-costing to fill in the gaps as needed (Figure 3.1). Data can be collected through a mix of retrospective and prospective data collection activities.

In addition, the time horizon of the costing study must be considered. Resource use can be collected for startup activities and for a typical year of the program, or it can be collected for the entire project period, which may run for several years. The final choice on time horizon for the cost data collection period will depend on the cost study budget and the feasibility of integrating cost data collection alongside planning, implementation and evaluation of the intervention.

Figure 3.1 Mixed methods cost data collection approach



Source: SEEMS-Nutrition, 2018.

Activity-based costing recognizes that activities consume resources, and resources yield services, outputs, and outcomes. Therefore, focusing on activities can generate more detailed cost estimates. When using financial expense reports for estimating activity costs, some expenditure line items may be described by activity, but in general, these are listed instead by input categories. Often significant expenditures, such as personnel and capital equipment costs must be assigned to discrete activities.

The SEEMS Nutrition approach does not allocate indirect program and overhead costs to each activity. For simplification, the approach includes overhead and indirect costs as its own 'activity' category. Therefore, an important part of the SEEMS-Nutrition framework is to allocate all line-item costs to discrete input and activity cost categories (described above in Section 2.3 and Tables 2.3 and 2.5). However, assigning costs to activity categories, when using financial expenditure data can be challenging. A mixed-methods approach can be used to explore resource use in greater detail by using micro-costing. Table 3.1 offers recommended approaches to working around common challenges.

Table 3.1 Overcoming challenges with assigning costs to activity categories

COMMON CHALLENGES	RECOMMENDED APPROACH
Some financial accounting data may be listed only by inputs, such as personnel, equipment or supplies, contracted services or subcontractor awards, without any indication of how costs were allocated to specific activities.	Assess time allocation of personnel staff across key implementing activities and develop allocating percentages of time derived from interview data (or assumptions). When available, project-level or task-level timesheets may be used.
Disaggregated subcontractor expenditure data may not always be available from the Prime Contractor or the subcontractor.	Work with prime contractors to obtain detailed line-item expense reports from subcontractor partners whenever possible.
Government program costs may not be readily available.	Use micro-costing to understand resource use for activities.
Level of detail in financial expense reports, including types of line items, and disaggregation of information varies considerably across government, international NGOs and local NGOs for the same program.	Develop and apply consistent allocation rules to assign costs to similar activity and input categories.
Joint costs (shared program costs for administration, management, coordination, distribution of inputs (vehicles, storage), planning meetings, training, and overhead) are used for more than one program or intervention component.	Allocate joint costs based on estimates provided by program managers or expert opinion, or derive a consistent allocation rule to assign joint costs to different program or intervention components.

Source: SEEMS-Nutrition.

Drawing on the economic evaluation matrix described in Section 1.2 and the activity tracking sheet in Section 2.3 can help identify the most appropriate cost data collection approach. For example, if most of the expenditures are covered by a single organization that is funding the project, then a mixed methods approach may be used that draws both on organizational expenditure reports to capture financial costs, with a micro-costing approach to obtain time allocation and out-of-pocket expenditures to estimate the opportunity costs of time and money by volunteers and participants. However, if one or more government ministries is implementing a national multisectoral nutrition program, then a micro-costing approach may be more appropriate. Disaggregation of cost by input and activity allows for robust assessment of cost drivers.

3.2 Timing of costs

The timing of costs for some activities and their inputs occurs at different times in a program or project lifecycle. To enhance the comparability of costs for resources that are used at different times over the course of a project, analysts can annualize and discount counts. Capital inputs are items that are typically purchased once, are greater than \$100 and last longer than one year. Some start-up activities are often treated as capital inputs, as formative research, the development of training and awareness materials, training, and awareness raising activities may occur one or more times in the first year of a project, and their impact lasts longer than one year. Recurrent items are inputs used throughout the life of the project. Annualizing provides an equivalent cost per year, that is spread over the course of the project. For example, the purchase of capital goods (i.e., vehicles or computers) occurs during the start-up period for a project, but their use occurs during the entire project, which may last several years. In this case, typically, we calculate depreciation costs, which is the amount of capital consumed in one year. Discounting captures the concepts of opportunity cost and time preference, notably that (1) money spent

on capital inputs today, cannot be saved or invested in the future; and (2) individuals prefer spending a dollar today than more tomorrow. Time preference implies that future costs are worth less, and discounted more to have resources and money today, rather than in the future. See Walker and Kumaranayake (2002) for guidance on applying annualization and discounting adjustments for costing analysis. The approaches will vary depending on the purpose and use of costing in economic evaluation.

3.3 Financial costs and expenditure data

SEEMS-Nutrition developed a simple Excel-based expenditure analysis template. Analysts input raw expenditure data, convert it to a standard USD amount, and then code it by input type and activity (Tables 2.3 and 2.5) to allocate the costs. Expenditures can also be coded by platform, nutrition-sensitive value chain typology, sector or trial treatment arms, or other factors. Large up-front and capital costs can be annuitized over their expected useful life. Where available, expenditures can be linked to account and monitoring codes to support contextualization of expenses. These account codes can often be obtained from implementer finance personnel and save significant amounts of time in coding expenditures as the process to link line items and codes can be automated.

The expenditure analysis template produces simple summaries of project expenses by input type, activity type, program year, and by several other inputs. See Toolbox 3.1 for the template and specific guidance on how to use this expenditure analysis tool to allocate resources across activities and other classifications.

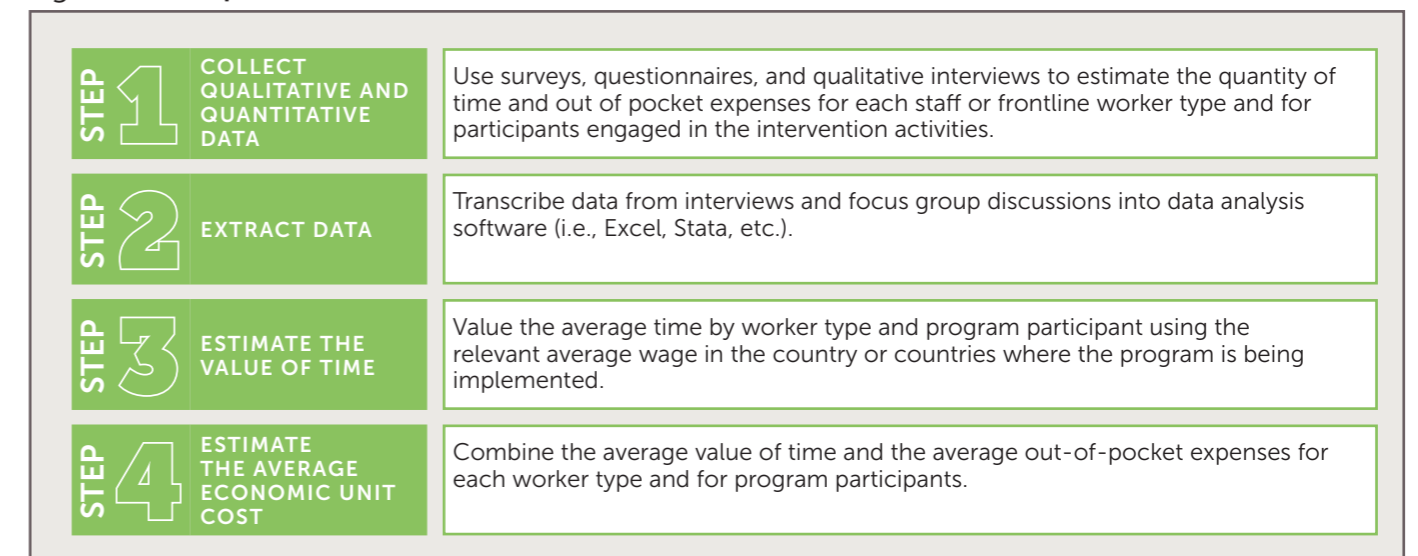
Toolbox 3.1
Tools for Expenditure Analysis

- Options for Allocation Methods**
- Cost Codebook**
- Expenditure Analysis Template**
- Guidance on Expenditure Analysis Template**

3.4 Economic costs

The steps for estimating economic costs will vary depending on the size of the project being implemented and evaluated. For smaller projects, with smaller sample sizes, Excel may be sufficient. The figure below illustrates the basic steps to estimating economic costs.

Figure 3.2. Steps to estimate economic costs



Source: Adapted from presentation, SEEMS-Nutrition Suaahara II Costing, August 2022.





Data collection through process evaluations or other survey instruments (questionnaires, guided focus groups) can be used to capture detailed information on time and resource use through micro-costing techniques. Data on how personnel used their time is needed to allocate the costs of their time to specific activities. Staff salaries are generally obtained from financial expenditure data. However, these data do not contain information on how staff spent their time on various program activities. Survey data can fill this gap and also gather data on the economic costs of other participants in the program, including volunteers and frontline workers.

When working with staff from the government and NGO sector, such as program coordinators and supervisors, it is often easy to sit down with a white board and create timelines of program activities by year and allocate their annual staff time across these activities (in percentages). This is a simple and efficient way to obtain time allocation for program staff.

With frontline program staff, volunteers, and program participants, analysts should collect data on time spent on project activities, travel to/from activities, and out-of-pocket costs. For any resource use not included in the financial expenditure records, these data can be used to estimate the opportunity costs for NGO field staff, volunteers, participants, and other stakeholders, such as government partners who support program implementation at the national and sub-national level. The tools in Toolbox 3.2 can support data collection from many different sources.

Toolbox 3.2

Data Collection Tools

-  **Data Collection Planning Form**
-  **Interview Guides** (various, see [Resource List](#))
-  **Time Allocation Form**
-  **Generic Activity Tracking Sheet** (also in [Toolbox 2.1](#))

3.5 Sampling for costing studies

In many cases, it may be feasible to collect and analyze all the program's expenditure records to assess direct program costs. However, it is generally not possible to collect micro-costing data for all implementers, partners, and participants across an entire program or project. Rather, it is efficient and equally valid to take a representative sample of the overall program or project, with the goal of estimating cost within that sample and extrapolating to estimate the total cost of the program or project. Depending on the goal of the costing study and on the scope of the program or project being evaluated, sampling may involve choosing a set of countries, a set of regions or sub-national units within countries, implementation sites within sub-national units, and implementers and participants within implementation sites. This section outlines some key considerations for determining an appropriate sampling strategy and target sample size, depending on the goal and characteristics of the costing study.

Sampling Strategy

Appropriate and transparent sampling frames and strategies are critical to ensuring study validity and replicability, and to promoting the portability of cost estimates to new settings. For more on sampling strategy, please refer to the [Global Health Cost Consortium \(GHCC\) Reference Case for Estimating the Costs of Global Health Services and Interventions](#). The choice of sampling strategy depends on the purpose of the study, the nature of the sampling frame, resources for the evaluation and the feasibility and timeline of data collection. Many studies will use a combination of sampling methods across multiple levels of analysis. Sampling strategies should be clearly explained and documented.

Sample Size

Historically, costing studies have approached sample size estimation like qualitative studies, aiming for "saturation" by sampling as many units as necessary to observe maximum variation and evidence of an appropriate mean estimate. However, cost data can be highly skewed due to geography, urban vs. rural, or the intervention delivery venue (household, community, health facility), meaning that large sample sizes may be necessary to obtain precise estimates (Vassall et al. 2017). Formal guidance on sample size estimation for costing studies is currently equivocal. Ultimately, the choice of sample size will usually be based on the resources available for data collection. Please see the articles on sample size in qualitative research by [Sandelowski \(1995\)](#) and [Hennink and Kaiser \(2022\)](#) for more information. As with the sampling strategy, the process of sample size estimation should be clearly explained and documented.


3.6 Data analysis

Financial and economic cost estimates can be analyzed using Excel to generate total and unit costs by inputs, activities, and program stage (start-up and recurrent). SEEMS-Nutrition has developed several tools to support cost estimation and analysis ([Toolbox 3.3](#)). The economic cost analysis model summarizes qualitative data and calculates average economic costs for different types of project participants, government partners, front-line workers and community volunteers. The model also enables analysts to extrapolate from individual economic costs per person or per worker type to overall economic costs at the level of the program. Time use and out-of-pocket costs can be coded to specific project activities and combined with the financial expenditure data to obtain total program financial and economic costs. These tools can be used to convert raw expenditure data to a standard USD amount, as well as annualize and discount large up-front costs.

Once financial and economic costs are combined in the same Excel file, total and unit costs can be estimated, as well as cost shares. Total costs are equal to the sum of financial and economic costs. Unit costs are equal to the total costs divided by the total number of outputs. The list of outputs will be specific to the program impact pathway, but typically include the number of program households or participants reached. Cost shares are easily estimated as the percentage of line-item costs for inputs or activities over the total program cost. SEEMS-Nutrition has created a simple Excel template to combine economic and financial costs, stratified by input type, activity type, and program stage. For larger, more complex studies, with larger sample sizes (see [Section 3.5](#)), the analyst may use these Excel tools in combination with Stata.

Toolbox 3.3

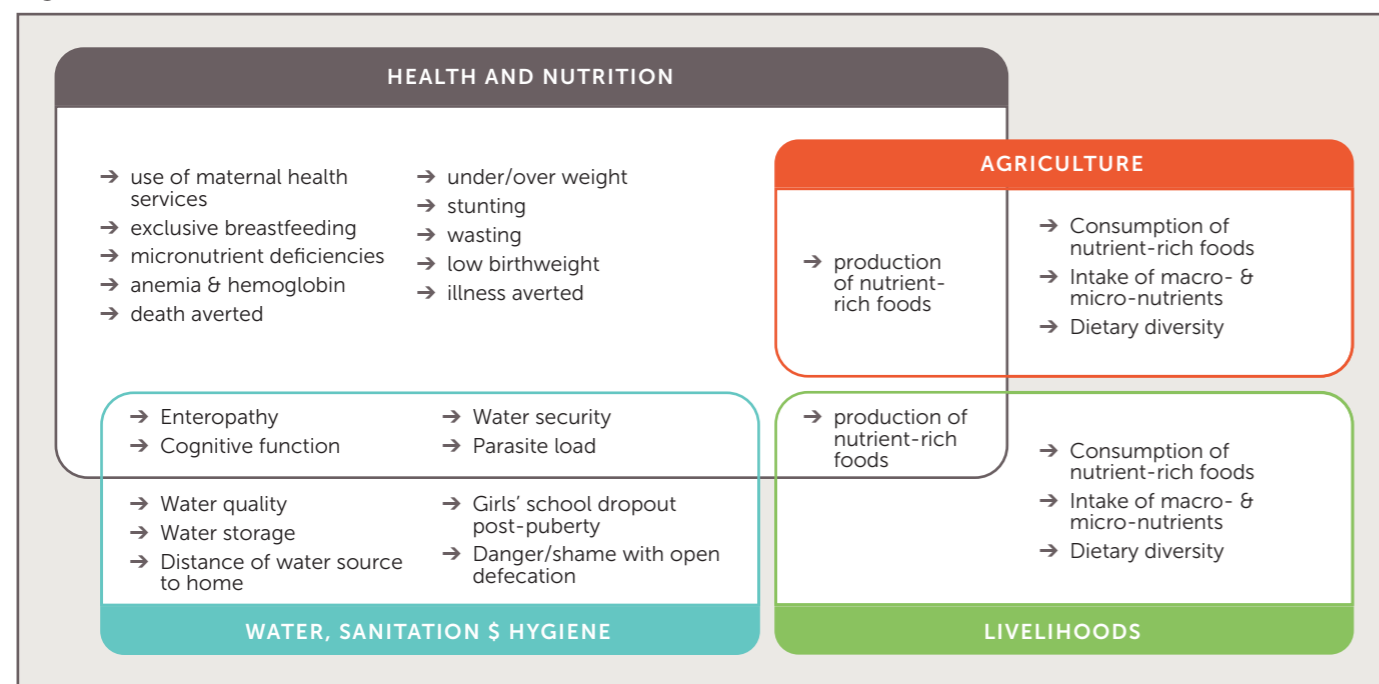
Cost Estimation and Analysis Tools

-  **Guidance on Economic Cost Analysis Template**
-  **Economic Cost Analysis Template**
-  **Combining Financial and Economic Costs Template**

Define and measure benefits

Economic evaluations focus on the health and monetary benefits a program or intervention produce. Many forms described in Table 1.1 (CEA, CUA, BCA) require an estimate of the effectiveness of the intervention's or program's outcomes. However, multisectoral investments that address nutrition outcomes face challenges in capturing the full range of benefits along the program impact pathway (Figure 4.1).

Figure 4.1 Overview of measurable multisectoral benefits across the impact pathway



Source: SEEMS-Nutrition.

When evaluating multisectoral approaches to improve nutrition, analysts should consider two broad benefit categories:

1. Benefits from reducing illness and death via one or more improvements in nutrition and health. Reductions in wasting, stunting and micronutrient deficiencies can be converted to disability, deaths, and Disability Adjusted Life Years (DALYs) averted.
2. Benefits related to changes in knowledge and practices for production or consumption, changes in dietary practices and dietary diversity, improved food and water security, reduced vulnerability, and enhanced gender empowerment. These benefits tend to be harder to measure and incorporate in economic evaluation.

4.1 Commonly considered monetary benefits

To support a cost and benefits analysis, monetary values are often assigned to health and nutrition benefits or outcomes, such as changes in commercial or small-scale production, in income and profits, or even in the value of household consumption. Health-related monetary benefits include savings from averted health costs, higher future earnings, or any other money that is generated or saved due to an intervention.

Changes in income, expenditure, sales – Changes in expenditure incurred (-) or income gained (+) as the result of an intervention already are presented in monetary terms.

Time savings – The time households or individuals save by participating in an intervention can be assigned a monetary value.

Cost of illness – Estimating an individual's averted (or saved) cost of illness involves estimating the direct and indirect costs incurred due to illness. Direct costs may relate to treatment, for example, doctor's visits and medication. Indirect costs include the value of time a worker loses while sick and time other household members spend caring for the sick family member (Robinson et al. 2019).

Productivity gains due to reduced illness or disease and/or improved cognitive gains from early education – Increased labor productivity due to anemia treatment and prevention have been noted in many cross-sectional and interventional studies. A recent systematic review of data from 12 studies found strong evidence that anemia negatively impacts occupational performance and that therapeutic iron interventions through fortification or supplementation can yield substantial productivity gains. Outcome measures considered were quantitative measures of labor-outcome relevant to the occupational context (e.g., mass of product harvested), which can be translated to additional income or sales (Marcus, Schauer, Zlotkin 2021).

Morbidity and mortality – Where possible, changes in health and nutrition outcomes can be converted into mortality and disability (including infections) prevented by an intervention; for many diseases these can then be converted into Disability-Adjusted Life Years (DALYs) averted. Mathematically, a DALY reflects YLL (years of life lost due to premature mortality) plus YLD (years lost to disability). The DALY is a composite measure of death and disability attributable to specific diseases.

Estimating DALYs and cost per DALY averted by an intervention provides important information that can be used for program design and advocacy. DALYs are based on the idea of "utility," an economic concept related to the satisfaction (or lack thereof) that a person experiences in different health states. Mortality, disability and DALYs can be measured or modeled, using evidence from primary data, published literature or systematic reviews. Analysts can directly estimate DALYs using off-the-shelf tools or approximations. A popular tool for estimating deaths averted from stunting or wasting is the Lives Saved Tool (LiST) (Clermont and Walker 2017).³ In settings where data are scarce, the Global Health DALY Calculator, developed by the Tufts University Center for the Evaluation of Value and Risk in Health (CEVR), can convert health outcomes expressed in cases or deaths averted into DALYs. Even more roughly, another way to approximate is to assume 32 DALY equivalents to one death averted (Horton and Levin 2016).

To monetize DALYs and QALYs, analysts must assign a value to years of life lost due to premature death or spent living in suboptimal health, by using the value of a statistical life year (VSLY). See Box 4.1 on the controversy around VSLY. The Reference Case Guidelines for Benefit-Cost Analysis (Robinson et al. 2019) summarizes current recommendations for how to monetize DALYs, QALYs and other benefits like time savings.

³ The Lives Saved Tool (LiST) is a web-based modeling tool that allows users to estimate the impact of intervention coverage change on deaths averted for the set of nutrition-specific interventions. LiST also has several established country models that are available upon request. They have developed subnational models for many countries as well. Visit the LiST website to apply the evidence-based tool to estimate nutrition intervention impact.



Box 4.1 Controversy in monetizing death and disability

Death and disability are valued using metrics such as the value of a statistical life year (VSLY). These metrics are influenced by income levels, and their dollar value is higher in higher-income settings. This method implies that the value of a life varies by country and context. The Reference Case Guidelines for Benefit-Cost Analysis (Robinson et al. 2019) recommends performing a sensitivity analysis using VSLY from high- and low-income settings to gauge how the analysis' conclusions are affected by these assumed values.

4.2 Benefits that are harder to incorporate into economic evaluation

Multisectoral nutrition programs bring a variety of positive outcomes to households and communities. However, some of these outcomes cannot be monetized or easily converted to a death or DALY measurement as part of an economic analysis. These benefits also fall into two categories: those that can be measured quantitatively (e.g., in a sector-specific index), and those that must be described qualitatively.

For outcomes that can be quantitatively measured, like an index, we recommend including them in a cost-consequence analysis (CAA). As detailed in [Table 1.1](#), CCA is a form of economic evaluation where disaggregated costs and a range of outcomes are presented to allow decision-makers to form their own opinion on context relevance and relative importance. Qualitative outcomes also represent an important program benefit for a community. These should be described in a separate section of the economic evaluation report.

A growing research area involves analyzing costs and benefits of multisectoral nutrition programs. In the future, we hope that tools and methods will be developed to quantify and monetize more of the numerous benefits that multisectoral nutrition programs produced.

4.3 Using measured impact and outputs in economic evaluations

The most appropriate way to measure program impact for an ex-post economic evaluation is an impact evaluation. Impact evaluations measure changes in outcomes based on cause and effect. These measurements provide data for the denominators used in economic evaluations (for example, cost per DALY averted, see Section 4.2). The SEEMS Nutrition approach recommends that researchers integrate standardized costing into planned impact evaluations. For detailed guidance on how to conduct impact evaluations for multisectoral programs, please see the resources below:

- [Measure Evaluation: Guide to fundamentals of economic evaluation in public health \(Moreland et al. 2019\)](#)
- [ANH Academy SCANR](#)
- [IFPRI: Evaluation of nutrition-sensitive programs \(Olney et al. 2017\)](#)

**Compare program costs and benefits**

When conducting an economic evaluation, the final step is to compare program costs and benefits, as defined and valued in the steps above, according to the selected evaluation type from [Table 1.1](#).

5.1 Cost-efficiency analysis

Cost efficiency can be measured by estimating the average cost per output (for example, the intervention cost per household reached). This will be the total cost of the program divided by the sum of the participants the intervention reached. Cost efficiency can also measure the average unit cost per outcome changes, such as the cost per change in a standardized knowledge, attitudes and practices (KAP) score. Data on output and outcomes should be obtained through the program or project-monitoring and evaluation system linked to the theory of change or program impact pathway. Analysts can assess the main cost drivers by generating cost profiles for inputs and activities. A cost profile looks at the share of an individual input, activity or intervention component out of total program costs. Additional guidance on program monitoring and evaluation can be found elsewhere (TANGO 2007, FHI360 2016), including guidance specific to evaluating nutrition-sensitive programs (see Leroy et al. 2016).

5.2 Cost-effectiveness analysis

A cost-effectiveness analysis (CEA) compares the net costs and effectiveness of alternative approaches to improve nutrition or health outcomes. CEA expresses outcomes by a measure of some health outcome unit, such as the number of wasting cases prevented, or the number of lives saved. Therefore, the CEA metric is the cost per health outcome unit achieved, (i.e., the cost per wasting case prevented or cost per life saved). CEAs can assist with boosting technical efficiency by helping you choose an intervention or interventions based on the lowest cost per unit of health benefit achieved. Alternatively, CEA can be used for allocative efficiency: choosing an intervention or interventions to achieve the maximum benefits at the population or societal level. For more on the pros and cons of CEA, specifically within the context of nutrition and food security interventions, see [this publication from Action Against Hunger \(ACF\)](#).

For nutrition outcomes that can be converted into disability or death (i.e., wasting, stunting, micronutrient deficiencies), analysts can estimate DALYs directly, use off-the-shelf tools or use approximations. Analysts can directly estimate DALYs using methods recommended by Fox-Rushby and Hanson (2001).

5.3 Benefit-cost analysis

Cost and benefit information can be used to estimate a rate of return on an investment. You can determine how good an investment is by assessing how many dollars you generate for every dollar spent. Summary measures may include net benefits (benefits minus costs), the ratio of benefits to costs (benefits divided by costs) and/or the internal rate of return (the discount rate at which the net present value is zero). For guidance on how to estimate these, see the [Reference Case Guidelines for BCA in Global Health and Development \(Robinson, et al., 2019\)](#). Ideally, the benefit-cost analysis should also capture all discounted future-year impacts and the opportunity costs of investments made. All non-health benefits, such as increases in household food production, should be monetized to arrive at net income due to agriculture interventions that support nutrition. In benefit-cost analysis, health and nutrition benefits (such as deaths or DALYs) are monetized, as described in Section 4.1, and net costs are compared to net benefits.



Workbook 4

Results of a benefit-cost study: Malawi NEEP-IE

Based on a conservative estimate in the economic evaluation conducted by NEEP-IE, the total monetary value of benefits due to averted premature mortality, increased life productivity, and increased agricultural production was 3.6 times the cost of the intervention. This was comparable to other similar cost-effective interventions in the literature.

Table 5.1 Benefit-cost comparisons to similar interventions

INTERVENTION	COUNTRY	SECTORS	BENEFIT/COST RATIO	SOURCE
Essential nutrition-specific interventions	17 countries	Nutrition, Health	18 (3.6 – 48)	Hoddinott et al. (2013a, b)
Essential nutrition-specific interventions	Haiti	Nutrition, Health	5.2 (2 – 8.4)	Wong & Radin (2019)
School feeding	Nepal	Nutrition, Education	5.2 (3.1 – 8.6)	WFP & MasterCard (2018)
NEEP (Integrated nutrition/ECD)	Malawi	Nutrition, Agriculture	3.6 (3.6 – 24.7)	Gelli et al. (2019)
Rural sanitation project	India	WASH	2.5 – 5	Weiss et al. (2018)
Community-led total sanitation	Hypothetical SSA	WASH	1.6 (1.2 – 2)	Radin et al. (2020)
Integrated nutrition and ECD	Nicaragua	Nutrition, education	1.5 (1.3 – 2.3)	Boo et al. (2014)

Note: Table reproduced from Table 5 in Gelli (2021).

Source: Gelli (2021).

6

Present and communicate analysis



Conducting more economic evaluations of multisector nutrition programs will drive future investment only when results are shared with transparency, presented in a standardized way, and communicated clearly to inform decision-making.

6.1 Transparent and standard reporting

To improve the comprehension and use of economic evaluation and cost data, it is critically important to follow standardized reporting. This allows policymakers and planners to assess the quality of evidence in decision-making for nutrition investments. Several tools available support reporting results. Toolbox 6.1 includes standardized templates for transparently reporting study design and data collection methods for economic evaluations and estimation of costs. One of these resources from GHCC provides a reporting checklist with the following principles on cost study design and scope, service and resource use measurement, valuation and pricing, and analyzing and presenting results. Workbook 5, below, uses the checklist to prepare the results from the Malawi NEEP-IE costing study for reporting.

Toolbox 6.1
Tools for reporting

- GHCC Principles and Methods Reporting Checklist
- Consolidated Health Economic Evaluation Reporting Standards (CHEERS) 2022 Checklist for Reporting



Workbook 5

Using the GHCC checklist for transparent and standard reporting: Malawi NEEP-IE

To prepare results for reporting, analysts used the GHCC checklist to align terminology and ensure all key aspects of costing are considered when reporting results.

GHCC REPORTING PRINCIPLE	MALAWI COST ANALYSIS
1 The purpose of the study, the population, and the intervention and/or service/output being costed should be clearly defined.	Purpose: To assess the economic costs and cost efficiency of implementing an effective integrated nutrition-sensitive intervention through a preschool platform in Malawi, including community-level contributions. Population is preschool children and younger siblings; intervention and outputs are clearly defined.
2 The perspective (extent of the resource use captured) of the cost estimation should be stated and judged relevant to purpose.	Provider perspective
3 The type of cost being estimated should be clearly defined, in terms of economic vs. financial, real world vs. guideline, and incremental vs. full cost, and whether the cost is "net of future cost," should be justified relevant to purpose.	Financial and economic costs, incremental to the government preschool program.
4 The "units" in the unit costs for strategies, services and interventions should be defined, relevant for the costing purpose, and generalizable.	Cost per preschool child served
5 The time horizon should be long enough to capture all costs relevant to the purpose, and consideration should be given to disaggregating costs into separate time periods where appropriate.	Time horizon is September 2015 to October 2019.
6 The scope of the inputs to include in the cost estimation should be defined and justified relevant to purpose.	Inputs clearly linked to intervention activities, includes all intervention costs, start up and recurrent, omits research costs.

GHCC REPORTING PRINCIPLE		MALAWI COST ANALYSIS
7	The methods for estimating the quantity of inputs should be described, including data sources and criteria for allocating resources.	A mixed methods approach, using financial expenditure data and micro-costing methods.
8	The sampling strategy used should be determined by the precision demanded by the costing purpose and designed to minimize bias.	Sampling strategy for in-depth interviews not described.
9	The selection of the data source(s) and methods for estimating service use should be described, and potential biases reported in the study limitations.	Data sources and methods for estimating service use described. Limitations described in discussion.
10	Consideration should be given to the timing of data collection to minimize recall bias and, where relevant, the impact of seasonality and other differences over time.	Sensitivity analyses conducted to explore scenarios with differential timing of training activities.
11	The sources for price data should be listed by input, and clear delineation should be made between local and international price data sources, and tradeable, non-tradeable goods.	Source for wage rates described. Does not distinguish between tradeable and non-tradeable.
12	Capital costs should be appropriately annuitized or depreciated to reflect the expected life of capital inputs.	Capital costs annuitized and depreciated.
13	Where relevant an appropriate discount rate, inflation and exchange rates should be used, and clearly stated.	Discount rate and exchange rates clearly stated.
14	The use and source of shadow prices for goods and for the opportunity cost of time should be reported.	Wage rate and source for valuing volunteer and participant labor reported.
15	Variation in the cost of the intervention by site size/ organization, subpopulations, or by other drivers of heterogeneity should be explored and reported.	Variation in cost-efficiency metrics explored and reported.
16	The uncertainty associated with cost estimates should be appropriately characterized.	Sensitivity analysis conducted for wage rate uncertainty.
17	Cost estimates should be communicated clearly and transparently to enable decision-maker(s) to interpret and use the results.	Published manuscript followed GHCC reporting guidance.

Source: Margolies et al. (2021).

6.2 Presenting results

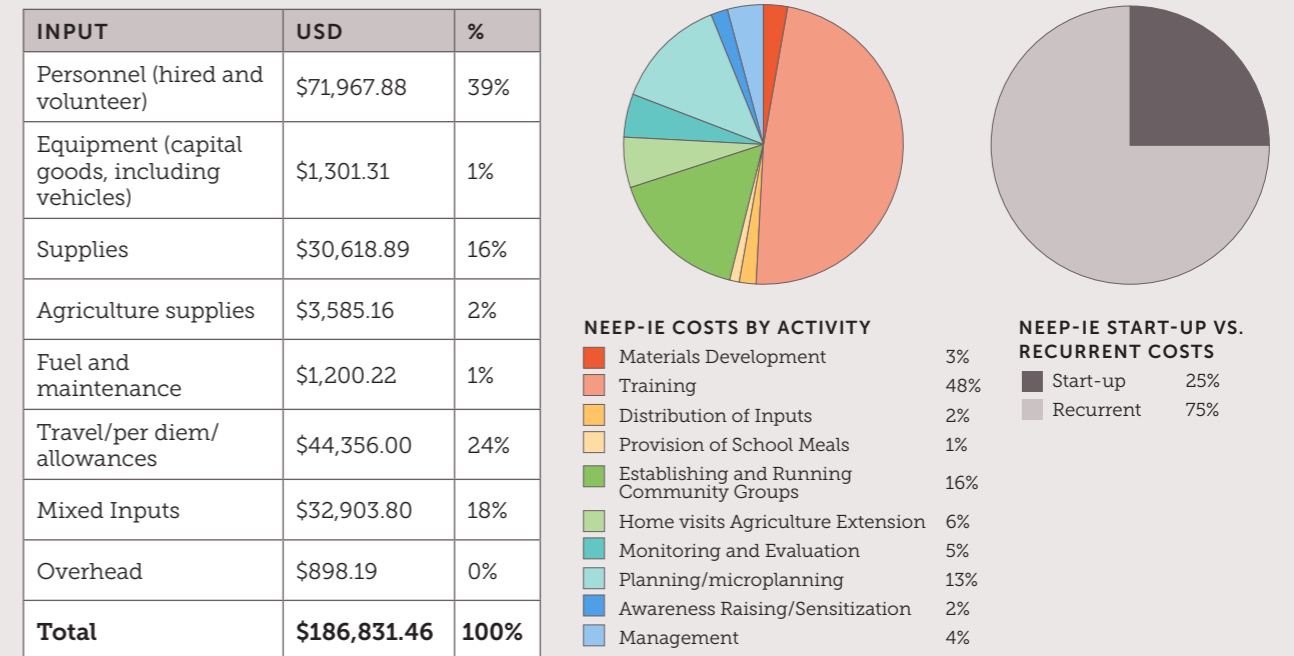
Graphics, including figures and tables, should be clear, concise, and easy to understand. Visualizations play an important role in facilitating decision-making by presenting data in a way that can be easily interpreted and that is persuasive in conveying key messages. Presentation of the analysis from the Malawi NEEP-IE activity, in Workbook 6, provides an example of how costing data could be presented.

Workbook 6

Presenting results – Malawi NEEP-IE

Results from a costing analysis can be presented in several ways. The NEEP-IE activity presented costs by activity and compared start-up versus recurrent costs over the program lifecycle.

Figure 6.1 NEEP-IE Costs



Cost-efficiency and cost effectiveness analysis can also be presented in simple tables to communicate results. The tables below illustrate a basic format that can be tailored to program specifics.

Table 6.1 NEEP-IE Cost Efficiency

TOTAL COST	POPULATION		COST/REACHED	
\$186,832	Pre-School Children:	1,017	\$182	per child
	Participants:	4,806	\$39	per participant
	Households:	900	\$206	per household

Table 6.2 NEEP- IE Cost Effectiveness

INCREMENTAL COST EFFECTIVENESS RATIO (ICER) ESTIMATES		
Stunting	\$569	\$/case of stunting averted
Death	\$15,569	\$/death averted
DALY (standard LE)	\$488	\$/DALY averted
DALY (Malawi LE)	\$514	\$/DALY averted

Source: Adapted from Carol Levin (2020), Presentation, SEEMS-Nutrition: A common approach to the measurement of costs and benefits of multi-sector nutrition programs: overview and preliminary results from Malawi NEEP-IE

6.3 Communicating with stakeholders

When evidence is generated, it is important to consider how to promote uptake by stakeholders and what factors will make it most useful to decision-makers. As part of a 2019 partnership, SEEMS-Nutrition and Results for Development conducted stakeholder interviews and desk research to identify key steps for researchers to promote the uptake, use, or influence of research evidence by decision-makers:

1. Define what the goals are by understanding the decision-maker's priority areas to ensure that the evidence is relevant to them
 - What are the key questions they want to focus on?
 - What are the intermediate and ultimate outcomes they seek?
 - Decision-makers can help design research questions and approaches.
2. Design the research in a way that responds to the decision-makers' goals while also aligning with the local context.
 - Engage with multisectoral stakeholders on the ground who understand the full context as much as possible (political, cultural, economic and social facets of context).
3. Use feedback results early to iterate and adapt along the way
 - Rather than testing results *after* the research process, test them *during* the process and be open to adapting the research along the way
 - It is also a good idea to begin incorporating feedback from decision-makers early on, to help facilitate the process of evidence translation. For example, validation workshops can be useful for sharing preliminary results (e.g., disaggregated resource use and costs per participant) with policymakers and/or program staff at the country level
4. Communicate results clearly and simply to decision-makers
 - Test what types of data visualization work best with decision-makers before developing dissemination materials. What makes the most sense to them?
 - Along with a full report, provide summarized pieces such as an executive summary and/or infographics of the key highlights.

For more information on decision-making in nutrition and results from the survey involving the multisectoral nutrition community, see the presentation [here](#).



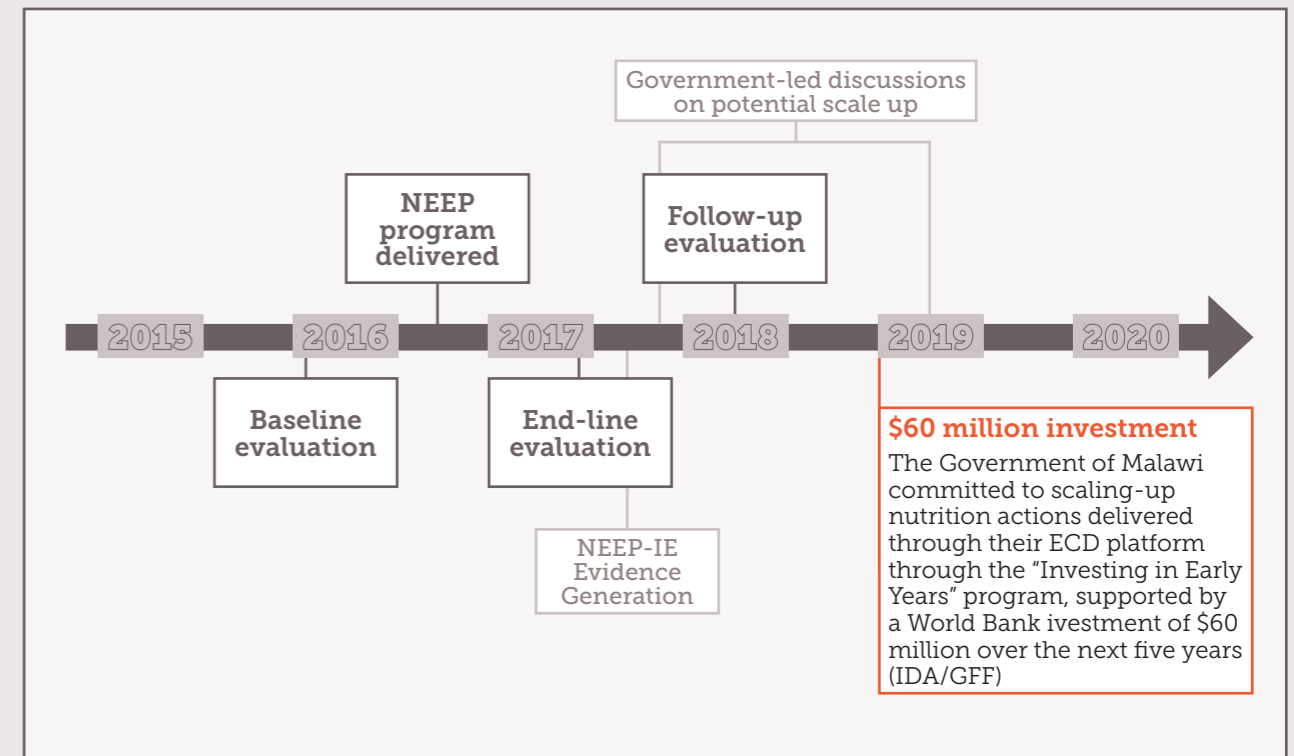
Workbook 7

Supporting data-driven decisions to scale up investment in nutrition: Malawi NEEP-IE

In 2018, researchers demonstrated the NEEP-IE program's ability to improve diets and reduce stunting in children under 2 years of age. In 2019, the costing study, cost-effectiveness and benefit-cost analysis for the NEEP-IE project was completed (Gelli et al., 2018). These findings were shared with decision-makers and fed into policy discussions, which supported scale-up of NEEP-IE programs. A key enabling factor in this decision was the availability of a strong base of evidence on impact and economic rationale.

Integrating a costing study into the rigorous impact evaluation provided the needed evidence that NEEP-IE is a good investment for the Government of Malawi. The study also demonstrated that the costs to deliver nutrition actions through CBCCs were lower than expected and an affordable investment, compared to alternatives.

Figure 6.2 Timeline of NEEP program implementation, evaluation, and scale-up



Source: Presentation, IFPRI Policy Seminar. How evidence informs decision-making: the scale-up of nutrition actions through an early childhood development platform in Malawi. 6 November 2019.

Note: The timeline is presented here in a simplified form, as many other interrelated events and partnerships were occurring that may have influenced the decision to scale-up.

Conclusion

While many challenges to comparing evaluations of multisectoral nutrition strategies persist, a common approach to conducting costing studies can strengthen the design and implementation of economic evaluation to produce high-quality evidence for decision-making. Through the six steps detailed in the preceding chapters (from defining evaluation scope to presenting and communicating analysis results), this guidance document supports analysts and practitioners who seek to generate evidence on the costs and benefits of multisectoral nutrition programs.

All cost data collection tools for estimating financial and economic costs can be found in **Annex 1**.

Annex 1 Resource List

The tools and resources in the main section of this document are presented in order of use. The list below provides these resources in one place:

GENERAL GUIDANCE

- [ANH Academy Technical Brief on Economic Evaluations of Multisectoral Actions for Health and Nutrition](#)
- [A Guide to the Fundamentals of Economic Evaluation in Public Health \(Measure Evaluation\)](#)
- [Reference Case for Estimating the Costs of Global Health Services and Interventions \(GHCC\)](#)
- [iDSI Reference Case for Economic Evaluation](#)

STEP 1 DETERMINE THE SCOPE OF THE ECONOMIC EVALUATION

- [Economic Evaluation Matrix \(SEEMS-Nutrition\)](#)
- [Generic Protocol of Data Collection and Analysis \(SEEMS-Nutrition\)](#)

STEP 2 DESCRIBE INTERVENTION COMPONENTS

- [Generic Activity Tracking Sheet \(SEEMS-Nutrition\)](#)
 - [Guidance on Activity Tracking \(SEEMS-Nutrition\)](#)

STEP 3 UNDERSTAND PROGRAM COSTS

- [Options for Allocation Methods \(SEEMS-Nutrition\)](#)
- [Cost Codebook \(SEEMS-Nutrition\)](#)
- [Data Collection Planning Form \(SEEMS-Nutrition\)](#)
- [Data Collection Instruments](#)
 - [Time Allocation Form \(SEEMS-Nutrition\)](#)
 - [FGD Guide - Beneficiary \(SEEMS-Nutrition\)](#)
 - [FGD Guide - Frontline Worker \(SEEMS-Nutrition\)](#)
 - [KII Guide - District-level NGO Staff \(SEEMS-Nutrition\)](#)
 - [KII Guide - Market-based Enterprise Staff \(SEEMS-Nutrition\)](#)
 - [KII Guide - National-level NGO Staff \(SEEMS-Nutrition\)](#)
- [Financial Expenditure Analysis Template \(SEEMS-Nutrition\)](#)
 - [Guidance on using the Expenditure Analysis Template \(SEEMS-Nutrition\)](#)
- [Economic Cost Analysis Template \(SEEMS-Nutrition\)](#)
 - [Guidance on using the Economic Cost Analysis Template \(SEEMS-Nutrition\)](#)
- [Combining Financial and Economic Costs Template \(SEEMS-Nutrition\)](#)

STEP 4 DEFINE AND MEASURE BENEFITS

- [Global Health DALY Calculator \(CEA Registry\)](#)

STEP 5 COMPARE PROGRAM COSTS AND BENEFITS

- [Cost-Effectiveness Analysis for Nutrition and Food Security \(ACF, 2016\)](#)
- [Reference Case Guidelines for Benefit-Cost Analysis in Global Health and Development \(Robinson et al., 2019\)](#)

STEP 6 PRESENT AND COMMUNICATE ANALYSIS

- [Principles and Methods Reporting Checklist \(GHCC\)](#)
- [Consolidated Health Economic Evaluation Reporting Standards \(CHEERS\) 2022 Checklist for Reporting](#)

Annex 2 How much does it cost to conduct a costing study?

In addition to technical and feasibility considerations, total cost of conducting a costing study may impact the study design itself. The two scenarios below roughly estimate the costs of doing a cost study, whether stand-alone or as part of an ongoing evaluation. Both options assume a cost study workplan with the following main components:

- Establish collaboration
- Conduct scoping visit
- Develop or adapt data collection protocol and forms
- Submit request and obtain research approval from the Institutional Review Board (IRB)
- Collect primary data
- Analyze preliminary data
- Report, revise, finalize

Option 1 Stand-alone costing study

COMPONENT	COST (2020 USD)
Technical assistance → PI (40 days) → RA (130 days) → Administrative (7 days) → Travel, optional	\$65,000 (+\$3,500/optional trip)
Field data collection → Three 10-day field visits	\$34,000 (includes consultant and RA fee, accommodation, and travel costs)
Total	\$99,000 – \$125,000

Option 2 Integrated into an on-going evaluation

COMPONENT	COST (2020 USD)
Technical assistance → PI (16 days) → RA (20 days) → Travel, optional	\$23,000 (+\$3,500/optional trip)
Field data collection → Single field visit	\$7,500 – \$15,000 per data collection round, includes accommodation and travel costs (high-end uses local consultant)
Total	\$34,000 – \$43,000

Source: Adapted from Carol Levin (2020), Presentation, SEEMS-Nutrition: costing complex multisectoral intervention programs.

References

- Clermont, Adrienne, and Neff Walker. 2017. "Nutrition interventions in the Lives Saved Tool (LiST)." *The Journal of Nutrition* 147 (11): 2132S–2140S. <https://doi.org/10.3945/jn.116.243766>.
- Douthwaite, Boru, Thomas Kuby, Elske van de Fliert, and Steffen Schulz. 2003. "Impact pathway evaluation: An approach for achieving and attributing impact in complex systems." *Agricultural Systems, Learning for the future: Innovative approaches to evaluating agricultural research*, 78 (2): 243–65. [https://doi.org/10.1016/S0308-521X\(03\)00128-8](https://doi.org/10.1016/S0308-521X(03)00128-8).
- Drummond, Michael, and Mark Sculpher. 2005. "Common Methodological Flaws in Economic Evaluations." *Medical Care* 43, no. 7 Suppl (July): 5–14. <https://doi.org/10.1097/01.mlr.0000170001.10393.b7>.
- Drummond, Michael F., Mark J. Sculpher, Karl Claxton, Greg L. Stoddart, and George W. Torrance. 2015. *Methods for the economic evaluation of health care programmes*. Oxford University Press.
- Gelli, Aulo, CG Kemp, A. Margolies, A. Twalibu, M. Katundu, and C. Levin. 2022. "Economic evaluation of an early childhood development center-based agriculture and nutrition intervention in Malawi." *Food Security* 14 (1): 67–80. <https://doi.org/10.1007/s12571-021-01203-6>.
- Gelli, Aulo, Amy Margolies, Marco Santacroce, Katie Sproule, Sophie Theis, Natalie Roschnik, Aisha Twalibu, et al. 2017. "Improving child nutrition and development through community-based childcare centres in Malawi - The NEEP-IE Study: Study protocol for a randomised controlled trial." *Trials* 18, no. 1 (June 19, 2017): 284. <https://doi.org/10.1186/s13063-017-2003-7>.
- Gelli, Aulo, Amy Margolies, Marco Santacroce, Natalie Roschnik, Aisha Twalibu, Mangani Katundu, Helen Moestue, Harold Alderman, and Marie Ruel. 2018. "Using a community-based early childhood development center as a platform to promote production and consumption diversity increases children's dietary intake and reduces stunting in Malawi: a cluster-randomized trial." *The Journal of Nutrition* 148, no. 10: 1587–1597.
- Gelli, Aulo, Corinna Hawkes, Jason Donovan, Jody Harris, Summer L. Allen, Alan de Brauw, Spencer Henson, Nancy Johnson, James Garrett, and David Ryckembusch. 2015. "Value chains and nutrition: A framework to support the identification, design, and evaluation of interventions." *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2564541>.
- Global Health Cost Consortium. n.d. "Principles and methods reporting checklist." Accessed December 19, 2022. https://www.ghcosting.org/pages/standards/appendices/principles_and_methods_reporting_checklist.
- Global Health Cost Consortium. n.d. "Standards & methods: Glossary." Accessed December 19, 2022. <https://ghcosting.org/pages/standards/glossary#E>.
- Haghighparast-Bidgoli, Hassan, Jolene Skordis, Helen Harris-Fry, Sneha Krishnan, Meghan O'Hearn, Abhinav Kumar, Ronali Pradhan, et al. 2019. "Protocol for the cost-consequence and equity impact analyses of a cluster randomized controlled trial comparing three variants of a nutrition-sensitive agricultural extension intervention to improve maternal and child dietary diversity and nutritional status in rural Odisha, India (UPAVAN Trial)." *Trials* 20 (1): 287. <https://doi.org/10.1186/s13063-019-3388-2>.
- Harvard T.H. Chan School of Public Health, n.d. "Guidelines for benefit-cost analysis." *Guidelines for benefit-cost analysis*. Accessed Dec. 19, 2022. <https://sites.sph.harvard.edu/bcguidelines/>.
- Hawkes, Corinna, and Marie T Ruel. 2011. "Value chains for nutrition." *Leveraging Agriculture for Improving Nutrition and Health*, February.
- Hennink, Monique, and Bonnie N. Kaiser. 2022. "Sample sizes for saturation in qualitative research: A systematic review of empirical tests." *Social Science & Medicine* (1982) 292 (January 2022): 114523. <https://doi.org/10.1016/j.socscimed.2021.114523>.
- Horton, Sue, Harold Alderman, and Juan Rivera. 2008. "The challenge of hunger and malnutrition."
- Horton, Susan, and Carol Levin. 2016. "Cost-effectiveness of interventions for reproductive, maternal, neonatal, and child health." In *Reproductive, Maternal, Newborn, and Child Health: Disease Control Priorities, Third Edition (Volume 2)*, edited by Robert E. Black, Ramanan Laxminarayan, Marleen Temmerman, and Neff Walker. Washington, DC: The International Bank for Reconstruction and Development / The World Bank. <http://www.ncbi.nlm.nih.gov/books/NBK361909/>.
- Husereau, Don, Michael Drummond, Federico Augustovski, Esther de Bekker-Grob, Andrew H. Briggs, Chris Carswell, Lisa Caulley, et al. 2022. "Consolidated health economic evaluation reporting standards 2022 (CHEERS 2022)." *Health Policy OPEN* 3 (December): 100063. <https://doi.org/10.1016/j.hpopen.2021.100063>.
- International Food Policy Research Institute. n.d. "Impact assessment (IA)." Accessed Dec. 19, 2022. <https://www.ifpri.org/impact-assessment>.
- Levin, C., W. Masters, A. Gelli, H. Harris-Fry, S. Kadiyala, S. Kalamatianou, J. Low, C. Puett, J. Skordis-Worrall, and S. Vosti. 2019. *Economic Evaluation of Multisectoral Actions for Health and Nutrition*. Agriculture, Nutrition and Health Academy Working Group of Economic Evaluations. Innovative Methods and Metrics for Agriculture and Nutrition Actions programme, London.
- Marcus H., C. Schauer, and S. Zlotkin. 2021. "Effect of anemia on work productivity in both labor- and nonlabor-intensive occupations: A systematic narrative synthesis." *Food and Nutrition Bulletin*. 42 (2):289–308. doi:10.1177/03795721211006658.

- Margolies, Amy, Aulo Gelli, Roshan Daryanani, Aisha Twalibu, and Carol Levin. 2021. "When communities pull their weight: The economic costs of an integrated agriculture and nutrition home-grown preschool meal intervention in Malawi." *Food and Nutrition Bulletin* 42 (1): 3–22. <https://doi.org/10.1177/0379572120986693>.
- Office for Health Improvement and Disparities. "Cost Consequence Analysis: Health Economic Studies." GOV.UK. Accessed June 7, 2023. <https://www.gov.uk/guidance/cost-consequence-analysis-health-economic-studies>.
- Olney, Deanna K., Sao Vicheka, Meng Kro, Chhom Chakriya, Hou Kroeun, Ly Sok Hoing, Aminzzaman Talukder, et al. 2013. "Using program impact pathways to understand and improve program delivery, utilization, and potential for impact of Helen Keller International's Homestead Food Production Program in Cambodia." *Food and Nutrition Bulletin* 34 (2): 169–84. <https://doi.org/10.1177/156482651303400206>.
- Puett, Chloe. 2016. "Cost-effectiveness analysis for nutrition and food security." *Action Against Hunger*. <https://www.actionagainsthunger.org/story/cost-effectiveness-analysis-nutrition-and-food-security/>.
- Puett, Chloe, Cécile Salpéteur, Elisabeth Lacroix, Simbarashe Dennis Zimunya, Anne-Dominique Israël, and Myriam Aït-Aïssa. 2014. "Cost-effectiveness of community vegetable gardens for people living with HIV in Zimbabwe." *Cost Effectiveness and Resource Allocation: C/E* 12 (April): 11. <https://doi.org/10.1186/1478-7547-12-11>.
- Rawat, Rahul, Phuong H. Nguyen, Disha Ali, Kuntal Saha, Silvia Alayon, Sunny S. Kim, Marie Ruel, and Purnima Menon. 2013. "Learning how programs achieve their impact: Embedding theory-driven process evaluation and other program learning mechanisms in Alive & Thrive." *Food and Nutrition Bulletin* 34 (3 Suppl): S212–225. <https://doi.org/10.1177/156482651303435207>.
- Robinson, Lisa A., James K. Hammit, Michele Cecchini, Kalipso Chalkidou, Karl Claxton, Maureen L. Cropper, Patrick Eozenou, et al. 2019. "Reference case guidelines for benefit-cost analysis in global health and development." *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4015886>.
- Ruel, Marie T., Agnes R. Quisumbing, and Mysbah Balagamwala. 2018. "Nutrition-sensitive agriculture: What have we learned so far?" *Global Food Security* 17 (June 1): 128–53. <https://doi.org/10.1016/j.gfs.2018.01.002>.
- Sandelowski, Margarete. 1995. "Sample size in qualitative research." *Research in nursing & health* 18 (2): 179–83. <https://doi.org/10.1002/nur.4770180211>.
- SCANR- ANH. n.d. "Support Centre for Agriculture and Nutrition Research." Accessed Dec.19, 2022. <https://www.anh-academy.org/scanr>.
- Scott Moreland, Shaylen Foley, and Lauren Morris. 2019. "A guide to the fundamentals of economic evaluation in public health – MEASURE evaluation." Publication. 2019. <https://www.measureevaluation.org/resources/publications/ms-19-162.html>.
- "SEEMS-Nutrition Home Page." n.d. Accessed Dec. 19, 2022. <https://sites.google.com/uw.edu/seems-nutrition/home>.
- "Strengthening economic evaluation for multisectoral strategies for nutrition - SEEMS." n.d. Results for Development (blog). Accessed Dec. 19, 2022. <https://r4d.org/projects/strengthening-economic-evaluation-for-multisectoral-strategies-for-nutrition-seems/>.
- Swinnen, Tui, Jeremy Shoham, Carmel Dolan, Charulatha Banerjee, Lillian Karanja-Odhiambo, and Ambarka Youssoufane. 2018. "Exploring multi-sector programming at district level in Senegal, Nepal and Kenya." *Field Exchange* 57, Aug. 4, 2018, 21.
- "Technical Brief: Economic evaluations of multi-sectoral actions for health and nutrition." n.d. Accessed Dec. 19, 2022. <https://www.anh-academy.org/community/news/technical-brief-economic-evaluations-multi-sectoral-actions-health-and-nutrition>.
- Turner, Christopher, Anju Aggarwal, Helen Walls, Anna Herforth, Adam Drewnowski, Jennifer Coates, Sofia Kalamatianou, and Suneetha Kadiyala. 2018. "Concepts and critical perspectives for food environment research: A global framework with implications for action in low- and middle-income countries." *Global Food Security* 18 (September): 93–101. <https://doi.org/10.1016/j.gfs.2018.08.003>.
- Vassall, Anna, Sedona Sweeney, Jim Kahn, Gabriela B. Gomez, Lori Bollinger, Elliot Marseille, Ben Herzel, et al. 2017. "Reference case for estimating the costs of global health services and interventions." September 12, 2017. https://ghcosting.org/pages/standards/reference_case.
- Walker, Damian, and Lilani Kumaranayake. 2022. "Allowing for differential timing in cost analyses: discounting and annualization." *Health Policy and Planning* 17.1: 112–118.
- Wun, J., C. Kemp, C. Puett, D. Bushnell, J. Crocker, and C. Levin. 2022. Measurement of benefits in economic evaluations of nutrition interventions in low- and middle-income countries: A systematic review. *Maternal & Child Nutrition*, 18 (2), e13323.