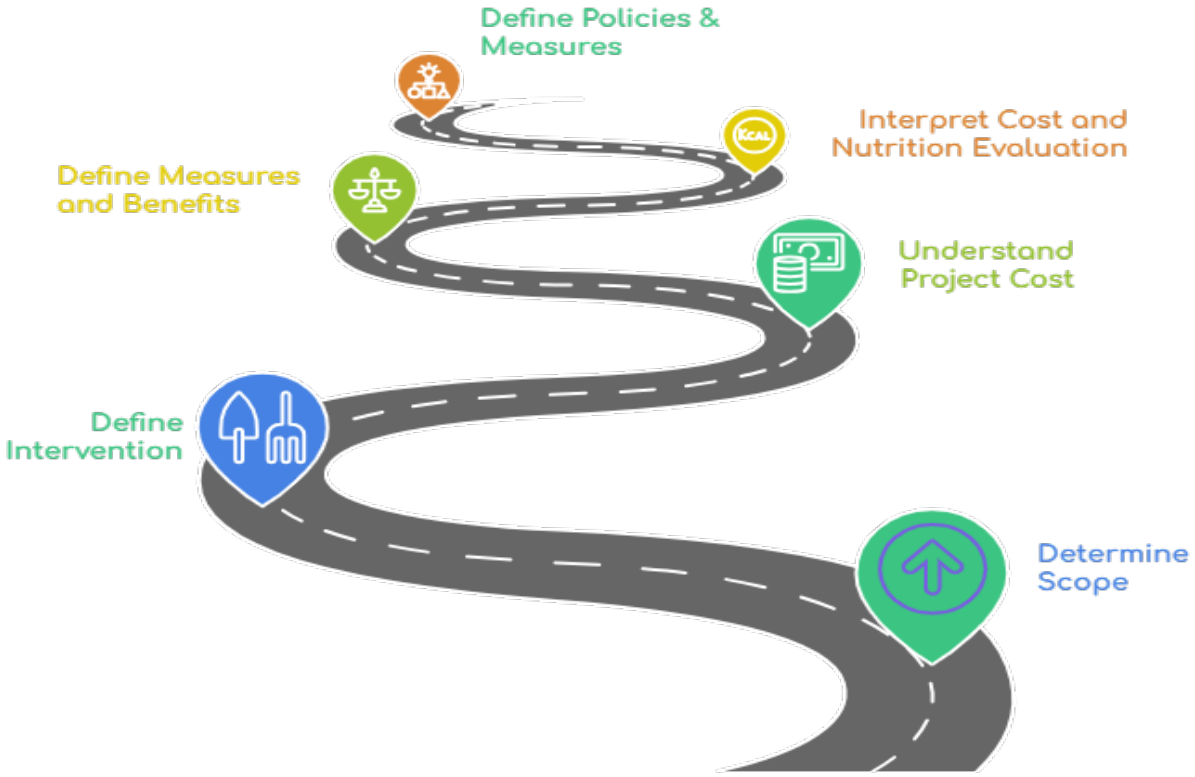
Cost-Nutrition Assessment Guideline of School Feeding Program

VANNA Phuong Vichea, SIM Sokcheng, KEO Sombath



Cost Assessment Guideline for Nutritional Evaluation in the Context of School Feeding Program in Cambodia

Introduction

This document delves deeper into the SEEM (Scope, Economic Components, Evaluation, and Measurement) framework and how it has been applied to school feeding program in Cambodia. The SEEM framework is a comprehensive method for assessing the economic impact of multisectoral efforts, providing insights into cost-effectiveness, efficiency, and nutritional results. To improve clarity, this document arranges crucial information into tables and provides thorough explanations.

The SEEM Nutrition Framework: A Detailed Overview

The SEEM Nutrition Framework (SEEM) is a structured and comprehensive approach to cost evaluation for nutrition strategies. The tool integrates both financial and economic cost data with program impact evaluations. The main idea of the framework is to give stakeholders detailed information to inform decision-makers, better resource allocation, and especially assess the cost-effectiveness behavior of the interventions. It ensures the programs are cost-efficient, nutritionally impactful, and sustainable by ensuring the betterment of health and education through sufficient nutrition.

The "SEEM" framework, overall, starts defining the program or intervention's boundaries (Scope), followed by identifying and managing financial aspects (Economic Components). The framework, thereafter, evaluates the efficiency and long-term sustainability – known as Evaluation, and measures the program's success in catering dietary requirement (Measurement). The approach ensures the programs are not only operationally sound but also provide impactful outcomes.

Table 1: SEEM Approach Overview

Component	Explanation
Scope	Defines the boundaries of the evaluation, including target population, geographical context, and program goals.
Economic Components	Identifies cost drivers and expenses.
Evaluation	Assesses the efficiency, cost-effectiveness, and sustainability of the program.
Measurement	Quantifies nutritional outcomes, cost per beneficiary, and long-term benefits.

Table 2: Detailed Steps in SEEMS-Nutrition Approach

Step	Description	Key Activities
1. Determine the Scope of the Economic Evaluation	- Define the purpose, perspective or standpoint (e.g., societal, payer etc.), and type of analysis. - Employ the economic evaluation matrix to outline objectives, costs, and benefits	- Define program objectives - Identify key stakeholders - Establish the evaluation timeline
2. Describe Intervention Components	- Classify interventions using a standard typology (e.g., demand for nutritious foods). - Map out costs and benefits along the impact pathway. - Categorize intervention activities and inputs for comparative analysis	- Identify intervention typologies - Develop a program impact pathway - Map intervention activities to cost categories
3. Understand Program Costs	Conduct mixed methods costing to combine financial records with qualitative data.	- Collect financial expenditure data - Conduct qualitative interviews - Allocate costs by activity and input categories
4. Define and Measure Benefits	- Quantify health and nutrition outcomes (e.g., DALYs averted). - Monetize benefits where possible - Capture qualitative outcomes through indices or descriptions.	- Measure health and nutrition outcomes - Monetize benefits like productivity gains - Capture qualitative outcomes (e.g., empowerment)
5. Compare Program Costs and Benefits	Evaluate the relationship between costs and benefits using methods such as cost-efficiency, cost-effectiveness, and benefit-cost analysis.	- Conduct cost-efficiency analysis (e.g., cost per beneficiary) - Perform cost-effectiveness analysis (e.g., cost per DALY averted) - Calculate benefit-cost ratios
6. Present and Communicate Analysis	- Present transparent reports tailored to stakeholders. - Highlight key findings, relevance, and policy implications.	- Visualize key data and findings - Engage stakeholders with tailored presentations

Contextualized SEEM Framework for School Feeding Program in Cambodia (SFP)

a. Step 1: Scope of the Evaluation

In the context of Cambodia, the scope defines the boundaries of the evaluation by mainly focusing on school-managed feeding program where the primary goal is to assess the true cost and its impacts to schoolchildren and to provide insights to decision-makers to ensure that the program implementation is on the right track. By doing do, stakeholders could be aware of any necessary adjustments in the implementation of the SFP. Unlike the centralized or donor-led models, the current practice of the program is decentralized model where schools act as the implementor; hence, the program is technically analyzed at the school level in order to easily capture specific challenges which include resource availability, infrastructure, and other operational constraints.

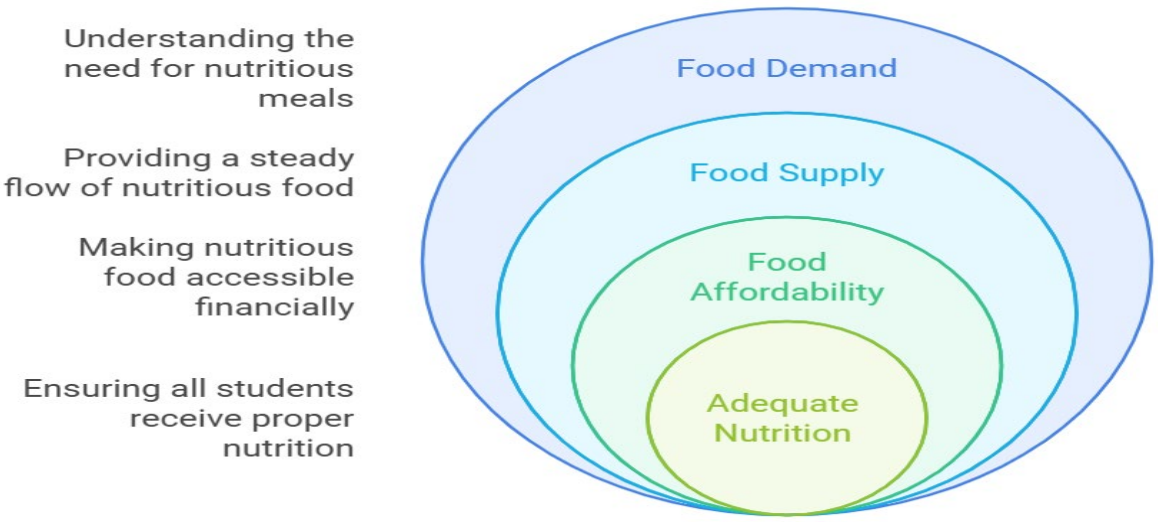
With this regard, there are three main key aspects that the evaluation include:

- **Target population:** Schoolchildren from 6–to-12-year-old in Cambodia.
- **Geographical context:** Rural and urban schools with varying access to resources.
- **Program goal:** Improving nutritional outcomes, cost-efficiency, and sustainability.

b. Step 2: Defining the Intervention

The SFP in Cambodia case mainly shapes its focus to three key areas which consist of the demands for nutritious food, the supply of nutritious meal, and the increase in food affordability. The combination of these elements is vital for ensuring that the cost-associated with school meals (breakfast) effectively reach the schoolchildren. The evaluation in this case will also assess whether the nutritional content of the breakfast provided meets the requirement and the needs of each student to make sure that all the schoolchildren receive sufficient nutrition.

Figure 1: SFP's Intervention Focus on Cambodia Context



c. Step 3: Understand the Project Cost

Understanding the related cost of the program is pivotal since it could convey a better view of the result interpretation. The case of school feeding program in Cambodia embeds both economic and financial aspects. Given that the School Feeding program (SFP) nature is quite different from the traditional project-based implementations, the evaluation approach is distinct. Since the modality of the SFP has a decentralized behavior where the schools mainly involve in the program – act as the key actor – the understanding of the costs involved also start the school level. Additionally, related costs at this point will also vary from school to school; thereby, the nutrition-cost evaluation necessitates a "bottom-up" technique rather the "top-down" approach.

The applied approach in the context of SFP accounts for both incurring costs which include food consumption cost, labor cost, utility cost, and administrative costs); while the non-recurring costs involve capital costs, equipment and maintenance costs, and other related costs. The cost related expenses existed in the AY 2022-2023 timeframe.

Figure 2: Cost Related Summary of SFP Case

Type of Costs	Cost Involved	Description
Recurring Costs	Food Consumption Cost	- Monthly expense on the food purchase order considers (monthly expense bonds/invoices on food purchasing were collected to see actual amount and the price of each category that includes vegetables, meat and grain. - Additional food items that consist of ingredients and spices also consider. - The estimation solely based on the total amount of each purchasing items and the average cost of each item sold in the local market.
	Labor Cost	- The cost involves the expenses to the cooks who produce meals (breakfast) for students - Estimated through multiplying the average salary and/or incentives that they got each month supported by different agents (e.g. WFP, state, local authority, or communities.)
	Utility Costs	- Monthly incurred expenses on cooking materials, electricity consumption, water consumption
	Administrative Cost	- Expenses include activities that contribute to serve the program ranging from printing document to purchasing office stationery for daily usage

Non-recurring Costs	Capital, Equipment, and maintenance Costs	- Costs incurred on construction costs which include kitchen, eating shelters. - The estimation was conducted by the summing the amount of construction expenses - The calculation also considers the depreciation rate of the structures, and the equipment purchase lifetime with the respective rate of 5 percent with the amount of 5-year life span in average for equipment and 10-year lifespan for construction - Straight-line method
	Other Costs	- Related costs that did not fall under any of other categories - The costs were miscellaneous expenses such activities that were indirectly supported to the program including constructions/structures (e.g. washing areas, pumping facilities, managing land for plantation, etc.)

Table 3: Cost Estimation of SFP Case

Estimation on Cost Expenditure	Estimation on the Cost Per Beneficiary
Estimation on the cost expenditure is explained by: **$C_T = FC_s + LC_s + RC_s + CC_s + EC_s + OC_s$** Where: - C_T: Total expenditure at the school-level in current year (USD) - FC_s: Total food consumption costs (USD) - RC_s: Total running costs (USD) - CC_s: Total capital costs (USD) - EC_s: Total equipment and maintenance costs - OC_s: Total other related costs (USD)	Estimation on Cost Per Beneficiary is explained by: **$C_p = \sum C_T / S_n$** Where: - C_p: Cost per beneficiary (USD/yr) - $\sum C_T$: Summation of the total cost expenditure (USD) - S_n: Total Number of the students

d. Step 4: Define and Measure Benefits

In this step, the nutrition-cost assessment evaluates the efficiency of the cost spent on food across different modalities, and it also examines the cost-benefit relationship of integrating school-grown gardening. The ultimate goal is to determine whether the integration could maximize the program cost expenditure. Additionally, concerning the health and nutrition aspect, it involves the estimation of the level of nutritional intake from the food consumed by schoolchildren weekly. Unlike the nature of SEEM project-based platform, the focus on health benefits rather aims at evaluating long-term health impact outcomes by using "DALY" and "QALY". However, the assessment in the case of the school feeding program focuses

more on the sufficiency of the level of nutritional intake of the students receive from their breakfast by understanding more the current practice of the breakfast provided whether it meets the recommended daily standards for students, focusing on both macro and micro-nutrients which include carbohydrate, protein, fats, Calcium, Iron, Vitamin A, Vitamin C, and Vitamin D – these nutrients are vitally crucial for schoolchildren's physical and cognitive growth.

The estimation of the nutritional intake on both macro and micronutrients base on the total amount of each category, while the data is extracted from existing data from *FOOD Consumption Table for Cambodia by Ministry of Agriculture, Forestry, and Fishery* (2013). The data involved the estimation of the value of nutrient per 100 grams of each category. The interpretation will be categorized into two aspects which one will cover the overall intake of macro nutrition absorption in average, while another will explain the micronutrient intake. The implication will adapt the minimum requirement that each schoolchild should have received, while the requirement or the recommended standards adapted from *"Development of Recommended Dietary Allowance and Food-Based" Dietary for School-Aged Children in Cambodia Guideline"* (2017).

e. Step 5 & 6: Interpretation of Cost and Nutrition Evaluation

The final step involves interpreting the combined results of the cost and nutrition evaluations together to identify potential outcomes and necessary changes for improved implementation of the SFP. The insights derived from the analysis will serve as valuable inputs for stakeholders and policymakers, guiding them in making crucial decisions to enhance school feeding program's effectiveness and especially maximize the benefits and outcomes for schoolchildren.

Appendices

Case Study of School Feeding Program Nutrition-Cost Assessment Evaluation

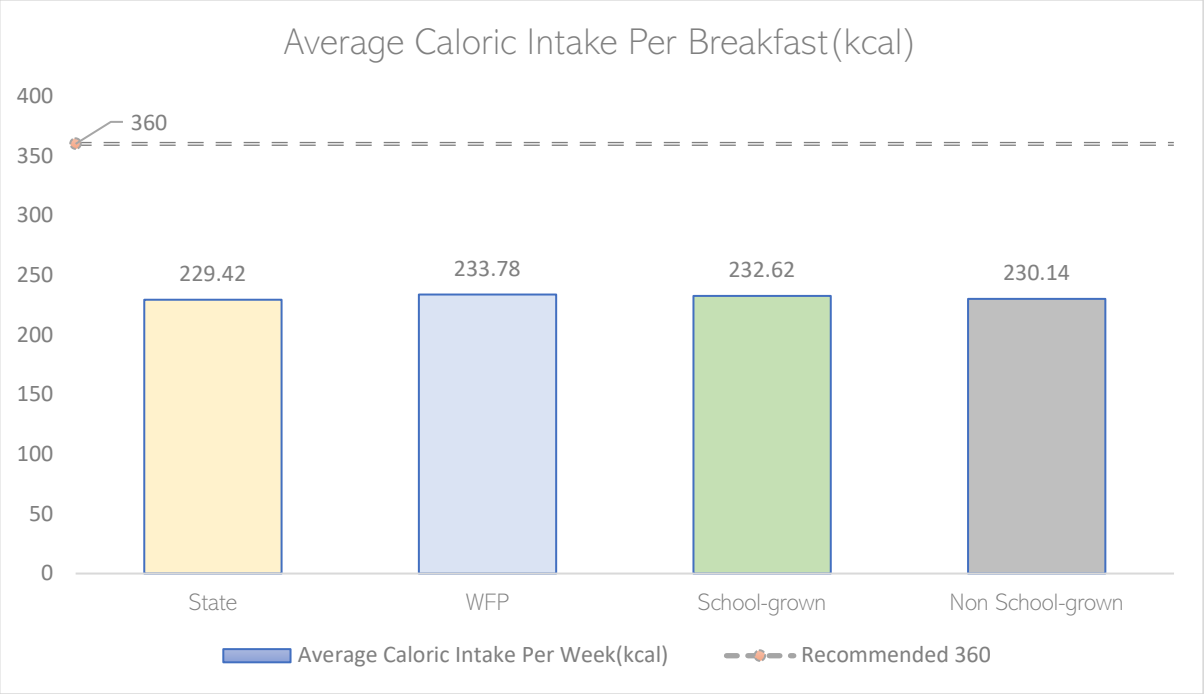
Table 4: Cost Category and Cost Per Item Delivered

Cost Item	Total Number of the Students (4471)		
	Total cost (USD)	Cost item per beneficiary (USD)	% Cost item contributed
Food Consumption	102,748.89	*22.98*	***54.525***
Labor	15,342.5	*3.43*	***8.141***
Running	14,660.21	*1.03*	***2.304***
Construction	42,301.575	*9.46*	***22.448***
Equipment & Maintenance	4,695.425	*1.05*	***2.491***
Other	18,728.88	*4.15*	***9.938***
Total	198,307.47	**44.35**	100

Table 5: Cost Per Beneficiary and Cost Per Breakfast Delivered in Different Modalities

Scenario	Cost Per Beneficiary (USD)	Cost Per Breakfast Delivered (USD)
State-run	38.9	29.39
WFP-run	55.24	30.29
Non-school-grown	40.95	28.55
School-grown	53.08	32.60

Figure 3: Comparison of Caloric Intake Per Breakfast



In the case of the current practice of SFP in Cambodia context, the pattern of a low-caloric intake accompanying by moderate-to-least-moderate quantities in both macro and micro-nutrients may result in children having:

- ***Decreased energy levels***: By mid-morning, the schoolchildren could experience hunger after 2-3 hours after breakfast, and they could feel sluggish because of the low energy in their meal, which could trigger a direct impact on attention, focus, and memory.
- ***Poor focus and academic performance***: A lack of iron, vitamin A, and protein resulted in poor cognitive function. Iron deficiency particularly could even make shorter attention spans and cognitive tiredness.
- ***Increased likelihood of hunger***: With limited fat and protein intake, children may become hungry sooner, resulting in irritation and a drop in performance throughout the school day.
- ***Long-run effects***: A breakfast with a combination of inadequate calcium and somewhat sufficient vitamin D intake might disrupt bone formation over time. Without enough calcium to support bone formation, even with adequate vitamin D, the risk of weaker bones increased. Plus, a borderline iron intake and perhaps lower overall diet iron absorption (depending on the rest of the meals), children could develop iron-deficiency anemia over time, resulting in chronic weariness, poor focus, and impaired academic performance.

References

1) Adolphus, K., Lawton, C. L., & Dye, L. (2013). The effects of breakfast on behavior and academic performance in children and adolescents. *Frontiers in Human Neuroscience*, 7, 425. doi:10.3389/fnhum.2013.00425
2) FAO (2016). Development of Recommended Dietary Allowance and Food-Based Dietary Guidelines for School-Aged Children in Cambodia.
3) FAO. (2016). School gardens for better nutrition and education. Food and Agriculture Organization of the United Nations.
4) Levin, M. (2011). *Breakfast for Learning: Scientific research on the link between children's nutrition and academic performance*. Food Research & Action Center.
5) Rampersaud, G. C., Pereira, M. A., Girard, B. L., Adams, J., & Metzl, J. D. (2005). Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. *Journal of the American Dietetic Association*, 105(5), 743-760. doi: 10.1016/j.jada.2005.02.007
6) Ssekabira, P. (2018). Impact of school gardening on food cost reduction and community engagement. Journal of Agricultural Education and Extension, 24(3), 245-25.
7) Willitts-King B, Upadhyaya H. School meals in Nepal: a comparative study of the use of cash vs food. Lalitpur: World Food Program; 2013.
8) World Food Programme (WFP). (2021). School feeding. Retrieved from https://www.wfp.org/school-feeding
9) World Food Programme (2023). WFP Annual Review 2023. Retrieved from publications.wfp.org (WFP Publications).