

NATIONAL NUTRITION INFORMATION SYSTEM

TECHNICAL NOTE

Costing a National Nutrition Information System

Acknowledgements

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Costing a National Nutrition Information System

A costing exercise is an important early step in planning a national nutrition information system (NNIS). The exercise helps to specify the resources required for the successful development and implementation of an NNIS (i.e., the investment of resources and efforts required to build a functioning NNIS). To help with the exercise, this technical note outlines key steps that countries can take to cost their nutrition information systems.

INTRODUCTION

A well-executed costing exercise helps key stakeholders, including government, civil society and development partners, to plan, finance and implement a practical and good-quality NNIS. The exercise can also encourage transparency and accountability in system design and operation. Table 1 provides examples of use cases that show how a costing exercise can contribute to the NNIS development process.

There are relatively few publicly available examples of costing exercises related to nutrition data and information systems.

A 2019 review of national nutrition plans in SUN countries (i.e., country members of the Scaling up Nutrition Movement) found that only 33 of 58 countries had costed plans with explicit sections addressing data and monitoring and evaluation (M&E). Of these, only 19 plans included costs for data and M&E, and most cited only a single number or a few high-level item lines.¹ This suggests a need for guidance about how to do more granular costing related to nutrition data and M&E, including NNIS costings.

Table 1. Use cases for NNIS costing exercises

Government	Development partners	Civil society
Prioritization. Understand necessary financial information to ensure an NNIS is adequately funded in national budgets.	Resource mobilization. Identify investment opportunities based on any funding gaps, and support investments to strengthen NNIS design and implementation.	Resource tracking. Monitor investment in an NNIS based on the costing.
Resource allocation. Ensure funds required to implement NNIS activities are allocated.	Efficiency assessment. Provide additional detail on how an NNIS is implemented, including assessing the efficiency of its implementation.	Advocacy. Ensure adequate funds are available for and allocated to the NNIS.
Efficiency assessment. Provide additional detail on how an NNIS is implemented, including assessing the efficiency of its implementation.		

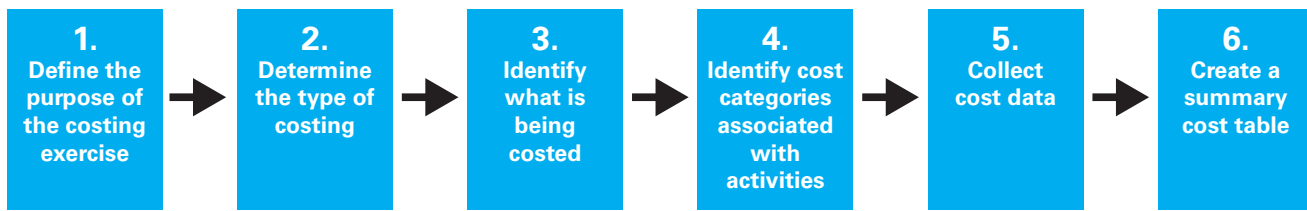


Figure 1. Six steps to cost a national nutrition information system (NNIS) or components of an NNIS

KEY STEPS WHEN COSTING AN NNIS

There are six broad steps involved in an NNIS costing exercise. The steps can be used to cost a full NNIS or specific components of one; see Figure 2.

When following these steps, it is important to keep the following points in mind:

- The steps are a basic framework for people conducting a costing exercise themselves or commissioning another individual or group to do complete the exercise.
- The steps are not exhaustive; they are designed to give users some basic tools and approaches. The steps may need to be adapted to specific use cases.
- These steps are intended to catalyse an inclusive and productive conversation about the actual costs of implementing, maintaining and/or expanding an NNIS.

Stakeholder engagement is critical throughout an NNIS costing exercise. For example, at the outset of the costing exercise, it is important to have a clear mandate to engage the various line ministries that will be involved with the NNIS, including the Ministry of Finance. It can be useful to have one or more inception workshops to discuss and build consensus for the purpose the costing exercise (see Step 1). An inception workshop is also an opportunity to get clarity and consensus about the costing exercise process, including issues, roles and responsibilities. These workshops are also an opportunity to identify additional stakeholders who may have information about activities, costs and other contacts who could be useful during data collection (Steps 4 and 5). Given the limited guidance or examples specific to NNIS costing, it can be useful to adapt general guidance on costing.² Adaptations have been largely informed by Maximising the Quality of Scaling Up Nutrition Plus (MQSUN+³) on Approaches for Nutrition Costing and Financial Tracking in SUN Countries⁴ and by work done under the Data for Decisions to Expand Nutrition Transformations (DataDENT) in Nigeria.^{5 6}

Step 1. Define the purpose of the costing exercise

The first step is to be clear on why the costing exercise is being done and how the findings will be used. The use cases included in Table 2 can help answer these questions. In some cases, only specific components of the NNIS need to be costed (e.g., the development of a dashboard). Understanding the purpose is critical for determining the issues and/or components that should be included in the costing exercise. For instance, if the purpose is to determine the annual budget for ongoing implementation, then capturing start-up costs of the NNIS is not necessary.

In Step 1, it is also important to specify the perspective guiding the costing exercise. The perspective relates to whose costs will be included in the exercise (i.e., who is providing the funds and what are their expectations). The perspective can be narrow (e.g., a specific government unit or development partner) or broad (e.g., all funders and implementers). Table 2 provides examples of costing questions relevant to different purposes and perspectives.

Step 2. Determine the type of costing

The purpose and perspective of the exercise determines the type of costing that will be done. There are three broad types of cost analyses relevant to NNIS use cases: financial costing, economic costing and marginal costing. It is important to be clear about the type of costing being used in the exercise to ensure all relevant cost items and estimates are included in the analysis.

- **Financial costing** includes the total cost of an NNIS or components of a system that need to be paid by NNIS funders (e.g., government, development partners). Multiple funders can be included in a financial costing exercise. Financial costing focuses on the explicit or actual costs to the funders. The costing is used to answer questions such as, *what is the cost of implementing the NNIS and who funds it?* (This is the most common type of costing exercise.)
- **Economic costing** includes the total value of all resources, including both explicit (i.e., out-of-pocket) and implicit (i.e., opportunity) costs. *Opportunity*

Table 2. Examples of costing questions with purpose and possible perspectives

Question	Purpose	Possible perspectives
What is the total cost of the NNIS?	<ul style="list-style-type: none"> To generate information regarding the cost to develop and/or strengthen an NNIS To understand which stakeholders would bear the burden of those costs To inform priority-setting exercises that include both costs and impacts, especially when choosing where to spend limited resources 	<ul style="list-style-type: none"> Government Funders Implementers
What is the ongoing cost of implementing an NNIS?	<ul style="list-style-type: none"> To plan the budget for implementation 	<ul style="list-style-type: none"> Government Funders Implementers
What are the costs associated with switching from a manual to digital NNIS?	<ul style="list-style-type: none"> To understand the start-up costs of implementing a new system To understand the on-going costs associated with a digital NNIS 	<ul style="list-style-type: none"> Government Funders Implementers
What is the cost of adding a dashboard feature to an existing NNIS?	<ul style="list-style-type: none"> To understand the costs of additional features/functionality to an NNIS, including the implications for existing features and stakeholders 	<ul style="list-style-type: none"> Government Funders Implementers
What is cost of scaling an NNIS nationally or across specific regions?	<ul style="list-style-type: none"> To understand the costs of scaling-up an NNIS to cover more of the country 	<ul style="list-style-type: none"> Government Funders Implementers

costs capture the economic trade-offs of not using the resources for another purpose. This type of costing is the most resource intensive and is used to answer questions such as, what is the total value of all resources required to implement the NNIS?

- **Marginal costing** includes only the additional costs to funders. This costing is useful for adding new components to an NNIS and/or when new or expanded NNIS-related activities are taken up by structures or stakeholders (e.g., government ministry/departments). Marginal costing is used to answer questions such as, *what is the cost of adding a dashboard feature to an existing NNIS?* Or *what is the cost of adding an NNIS-related role for a new ministry/department?*

Step 3. Identify what is being costed

Once the type of costing is determined, it is important to specify what is being costed; the **who**, **what** and **when** related to costing. Issues to consider in Step 3 include:

Who? Identify the stakeholders who are relevant to the exercise given the purpose and perspective defined in Step 1. These may include government representatives, funders, implementers, data contributors and users. It is important to consult these stakeholders to accurately capture all costs in the exercise.

What? Identify key activities that will be costed given the purpose, perspective and type of costing. It is also important to define the scope of what is being costed; for example, start-up costs, recurrent costs or a combination of both. Start-up costs include costs for activities prior to implementation, such as planning, development of systems (hardware, software), training or infrastructure investments. Recurrent costs include all activities associated with ongoing implementation. For a complete NNIS, recurrent costs should include those associated with all key activities included in the nutrition data value chain; see Figure 4.

Note: Rather than costing an entire NNIS, it is possible to conduct a targeted costing exercise focused on one or more individual components in the data value chain. For example, an exercise can assess the cost of installing necessary technology (i.e., hardware, software, telecommunications) to scale an NNIS nationally or the cost of adding a new data collection activity such as a micronutrient survey. Even if the costing exercise is targeted, it is important to understand where the activity sits in the larger context of the data value chain. Targeted costing exercises are more likely to be carried out after an initial NNIS is in place.

When? Define the time frame that will be used in the costing exercise; for example, one year is useful for annual budgeting and five years is more useful for strategic planning. The time frame could be based on the time required to carry out a specific activity,

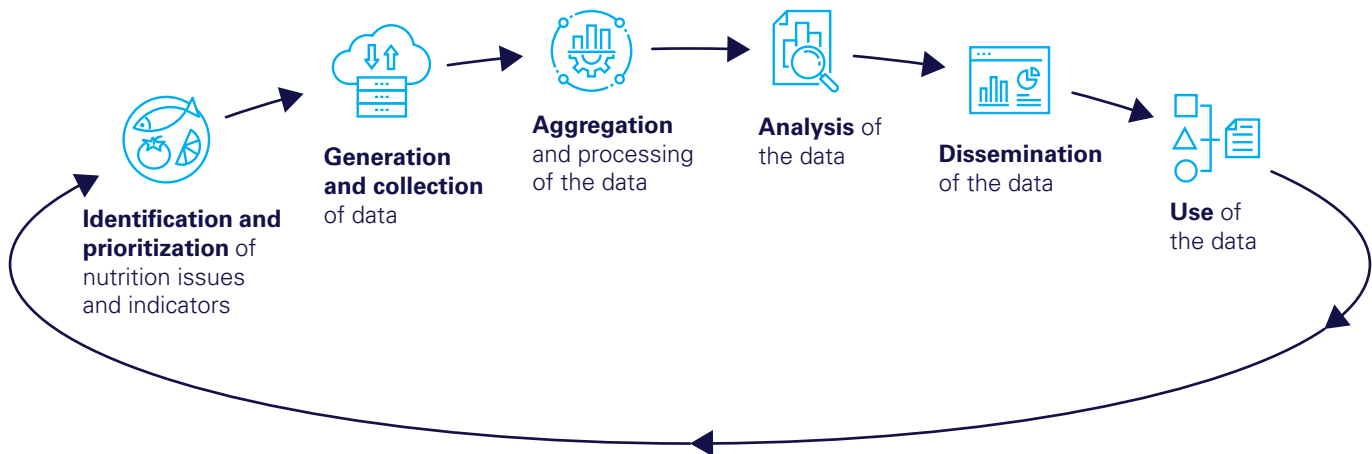


Figure 2. Main components of an NNIS: Nutrition data value chain

such as a technology upgrade. It could also be based on the time needed to expand NNIS coverage to include additional districts or to carry out a one-time baseline survey.

In countries planning a new NNIS, it can be challenging to identify the *who*, *what* and *when* for the costing exercise. Looking at similar types of systems in a country (e.g., Health Management Information System (HMIS) or an Educational Management Information System (EMIS)) can offer insights into this process. In countries with an existing NNIS, past and present planning documents, budgets, and expense reports from various stakeholders are likely to be vital resources.

By the end of Step 3, the objective is to have a complete list of activities that need to be costed and an anticipated time frame for when the funds for each activity need to be spent.

Step 4. Identify cost categories associated with activities

The next step is to identify relevant cost categories associated with the activities identified in Step 3. Within each category, it is important to specify items/costs to the fullest extent possible. For example, in the category of personnel, list the number of salaried staff and their approximate level of effort (e.g., full-time, half-time); in the category of technology equipment, list specific items/costs such as 4-6 personal computers and database software. While identifying the different categories and items/costs, try to take note of whether reasonable costing data are available for them (e.g., hourly wages, etc.).

The following list includes general categories that are likely to be part of an NNIS costing exercise and for which costing data should be available:

- **Personnel**, including salaried staff, contract staff and volunteers. Salaried staff includes the NNIS management team and technical experts who maintain the system (e.g., project managers, programmers, database administrators, security experts and systems operators). Contract staff are self-employed and paid on a contract basis to provide specific services (e.g., programming). Volunteers can include members of steering committees or technical advisory committees who may receive honorariums and/or expenses. Any personnel cost should reflect all remuneration provided, including salaries, fees, honorariums, benefits and expenses.
- **Contracted services**, including any external organizations that provides services for a fee in support of NNIS activities (e.g., an IT contractor who maintains servers used to host the NNIS platform; a cloud-based storage company; or a vendor who plans and hosts workshops).
- **Technology equipment**, ranging from smart phones, tablets and personal computers to software, servers and switchers/routers.
- **Non-technology equipment**, ranging from office furniture to vehicles. In economic costing, analyses should account for depreciation, which is the reduction in the value of the equipment over time due to wear and tear.
- **Training**, including travel costs associated with attending training (e.g., per diem), and costs to implement training. It is important to distinguish between initial training and refresher training.

Non-personnel costs associated with mentorship or supportive supervision could be included under training.

- **Supplies**, including office supplies (e.g., stationery, printer cartridges) and other sundry items.
- **Infrastructure**, including office space, storage facilities and new construction.
- **Utilities** associated with infrastructure, including water, electricity and internet.

In some cases, *shared costs* may need to be estimated. For example, a Director in the Ministry of Health may be responsible for the operation of all health-related information systems, of which the NNIS is only one. The costing exercise would need to estimate the proportion of time to attribute to the Director for his or her work on the NNIS; there should also be a clear explanation of the rationale for that estimate. The Director may have to provide an estimate of the time spent on the NNIS. A similar process can also be used for determining the cost for other shared inputs where it is difficult to precisely determine or allocate percentages, including equipment, supplies and infrastructure.

The end of Step 4 is an opportunity to build a matrix that correlates the different activities identified in Step 3 with the categories and costs/items identified in Step 4. Include notes in the matrix about the availability of costing data for each line item. This matrix will become a valuable tool during Step 5, when cost data are collected.

Step 5. Collect cost data

The next step is to collect cost data for each of the line items in the abovementioned matrix. The sources and availability of these data vary widely, depending on the setting and context. Examples of where data can be obtained include:

Planning documents, budgets and expense reports that include exact or comparable costs per item are a primary source of cost information. For example, a ministry or department is likely to have costs for qualified personnel, contracted services and technology equipment associated with an existing information system (e.g., NNIS, HMIS, EMIS). Many of the activities involved in developing an NNIS are directly comparable to activities carried out for different purposes (e.g., project management, software development). Consequently, budget categories and cost structures can be directly relevant.

Interviews can be used to understand activities/inputs and their corresponding costs. For example, interviews with key personnel can be a useful way to estimate the number of hours or percentage of time that will be spent by senior managers to serve on an NNIS advisory/steering committee or to supervise NNIS team members.

Observation can also be a valuable source of information, particularly for observing how staff manage and implement specific activities and the time required to complete different assignments.

Regardless of the source, there are two basic approaches to capturing cost information: *top-down* and *bottom-up*. In a *top-down approach*, cost data are available from budget and expenditure data. *Bottom-up costing* is more granular and involves identifying specific costs and aggregating them upwards.

Many costing exercises use a combination of *top-down* and *bottom-up* approaches. For example, start-up activities — where no historical cost information is available — may be estimated with a top-down approach. A bottom-up approach — where specific activities, inputs, and input unit costs are required — may be an option for ongoing NNIS implementation, where actual processes can be observed. A bottom-up approach is especially helpful to estimate hidden costs, such as the time of “volunteers”. In practice, the choice of approach often depends on a combination of what data are most readily available and whether those data can answer the costing questions.

The need to involve multiple actors can make collection of NNIS cost data complex. Consequently, it is critical to have consensus on a clear mandate for the costing exercise and to engage all key stakeholders throughout the process to ensure they are clear on how the information they provide will be used.

As a reminder, each line item in the matrix created at the end of Step 4 should be costed in Step 5, and the line-item costs should be added to the matrix before moving on to Step 6.

Step 6. Create a summary cost table

Once data collection is complete, the next step is aggregate the various costs into a summary cost table. The cost table can be used to assess whether the right activities have been included and if reasonable costs are assigned to them. It can be helpful to include a cost range for key activities to account for any uncertainties (e.g., differences in factors such as quality and availability).

The cost table can be used to organize and review costs by category (e.g., personnel). Depending on the purpose of the costing exercise, the summary can also be used to aggregate and differentiate start-up costs, annual/recurring costs, total costs and future-year costs. It may be useful to identify the source of funds (e.g., Ministry of Health, Ministry of Agriculture, Prime Minister's Office, bilateral donor) in the cost table. Including this information can help stakeholders understand and assess if or how the source of the funds affects the costing exercise.

There should be a straightforward narrative report that explains the summary cost table (e.g., what is being costed, any assumptions that were made, any limitations or uncertainties, and any conflicts of interest). If possible, the report and table should be reviewed by the individuals and organizations who participated in the previous steps of the costing exercise. Being inclusive and collaborative can help refine the cost table; it can also encourage buy-in from key stakeholders.

The cost table and narrative report are also excellent advocacy tools. Presenting the findings and/or making the documents readily accessible to interested parties can further encourage buy-in by key stakeholders (e.g., nutrition coordination bodies, partner forums, technical working groups, donor coordination bodies). In countries with a national investment framework for nutrition, NNIS costs should be reflected in that plan.

CONCLUSION

The six steps outline a basic approach to conducting an NNIS costing exercise. The steps aim to make the process an inclusive and productive one that encourages stakeholders to carefully — and realistically — identify the costs associated with building a new NNIS or improving an existing one. Overall, the costing exercise is an important way to engage stakeholders in a frank discussion about the value of a strong NNIS.

COST CONSIDERATIONS: NIGERIA EXAMPLE

In 2021–2022, DataDENT collaborated with a multi-agency Nutrition Information System Task Team in Nigeria, which was coordinated by the Federal Ministry of Health. The team was charged with developing recommendations for strengthening the collection of national nutrition data. As part of its work, the team identified cost considerations to guide decisions around whether and how to collect data for specific indicators using various surveys and administrative data sources. The following cost considerations identified through these efforts may be relevant for stakeholders considering changes to an NNIS:

When introducing changes to an NNIS, there are both monetary and non-monetary costs. Non-monetary costs are largely reflected in data quality. For example, adding indicators to the NNIS may lower the overall quality of the data if there are insufficient resources to support data collection, curation, analysis and presentation.

Cost implications vary by the scale or scope of the changes and the information system. For example, even a seemingly minor change, such as updating the basic hardware used to capture data (e.g., smart phones, desktops), can be costly for a large information system. Similarly, a significant upgrade to the underlying software powering the NNIS can be costly, regardless of the overall size of the system.

The cost of data collection for different indicators varies by source. For example, if a survey tool is used to collect data for an NNIS, the number of people and sites included in the survey may have significant cost implications. These implications should be considered when assessing the value of individual indicators.

KEY TERMINOLOGY

Term	Definition ⁷
Bottom-up costing	Costing approach that involves identifying unit costs and multiplying unit costs by the total number of inputs to get total costs.
Budget	Financial plan for a specified future period of time.
Cost	A general term that refers to the value of resources/inputs used to produce a good or service. This can refer to financial, economic, unit or average, or other types of costs depending on the ingredients included.
Cost aggregation	Summing the costs for each individual activity up to the larger costs of the programme.
Depreciation	Reduction in the value of the equipment over time due to wear and tear.
National nutrition information system (NNIS)	An integrated set of principles, practices and processes guiding the prioritization, collection, storage, organization, analysis and dissemination of essential nutrition-related data drawn from multiple sectors and sources.
Nutrition data value chain⁸	The data value chain encompasses multiple links, ranging from prioritization of what to measure and how, to the collection, curation and analysis of this data, and its translation into information and evidence that is widely shared and informs decision-making.
Opportunity cost	The economic trade-offs of not using the resources for another purpose.
Recurrent cost	A cost that repeatedly occurs for similar goods or services on a continuing basis (e.g., supplies and personnel).
Resource allocation	Assignment of available resources to various uses.
Resource mobilization	All activities involved in securing new and additional resources. It also involves making better use of, and maximizing, existing resources.
Resource tracking	Measuring and tracking the flow of funds.
Sensitivity analysis	An analysis that determines how different values of an independent variable affect a particular dependent variable under a given set of assumptions.
Start-up cost	The one-time commitment of resources required to establish a programme to the point where it can begin (e.g., planning or staff training).
Top-down costing	Costing approach that divides overall programme costs or expenditures by number of outputs to calculate unit cost.

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ENDNOTES

- 1 Manarat, R., Rana, Y., Borces, K. *et al.* How are countries planning for costs of nutrition data and information systems? [version 1; peer review: 2 approved]. Gates Open Res 2020, 4:60 (<https://doi.org/10.12688/gatesopenres.13145.1>).
- 2 For detailed costing guidance, we recommend readers consult available resources, such as the Global Health Cost Consortium guidance on standards and methods for estimating costs of global health services and interventions
- 3 Maximizing the Quality of Scaling Up Nutrition Plus is a consortium of five expert nutrition contributing technical expertise and assistance to the SUN Movement. See: <https://mqsunplus.path.org/>.
- 4 Approaches for Nutrition Costing and Financial Tracking in SUN Countries; MQSUN+ Guidance Note / 24 March 2020, <https://scalingupnutrition.org/wp-content/uploads/2020/06/Approaches-for-Nutrition-Costing-and-Financing-Guidance-Note_web.pdf>.
- 5 DataDENT was established in 2017 to transform the availability and use of nutrition data by addressing gaps in nutrition measurement and advocating for stronger nutrition data systems.
- 6 In Nigeria, DataDENT collaborated with a multi-agency Nutrition Information System Task Team coordinated by the Federal Ministry of Health to develop recommendations for improved coordination of national nutrition data collection. As part of this work, the team outlined cost considerations to guide decisions around whether and how to collect specific indicators across different survey and administrative data sources. Key insights from the consultations conducted for this work have been included in this technical note.
- 7 All definitions are taken from the Global Health Cost Consortium Draft Reference Case Version Document unless otherwise noted. See: <<https://ghcosting.org/pages/standards/glossary>>.
- 8 Piwoz, E., and Rawat, R., 'Strengthening the Nutrition Data Value Chain for Accountability and Action', Sight and Life, 33:1, 2019, <https://www.anh-academy.org/sites/default/files/SightandLifeMagazine_2019_Data_in_Nutrition_StrengtheningtheDataValueChain-AccountabilityandAction.pdf>.

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