The Spindle

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Efficiency analysis in value chain development projects

Since the turn of the century, practitioners in agricultural development shifted their attention from farming systems, with a focus on technology and productivity at farmer household level, to value chains. In addition to the introduction of new technologies to enhance productivity (the "push" factors), the value chain development approach focuses in first instance on market opportunities (the "pull" factors). Instrumental in this approach is the establishment of business linkages between farmer groups and actors downstream the value chain including, traders and processors. This case explains how to analyse efficiency in value chain development projects.

The Partos Efficiency Lab, November 2017

This case is one of a series of ten that was produced in the framework of the Partos Efficiency Lab. See back cover for more information.

Project at-a-glance

- Project type: Value chain development project
- Geographic intervention area: Region in an East African Country
- Project budget: US$ 10 million
- Budgeted for end-of-project evaluation: US$ 40,000
- Project Duration: 4 years

Project objective

The project objective is to increase the income from farming of 15.000 smallholders with 50% in one region of an East African country. The focus is on small holders who currently earn on average of approximately US$500/year. Considering that the average household size is 5 persons, their level of income is far below the poverty line. By the end of the project period the average income of the target group from farming is expected to have risen to US$750/year on a sustainable basis. (without adverse effects for women in terms of reduced access to cash, reduced involvement in decision making, or increased workload).

Project approach

This impact will be achieved through six outcomes:

1. Farmers upgrade agricultural production

Farmers will be supported to increase the volume and improve the quality of agricultural produce of a selection of commodities including milk, honey, fresh vegetables and maize. Currently, farmers are already engaged in producing these products but mainly for subsistence purposes. Traders and processors are not interested because the volumes are too small, and the quality is sub-standard. Innovative technologies need to be introduced to increase productivity and enhance quality.

2. Farmers form producer groups

Farmers will be supported to organise themselves in farmer groups. Group formation is important for various reasons. For traders and processors is commercially not interesting to buy small quantities from individual farmers. The farmer groups will take responsibility for bulking the products making it possible for the trader to collect the produce at one location, which can be a group owned store or a milk collection centre. Furthermore, for suppliers of inputs and providers of extension services the transaction costs of dealing with each small farmer on an individual basis would be prohibitively high. Delivering inputs and services to groups is much more economical.

3. Farmer groups and buyers engage in contractual relationships (B2B linkages)

Through value chain mapping traders and processors will be identified that have a stake in this project. Farmers, traders and processors will be supported to engage in contractual relationships. The contract terms concern the volumes, quality and timing of the agricultural produce to be delivered by the farmer groups. Furthermore, the contracts include agreements about price and the embedded services (including inputs, advisory services and credit) to be delivered by the buyer.

4. Extension service providers train farmers

Government agencies and private actors involved in the provision of extension services will be equipped with the skills, extension messages and extension materials they need to train farmers in how to upgrade their production of the selected commodities.

5. Supply chain actors provide inputs

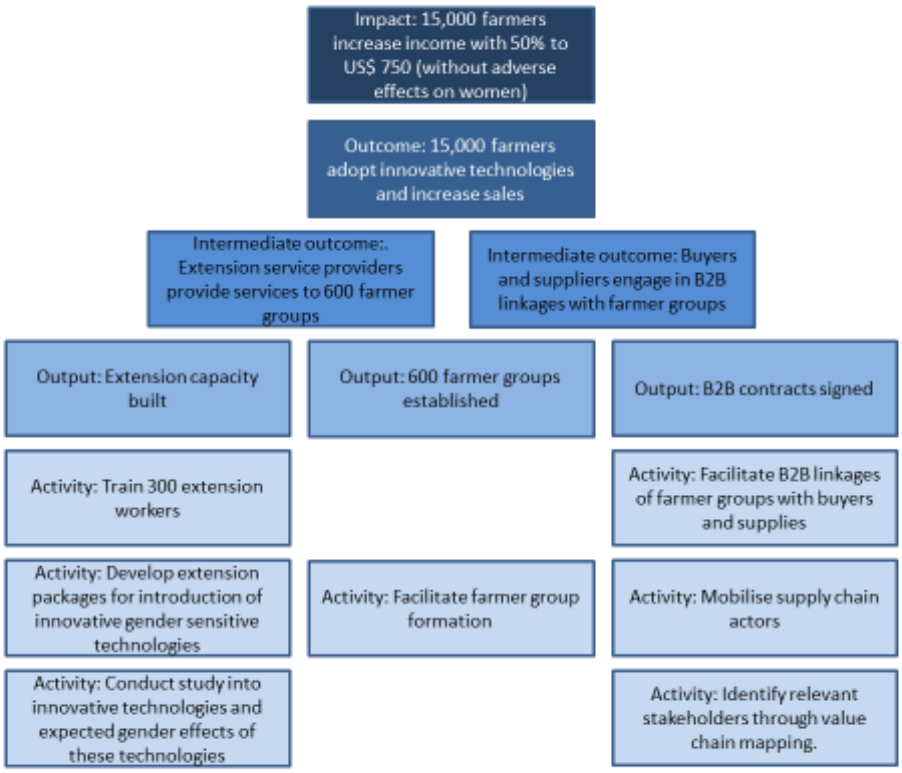
Through value chain mapping actors on the supply side will be identified that have a stake in this project. These may include agricultural supply stores and the manufactures and importers of agricultural inputs will be mobilised to make sure that farmers have access to essential inputs they need to upgrade production.

6. Women benefit from gender- equitable VCD

Value chain development generates opportunities and threats for women. This component focuses on:

- Conducting thorough gender analyses prior to the interventions;
- Developing strategies to ensure that also women will benefit from value chain development;
- Collecting gender disaggregate monitoring data during the intervention; and
- Initiating adjustments in the approach whenever required from a gender equity perspective.

Theory of Change



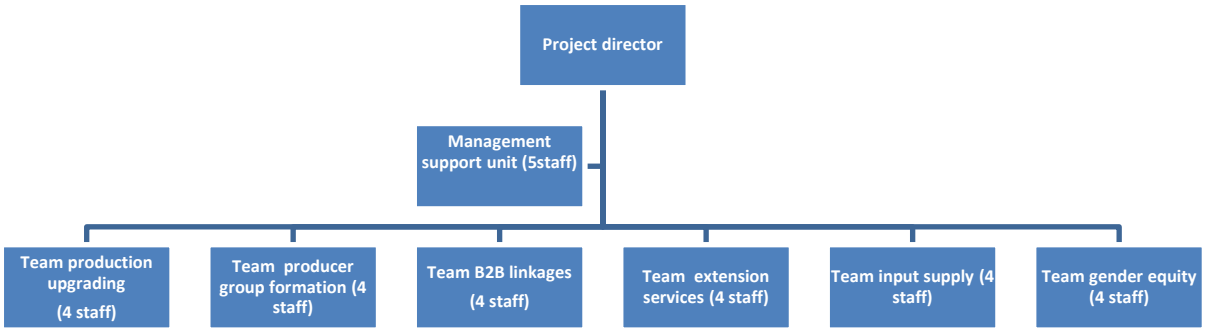
Assumptions

It assumed that B2B linkages can be facilitated between producer groups and other stakeholders up- and down-stream the value chain that are considered profitable by these other stakeholders. However, it is expected that the project implementers have very limited access to reliable data on benefits or costs incurred by suppliers, traders and processors. This is because their involvement is

the result of a negotiation process which is facilitated by the project. Traders and processors make their own cost-benefit analysis but may be reluctant not share this information with the project.
As a result of improved extension capacity and the establishment of B2B linkages between relevant stakeholders, further value chain development will become a "self-propelled process" that continues after the project has come to a close.

Project organisation

The project management is composed of a director, a management support unit and six thematic units. One thematic unit for each outcome.
The project has 30 staff. 24 are involved in project work. 6 staff including the director in project management and administration. Each staff member is provided with office space, a computer and a mobile phone. The project has one car and 12 motor bikes.



Recommended approaches for assessing efficiency

Notes on applicable tools and methods, Markus Palenberg

This note summarizes tools and methods that can be applied to assess efficiency in the value chain development project (case #1). It reflects my personal assessment and views.

After brief remarks on the case (Section 1), I discuss applicable tools and methods first for level 2 (Section 2), and then for level 1 (Section 3).

1. Remarks on the case

The evaluation budget of USD 40,000 USD does not allow for much direct evidence-gathering. In view of 15,000 targeted smallholder farming households, 600 planned farmer groups, and 300 to-be-trained extension agents, any ex-post evaluation will rely on M&E data provided by the project or gathered by third parties. Value chain development generates

2. Level 2 tools and methods

Level 2 tools and methods compare the efficiency of entire aid interventions with alternatives or benchmarks with the purpose of selecting those interventions producing the largest total net benefit with available resources.

Conducted ex-ante, level 2 tools and methods are of interest for:

- Program officers of development organizations who are in charge of project identification and design;
- Funders who need to select projects to which resources will be allocated; and
- Evaluators tasked to evaluate efficiency.

The methods in this group can also be conducted ex-post for accountability and learning purposes, i.e. to verify or correct ex-ante estimates, to improve assumptions for subsequent ex-ante application, and to help project managers improve on operational performance.

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Cost-Effectiveness Analysis (CEA)

As the project aims at a well-defined quantitative outcome[1], a Cost-Effectiveness Analysis (CEA) can be conducted. An ex-ante CEA can, for example, estimate the average (project) cost per 1 USD income increase in a targeted farming household, and compare this with the same quantity in other projects for the purpose of selecting the most cost-effective project, if presented with several options. Applied ex-post, CEA can use actual data and thereby validate or correct ex-ante estimates.

A challenge with applying CEA ex-post is measurement of baseline incomes and post-project incomes. If the project does not track this information reliably as part of its M&E and reporting processes, the evaluation will be very stretched in collecting that information in a reliable fashion.

[1] 15.000 smallholder households brought, on average, from USD 500 at project start to USD 750 annual income four years later.

Another challenge is the degree to which measured income changes are attributable to the project. Within the limited evaluation budget, control-group-based impact evaluation methods cannot be applied and qualitative methods such as contribution analysis, outcome mapping/harvesting or process tracing may help.

CEA is limited in that it doesn't have much explanatory value on how (or why not) outcomes were achieved, something that can be addressed if CEA is complemented by theory-based evaluation approaches. Another weakness is that CEA, as described above, does not track the gender dimension of the project (which can be addressed by using gender-disaggregated results data, if available). Finally, CEA provides only a limited account of overall social and financial costs and benefits associated with the projects, something that Cost-Benefit Analysis may be better suited to capture (see below).
CEA can usually be conducted in a matter of several days to several weeks and only requires basic economic and financial analysis skills.

Cost-Benefit Analysis (CBA)

Cost-Benefit Analysis (CBA) can be applied in a similar fashion to CEA, the key differences being that it i) attempts to estimate all costs and benefits to society caused by the project and ii) that it aggregates and discounts these quantities over time. In this way, CBA estimates the net present benefit of the project to society, a quantity of central importance in rational decision-making that can be compared across aid intervention alternatives.

Ex-post CBAs are subject to similar challenges as CEAs regarding M&E data availability and causal attribution. Compared to CEA, CBA requires information not only about project costs and income effects but also on other costs and benefits experienced by the targeted smallholders and by other project stakeholders such as agricultural input providers, traders, processors, wholesalers, and extension service providers. Where such data is unavailable, assumptions need to be made.
Ex-ante CBAs require reliable context data and realistic, informed assumptions about expected changes associated with the project. While CEA can be conducted by evaluators with basic analytic skills, in-depth experience with economic analysis is required for CBA.

If applied rigorously, CBA provides a more complete picture than CEA of the outcome/impact efficiency of the project at hand. To assess the project's gender (and other equity) dimensions, additional CBAs can be conducted from the perspective of specific sub-groups, for example to ascertain if the project is also beneficial to women in smallholder households, or to verify economic viability from the perspective of the project's private sector partners (see financial analysis below).
As CBA naturally hinges on many assumptions, some of which may be hidden deeply within complicated spreadsheets operated by analysts, a general good practice for CBA is to conduct sensitivity analyses that demonstrate how CBA results change if underlying key assumptions change. This can be somewhat of a challenge for evaluators wishing to provide their clients with helpful evidence if that sensitivity is so strong that CBA results become inconclusive; a situation where peer review of a CBA may help.

Conducting a CBA usually takes several to many weeks and requires advanced economic analysis skills.

Multiple-Attribute Decision-Making (MADM)

Methods for Multiple-Attribute Decision-Making (MADM) can also be applied to the present case. MADM methods and tools facilitate decision-making in the face of incomplete data and uncertainty. As such, they complement rather than replace other methods, i.e. they could, for example, build on results of level 1 efficiency analysis (see next section) or any other evaluative information.

In the present case, a pragmatic scoring model (see table below) can be used to inform (ex-ante) decision-making about whether to invest in this or another project, or to learn (ex-post) about the validity of past project funding decisions.

Criteria	Weight (percent)	Criterion Fulfillment Score			
		Value chain development project	Alternative project 1	Alternative project 2	
Criterion 1					
Criterion 2					
…					
Total					

A MADM scoring model calculates total scores for different intervention alternatives based on a set of weighted criteria. Scoring models are best used iteratively, i.e. by inviting the adjustment of previously established criteria and weights after initial scoring until the model best reflects available information and data, and the professional opinions, experiences and preferences of those conducting the exercise. The main advantage of this approach is that the decision-making process is transparent to the decision-maker and to stakeholders. It is also systematic in the sense that criteria, weights and scores can be critiqued separately, leading to more informed decisions. However, the transparency of this approach can become caveat if decisions are significantly driven by arguments decision-makers decline to share; something to ascertain before deciding to implement it.

In the present case, criteria could be, for example, average poverty levels of the target groups, expected net benefits drawn from CBA, economic viability for private sector partners drawn from financial analysis (see next section), estimated sustainability of project outcomes and impacts, positive impact on women's rights, fair participation of women in project benefits, and project costs. The final set of criteria should be developed in a participatory process. Scoring can be done by the decision-makers alone, or as a group exercise involving other stakeholders as well.

MADM exists also in a scientific form, based on systematic development of decision trees and the mapping of decision-maker preferences as cardinal utility functions along each decision-making pathway. If decisions-makers are willing to engage in such a longer-term and rigorous process exist, this would be a viable option as well.

Scoring models usually require several days of analysis time and basic analytical and stakeholder interaction skills. Utility theory (scientific MADM) usually requires many weeks and advanced skills in decision and utility theory.

3. Applicable level 1 tools and methods

Level 1 tools and methods identify efficiency improvement potential in one project. While level 2 methods compare the outcome/impact efficiency of different interventions, level 1 analysis focuses on the operational efficiency of a single intervention.

Level 1 tools and methods are often conducted ex-post. They are of interest to:

- Project managers responsible for project planning and implementation;
- Funders and program officers of development organizations who want to ensure that funded projects operate with maximal efficiency; and
- Evaluators tasked to evaluate efficiency.

Methods in this group can also be applied ex-ante (or during implementation) to inform project design and to adjust project approaches and implementation plans.

* * *

Several level 1 tools and methods are useful for evaluating the project at hand.

Benchmarking of unit costs **and other** partial efficiency indicators

Benchmarking of unit costs can be a usefully applied in several ways for this project. For example, the cost per farming household reached can be compared across the different sub-regions of the project. This is very similar to the level 2 CEA described earlier, the difference being that unit cost benchmarking is applied project-internally. Other potentially useful unit costs for project-internal benchmarking are, for example:

- Adoption costs of new technology (e.g. cost per adopting farm household or cost per ha of new crops planted) in component 1;
- Producer group establishment costs (e.g. cost per established group, or cost per group member) in component 2; or
- Training cost (cost per training, cost per participant, or cost per participant day) in project component 4.

A principal caveat with unit costs benchmarking is that it does not allow straightforward conclusions about outcome/impact-level effectiveness and efficiency. For example, a higher-than-average cost per farmer reached in one sub-region of the project may indicate operational inefficiencies, but it can also be entirely justified by higher quality (e.g. higher income increases per farmer) or the fact that the poorest smallholders are hardest to reach. Conversely, low unit costs do not necessarily imply high operational efficiency.

Therefore, unit cost benchmarking is a useful tool for identifying potential operational (in)efficiencies but needs to be complemented by further analysis before conclusions can be drawn. Similar caveats hold for all level 1 tools and methods as they all focus on partial efficiency (rather than outcome/impact level efficiency).

Apart from unit cost, other partial efficiency indicators can be useful as well, especially when tracking key assumptions made in the project. For example, the percentage of annual harvest channelled through producer groups (component 2) and reflected in contracts (component 3) can be useful for in-project benchmarking. There are many options for such indicators and selection should be based on what specific information and learning needs project implementers and stakeholders have.

Unit costs and partial efficiency indicators can also be compared across different projects, but care must be taken that they allow for meaningful benchmarking. On a technical level, this requires that they are calculated with the same protocol. On a qualitative level, it means that they are applied to similar projects under similar conditions.

Benchmarking of unit costs and other partial efficiency indicators can usually be done in a matter of days (provided required information is available) and does only require basic analytical and quantitative skills.

"Follow the Money" approach

A simple and straightforward approach with high potential for identifying cost saving potential in the project at hand is the "Follow the Money" approach. When applying it, the evaluator systematically disaggregates total project expenditures and, for each budget or expense category, conducts additional analysis to determine whether there is cost-saving (or yield increase) potential. One strength of this approach is that it systematically screens all project expenses including for example administrative and infrastructure expenses sometimes neglected in evaluations. A weakness is, as with all level 1 methods, that it is often difficult to judge outcome/impact-level consequences of lower cost options.

Applying the Follow the Money approach requires one to several weeks. Evaluators require basic analytical, financial, and problem-solving skills.

Financial analysis

In the value chain development project, financial analysis is relevant and useful for input providers, traders, processors and other private sector players along the value chain who are involved in – and affected by – the project. The basic rationale is that the project can only be successful and sustainable if viable economic opportunities exist for those players. Standard financial analysis calculates the net present value (NPV) from a business perspective. In other words, it judges whether a business idea is likely to be viable from an investment perspective. In most cases in the project at hand, involved private sector players are expected to adjust their business portfolio and practices to the project (rather than being set up for the project). Hence, financial analysis should focus on add-on business cases rather than on the players' entire business.

A challenge with financial analysis of private sector players is often access to information. Financial analysis of companies requires core business data that companies may be unwilling to share because it may render them vulnerable to competitors or endanger their bottom line.
Financial analysis can also be conducted for farmer production groups or, importantly, for the farming household. In these cases, non-financial effects are usually as important – or more important – than financial income and costs. A typical example is additional or reduced workload of smallholder household members because of the project. To include these effects properly, financial analysis needs to be expanded to a **partial Cost-Benefit Analysis (CBA)** of the social and financial costs and benefits for these groups (see section on level 2 methods and tools).

Depending on the entity analysed, financial analysis usually requires several days to several weeks in time, and evaluators need to have basic economic and solid financial analysis skills.

Comparative ratings by stakeholders.

A participatory method that can be useful in the present case is to ask or systematically survey stakeholders for their opinions and preferences regarding available project design choices. Questions can directly aim at partial efficiency or, if cost considerations are difficult to assess for stakeholders, at effectiveness (which the evaluator then complements with information on costs during analysis).

For example, farmers could be surveyed regarding agricultural innovation choices, indicating their preferences and estimating productivity impacts. Together with cost information collated by the evaluator, this information could guide project design (ex-ante) or be used to estimate partial efficiency (ex-post). In a similar vein, farmers could be asked about their preferences regarding producer groups (component 2), training needs (4), input needs (5), and women farmers and household members could be surveyed regarding the most pressing gender-related issues and options for addressing those.

As farmers cannot be reached by online survey tools, information gathering for comparative ratings is restricted to face-to-face interactions with a subset of farmers. To reach a representative sample size within the limited evaluation budget, integration of the household survey with the project's outreach activities or with other evaluation activities should be tried.

Apart from the time required for information gathering, comparative ratings usually require only little time (e.g. several days) for conducting the analysis. Evaluators need basic analytical and survey skills

The Partos Efficiency Lab

This case is one of a series of ten that was produced in the framework of the Partos Efficiency Lab. The Efficiency Lab was established mid-2017, in response to the finding from the MFS II evaluation that development organisations in the North and the South, as well as evaluators, struggle with the concept of efficiency, and with how to measure and analyse efficiency.

The aim of the efficiency lab is twofold:

- To develop a common understanding among Partos members about the concept of efficiency, the various methods for assessing efficiency, including their advantages and disadvantages.
- To identify and/or develop a recommended repertoire of appropriate policies, methods and tools for addressing the efficiency question in development interventions.

On 23 November 2017 Partos organised a conference on efficiency. Important insights shared by a panel of experts include that efficiency analysis is often of very poor quality in project setups and evaluations. This is because there is a lot of confusion about the concept of efficiency.

- First, definitions used by influential bodies such as OECD suggest that efficiency is about the relation between costs of inputs and outputs. According to these definitions even a project that has no, or even negative, outcomes or impact, can still be efficient. A definition that can lead to such conclusions is not helpful for innovation and the improvement of interventions. A useful definition must be based on the premise that effectiveness is a prerequisite for efficiency. In other words, without effectiveness there can be no efficiency.
- Second, the purpose of conducting an efficiency analysis should be made explicit, because the purpose has consequences for the choice of methods and tools used. Two important types of purposes need to be distinguished: 1. comparing the efficiency of an intervention with alternatives or benchmarks, and 2. improving the efficiency of individual interventions.

The experts also looked into ten typical cases of development interventions drawn from the practice of member organisations of Partos. For each of the cases they have provided recommended methods and tools for analysing efficiency. This paper presents one of these ten cases.

The participants of the Efficiency Lab are: Mark Kirkels (War Child), Margriet Poel (SNV), Jeroen Bolhuis (Plan Nederland), Marieke de Vries (CNV International), Arnold van Willigen (Woord en Daad), Erik Boonstoppel (Oxfam Novib), Simon Bailey (Aflatoun), Kees Kolsteeg (GPPAC), Julio C. García Martínez (ZOA), Agnès Marsan (Simavi) Anita van der Laan (Akvo), Jan de Vries (Pax).

Facilitators of the Efficiency Lab are: Anne-Marie Heemskerk (Partos) and Heinz Greijn (L4D)

The panel of experts is composed of:

- **Markus Palenberg**, CEO of the Institute for Development Strategy in Munich, Germany and author of what is considered standard literature in this field: "Tools and Methods for Evaluating the Efficiency of Development Interventions. Evaluation Working Papers. Bonn: Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (2011)
- **Pol de Greve**, Development Economist at Context, international cooperation, with experience an assessing the efficiency of development projects
- **Antonie de Kemp** who worked as a researcher for the Netherlands Court of Audit, the Netherlands Institute for Social Research (SCP) and the Institute for Research on Public Expenditure (IOO). He joined the Ministry of Foreign Affairs in 1997, and since 2005 has been an evaluator at IOB.