

# Measuring Attribution: MDF in East Timor using the Before and After Comparison Method for the Acelda intervention

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## Synopsis

Measuring impact in private sector development programs is important but also challenging. This case is part of a larger guidance paper that provides an overview of the most common attribution methods, and offers guidance on how to select the most appropriate attribution method for the diversity of interventions within their context. This is one of four case studies documenting how programs have selected and implemented different attribution methods. This case explains how MDF selected the Before and After Comparison with Opinion Method for the Acelda intervention and why MDF considers this the most appropriate method for this intervention, as well as how they carried out the measurements.

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## Acknowledgements:

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*This case describes how the programs have addressed a typical challenge in results measurement. The aim of the case is to provide insights that will be useful to other practitioners facing a similar challenge. The authors do not represent the DCED, nor do the views expressed in the case necessarily reflect the views of the DCED and DFAT.*

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## 2 Introducing the Market Development Facility (MDF)

The Market Development Facility ([MDF](#)) stimulates investment, business innovations and regulatory reform in order to create jobs and increase the income of poor women and men in the Indo-Pacific region. MDF began in Fiji in July 2011 and has since expanded to Timor-Leste (in 2012), Pakistan (in 2013) and to Papua New Guinea and Sri Lanka in 2015. MDF is financed by the Australian Department of Foreign Affairs and Trade (DFAT) and implemented by Cardno Emerging Markets. The total budget for MDF is AUD 48 million for the 6-year period up to 2017.

MDF applies the market system development approach. It negotiates partnerships with strategically positioned private and public sector organizations. It offers tailor-made packages that enable the partners to innovate, invest or undertake reforms in such a manner that small farms and firms benefit from better access to inputs, services and markets. At the end of 2014, MDF had built up a portfolio of 39 partnerships, and had reached 1812 poor men and women who have increased their incomes by a total of USD 671,000 additional income and 83 jobs (FTEs) have been created. The [MDF Annual Aggregation of Results](#) provides more information.

In Timor-Leste, MDF has a five-year budget of AUD 7.2 million, employs some 14 staff, and manages 10 interventions (as of December 2014). In Timor-Leste, MDF is active in two sectors: Agribusiness, processing and rural distribution, and Greenfield Industries. In the first sector, MDF stimulates investments in agricultural value chains to connect farmers to markets and reduce imports. In the Greenfield industries sector, MDF triggers investments in 'first of its kind-industries' outside agriculture.

## 3 Introducing the intervention

Farmers in Timor-Leste are disconnected from markets. As a result, there is little incentive for farmers to increase productivity. The MDF strategy is first to create access to markets, and then address productivity constraints through inputs and practices.

MDF assisted an agribusiness company, Acelda, to start processing and marketing locally sourced rice. MDF supported Acelda to establish a modern rice milling facility, to develop an efficient and effective sourcing plan and to develop marketing campaigns. Acelda was then able to supply local rice to the domestic market that can compete with imported rice varieties.

Most importantly, Acelda will show to the farmers that it is able to provide a reliable market for them to sell to. It is expected that as time goes by and trust increases, farmers will consider farming more lucrative and subsequently be motivated to invest in improving productivity of their farms. Acelda will source multiple products that occupy different parts of existing cropping patterns. Farmers will then be able to sell their surplus of multiple products at various times in the year, realising a constant income.

[The intervention](#) will contribute to substituting imported agri-products and will connect rural production centres with national markets, thus giving farmers reasons to invest in their farms. Branding locally produced goods, with the exception of coffee, is new to the country.

MDF wishes to report the outreach, additional income and number of jobs created. In this case description, the focus is on measuring the impact in terms of outreach and farmers' income. The intervention started in 2014 and the final impact will be assessed in 2017. MDF also measures early signs of impact after one season. This helps management to assess whether the intervention is on track: *'is the business model working, will the projected impact be achieved?'*

More intervention details are provided in the [fact sheet](#) and [results chain](#). [Listen to Mujaddid Mohsin who explains how this intervention fits into the MDF sector strategy.](#)

## 4 Selecting the attribution method

The five questions that help to select the most appropriate attribution method to assess the net additional income of the rice farmers are answered here and show why a Before and After Comparison with Opinion (BACO) is the most appropriate attribution method for this intervention with Acelda.

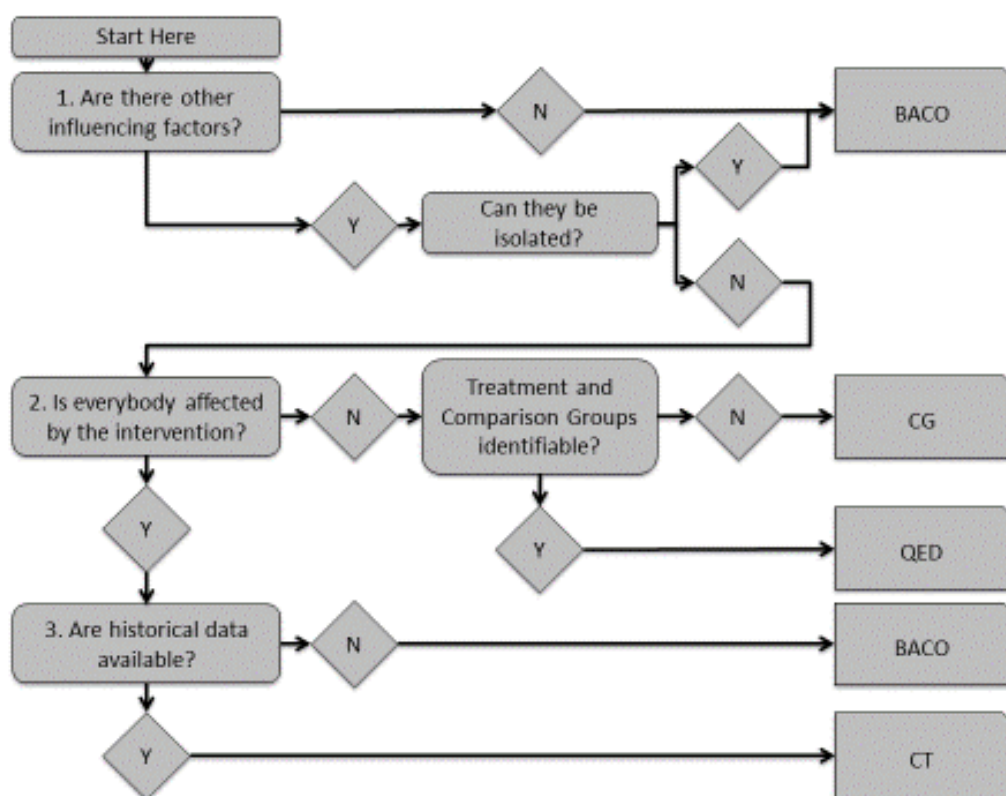


Figure1 Attribution Selection Aid

### Q1 Are there other influencing factors?

The intervention aims to link farmers to markets. These farmers do produce some surplus rice besides the rice they produce for their own consumption, but they have difficulty selling it. By creating access to markets, the surplus rice production will be sold. The counterfactual is the answer to the question, *'what would the farmers have done with the surplus rice production had Acelda not bought it?'* At present, surplus production is sold at local markets, or is wasted. In the future, other external buyers could be entering the markets too. The income farmers earn by selling rice to Acelda therefore needs to be deducted from the income these farmers would have had if they had sold the rice at local markets or to other external buyers, or if they had not sold the rice at all.

The intervention does not provide the farmers with the means (improved inputs or practices) to increase productivity. Fluctuations in rice productivity are thus the result of other factors like the weather or the use of other inputs. These factors are the same, whether these farmers sell to Acelda or not, hence don't need to be taken into account in the assessment of attribution. Only as a result of the reliable market (in the longer term), it is assumed that farmers will actually start producing more either by increasing productivity, or by enlarging the production area. *Yes, there are other influencing factors (demand and prices at local markets).*

### Can these influencing factors be isolated?

Fluctuations in the demand and supply of rice may lead to fluctuations in the price of rice at farm gates and at local markets. The difference between the before-situation and the after-situation (based upon the Acelda price paid for the rice at the time of the end-line) can be corrected to the market price prevailing at the time of the end-line. Acelda, by entering the market, might influence the prevailing market price itself. This is not very likely to happen, but the project should be able to analyze, and isolate, this effect if it does happen. *Yes, other influencing factors can be isolated.*

### Q2 Is everybody affected by the intervention?<sup>2</sup>

Acelda (at present) operates in two districts. Within these districts, Acelda announces its purchasing plan and every farmer in the selected districts is informed and able to supply to Acelda. Farmers in other districts won't be informed and won't be able to supply to Acelda. *No, not everybody will be affected.*

### Are a treatment and comparison group identifiable?

All the farmers in the selected two districts will be informed. It is impossible (and against the intervention logic) not to inform farmers or to offer the choice of participation on a limited basis. *A Quasi-Experimental Design that distinguishes between treatment and comparison farmers from within the two districts is not feasible.*

Acelda will not operate in other districts, so it would be possible to compare the farmers within the two selected districts with other farmers in other districts. However, the situation in the other districts is not identical. The farmers' profiles differ and prices fluctuate in local

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<sup>2</sup> In real life, it is not necessary to continue answering the questions. In this case, we have answered the other questions too to show that other attribution methods are not appropriate

markets. The entry of another buyer in another district will influence the counterfactual enormously. Moreover, as the first year has already demonstrated, the effect of Acelda operating in two districts influences the neighboring districts. Local trading farmers act as sourcing centers, sourcing locally and supplying to Acelda. *No, the counterfactual cannot be established by comparing the farmers from within the districts targeted by Acelda with other farmers in other districts.*

Could one, after the intervention, distinguish between users (those that sold rice to Acelda) and non-users (those farmers that didn't supply to Acelda)? In other words, could one at the time of the end-line survey allocate farmers from the base-line to either user-group (treatment group) or non-user-group (comparison group)? Assuming that these two groups are equal is too risky: there might be reasons why some farmers do sell, and some farmers don't sell their surplus rice to Acelda. One obvious reason that farmers sell to Acelda is that they are near procurement centers or procurement routes; they are in a different position from the farmers who don't sell to Acelda because they are further away. Their trading opportunities are not equal. *No, the counterfactual cannot be established by comparing users and non-users within the selected districts.*

### Q3 Are historical data available?

There are some historical data available, yet insufficiently reliable and up to date to be able to use them to analyze the trend and to reason why changes in the trend are due (or not) to the intervention. The agricultural and trading climate is too volatile, and the intervention targets only a fraction of the (national) population. There are too many different factors influencing the various districts. *No, historical data can't be used.*

### Conclusion:

The selected method for measuring the results of this intervention is a Before and After Comparison with Opinion (BACO). Price, the main influencing factor, can be isolated if need be. Before the intervention, surplus rice production is either sold at local markets, or simply wasted. In the future, other buyers might present themselves. In the case of other buyers entering the two selected districts in the near future, the main question is: would they have entered anyway (then they would have been the 'counterfactual') or did they enter as a result of Acelda's presence (then they would have been considered to be crowding in).

## 5 Before and After Comparison with Opinion (BACO)

The project needs to construct the base-line and the end-line. This section explains how the base-line has been constructed and how early signs of impact have been assessed by MDF. MDF plans to measure the final impact in 2017 and this section explains how MDF plans to do that.

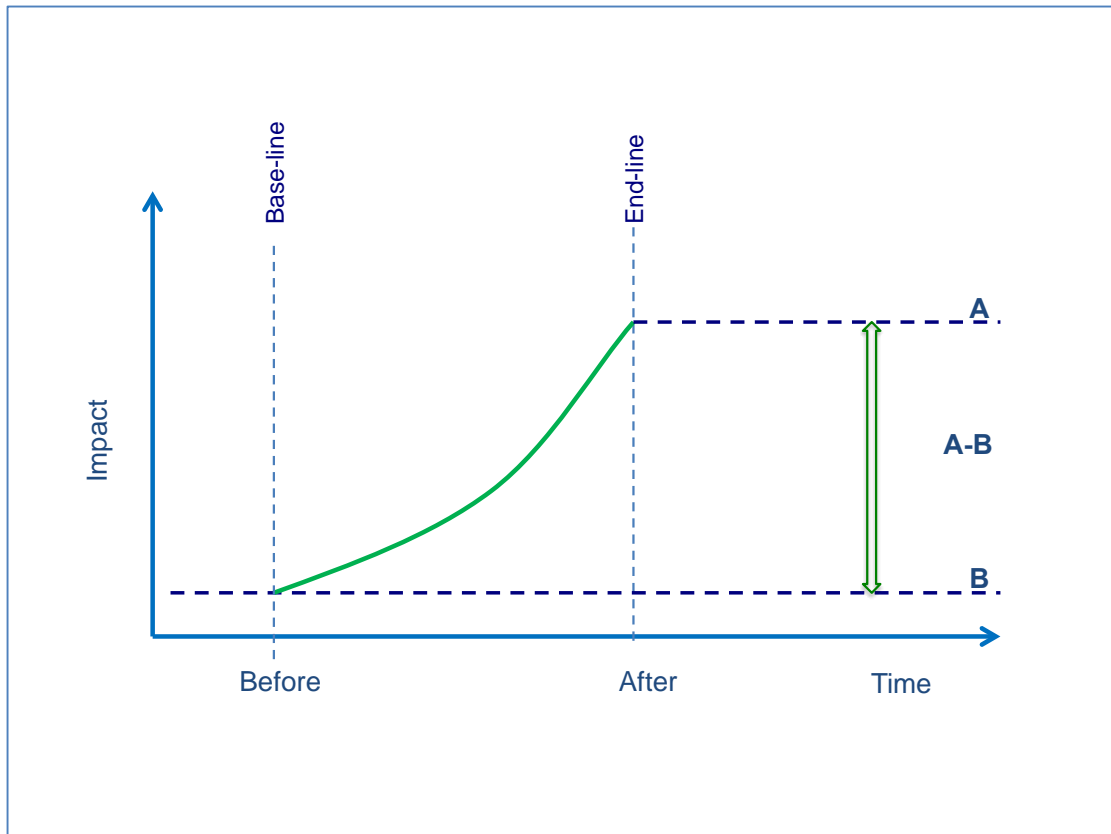


Figure 2 Before and After Comparison

### Reconstruct the base-line.

The base-line was reconstructed by selecting a representative sample from the list of farmers that sold paddy to Acelda in the first season. Initially, Acelda's plan was to register interested farmers at the beginning of the season. Start-up activities were delayed and the list was only available at the end of the cultivation season. MDF could therefore only draw a representative sample from the total number of farmers on the list in October 2014. That implied that the base-line had to be reconstructed, asking farmers to recall the 'before' situation. Given that the time that had passed was relatively short (at the end of the first season) and that the significance of the change was considerable (selling or not), recall was a feasible option because farmers were able to remember.

Acelda sourced paddy from two districts; Manatuto and Baucau. The majority of the sourcing was done from Manatuto district, from approximately 80 farmers. Only 20 farmers from Baucau district supplied paddy to Acelda. The list also revealed that there was considerable variation in the volume supplied to Acelda by the farmers. MDF therefore created three categories from which to sample: (1) farmers supplying less than 100kg; (2) farmers supplying between 100-500kg; and (3) farmers supplying more than 500kg.



Figure 3 Map of Timor-Leste

Given the population size (some 100 farmers), MDF opted for a sample size of 30 farmers for the following reasons:

- The expected change between farmers previously not selling paddy and farmers selling paddy to Acelda is large and MDF can therefore accept the relatively high margin of error.<sup>3</sup>
- The interviews with the farmers are in-depth interviews, providing a lot of detail, but also requiring a lot of time (and thus costs). MDF triangulates the findings with other sources, and complements the quantitative data with qualitative indicators, thus improving the quality of the information.
- Last but not least, the base-line is expected to 'expand over time', when more farmers start selling to Acelda, possibly from other *sucos* (sub-districts).

MDF first stratified geographically: 22 out of 80 farmers in Manatuto and 9 out of 20 farmers in Baucau), and then stratified according to the three categories of 'supplied paddy volume'. Within each stratum, MDF selected the respondents at random using Acelda's list. It implied that the respondents were geographically dispersed, which was necessary in order to ensure that the sample was representative because differences between '*sucos*' within the districts are considerable, but within each *suco* farming practices, cropping patterns, trading practices and microclimates are homogeneous.

### Interim assessments

The base-line survey took place after the farmers had sold the paddy to Acelda, hence MDF could reconstruct the base-line situation and assess the early signs of impact through one survey. The questions in the [questionnaire](#) referred to the period before the intervention (farmers not yet selling to Acelda) as well as to the after period (farmers selling to Acelda).

The difference between the before-situation (local sales at local prices) and the after-situation (sales to Acelda using their prices) represents the impact due to the intervention, if

<sup>3</sup> Margin of Error 10-15%, confidence level 90%

local market demand and price remained the same. If, however, the local market demand and price changed due to external factors, then MDF would have to use the local market price to estimate the counterfactual ('had the farmers not sold to Acelda, they would have sold to the local market for the local market price'). However, local market prices hardly changed, and MDF concluded that had Acelda not announced and bought the surplus rice, farmers would not have sold their rice.

As of December 2014, Acelda purchased rice from 87 farmers. Table 1 shows the income changes due to the intervention.

	Y0 – Before	Y1 – After	Net additional increase per farmer
Average volume of rice sold per farmer (kg)	141	353	212
Average net income per farmer (sales revenue minus cost of production in USD)	US\$55	US\$112	US\$57
<ul style="list-style-type: none"> <li>- <i>In Y1 farmers did not sell to any other buyer besides Acelda.</i></li> <li>- <i>The cost of production remained the same over the two periods</i></li> <li>- <i>The local market price has not changed due to external factors</i></li> </ul>			

**Table 1: Income changes due to the intervention**

To better understand the changes in the behavior of the farmers, MDF will conduct more research in 2015. MDF will hold Focus Group Discussions with farmers and conduct more in-depth interviews with key informants such as local traders, the village chiefs, the Suco Chiefs, the Sub-District Administrators and representatives from the Ministry of Agriculture and Fisheries (MAF) and the Ministry of Commerce, Industries and Environment (MCIE).

The project had ensured during the design phase that Acelda would collect and share certain company records with MDF and provide a periodic progress report. Access to Acelda's sourcing records provides MDF with crucial information on the supplying farmers (volumes, prices, dates, etc.).

All of this enables MDF to triangulate findings and understand the production and sales behavior of farmers, to cross-check the emergence of other buyers in the districts, and to understand the potential influence of Acelda on the market prices.

## Planning the impact assessment

The final impact assessment is scheduled to take place in 2017, two years (seasons) after the intervention activities are completed. The intervention is now in its initial stages. It is expected that Acelda will continue to buy from farmers that are already supplying to them, to ensure continuity, but will also expand and buy from other farmers, possibly from other districts too.

The final impact assessment will apply the same methodology but should be using a mix of farmers: those within the initial group of supplying farmers and those farmers joining later. For the latter, the survey will again be covering two periods: the previous period (not yet selling to Acelda) and the period after (selling to Acelda).

## 6 The research in practice



For each assessment, a [research plan](#) is made that specifies the research questions and the methodology. The [questionnaires](#) were developed and tested before the team went to the field.

Tip:

Go through the completed questionnaires every evening to ensure they are correct and discuss the findings

The team consisted of four MDF staff: three Intervention Managers and one Results Measurement Manager. They interviewed some 30 farmers over seven working days. The team was supported by the Acelda staff. The Acelda staff was not present during the interviews, but played a crucial role in identifying the location of the farmers.

The field research proved to be valuable but took more time than expected. This is partly related to the fact that for the MDF staff in Timor-Leste, this was one of the first surveys that had been conducted and staff had to learn how to conduct such interviews. The size of the questionnaires, with many in-depth discussions as well as obtaining the data for both the Before and the After situation, led to long interviews.

Tip:

Bring a tape, a scale and a bucket to verify locally varying terms and units for plot sizes, weights and volumes

Tip:

Involve your private sector partner in preparing the logistical aspects (permission, travel plans, etc.)

Last but not least, it was time-consuming obtaining permission from the local structures, finding the farmers and being able to interview them, also required considerable effort. Often, the team had to come back because farmers were not available due to local religious or social events. This was time consuming in a district where rural roads are in poor condition.

## 7 Benefits of the selected attribution method

The base-line, intermediate assessments and end-line surveys were labor intensive, but very valuable not only in terms of being able to 'report credible impact' but also the measurement increased insight and created a more in-depth understanding of the rice sector. Data obtained from secondary sources, had they been available, would never have been as rich as the primary data obtained through the surveys conducted by MDF.

The measurement is relatively easy; surveys are limited to those farmers that sell and benefit and do not require the project to establish a comparison group. The ability to sample from a list of supplying farmers is crucial. It ensures that sampling can be truly random as compared with searching for respondents in the field and it greatly facilitates extrapolation among the farmers. As a result, MDF was able to estimate the early signs of impact. As of December 2014, some 87 farmers have gained approximately \$57 net additional income each.

[Listen to Syeda Samira Saif explaining the assessment.](#)

## 8 Annexes

[Fact book](#)

[Annual Aggregation of Results 2014 headline results table 4 and 5](#)

[Audio Mujaddid Mohsin](#)

[Audio Syeda Samira Saif](#)

[Questionnaire](#)

[Research Plan](#)

## Other Case Studies on Attribution

- [A practical framework to select appropriate attribution methods](#), introducing and explaining the attribution selection aid.
- [Samarth-NDMP intervention in the ginger sector in Nepal](#), illustrating the use of a quasi-experimental (QED) method.
- [The Alliances Lesser Caucasus Programme \(ALCP\) in Georgia](#), illustrating how a single impact assessment could assess attribution for multiple interventions.
- [Propcom Mai-Karfi \(PM\) intervention in the tractor market in Nigeria](#), illustrating the use of comparison groups (CG)