Measuring Attribution: ALCP in Georgia undertaking a sector impact assessment

Synopsis

Measuring impact in private sector development programs is important but also challenging. This case is part of a 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 given context. This paper also documents the ways in which four programs selected and implemented four different attribution methods. It explains how ALCP assessed their impact in the livestock sector and why ALCP considers this particular attribution method the most appropriate way to assess the impact of their interventions. It also explains how they carried out the measurements.

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Acknowledgements

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 similar challenges. The authors do not represent the DCED or SDC, nor do the views expressed in the case necessarily reflect the views of the DCED or SDC.

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2 Introducing Alliances-KK

Alliances-KK was the first phase of a Swiss Agency for Development and Cooperation market development project implemented by Mercy Corps Georgia working in the dairy, beef and sheep sub-sectors in three municipalities of the Kvemo Kartli region, a region in the South East of Georgia highly dependent on livestock production. The program inception phase was February until September 2011 and the implementation phase began on September 2011. The first phase of the project ran until February 2014 with a budget of CHF 2,258,035. From March 1st, 2014, Alliances-KK was merged into the tri-regional 'The Alliances Lesser Caucasus Program (ALCP)' becoming ALCP KK[2].

Alliances-KK worked in Dmanisi, Tsalka and Tetri Tskaro municipalities. The map of the region can be seen in the following figure.

Figure 1 Map of Kvemo Kartli

The goal of Alliances-KK is to contribute to poverty alleviation and the transition to a durable market economy for the livestock sector in the Kvemo Kartli by creating sustainable changes in the dairy, beef and sheep market systems for the ultimate equitable benefit of small, poor farmers, regardless of gender or ethnicity.

The program is run according to the Market Development Approach. This facilitates key market players in the relevant value chains through co-investment, advice and linkages, to address key constraints in core markets and supporting functions such as transport and veterinary services. This is in order to exploit pro-poor opportunities for growth.

3 Introducing the interventions

This phase of the program worked in confined geographic areas targeting some 26,000 households. The program worked in three intervention areas (organized as outcomes) which are:

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[2] The ALCP comprises the three regions of the Lesser Caucasus mountain range in southern Georgia, Kvemo Kartli, Samstkhe Javakheti and Ajara and runs until February 2019.

- Outcome 1: increased outreach, information dissemination and quality of target services for small-scale livestock producers (SSLP); increased access and enabling SSLP's to make informed decisions on animal health, breeding and nutrition. The interventions in this area included veterinary pharmacies, artificial insemination services, improved bull services, improved nutritional inputs, and machinery services through access to financial mechanisms and a newspaper and television program.
- Outcome 2: market access and terms of trade made more advantageous for small-scale livestock producers. The interventions in this area include food safety and hygiene consultancy services (BDS), access to a slaughterhouse, access to the livestock market, access to the dairy market and access to the wool market.
- Outcome 3: enhanced local government capacity to support the growth of a robust and durable agricultural sector which is more resilient to natural disasters. The interventions in this area included an advisory committee, disaster risk reduction working groups, women rooms and women's access to decision making.

The summary of the different types of interventions can be seen in the following table:

No.	Intervention Type	Starting Date	Intervention Objective
1.	Vet Pharmacies	17/01/12	Improved distribution of and access to drugs and vet services and embedded advice so that farmers are able to prevent and treat livestock diseases by proper usage of medicines.
2.	Bull Services	19/12/12	Improved distribution of, and access to, improved breeding bull services so that farmers will have improved cattle breeds that produce higher milk and meat yields.
3.	Improved Feed	20/02/13	Improved distribution of, and access to, affordable, higher quality feed e.g. brewer grains & combined feed, for livestock that will boost milk yield, growth rates and aid fattening.
4.	Agricultural Contents of the Newspaper	05/10/12	Improved agricultural content of the newspaper so that farmers can apply the knowledge gained from the newspaper to their agriculture.
5.	Agricultural Television Program	25/06/13	Improved content of the agricultural television program so that farmers can apply the knowledge gained from the TV program to their agriculture.
6.	Small-scale Machinery Leasing and Hire Purchase Services	10/08/12	Improved outreach of leasing/hire purchase/credit services for small scale machinery service providers so that famers can access efficient, cost-effective and timely hay making services in order to improve nutritional contents in hay.
7.	Food Safety and Hygiene consulting services (BDS)	22/07/13	Improved Food Safety and Health consulting services (BDS) provided to milk processors and slaughterhouses so that they can expand their sales and provide growing and stable markets for the farmers.
8.	Slaughter Houses	29/03/11	Improved slaughterhouses with upgraded facilities and a direct sourcing model so that they can expand their sales and provide a growing and stable market for the farmers.

9.	Dairy and Milk Processors	23/05/12	Improved dairy processors with upgraded facilities and supply chain management so that they can expand their sales and provide a growing and stable market for the farmers.
10.	Wool Supply Chain	28/02/13	Improved wool exporters with collection points and embedded advice to farmers so that famers can access a stable wool market with higher prices.
11.	Women's Room	02/03/12	Support municipalities to develop a Women's Room within the municipality buildings and provide practical guidelines/toolkits to municipal staff and trainings to village representatives on gender equality and good governance so that more women will participate in municipality and community decision-making processes.
12.	Disaster Risks Reduction	09/09/11	Capacity building of municipalities' DRR working group on quarantine arrangements and facilitation of process and stakeholders for the renovation of the national Animal Movement Route so that farmers can reduce their losses from diseases.

The program has an extensive system for collecting monthly quantitative data from their service providers and benefiting farmers (collected by service providers) to monitor the extent of changes that have happened along the results chain. The database also includes information on production, sales and income of farmers for a particular intervention. In addition, the program systematically collects information on how and why changes have happened or have not happened. This regular monitoring allows the program to steer, manage and improve interventions and adjust the sector strategy on a regular basis.

However, the information collected from the regular monitoring system is not sufficient to establish the counterfactual. Beneficiaries' information is collected from service providers and not directly from the beneficiaries. In addition, some service providers do not keep track and provide the information for all customers. The program therefore decided to conduct one impact assessment to capture the attributable impacts of the interventions and to triangulate with beneficiaries' information collected via service providers.

The key challenge for the program in terms of impact assessment is that the program cannot conduct a separate impact assessment for each intervention as is typically done in other programs. As discussed above, all interventions are implemented to target all beneficiaries in the small geographic areas. Hence, it is likely the users will benefit from more than one intervention. Moreover, it is very difficult to isolate or identify the beneficiaries who only benefit from a particular intervention. For the same reasons, the program cannot find and compile a list of non-users which could be used as a comparison group.

 ALCPs therefore opted to assess the impact of all interventions (excluding intervention # 11 - Women's Room) on beneficiaries' income changes together as a package. This seems feasible in this particular case because the program is working in specific limited geographic areas and interventions target the beneficiaries in these areas. The samples could therefore be drawn from the total population (26,000 farming households). The program nevertheless faces attribution challenges.

4 Selecting the attribution method

The five questions that help to select the most appropriate attribution method are answered here, and show why comparison group (CG) is the most appropriate attribution method to assess the net additional income of the livestock farmers in the sector.
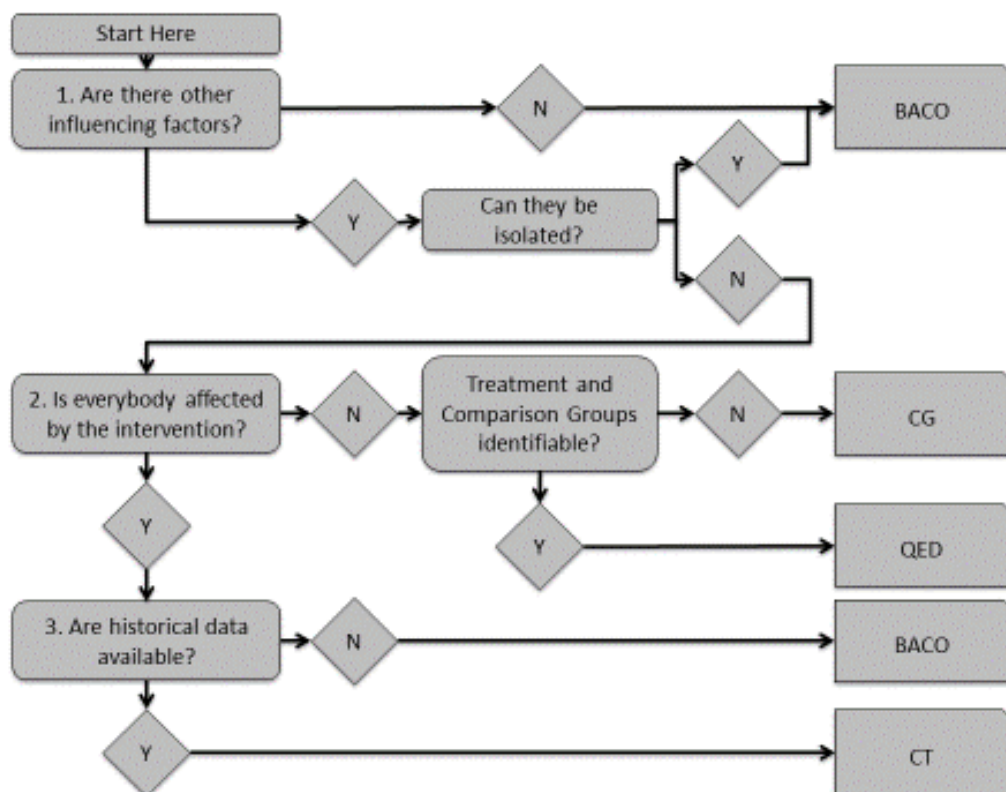

Fig 2 Attribution Selection aid

Q1 Are there other influencing factors?

In this case, the program assesses the impact of all combinations of the interventions together. As explained above, the interventions could potentially have an impact on beneficiaries' productivity, selling price and input costs. There are therefore a lot of influencing factors that will affect the beneficiaries' productivity, selling price and input costs e.g. weather conditions, changes in general market price, disease outbreaks, etc.
Yes, there are other influencing factors.

Can they be isolated?

In these cases, the impacts are assessed together and there are a lot of influencing factors that also affect beneficiaries' productivity, selling price and input costs. Hence, it is not possible to simply isolate the impact of other influencing factors from the total impacts.
No, they cannot be isolated.

Q2 Is everybody affected by the intervention?

Although it is likely that the program will affect a high proportion of target beneficiaries, not everybody will be affected. *No, not everybody is affected.*

Are a treatment and comparison group identifiable?

The program works in small areas and targets all potential target beneficiaries in the area through the intermediaries (input suppliers, service providers, etc). So, in every community, there are likely to be both users and non-users. The program cannot however pre-identify and compile the lists of users and non-users that can be used as sampling frames. *That implies that a Quasi Experimental Design, where one in advance determines who will and who will not make use of the services, is impossible*. The program can however allocate respondents at the time of the end-line survey into the user-group or non-user-group. *Yes, user-group and non-user-groups are identifiable.*

Q3 Are historical data available? [3]

The historical data from secondary sources are only available for some indicators and are not sufficient to establish the counterfactual*.*
No, there are no historical data that can be used to calculate attributable changes.

Conclusion:

The appropriate attribution strategy is to use a comparison group, since it is not possible to identify treatment and control groups beforehand, and there is a need to isolate the impact of other external factors. Respondents will be interviewed, and depending on their answers, will be allocated to the treatment group or to the comparison group.

5 Comparison Group

This method implies collecting base-line and end-line data for all samples. Then, after the end-line survey, the samples are allocated to treatment (green line) and comparison group (orange line) by using screening questions during the end-line survey. The treatment groups are the one that benefited from interventions and the comparison groups are the ones which do not use the services promoted by the interventions. Since both treatment and comparison groups are exposed to similar external factors, the difference-in-difference (B-A) is the impact attributable to program interventions. This is illustrated in the figure below:

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[3] 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
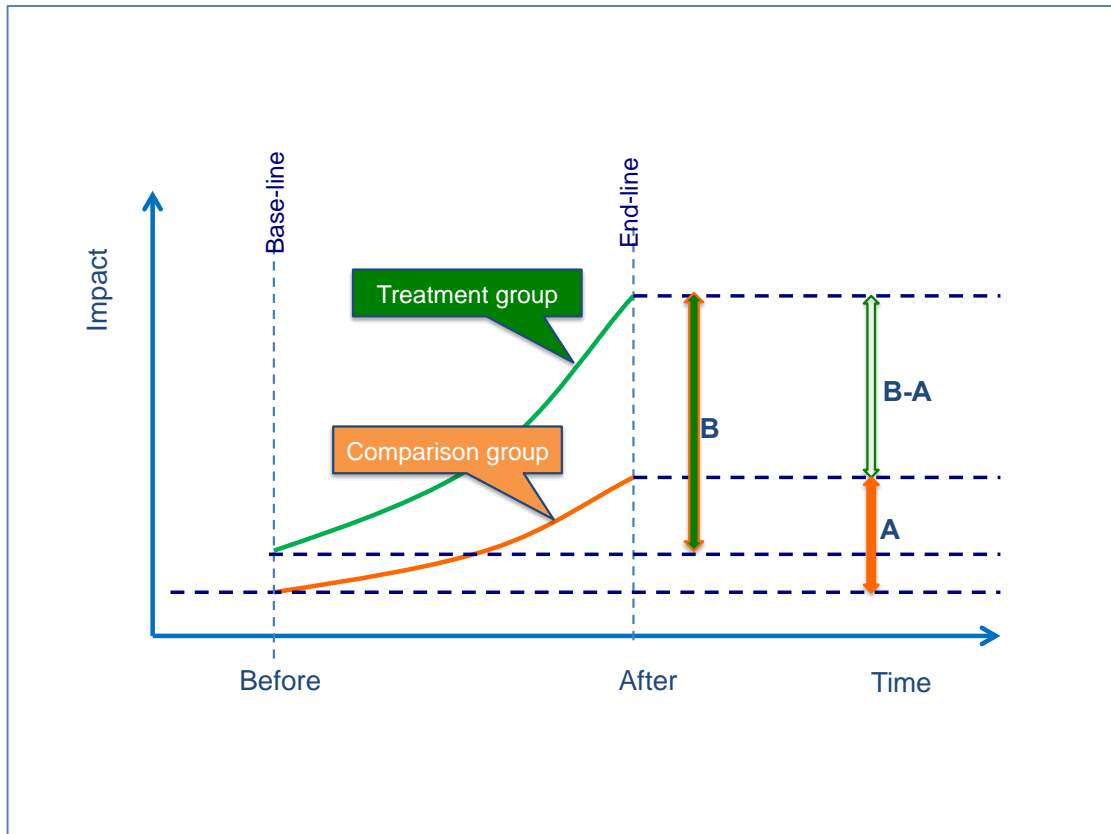
Fig 3 Difference-In-Difference Graph

6 The research in practice

As discussed above, the key challenge for the program is that it cannot conduct the impact assessment for each individual intervention because it works in confined geographic areas with limited numbers of total target population (26,000 households). And, combined with the high intensity of the interventions implemented, it is likely that a high percentage of the target population used at least one service from the program's interventions. Hence, in this case, the program has to assess the impacts of all interventions together by drawing a representative sample from the total target population.

Since the survey is measuring the impact of average uptake of interventions, the variability of the data is going to be quite high. So, the program decided to calculate the sample size (number of samples) based on 95 % confidence level and 5% margin of error. Therefore, the 389 samples were drawn from the total target population of around 26,000 households[4]. The program used multi-stage stage cluster sampling. The first stage is the municipality. For this stage, all target municipalities are included. Villages form the second stage. Since there are more differences between villages than differences within each village, the sampling strategy requires maximizing the number of villages and minimizing the number of farming households within each village. For this study, to keep the costs under control, the average number of sampled households within each village is ten. So, around 38 villages are

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[4] For more information, see the DCED Sample Size Calculator at www.enterprise-development.org/page/sample-calculator

randomly sampled by using the Probability Proportional to Size (PPS) method[5]. For the last stage, the farming households are selected by a random walking method using steps between households. In this case, for each village, the survey started with visiting the house at the center of the village and then selecting every fifth house until the required sample size is collected.

Although a general sector base-line study was conducted at the beginning of the project, the information is not sufficient to be used for impact assessment because at that time, it was still unclear which interventions would be developed, hence the intervention specific indicators were not yet defined or measured. For this survey, the base-line data were collected retrospectively for year 2011. Farmers were asked to recall the situation in 2011 in relation to the current situation. Depending on the type of information, farmers might not be able to accurately recall all of the 2011 information. This recall bias is one of the key limitations of the study. However, the program has also used several measures to reduce the risks of recall bias e.g. triangulating with information from the National Statistics Office of Georgia. In the new phase, the program plans to conduct the base-line survey from (or for) a representative sample of the target population. Then, the program will revisit the same samples for the mid-term and the end of the phase impact assessment.

After the survey, the samples were allocated to user and non-users groups by screening questions. The farmers who did not use any of the services were allocated to the non-users and used as a comparison group. The treatment group included the farmers who used at least one of the services promoted by the program. The treatment and comparison groups were analyzed and tested for homogeneity. Both groups were homogenous according to the main variables (e.g. age, region, household size, number of livestock, etc.)[6].Moreover, both groups are also equally exposed to similar external factors such as the weather and disease outbreaks. Hence, the non-users could be used as a comparison group to establish the counterfactual. To minimize possible differences in user and non-user groups, the net attributable income change (NAIC) was calculated by using Differences-in-Differences of average net income from livestock of user and non-users.

Limitation of the Study

Although the program was able to assess the impacts on its beneficiaries, there are also some limitations of the chosen approach. These can be summarized as follows:
- There will be some recall bias. The impact assessment was conducted during early 2014 and required recall information from the farmers for 2011, which is a very long period.
- Although combining the assessment for all interventions in one survey can capture the synergy effect of combined interventions, it will be virtually impossible to credibly isolate the impact of individual interventions. The number of samples who only use a particular service is likely to be too small. The program could also try to assess impacts on various combinations to isolate the impact of a particular intervention. However, the lists of possible combinations will be too large and the numbers of samples per combination will be too small to be able to provide credible results. The measurement doesn't give information on the impact of a particular intervention and management therefore has to rely on the monthly monitoring system to assess what are the most effective or efficient interventions.

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[6] The self-selection bias can't be avoided but is assumed to be limited

- The sample is representative for the program area, but it cannot claim to show the statistically significant differences for sub clusters e.g. for each municipality or community since the number of samples per municipality or community will be too small.
- The number of farmers benefiting should only include the user who benefited financially. The corresponding net income increase for financially benefited user should only be calculated for that portion of the samples.

Annexes

ALCP Webpage
Alliance KK Impact Assessment Report

Other Case Studies on Attribution

- A practical framework to select appropriate attribution methods, introducing and explaining the attribution selection aid.
- The intervention of MDF with Acelda in Timor Leste, illustrating the use of a before and after with opinion (BACO) method.
- Samarth-NDMP intervention in the ginger sector in Nepal, illustrating the use of a quasi-experimental (QED) method.
- Propcom Mai-Karfi (PM) intervention in the tractor market in Nigeria, illustrating the use of comparison groups (CG)