

# Executive Report

## **Sembrar-Sartawi Evaluation 2015-2019**

Dr. Francesco Cecchi

Prof. Robert Lensink

The evaluation is a joint effort by the University of Groningen (RUG), Wageningen University (WUR), the University of Sheffield (Sheffield) and the Institute for Advanced Development Studies in Bolivia (INESAD).

**Overall team leader:** Robert Lensink (RUG/WUR)

**Other contributors:**

Boris Branisa (INESAD)

Francesco Cecchi (RUG)

Steffen Eriksen (RUG)

Adriana Garcia (RUG)

Carlos Gustavo Machicado (INESAD)

Paul Mosley (Sheffield)

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## EXECUTIVE SUMMARY

This report presents the results of a systematic impact evaluation of the investments made by the Netherlands Development Finance Company (FMO) to support Sembrar-Sartawi (referred below simply as Sartawi) in Bolivia through the MASSIF fund. Sartawi belongs to the Bolivian Federation of Rural Microfinance Institutions (Finrural) and mainly provides agricultural loans in rural areas. Moreover, Sartawi serves rural clients through the self-styled “triangle business model”: in addition to microcredit, it offers technical assistance and market access. Technical assistance aims at improving the production processes and practices of farmers and market access aims at linking farmers with potential buyers. In 2013 FMO invested USD 3 million debt and USD 2 million equity in Sartawi. This was in line with the MASSIF fund goal of supporting financial institutions serving rural and agricultural clients, considered as constrained and underserved.

According to FMO’s theory of change, the ultimate impact that the investments were expected to generate was on poverty reduction, food security and economic growth. More specifically, FMO’s interest was in understanding whether increased access to finance targeted to rural areas would have had impact on income, and whether there was a case for supporting the “triangle business model” – whether this model had value-addition with respect to a standard/leaner approach to lending. To establish this, between 2015 and 2019 we conducted three separate impact evaluations with multiple data collection rounds in three different regions of Bolivia. This included investigations into the financial, environmental, social and governance additionality as well as catalytic effects of FMO’s investments. The present report outlines the main findings of these exercises and is complemented by technical papers provided as separate Appendices.

FMO funds were timely during the expansion phase of the institution, and sustained it during rocky times (including a struggle with the banking authority to receive the banking license, and heavily subsidized competition from publicly owned banking institutions in core markets). They were crucial for the implementation of the triangle business model of Sartawi, in general, and the start-up and developing of the technical assistance program (which would probably have been

impossible without FMO funding). FMO funds were attractive, valuable and unique in the market, as they: 1) combined *equity* and *debt* funding, 2) entailed long term (five years) funding, 3) the interest rate was reasonable and lower than other market prospects (around half of that of other comparable opportunities) and 4) they were initially denominated in local currency, which took away some of the risks from Sartawi. FMO also worked closely with Sartawi to improve corporate governance of the latter, and a corporate governance expert from FMO guided the board of directors to set corporate governance standards.

The triangle business model of Sartawi, that was developed and sustained partially thanks to the timely support of FMO, is now recognized locally and internationally. Many development finance institutions have shown interest in the model, such as Fondesurco in Peru, Financiera FDL in Nicaragua, Credisol in Honduras and BDP in Bolivia. There is also strong evidence that FMO funds has acted as a catalyst, strengthening the trust of other funders in Sartawi. Because of the presence of FMO funding, Sartawi was able to attract new sources of funding, and could increase existing funding engagements of both local and international partners.

In terms of impacts on borrowers, we find that Sartawi's contribution is context dependent, and greater in areas that are more impoverished and have less lenders and investment opportunities. Overall lending from Sartawi drives agricultural outcomes down, in an apparent substitution to the advantage of non-farm activities. This result is in apparent contrast to the mission of Sartawi to provide agricultural loans and loans in more remote and rural areas. This apparent contradiction can however be explained by the fact that: 1) the triangular model of credit + assistance + market access is not yet fully implemented in most rural branches, and 2) in the absence of efforts to increase agricultural productivity (e.g. via technical assistance and market access) the returns to capital of off-farm investments may be greater than those of farming. This said, in more remote and less financially integrated areas Sartawi increases access to credit both at the extensive and intensive margin.<sup>1</sup> This is laudable as exclusion from financial markets seems to produce substantial misallocation of investments, which is partially corrected by Sartawi.

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<sup>1</sup> In other words, it increases the amount borrowed by people already borrowing (intensive margin), but it also gives access to finance to people that previously didn't have loans (extensive margin).

The reallocation away from agriculture is reversed in the presence of technical assistance and market access—the triangle model. In fact, we find that access to veterinary and advisory services, and a dedicated deal in which loans for dairy production can be discounted directly from the payments made by the processing company to the farmer, greatly benefit the agricultural clients. We find that both dairy production, revenues and profits are greatly increased. Clients greatly value access to technical assistance and implicitly consider it a discount to the interest rate offered (of about 5 percentage points on average), making Sartawi a more attractive lender and reducing the prevalence of clients that use Sartawi as a “lender of last resort”.

The triangle model seems to be very effective in this setting in providing opportunities for income growth, without necessarily having to abandon agricultural production (we find no evidence of substitution in this setting). Technical assistance and market access produce statistically significant and most importantly economically substantial impacts (e.g. a conservatively estimated increase in income of 16%), highlighting the potential for productivity improvements and poverty alleviation offered by the triangle model. However, it is possible that some of the impacts we observe are dependent on the specific conditions of our case study. For example, it is possible that branches that have less access to markets would find it harder to generate such growth in sales as a result of the triangle model. Similarly, it is imaginable that the scale opportunities in terms of advisory services cannot be reproduced in areas where farmers produce very heterogeneous products (instead of only milk as in our study area).

Given the evidence that FMO funding was a fundamental precondition to continued investment in technical assistance and market access (complementary to other actors in capital markets), it is foreseeable that FMO investments in Sartawi may bear significant long-term societal impacts. This is particularly true for rural communities that have little to gain from expanding non-farm investments, and at the same time have sufficient opportunities of market access for farm products. FMO should value the possibility of selectively supporting the expansion of the triangular model to promising locations across Bolivia, and particularly in rural areas.

## 1. Introduction, background and rationale

The Netherlands Development Finance Company (FMO) supports the private sector in developing countries and emerging markets around the world. Its objective is to contribute to the structural and sustainable socio-economic development in these countries while at the same time obtaining healthy returns.

In addition to its own financing activities FMO manages programs on behalf of the Dutch Government (off-balance). One of these programs is the MASSIF fund, which aims improving access to finance for micro, small and medium enterprises in developing countries through loans and equity investments in financial institutions. This fund allows FMO to invest in riskier projects. A particular focus of this fund is on financial institutions serving rural and agricultural clients, considered as constrained and underserved.

In 2013, FMO supported the microfinance institution Sembrar-Sartawi (referred below simply as Sartawi) in Bolivia through the MASSIF fund. At the time Sartawi was in the process of becoming a regulated non-bank financial institution (NBFI), which disburses microloans mainly for agricultural purposes. FMO invested USD 3 million debt and USD 2 million equity.<sup>2</sup>

### *Context*

The roots of microfinance in Bolivia can be traced back to the mid-1980s when the country experienced a major economic and financial crisis characterized by hyperinflation and negative growth rates. The recession, aggravated by the structural adjustment programs of the IMF and World Bank from the late 1980s onward led to a strong reduction of formal employment in the mining industry and government, pushing people into self-employed, mostly informal, economic activities. This created a potentially large market for microfinance services. The government, as well as external donors, actively supported the development of a microfinance sector to enabling them to finance these micro-entrepreneurs (Marconi and Mosley, 2006).

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<sup>2</sup> FMO also planned to provide certificates of deposit funding, channeled through Fundacion Sembrar, to support the expansion of a sustainable agriculture development project, or to fund the cost of a board member to support governance.

The initial MFIs were non-profit organizations (NGOs). Yet, in 1992 the first micro-bank, BancoSol entered the market.<sup>3</sup> From the early 1990s the Bolivian microfinance sector experienced massive growth, which among other things was also stimulated by changing government regulations in 1995 (Sucre Reyes, 2014). Between 1992 and 1997 there was a fifteen-fold increase in the number of microfinance clients (Mosley, 2001). The success of microfinance led to a rapid increase in the number of institutions entering the market, increasing competitive pressure and commercialization (Navajas et al., 2003). The increased supply of microcredit and the competition in the market led to over-indebtedness of many clients, and ultimately led to a severe economic and political crisis, which also engulfed the microfinance industry during the period 1999-2003 (Marconi and Mosley 2006; Mosley et al., 2012, ch. 12; Sucre Reyes, 2014). Yet, the industry recovered remarkably fast. During the 2000s MFIs further enhanced their activities and developed new activities such as new types of loans and savings accounts, money transfer services, etc. while at the same time improving their financial risk management and auditing systems, and professionalizing their staff. These developments all contributed to the strong development of the microfinance sector. Whereas in 1996, 136 MFI agencies were present in the country, this number had increased to 935 in 2013. The number of client borrowers rose from more than 435,000 to more than 776,000 between 2004 and 2013, which means that currently almost 65 per cent of all borrowers of Bolivia's financial system have access to a loan from an MFI. The annual average growth rate of loans (deposits) during the same period was 24.0 (27.6) per cent; commercial banks saw their portfolio grow by only 10.9 per cent during the same period.

#### *Sartawi*

Sartawi belongs to the Bolivian Federation of Rural Microfinance Institutions (Finrural), and has presence in 7 of 9 provinces of Bolivia. At the end of 2017, it was serving 28,605 clients through 4 branch offices, 16 rural agencies and 42 urban agencies. 50% of its clients has individual loans and the other half has group loans. However, individual loans constitute 87% of the loan portfolio

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<sup>3</sup> In that year, PRODEM, an NGO, was transformed into BancoSol. From the start, BancoSol was heavily sponsored by USAID, as a consequence of which there was no provision of complementary services ('credit plus') and a heavy emphasis on the rapid achievement of financial self-sufficiency.



and group loans only 13%. Roughly 50% of Sartawi's clients are female. With total assets of almost 339.8 million bolivianos (USD 49 million) as of 2015, Sartawi is small to medium sized competitor.

Sartawi mainly provides agricultural loans in rural areas, which represent 42% of the total loans. This made it an ideal partner to receive funding through the MASSIF fund. Moreover, Sartawi serves rural clients through the self-styled "triangle business model": in addition to microcredit, it offers technical assistance and market access. Technical assistance aims at improving the production processes and practices and market access aims at linking clients with buyers. These complementary services represent an added value and a competitive advantage to Sartawi, as it is the only institution in Bolivia providing them. However, at the start of the evaluation the triangle business model was only applied in three selected pilot branches, and later issues with licencing prevented Sartawi from expanding the model as initially intended (see below).

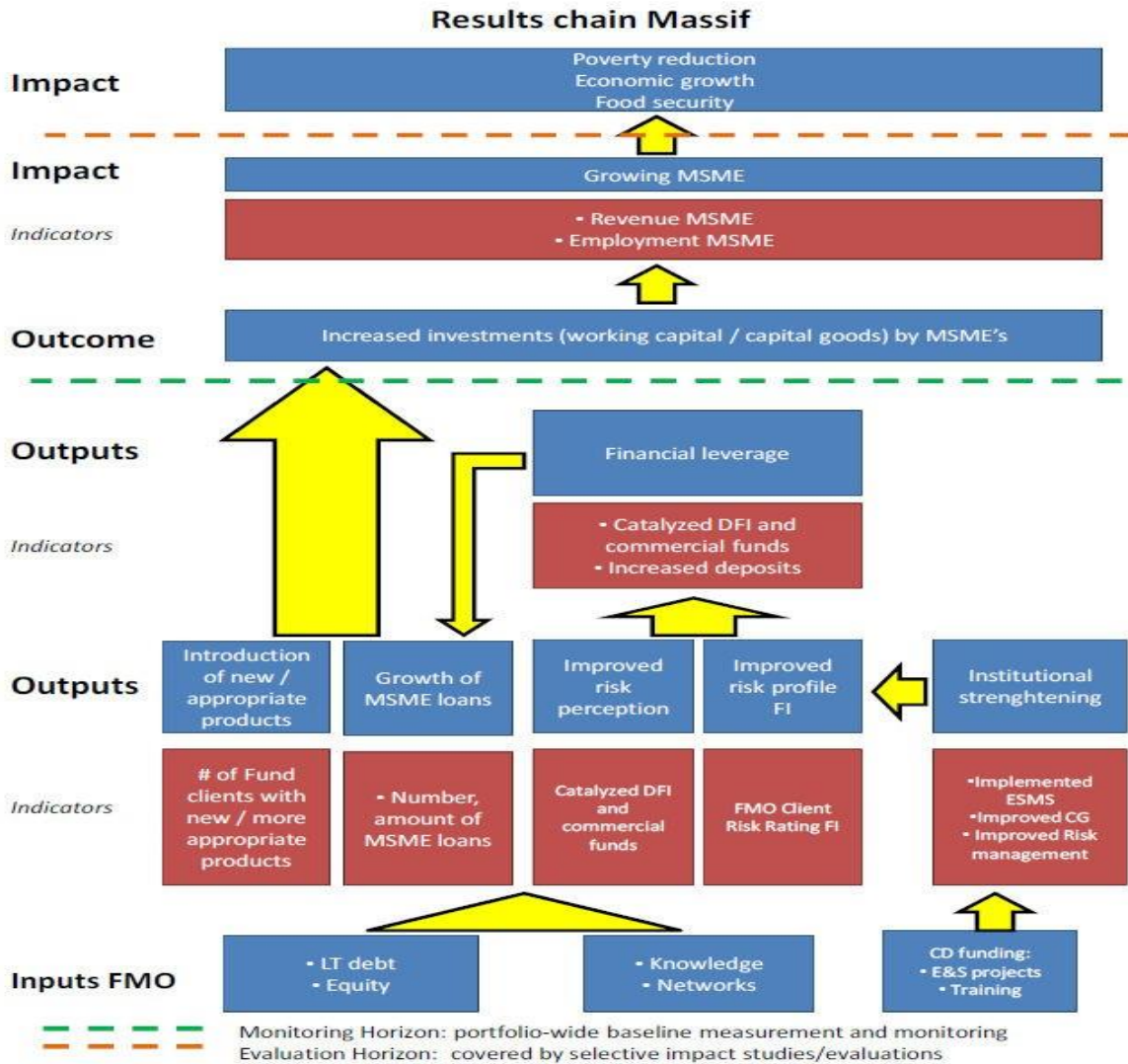
#### *Scope of the evaluation and challenges*

Evaluating the impact of its investments is one of the final aim of the MASSIF programme. Through a series of impact evaluations it aims to establish the effects of improved access to credit on end users and ultimate beneficiaries. For this reason, FMO first tendered an 'evaluability assessment' for its investments in Sartawi, concluded successfully in 2013, and later awarded the same team a mandate to do a full-scale impact evaluation.

The evaluation was to be based on MASSIF's theory of change (see Figure 1).<sup>4</sup> The ultimate impact that the investments were expected to generate was on poverty reduction, food security and economic growth. More specifically, FMO's interest was in understanding whether increased access to finance targeted to rural areas would have had impact on income, and whether there was a case for supporting the "triangle business model" – whether this model had value-addition with respect to a standard/leaner approach to lending. Importantly, the evaluation team was left free to identify the best methodology available, feasible and appropriate to the evaluation questions being investigated and to the specific context.

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<sup>4</sup> Importantly this was MASSIF's theory of change (ToC) at the time of the investment into Sartawi. There is a new ToC available since 2017, when MASSIF established a new strategy applied to all consequent projects.



**Figure 1.** FMO's theory of change

Initially this led to a two-phase evaluation plan, with a qualitative midline analysis. The plan was to make use of the expansion plan presented to the evaluators by Sartawi in 2015, to identify two regions that had already an existing agency available, and in which a second agency would have been opened soon—in a city that was socio-economically comparable to that of the existing agency. At least one of the two regions should have had a functioning triangle business model. After concerted discussion with Sartawi the choice fell on the Chuquisaca and Yungas regions. The plan was to collect baseline data around the location of the existing branch as well as the soon-to-come branch and use a follow-up data collection round to estimate impacts. Importantly, the Yungas agency (Coroico) was one of the three agencies that already had a functioning market

access / technical assistance triangle model. This would have allowed for a comparative analysis of impacts with and without the full business model at play.

However, after a round of quantitative baseline data had already been collected, the expansion plan envisioned by Sartawi never took place, rendering the original evaluation strategy untargeted. Moreover, an early qualitative scoping exercise done on all three agencies offering the triangular model revealed that in Coroico it was indeed active, but actually very dysfunctional. The same qualitative investigation revealed that at the time the only agency that offered concrete policies aiming at increasing market access and technical assistance to lenders was that of Patacamaya.<sup>5</sup>

As a result of this, the evaluation team decided, in agreement with FMO, to change the evaluation strategy. The first consequence of this was to split the assessment of the impacts of increased access to credit *per se* – which was done using cross-sectional estimators – into two separate evaluations based on the baseline data collected in Chuquisaca and Yungas. Given the different contexts and the similarity of evaluation methods, this allowed for a comparative analysis of impacts of access to credit. However, we also provide results for the combined sample, including both Chuquisaca and Yungas. A second consequence was to completely spin-off the evaluation of the market access and technical assistance components—which is carried out through a new baseline-endline data collection in Patacamaya.

In this endline report we will survey the main results of the entire evaluation. The structure of this report is as follows. We start by focusing on additionality, catalytic and demonstration effects of the FMO investments (Section 2), Next, we turn to the main results of the evaluation regarding impacts of increased access to credit (Section 3). Section 4 summarizes the results of the evaluation of technical assistance and market access. Sections 3 and 4 present results based on both the quantitative and qualitative analyses. Section 5 presents the conclusions and recommendations for Sartawi and indirectly FMO. All technical details, as well as background reports, are provided in separate Appendices.

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<sup>5</sup> This was at odds with the information previously obtained by the evaluation team.

## **2. Additionality of the investment, catalytic and demonstration effects**

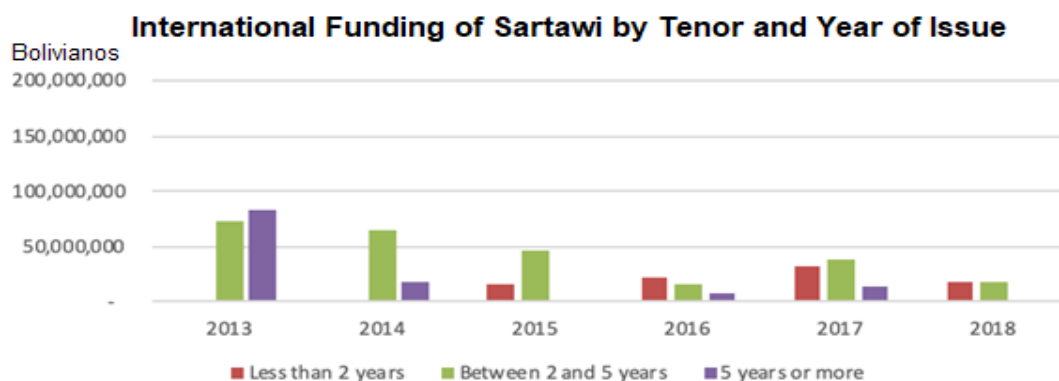
One of our evaluations tasks is to assess the additionality of the investment made by FMO, and to study whether catalytic and demonstration effects took place. This section surveys these evaluation results. The full report is available as an Appendix.

For this part of the evaluation, we conducted semi-structured interviews with seven stakeholders of Sartawi. In addition, we collected quantitative (financial) data. The results presented in this section are based on these interviews and the quantitative information.

### *Financial additionality*

FMO funds were timely during the expansion phase of the institution. They were crucial for the implementation of the triangle business model of Sartawi, in general, and the start-up and developing of the technical assistance program (which would probably have been impossible without FMO funding), in particular. FMO funding has been crucial for Sartawi's possibility to expand credit to the agricultural sector as well.

FMO funds were attractive, valuable and unique in the market, e.g. as the FMO funds combined *equity* and *debt* funding, it entailed long term (five years) funding, the interest rate was reasonable, and it was denominated in local currency. Locally, long term funding is virtually absent. Mostly local financial institutions prefer to engage in merger and acquisitions (as Sartawi did by acquiring Empreder, a competitor, in September 2016), and private investors are scarce. According to the stakeholders we interviewed, it is also very difficult to find international institutions working under similar terms as those offered by FMO. Most other financial institutions offer only debt, prefer to issue short-term (one or two years) debt, denominated in dollars, and are not willing to take up or share risks because of the socio-political situation in Bolivia. Figure 2 confirms that the international long-term (5 years or more) funding is scarce: the 2013 figure includes FMO's investments (in local currency), and clearly represents an exceptionality in long term funding.



**Figure 2.** International Funding by Tenor and Year of Issue. Source: Sartawi (2018)

It is also important to note that several interviews highlighted that it is highly probable that because of the presence and apparent blessing of FMO, Fundación Solidez provided 50% of the resources needed to develop the technical assistance program. Most importantly, FMO funding has been crucial not only to the growth, but to the survival of Startawi during difficult years, and was not readily available in the same long-term from in local or international markets.

#### *Environmental, Social and Governance (ESG) additionality*

FMO worked closely with Sartawi to improve corporate governance of the latter. Specifically, a corporate governance expert from FMO guided the board of directors to set corporate governance standards. For example, they established rules on the composition of the board: there must be 2-3 members outside Sartawi and a gender quota. They also established that the CFO and not the CEO is responsible for presenting the financial statements to the board.

Moreover, funds from FMO were partially used to develop three new systems, which complement the delivery of Sartawi financial and non-financial services (i.e. credit and technical assistance) to agricultural clients:

- GEMA: to measure environmental impact.
- GIRAS: to manage the agricultural and systemic risk information
- MEDIS: to measure social performance and impact

Indirectly, FMO contributed to the systematization of the technical assistance program. Because of FMOs presence, Sartawi was able to work with Frankfurt School of Finance to create a manual

with all the details of the program, starting from the training process of the technicians to the steps they need to follow to implement the program with Sartawi clients. The manual takes the example of the potato production, but it is designed to be adapted to other agricultural activities.

#### *Catalytic effect*

The interviews strongly suggest that FMO has acted as a catalyst for Sartawi: the presence of FMO strengthened the trust of other funders in Sartawi. Because of the presence of FMO funding, virtually all interviewees claim with a degree of certainty, Sartawi was able to attract new sources of funding, and could increase the engagement of existing investors. Some examples of international funders that showed interest in Sartawi after FMO's involvement are BIO from Belgium, OIKO Credit from the Netherlands, SIDI from France and IFU from Denmark. Examples from local banks that increased the funds after FMO invested in Sartawi, include BDP and Banco BISA.

#### *Demonstration effect*

The triangle business model of Sartawi has been recognized locally and internationally. In 2016, the Food and Agriculture Organization (FAO) wrote a case about Sartawi in the book "Estrategias innovadoras de gestión de riesgos en mercados financieros rurales y agropecuarios: Experiencias en América Latina". They highlighted the triangle business model of Sartawi as an innovation in the microfinance industry. This book presents, several international presentations by directors and managers of Sartawi, as well as the systematized manual of technical assistance have helped disseminate the triangle model of Sartawi. Many development finance institutions have been interested in the model, such as Fondesurco in Peru, Financiera FDL in Nicaragua, Credisol in Honduras and BDP in Bolivia.

Although they have not implemented it exactly as Sartawi does, they have learned how it works and some of them have adapted it according to the characteristics of the institution. BDP in Bolivia, for instance, is implementing a technical assistance program. BDP is an investment bank who is a Sartawi funder and it is also a commercial bank. As a funder, they know the technical assistance program very well and have implemented it to the clients from the commercial side.

### 3. The Impact of Sartawi’s microcredit programme

As explained in the introductory section, we conducted separate evaluations of the micro-credit programme of Sartawi, and the technical assistance and market access programme. In this section we present the main results of the credit evaluation; the next section focuses on the evaluation of the technical assistance and market access programme. Before surveying the main results, we briefly explain the activities we employed, the sampling as well as the identification strategy. A detailed description of the evaluation of the microcredit programme is provided in the separate evaluation report: Credit provided by Sartawi.

#### *Activities employed and sampling strategy*

The main part of the credit evaluation took place in the period March 2015-December 2017. In this period, we constructed a questionnaire, conducted a survey, analysed the data and wrote up the credit evaluation report.

The surveys took place in two regions: Yungas and Chuquisaca. In these regions, using information from the expansion strategy of Sartawi, we selected two communities where Sartawi currently has a branch (Coroico and San Lucas, respectively), two communities where Sartawi originally planned to open a branch relatively soon (Chulumani and Villa Charcas), and two communities where Sartawi aims to open branches in the further future (outside our evaluation period) (Irupana and Camargo). In total we surveyed around 2000 households, in 100 communities. About 50% of the surveyed households are living in the treatment villages (Coroico and San Lucas) and around 50% are living in the control villages. Table 1 provides details about our sample.

**Table 1.** Overview of sample

Area	Number of communities	Number of households
Coroico	25	493
Chulumani	17	344
Irupana	8	153
San Lucas	25	499
Villa Charcas	17	342
Camargo	8	163
Total	100	1,994

### *Identification strategy*

The main challenge of the quantitative impact analysis is the selection of a good counterfactual (or control) group, which enable us to avoid self-selection and program placement biases. Our *identification strategy* is in line with a double difference model. In general, a double-difference model differentiates between a control and treatment group, and between two time periods (baseline and endline). However, the double difference model we have used refers to a double difference in space. That is, we differentiate between a region with access to Sartawi loans, and within this region, borrowers who did and did not take up Sartawi loans, as well as a region where there is not yet access to Sartawi loans (but in the future a Sartawi branch will be opened), and within this region households who would (and would not) take up loans after opening the Sartawi branch. Thus, to reduce potential self-selection and program placement biases, we basically measure the impact of micro loans, by comparing existing borrowers with (possible) future borrowers. Our sampling strategy, by sampling clients and non-clients from an area where Sartawi is active, as well as potential future clients and non-clients from an expansion area, we are able to control for self-selection and programme placement bias. Yet, the validity of our identification strategy (as well as most other identification strategies) relies on several assumptions. Therefore, we have also used a standard propensity-score matching (PSM) approach that is more widely used. Below we only present the double-difference results; the PSM results, which are very much in line with the results presented in this executive report, are provided in the Evaluation report: Credit provided by Sartawi.

### *Main results*

In this sub-section, we present the main results of our impact analysis regarding the impact of microcredit provided by Sartawi. When interpreting the results, it should be noted that a considerable part of the control group (households who do not borrow from Sartawi) had access to other loans. This implies that our impact analysis shows whether, on average, households with a Sartawi loan perform better than households with access to loans from other financial intermediaries.



We conducted the analyses using both the full sample, and for sub-samples for each of the two regions (Yungas and Chuquisaca) separately. As Table 2 below will show, results for the two regions differ substantially, which strongly suggests that the relevance and impact of microcredit from Sartawi is to a large extent “context” dependent, it e.g. depends on availability of other loans, the welfare of the region, business opportunities and other location specific characteristics.

We assessed the impact of Sartawi credit on a broad range of outcome variables. Table 2 presents the main results, which we will briefly discuss for each outcome variable. We start by considering the impact of Sartawi credit on total loans outstanding. The total loans outstanding includes all loans the household has, including loans from Sartawi. For the overall sample, and the Yungas region, we do not document a significant increase in the total loans outstanding. This suggests that at least a substantial part of the loan proceedings of Sartawi in the Yungas region are spent paying off other outstanding debt. However, for the **Chuquisaca region, borrowing from Sartawi has resulted, on average, in a significant increase in total loans outstanding of about 4.018 bolivianos (about 580 USD)**. This effect might seem substantial, when considering that the average loan size for the Chuquisaca region is reported to be 2,402 bolivianos (780 USD). However, to put the estimated coefficient in better perspective, we have calculated the standardized coefficient, which appears to equal 0.238. The standardised coefficient can be interpreted as a change in the total loans outstanding measured in units of standard deviations, for a one standard deviation change in the independent variable in question. A standardised coefficient of around one quarter may still be considered relatively small. Most importantly, as, probably, a **substantial part of credit provided by Sartawi has been used to pay off other loans (especially in Yungas)**, it may not come as a surprise that impact of Sartawi credit on various welfare indicators will not be substantial. A first indication for this observation is that, across our three samples, we find relatively small and insignificant coefficients regarding the impact of Sartawi credit on household’s total monthly income.<sup>6</sup>

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<sup>6</sup> Total income includes: Business revenues, agricultural income, and other income, where other income is constituted of salaried labor, remittances, and other transfers.

In order to better assess the impact of credit by Sartawi, we consider impacts on business revenues, agricultural income and other income. Regarding business revenues, we find positive, but insignificant impacts for the whole sample, and for the Yungas region. However, for the Chuquisaca region, we observe a significant positive impact of 585 bolivianos (about 85 USD). On a yearly basis, this amounts to more than 1,000 USD, thereby constituting a significant impact for the average household in an otherwise poor region of Bolivia.

Regarding agricultural sales, we find an overall negative impact of Sartawi credit on agricultural sales of about 203 bolivianos (about 29 USD) on a monthly basis. This adds up to a yearly decrease of about 350 USD. However, this result is likely to be driven by the Chuquisaca region, where we observe a significant negative effect of 250, indicating a monthly decrease of 250 bolivianos (about 36 USD), which adds up to about 432 USD on a yearly basis. The picture for other income is somehow similar: again we find a significant negative impact for Chuquisaca, and an insignificant impact for Yungas. However, we now also find, on average, a significant impact for the entire sample. For the Chuquisaca region, we observe a significant negative impact of about 370 bolivianos (about 53 USD) on a monthly basis. Scaling this up to a yearly basis, this amounts to more than 360 USD decrease in total household income.

Overall, a consistent picture emerges. For Yungas, credit provided by Sartawi has not increased total loans outstanding, and therefore probably for a substantial part been used to pay off other debts or simply substitute credit provision from other lenders. As a result, for Yungas we do not find significant impacts of Sartawi credit on any income category. However, for Chuquisaca, borrowing from Sartawi has increased total loans outstanding. More importantly, the results suggest that a loan from Sartawi has financed an income shift from agriculture towards business in the Chuquisaca region. As the region is known as a dry region, and in general less suitable for cultivation of crops, it might seem logical that households attempt to direct their attention to other activities outside of agriculture. The shift from agriculture to business is also confirmed by the fact that in Chuquisaca, the income distribution changed in favour of business income (a significant increase in % business income and a significant decrease in % agricultural income).

**Table 2.** Summary of impact of microcredit provided by Sartawi

Dependent variable	Full sample	Yungas	Chuquisaca
Total loans outstanding	4,117.837	2,219.273	4,017.762*
Total monthly income	46.580	307.934	-35.623
Total monthly business revenues	275.803	244.740	584.613*
Total monthly agricultural sales	-203.223**	-109.980	-250.174**
Total monthly other income	-26.001	173.173	-370.062*
% business income	4.833	-5.697	20.046***
% agricultural income	-13.550**	-5.262	-18.142***

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### *Qualitative analyses*

In addition to the quantitative survey, we conducted several qualitative analyses to evaluate microcredit from Sartawi. Most importantly, we conducted 81 interviews with households in the regions of Patacamaya (an upland region some 100 km to the south of La Paz where Sartawi had fully implemented their triangular model) and Coroico (a more fertile tropical-farming region some 80 km to the north-east of La Paz). Probably the main result of the qualitative analyses is that a large majority (86%) of the sampled households reported that contacts with Sartawi have had a beneficial impact on them and their household income. The full qualitative report “INFORME FINAL Entrevistas Estructuradas a clientes con créditos agropecuarios” can be obtained on request.

Using the qualitative information gathered and explained in the report, we tried to explore how, in the perception of clients, loans from SARTAWI impacted on the recipient household, and how that impact could be enhanced. This analysis can also be found in the report “Qualitative interviews with SARTAWI agricultural clients” which can be obtained on request.

As most loans by SARTAWI are for agricultural purposes, we have a particular interest in trying to tease out how lending (but also technical support) from SARTAWI impacted on agricultural technology and farm yields. As is often the case, clients point to the tendency of agriculture to generate irregular and volatile income flows, varying with the seasons, has created great difficulties for regular on-time loan repayment. To this end, the qualitative analyses are especially informative regarding the “wishes” of clients; and regarding suggestions of clients in terms of

financial products they would like to be able to obtain and how to improve current lending practices. In particular, clients seem to desire:

- A speedier loan processing
- Emergency loans

Both points in combination with the generally high satisfaction of clients points towards a positive relationship between Sartawi and its clients, with a need for it to make its financial products more specialised to meet the protectional aspect of finance. Emergency loans could be disbursed to long-term clients with a virtuous repayment history, either at higher premiums or bundled to insurance products to protect Sartawi from the plausibly higher default risks. Also, increased use of ICT and software based credit scoring could help speeding up the lending process, especially for returning and well performing clients.

Clients often admit making use of multiple credit institutions at the same time (this is in line with quantitative evidence collected). Sartawi credit is sometimes used outside of the stated purpose, either to cover an emergency expenditure or to repay an overdue loan at an other institution. This is especially the case for clients that have access to multiple microcredit lenders. Moreover, during the evaluation period one specific competing bank was nationalized and started offering agricultural loans at subsidized interest rates. This increased the likelihood that Sartawi be used as secondary lender, or to increase the intensive margin of a loan. Improved (real-time) communication within the banking sector in Bolivia should in the future improve the monitoring of double-dippers, over-borrowers, and the development of vicious cycles of indebtedness caused by the repayment of loans through the borrowing from other institutions.

Finally, the qualitative analysis showed varying degrees of attachment and satisfaction of clients to Sartawi. In particular, clients that benefitted from technical assistance and market access revealed higher levels of fidelity to Sartawi, and were more likely to refer to Sartawi for a loan as first choice (more about this in the next section).

#### **4. The Impact of Sartawi’s Technical Assistance (TA) and market access**

This section surveys our main results of the evaluation of the technical assistance (and market access) programme. The entire study is presented in the “Technical Assistance” evaluation report. Before presenting the main results, we will pay attention to the region where our evaluation took place (Aroma province), provide details of the technical assistance programme, discuss the sampling strategy and explain our identification methods.

##### *Milk production in the Aroma Province*

Our evaluation took place in the Aroma Province in the Bolivian Plateau, which is one of the regions in the country with relatively high production of milk. Since the sixties, the government of Bolivia, as well as international organizations, have explicitly promoted milk production in order to improve the economic situation of small milk producers in the plateau and enhance milk consumption all over the country. The support to improve milk production has mainly been done by providing grants (e.g. to improve infrastructure).

Milk production in the Aroma Province is concentrated in four municipalities: Ayo, Patacamaya, Sica Sica and Umala. Sartawi is available in these four municipalities. Milk producers (farmers) sell milk to the two largest milk companies (Pil and Delizia); they also produce cheese. During 2016, the farmers suffered several shocks: there was a severe drought which affected the forage and water available to feed their cattle, the average price of the milk decreased from 3.5 Bolivianos<sup>7</sup> to 3 Bolivianos, and one of the milk companies introduced a quota that reduced and limited the liters of milk that farmers delivered every day to the company. These shocks induced many farmers to reduce their cattle, and hence their milk production.

##### *The Microcredit and Technical Assistance programmes*

Sartawi focuses on disbursing loans in the form of microcredits to help farmers in rural areas perform and expand their productive activities. In addition, it offers technical assistance as a service complementary to the microcredit program. The technical assistance programme is unique in Bolivia, as no other MFI in Bolivia provides technical assistance as a customized service

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<sup>7</sup> Fixed exchange rate: 1 US Dollar = 6.96 Bolivianos

to its clients. By providing technical assistance, Sartawi obtains a competitive advantage over other financial intermediaries in the region.

Sartawi has 4 office branches and 56 agencies all over Bolivia. Our technical assistance evaluation deals with the agency in the Aroma province, as especially in Aroma province milk producers are served. This agency is one of the very few that have the triangular model of credit, technical assistance and market access fully developed and functional. Access to technical assistance is optional and exclusive to Sartawi clients. The service is provided by a technician who is a full-time employee of Sartawi. While the service is in principal for free, costs for medicines (or suggested improved inputs) need to be covered. The technician delivers general and customized assistance to the clients. The technician provides technical assistance to many farmers at the same time by means of technical training workshops. He also organizes monthly workshops in the communities and yearly visits to farms and experimental centres based on clients' needs and interests. In addition to the workshops, the technician provides personalized assistance, helping only one client at a time: he serves clients through individual visits to their farms and tries to deal with their specific requests. The technical assistance program consists of five elements: (a) cattle sanitation to prevent and treat diseases, (b) cattle nutrition to prepare and optimize feed and efficiently use resources such as the native prairies, (c) cattle reproduction to enhance genetics, treat reproductive diseases and assist during pregnancy and births, (d) cattle management to improve caring practices, such as quarantine in the purchase of cattle, cattle deworming, barn cleaning and calf special care, and (e) milk transformation to improve milking practices and teach alternative transformation processes for more efficient use of milk. The technical assistance programme in the Aroma Province started in August 2016.

### *Sampling strategy*

A unique feature of our evaluation of the ongoing technical assistance program of Sartawi is that we focused on a homogeneous group of Sartawi clients: farmers engaged with milk production, i.e. milk farmers. Our study population, both for the treatment and control group, is composed of milk producers in the Aroma province. We have surveyed milk producers who are clients of Sartawi, but also milk producers who are not clients of Sartawi. Everybody has access to

microcredit, either from Sartawi or from another financial intermediary. However, only clients of Sartawi have access to technical assistance. As will become clear below, by surveying both Sartawi and non-Sartawi clients, we are able to use an intention to treat estimator, which enables to come around some selection problems which may bias the estimates.

We conducted a baseline survey in October 2017, about a year after the start of the technical assistance programme. The survey has been organised in collaboration with a local research institute, INESAD. We visited 39 communities, in four municipalities, Ayo Ayo, Patacamaya, Sica Sica, and Umala. In these communities, we targeted all milk producing clients of Sartawi. However, as some clients were unavailable for the interview, we were not able to survey all of them. In order to improve identification of the impact of technical assistance, we also surveyed non-clients, using a random sampling technique. The non-client group has similar characteristics to the clients group: they are also milk producers who mainly sell milk to the two milk buying companies, Pil and Delizia, or make cheese. They also have access to a (albeit different) microcredit program.

For our baseline survey, in total we surveyed 536 milk producers, of which 89 receive technical assistance (the census of all clients receiving assistance), and 447 not. While all farmers with technical assistance are clients of Sartawi, 239 farmers without technical assistance are not. About a year after the baseline survey, we conducted an endline survey. Due to logistical problems (farmers live in remote areas and are not always available for interviews) we faced problems resurveying exactly the same group of milk producers in the endline as we surveyed in the baseline. From the group of clients (non-clients) of the MFI, we were able to resurvey 183 (167) farmers. In order to avoid power problems, we also surveyed a group of farmers we didn't survey in the baseline. We especially increased our sample of non-clients, as we targeted already almost all clients of the MFI in the four municipalities. In total we surveyed 689 milk producers, of which 75 received technical assistance in the period between the baseline and the endline. In total 107 farmers used a technician sometime from the start of the technical assistance programme. By "merging" baseline and endline samples, we were able to construct a "merged" sample of 350 persons, with two data points per person.

### *Identification strategy*

The main challenge we face is to uncover the causal effect of the technical assistance and market access provided by Sartawi. As farmers cannot be forced to use a technical assistant, measuring impact may be troubled by self-selection biases. It may, for instance, be the case that only the most innovative farmers, who are open to change traditional production methods, decide to use a technical assistant. In this case, a simple comparison of farmers with and without technical assistance would probably overestimate the true impact. However, it is also possible that only farmers without any knowledge about farming practices use a technical assistant. In that case, the impact of technical assistance would be underestimated by simply comparing farmers with and without technical assistance. Moreover, our evaluation started a year after the initiation of the technical assistance programme of Sartawi, meaning once more we may underestimate the true impact.

We have dealt with potential selection biases by using several quasi-experimental identification strategies, using either cross-sectional regressions or panel regressions. Regarding the cross-sectional regressions, we have applied five methods to estimate impacts, using the baseline data and the endline data separately: (1) an intention to treat analysis (ITT) analysis which measures the impact of *having access* to technical assistance, irrespective of actually using a technician. In fact, this estimator compares Sartawi clients who do have access to technical assistance) with non-Sartawi clients (who do not have access to technical assistance). The advantage of the ITT method is that it controls, to a certain extent, for self-selection into the technical assistance programme. The disadvantage is that the ITT measures impact of having access to technical assistance, but not the effect of technical assistance itself. The other estimators we use measure impact of uptake of technical assistance; (2) a simple difference in means (OLS regression) to measure average impact of using a technician; (3) an OLS regression with controls to measure average impact of using a technician; (4) a propensity-score method (PSM) method to measure impact of using a technician; and (5) an Inverse Probability Weighted Regression Adjustment (IPWRA) technique to measure impact. We have applied these five estimators using the baseline data, and endline data separately, in line with repeated cross-sectional analyses.



In addition to the (repeated) cross-sectional regressions, we merged the baseline and endline data to conduct *between* estimates, which comes down to an OLS regression on averages of the baseline and endline data. In addition, we have used a *random effects* estimates, and the *Mundlak* estimator. The different methods we have used deal in some way, albeit differently, with selection problems. There is not a “preferred” model as all approaches we have used have advantages and disadvantages. For details, refer to the document in the Appendix.

### *Main results*

It is encouraging to see that the different methods we have used all point in the same direction: we find positive and significant effects of technical assistance on welfare of farmers, measured by *monthly revenues*, and *milk production per day* for all our estimators. This holds for the baseline estimates, the endline estimates, as well as the estimates using the merged sample. We also find positive and significant impacts of technical assistance on *monthly profits*, and *expectation of economic situation*. However, for the latter two outcome variables, some estimators suggest that impacts are insignificant. The table below provides a summary of the main results.

**Table 3.** Summary of impact of technical assistance and market access

Outcomes	Log monthly revenues	Log monthly profits	Log average litres of milk per day	Expectations of economic situation
Baseline				
ITT	+	0	+	+
OLS	+	+	+	+
OLS with controls	+	+	+	0
PSM	+	+	+	+
IPWRA	+	+	+	+
Endline				
ITT	+	0	+	0
OLS	+	+	+	0
OLS with controls	+	+	+	0
PSM	+	+	+	0
IPWRA	+	+	+	+
Merged sample				
Between	+	0	+	0
Random effects	+	0	+	0
Mundlak	+	0	+	0

Note: + means positive significant; 0 means insignificant. Expectations of economic situation is measured by self-reported “Expectation of economic situation in two years compared to current situation” (1-4 scale).

In order to get some idea about the economic relevance of triangle business model, the table below presents ranges of impacts on log monthly revenues and log average litres of milk per day (the two outcome variables that are always significant).

**Table 4.** Range of impacts for technical assistance

	Log monthly revenues	Log average litres of milk per day
Lowest	ITT baseline: 0.16	Lowest ITT baseline: 0.11
Highest	OLS without controls baseline: 0.41	OLS without controls endline: 0.34

The lowest impacts are always related to the ITT estimates. This is not surprising as the ITT estimates measure the impact of *having access to technical assistance*. It is to be expected that the impact of actually using a technician is higher. The highest impacts are found for the simple difference in means estimator (OLS without controls), which is also not surprising as this estimator probably is much less controlling for potential selection biases as the other estimators. It is to be expected that the panel estimators (*Mundlak* and *random effects*) and the IPWRA estimator (which is so-called double robust) are best in terms of controlling for selection biases. This is to some extent confirmed by the estimates, as the coefficients for these estimators are, in general, lower than for the OLS, OLS with controls and PSM estimators.

If we take the lowest and thus most conservative values of potential impacts of technical assistance, then the following holds: providing a farmer access to technical assistance will enable her/him to realise an increase in monthly revenues of around 16%, through an increase in average litres of milk per day of 11%.<sup>8</sup> These are statistically significant and most importantly economically substantial impacts, highlighting the potential for productivity improvements and poverty alleviation offered by the triangle model.

#### *Qualitative analyses*

In addition to the quantitative survey, we designed a short qualitative interview to evaluate the technical assistance and market access. These interviews were conducted in seven communities.

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<sup>8</sup> Production of milk per day varies over the year, but averages 20 liters in good months and 10 in bad months. The same applies to revenues. A rough estimate of 100 USD gross revenue per month can be made for an average dairy farmer throughout the year.

We randomly asked some milk producers, after taking the quantitative baseline survey, whether they would like to also participate in a qualitative interview. We interviewed eighteen milk producers: eleven currently receiving technical assistance, three who received it in the past, and four who never received it. The interview focused on capturing the experience and satisfaction with Sartawi's technical assistance. For those who do not receive it, we asked what type of technical assistance they need and whether they would like to receive it from Sartawi.

From the eighteen qualitative interviews, we found out that all farmers think it is a great idea that a financial institution provides technical assistance in addition to the loan. The eleven farmers who are currently receiving technical assistance and the three who received it in the past believe that technical assistance from Sartawi is an added value because it is essential for milk production, it is for free (they only pay medicines), and it is always available. If they did not have this service from Sartawi, some borrowers would have to pay expensive fees to private veterinarians and some others would not receive assistance as it would not be affordable.

Borrowers are very satisfied with the services provided by the technician. They think he is responsible, professional, committed, and trustable. Not only he treats the animals but he also teaches borrowers how to do it, and he always attends in case of emergencies and urgencies. Nevertheless, a few borrowers complain that sometimes visits are too quick and short and the technician does not attend to scheduled visits if he has to attend emergency or urgency visits.

Some borrowers have requested or renewed their loans because they want to receive or keep receiving technical assistance. For example, in one community, two people requested a loan and technical assistance because they saw how the technician cured a cow that was about to die. However, some other borrowers think that the loan is so expensive that technical assistance does not compensate the high interest rate.<sup>9</sup>

Borrowers identify some changes in their cattle since they receive technical assistance. For instance, the cattle are healthier not only because the technician has treated diseases but also

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<sup>9</sup> This is especially true since Banco Union, a competitor bank, was nationalized and started offering subsidised agricultural loans at sometimes as low as 6%, a rate unachievable by Sartawi which hovers about 3 times as high.

because he has prevented them using vitamins. Cattle fattening has improved through better nutrition and cattle genetics was enhanced replacing creole cattle for Brown Swiss and Holstein.

The four farmers who do not have technical assistance from Sartawi would like to receive this service, mainly about sanitation, genetics and nutrition. Some reasons why they do not receive technical assistance are: they are not clients, they are clients but do not have a productive (agricultural) loan, and they do not want it because they are not satisfied with the service.

Market access remains a more elusive aspect to elicit. Most respondents belonged to a dairy farmers' group and sold to one or more milk processors prior to their engagement with Sartawi. They do not make use of market information at the branch level and rarely make use of weather forecasting at the branch level (which is found to be defective in many occasions). Also, the interest rate discount provided to milk producers that enter the market access arrangements between, for instance, Sartawi and Delicia, are not openly publicized and remain for the most clients obscure. The lack of awareness of clients of the market access benefits provided by Sartawi is by no means evidence that this element of the triangle model is not important. Instead, it shows how more tangible non-financial services (such as technical assistance or medical care) are more likely to capture the attention of clients. Market access arrangements are instead more likely to directly impact Sartawi, as some of the arrangements (including the direct repayment of loans from the milk payouts) likely increase repayment rates and reduce lending risks.

Overall it is clear from the qualitative interviews that Sartawi clients highly appreciate the triangle model. Some even go as far as asserting that they would not be clients if it wasn't for the additional benefits that this bring along. Many clients claim that the interest rates charged by Sartawi are higher than those of the competition, for example, but that it is worth to pay the extra price as long as it comes with vaccinations and emergency treatment of cows in case of morbidity. Moreover, they assert that the presence of the technician as been beneficial to their repayment rates, especially when it resulted in them not losing a cow or milk production to a disease or death. Finally, farmers report that technical assistance has reduced the likelihood that their milk be rejected by aggregators due to lack of quality, increasing their disposable income are reducing their vulnerability.

## 5. Conclusions and Recommendations

This report presented the results of a systematic impact evaluation of the investments made by the Netherlands Development Finance Company (FMO) to support Sartawi in Bolivia through the MASSIF fund. The evaluation found strong evidence that FMO's intervention was perceived as unique and not substitutable by Sartawi. In that sense, there is little doubt that the investment created financial additionality. Moreover, Sartawi management felt supported by FMO during difficult years, and recognize the catalytic effects that FMO's engagement had on further investors at the national and international level. It also showcases its own 'triangle model' of non-financial services (namely, on top of credit, technical assistance and market access services for its clients) and openly asserts that without FMO's presence the model would not have been sustainable in the most difficult years when the client base and portfolio were static or shrinking. Admittedly, however, the triangle model is far from fully developed: it started out in three branches at the beginning of the evaluation, but ended being fully active and functioning in only one branch by the end of it. This poses an important dilemma for investors into Sartawi. In fact, while on the one hand most positive impacts for clients, and most of the innovativeness of its business model, come from this triangle strategy, on the other hand it is still unclear whether this model will ever be sustainable at scale without developing financing and/or impact investors involved.

Sartawi is a versatile institution that is capable of working both in urban and rural areas, both with micro-entrepreneurs, and productive agricultural loans, both with individual and group lending. It's lack of specialization and its capacity to adapt to different markets are probably part of the reason why it has been able to grow and reinvent itself over the years, even when the fundamentals looked bleak. At the same time Sartawi seems to have the highest value added with respect to clients that have fewer alternative lenders available, and in markets where other sometimes better positioned institutions do not dare to reach. This includes lower-income borrowers, and small-scale agricultural businesses in the proximity of larger towns and markets. However, these borrowers sometimes appear to be caught in a vicious circle of vulnerability to shocks and responses which aggravate that vulnerability.

The solution to this could be to increase and expand the provision of complementary financial services which reduce that vulnerability – and this, as the microfinance industry has discovered from bitter experience over the last two decades, means a rebalancing of microfinance towards activities which limit the risks to which the most vulnerable clients are exposed – such as savings, insurance and technical assistance – rather than activities which may augment those risks. Sartawi has shown how it can create virtuous cycles of improved productivity, increased repayment rates and client fidelity by providing technical and veterinarian assistance to dairy farmers. It should aim to expand this model selectively into regions and agencies with the correct mix of suitable characteristics, including 1) proximity to markets/aggregators, 2) sufficient economies of scale given by a relatively large number of clients working in the same industry or value chain, 3) rural areas with relatively less availability of credit alternatives.

Simultaneously, Sartawi could explore bundling its financial services with insurance (something we are aware Sartawi is already piloting), and savings products. The latter may pose obvious problems for an IFD (*Institución Financiera de Desarrollo*, or development finance institution) such as Sartawi, which is not licensed to accept deposits as commercial banks are – and whose clients, certainly on the evidence of this survey, have in most cases not achieved a regular savings habit, in spite of their relatively high incomes. One solution, as several Bolivian IFDs have found, is to form a partnership with a Bolivian microfinance institution (bank or *fondo financiero privado*) and encourage its clients to save with that institution, along the lines of ProMujer's partnership with FIE. Indeed, if this is done at the beginning of Sartawi's relationship with a new, presumably low-income client, it can provide a means of controlling the risk to which that client is subject, rather than let it become a victim to over-indebtedness. This 'staircase model', as it is known in South Asia, has been a great success there with the poorest clients, and it would be a bold and highly progressive idea for Sartawi to help pioneer its adoption in Bolivia.

Our other suggestion arises directly from the most distinctive characteristic of Sartawi's portfolio, which is its commitment to the agricultural sector – a brave decision which opens up the possibility of providing support to many of the most vulnerable people in the country. Sartawi should listen to its clients' needs for more timely delivery of credit (perhaps considering the

automatization of certain steps for returning and virtuous clients. It should also consider the possibility of opening emergency credit lines for agricultural clients that have a history of timely repayments but may have encountered idiosyncratic difficulties *una tantum* due to the vagaries of weather or other uncontrollable factors. Finally, Sartawi should improve its engagement with the 'market access' providing companies (e.g. Delicia) to ensure that the interest rate discounts applied to clients under such schemes are well publicized by both ends of the scheme (i.e. the company and Sartawi). Every qualifying dairy farmer that does not benefit from such discounted rates is a missed opportunity for all parties involved.

As to FMO, it is clear that its support has been fundamental into keeping Sartawi afloat, and it has generated significant interest and trust in its operations by international investors. However, if the ultimate impact ambitions of FMO is to generate poverty reduction, and increased food security and economic growth, the continued financing of Sartawi would have to be assumed with caveats. Indeed, among clients that are well included into financial markets the contribution of Sartawi to poverty reduction and income growth is trivial. Even more, as long as well functioning digitalized and real-time credit registries will not be fully functioning in Bolivia, the presence of an additional lender may increase the chance of over-indebtedness and financial malpractices. Instead, among less financially integrated clients Sartawi and its triangle model have the potential to form a winning strategy to increase investments while at the same time keeping risks for both the financial institution and the borrowers at bay. The development of such model at scale, in combination with additional risk mitigating financial and non-financial products should in our view be the very focus of any future investments by FMO into Sartawi.

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