Improving climate resilience among smallholder farmers

Program Crescer

December 6, 2017
Agenda

• Program Crescer scope
• Climate resilience implementation
• Key learnings
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  - Climate resilience implementation
  - Key learnings
Program Crescer aims to promote economic diversification through capacity building of key value chain actors and local institutions

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<th>Topics</th>
<th>Description</th>
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| Objective    | • Promote **inclusive and sustainable** social and economic development through **economic diversification** in the surrounding area of the mining operation reducing the dependence on the mining sector  
• Participating 4 municipalities (~60,000 population) in the area of direct influence from mining |
| Partners     | • IDB MIF  
• Anglo American Group Foundation  
• Anglo American Iron Ore Brazil (Minas-Rio)                                                                                       |
| Duration     | • 3 years from Nov-17 to Nov-19                                                                                                               |
| Investment   | • US$ 2,7 M                                                                                                                                     |
The market system approach is key to guarantee long term impact sustainability through direct and indirect implementation.

1. Development of public and private institutions
   *Indirect implementation*

2. Development of enterprises and its access to market
   *Direct implementation*

3. Knowledge management

Local context with social, economic, cultural, geographic and environmental factors.

- Milk & cheese
- Horticulture
- Beekeeping
- Tourism

Diagram showing the market system approach with inputs, producers, processors, distributors, retail & wholesale, and consumer.
The cheese sector is a key economic activity for 11 municipalities with a intangible heritage seal for its almost 300 years of history.

Context of cheese production
- 4 municipalities participating¹
- ~600 producers estimated
- 255 producers interviewed
- 80% of producers not certified for sanitary requirements
- 3 ton/year of cheese production
- 7 K animals
- 6,3 L/day average productivity per cow
- 47% of producers with low technical level, 39% with medium level, and 14% with advanced level
- >20% per year market growth

Regional scope of cheese production

¹ Conceição do Mato Dentro, Dom Joaquim, Alvorada de Minas, and Serro
There are three maturity levels defined by the 20 main technical practices related to production and productivity impact.

**Low maturity level**
- 0-33% maturity level
- 282 producers
- R$ 1.237 monthly income¹

**Medium maturity level**
- 33-66% maturity level
- 234 producers
- R$ 3.412 monthly income

**Advanced maturity level**
- 66-100% maturity level
- 84 producers
- R$ 8.000 monthly income

¹ Not considering family workforce
The diagnostic provided a deep analyses on the main value chain challenges and gaps.
Sector table is a collective governance to improve the local institutions leadership in the socioeconomic development strategy

<table>
<thead>
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<th>Capacity building</th>
<th>Formal fresh cheese</th>
<th>Informal fresh cheese</th>
<th>Ripened cheese</th>
<th>Other cheese</th>
<th>Fresh milk</th>
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<td>Articulation</td>
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<td>Association</td>
<td>Producer union</td>
<td>Leaderships</td>
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- **Climate resilience implementation**
- Key learnings
Climate resilience is an important component for short and long term impact sustainability in the dairy value chain

**Short term**
- Increased production efficiency
- Stay in the activity
- Generate cash flow to finance long term investments

**Long term**
- Regenerated environment
- Soil conservation
- Water resources restored
- Microclimatic change

**Expected result**
- Reduced variability in production and profitability
The methodology involved climate and production cross analyses to deliver the most suitable technical practices to be implemented

- Macro and micro climate analyses (INMET and ANA data, 1961-2014)
- Extreme events analyses
  - Reduced precipitation after 1990's
  - Increased temperature after 2000’s year
- Value chain production analyses (IBGE data, 1990-2014)
- Milk production as the main rural activity in the region
- 100% increase in the number of animals
- Increase in milk production
- Climate and production analyses (linear regression)
- 0.06% increase in milk production for every 1 mm/year increase in precipitation
- 113 mm less precipitation led to a 6.78% production decrease in the last 50 years
- Results validation on the field with producers
- Conversations with producers and visit to production areas
- Perception of reduced and later precipitation (longer periods with less rain per day)
- 11 detailed practices
- Water and feed availability as key aspects
- Sustainable intensification for feeding (sugar cane)
- Management of rural business (herd structure)
- Technoserve implementation through current TA plan
- R$30 M/ year of incremental sales due to resilient systems
- IRR 25-28%
- > R$130 K average investments – need for A2F support
Each practice selected has a detailed implementation plan

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<td><strong>Name of practice</strong></td>
<td>Pastejo Rotacionado</td>
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</table>
| **Objective**                   | → Otimizar eficiência produtiva  
   Diminuir oscilações produtivas  
   Recuperação dos serviços ecossistêmicos  
   Otimizar a eficiência produtiva através de um melhor manejo da pastagem, com o objetivo de diminuir a perda e fibra, garantir uma maior segurança alimentar e gerar vários benefícios com resultado econômico de curto, médio e longo prazo. |
| **Importance**                  | → Necessária (curtíssimo prazo)  
   Necessária (médio a longo prazo)  
   Aconselhada  
   Necessária com ação de curto prazo e resultado de curto, médio e longo prazo. |
| **Local context**               | Pastejo extensivo com subpastejo, resultando em forragem mal manejada, muita sobra no pasto e com permanente baixa qualidade nutricional do capim |
| **Description**                 | Tecnologia para uso no manejo da pastagem, que favorece a colheita pelos animais de uma forragem com qualidade nutricional superior |
| **Technical description**       | Tecnologia que tem sua base no período de descanso e período de ocupação da espécie forrageira |
| **Estimated impact**            | Intensificação do uso da área, e com isso diminuição da área necessária para criação dos animais, além de promover incremento da produção de leite, e diminuição da necessidade de concentrado. |
| **Investment needed**           | R$ 500- R$1500/Ha                                                                                                                           |
| **ROI**                         | 3 meses após ser assimilado                                                                                                                 |
| **Challenges**                  | Técnico capacitado para realizar essa intervenção e cultural. Produtores acostumados a produção de leite num sistema extrativista |
| **Requirements for implementation** | Planejamento da área necessária para comportar os animais, definição da área, mapeamento e definição do tamanho e da localização dos piquetes. Equipe de serviço técnico capacitado e com plano estruturado de visitas, caderno de anotações, software (ou excel) de análise produtiva e econômica, e metas |
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# Key learnings of climate resilience methodology implementation

## Feasibility of light touch methodology
- Efficient add-on methodology with potential inclusion in all relevant agricultural projects – producers module
- Data availability constraint on climate and production - no previous record data of individual producers

## Participative methodology efficiency
- Effective participative approach to engage producers through data validation/hypotheses testing on the field - increased chance of practices adoption

## Support for long term practices
- Long term practices implementation outside the program timeline – how to support implementation and monitoring of these practices? (e.g. reforestation for thermal comfort)
- Willingess for high investments of long term practices (e.g. R$27K for water storage, 10 years water shortage cycle)

## Cultural factors in practices implementation
- Producers perception of climate effect in production
- Cultural factors influence in practices adoption (e.g. corn versus sugar cane as supplementary feeding)
- Historical habits to use water spring for cattle
Contact information

TechnoServe | Brazil

Mônica Coutinho
Country Manager
Tel. 31 98318 2570
Tel. 11 98551 7080
E-mail: mcoutinho@tns.org

www.technoserve.org