Proadapta Sertao
Preliminary results

Climate Risk and Investment Symposium
Washington D.C.
20\textsuperscript{th} of April, 2017

Daniele Cesano
Agenda

1. Location
2. The problem
3. Our approach and business
4. Our impact
5. Possible scaling up mechanism
6. The market size
7. Lessons learnt and considerations
Location
Characteristics

- Abundant heat
- One main rainy season or two/three shorter seasons
- Little rain (600-800 mm/year)
- Negative water balance (Et ≈ 3P)
- High risk of drought (60%)
- Salinity of water and soil
- Dry winds
- Soil poor in nutrients
- Low population density (23 inhab/sqkm)
- Poverty (> 60% receive government subsidies)
Climate change over the past 50 years (1964-2014)

The combined and accumulated losses in milk, cattle, sheep, goats and corn in the dry season of 2012 in BJ: between R $ 18 and R $ 33 million for the Jacuípe Basin → 20% of overall income from agriculture and pasture

Source:
Distribution of milk production

- 95% of farmers in Brazil produce less than 200 liters/day and account to 67% of the production → the less efficient, poorer and more vulnerable farmers to climate change
- The remaining 5% produce 33% of the milk

Milk productivity (liters/animal/year)

Source: BNDES, 2014
# Mechanization

<table>
<thead>
<tr>
<th></th>
<th>North</th>
<th>Northeast</th>
<th>Southeast</th>
<th>South</th>
<th>Center-west</th>
<th>Brazil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk cooling tank</td>
<td>1.3%</td>
<td>0.3%</td>
<td>10.8%</td>
<td>24.1%</td>
<td>8.0%</td>
<td>10.8%</td>
</tr>
<tr>
<td>Mechanical milking</td>
<td>1.8%</td>
<td>2.1%</td>
<td>20.5%</td>
<td>38.2%</td>
<td>7.1%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Artificial insemination</td>
<td>2.6%</td>
<td>3.5%</td>
<td>9.6%</td>
<td>22.3%</td>
<td>4.7%</td>
<td>7.6%</td>
</tr>
<tr>
<td>Embrio transference</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.8%</td>
<td>0.9%</td>
<td>0.4%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Source: Censo Agropecuario 2006
Climate change and production inefficiency

- **CLIMATIC EVENTS** (climate change)
  - Climate
  - Public/private sector institutional framework and research institutions

- **R&D**

- **POLICIES**

- **INVESTMENTS**

- **ACCESS TO MARKET**

- **AGRO INDUSTRIES**

- **LOGISTICS**

- **VALUE CHAIN MANAGEMENT**

- **CAPITALIZATION (incl. CREDIT)**

- **TECHNICAL ASSISTANCE**

- **FARM MANAGEMENT**

- **PRODUCTION SYSTEM**

- **Value chain inefficiency**
  - Farmer
  - Private sector

- **Value chain risk**
Value chain steps for climate resilience

CLIMATIC EVENTS (climate change)
CLIMATIC EVENTS (baseline)
R&D
POLICIES
INVESTMENTS
ACCESS TO MARKET
AGRO INDUSTRIES
LOGISTICS
VALUE CHAIN MANAGEMENT
CAPITALIZATION (incl. CREDIT)
TECHNICAL ASSISTANCE
FARM MANAGEMENT
PRODUCTION SYSTEM

Public/private sector institutional framework and research institutions

Private sector

Farmer

Value chain inefficiency

Value chain risk

LOW
MEDIUM
HIGH

CLIMATE ANALYSIS AND CORRELATION STUDIES
RESEARCH PROGRAMS
INSTITUTIONAL INNOVATION
WORKING CAPITAL AND FINANCING
LOGISTICS OPTIMIZATION
BEST MANAGEMENT PRACTICES
CAPITALIZATION STRATEGY
MAIS (ATER)/Technical assistance
MAIS
MAISoft
• Climate Smart Agricultural System
  – Achieving maximum production efficiency → Prevent
  – Regenerating the environmental resources → Prepare
  – Minimizing production and income oscillations → Pass
MAIS: basic principles

1. **Specific** for each value chain
2. **Food and water security** for 2 dry years
3. **Rotational pasture**
   - 100% of pasture land needs to be in silvipastoral settings with 100% shadow
4. **Economic viability** to guarantee 2 minimum wedges/month/farmer
   - Minimum salary to stop rural exodus to urban areas
Building capacity among field technicians
Farmers’ work groups
Building farmers’ capacity
Farmers’ exchange visits
Our baseline

- **Production**
- **Time**

- **Rain season**
- **Dry season**
- **Severe drought**
- **Farmer’s exit**

Graph showing production levels during different seasons.
Our expectation with the MAIS
Viability analysis, milk production (March 2017)

Typical supplier to the diary industry

- Initial production volume (l/day): 67,60
- Initial net income (R$/month): 634,38
- Current production volume (l/day): 93,85
- Current net income (R$/month): 982,74
- Farmer’s investments: 4,194,94
- Nr of months: 10,43
  - Our objective: 130 l/day in 24 to 36 months

INDICATORS
- Increase in production (l/day): 26,24
- Increase in production (%): 39%
- Increase in net income (R$/month): 348,36
- Increase in income (%): 55%
Data source: Coopserqao
Scaling up: what and how to finance?

**ASSET 1:**
- **DIARY INDUSTRY**

**ASSET 2:**
- (Impact) investor?
- Industry?

**ASSET 3:**
- Bank and insurers?

**ASSET 4:**
- Governments?
- Devel. Banks
- Citizens?

1. Improved ecosystem services
2. Reduced social subsidies
3. Reduced credit insolvency and insurance premium
4. Reduced oscillations
5. Incremental production
6. Farmers’ baseline production

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- $?
- $?
- $?
Viability
USD$ 1 M investment

Government
• 250 farmers
• Increase in taxes: USD$ 431k
• Payback: 2.38 years
• Not including decrease in...
  – Insolvency rate
  – Subsidies
  – Rural migration

Private sector
• 250 farmers
• Increase in revenues: USD$ 234k
• Payback: 4.4 years
• Not including decrease in...
  – Logistics costs
  – Oscillation and process optimization
### The market

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<tbody>
<tr>
<td><strong>Our conservative production increase (%)</strong></td>
<td>38%</td>
</tr>
<tr>
<td><strong>Our potential market increase, milk, Brazil (USD$/year)</strong></td>
<td>5,961,774,704</td>
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<tr>
<td><strong>Our potential market increase, milk, Northeast Brazil (USD$/year)</strong></td>
<td>596,177,470</td>
</tr>
<tr>
<td><strong>Number of farmers, Brazil</strong></td>
<td>1,306,808</td>
</tr>
<tr>
<td><strong>Number of farmers, NE-Brazil</strong></td>
<td>130,681</td>
</tr>
<tr>
<td><strong>Investment needs (USD$/farmer)</strong></td>
<td>12,500</td>
</tr>
<tr>
<td><strong>Total investments, Brazil (USD$)</strong></td>
<td>16,335,100,000</td>
</tr>
<tr>
<td><strong>Total investments, Northeast (USD$)</strong></td>
<td>1,633,510,000</td>
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Lessons learnt and considerations

1. Farmers invest in resilience after achieving better production indices
   – Longer term investment
2. Governments need to shift rapidly from an approach that wants to universalizes technical assistance to a more result-based approach
   – Risk: a large number of farmers migrating to urban areas in the next 10 to 20 years
   – How can development banks operate in this transition?
3. We see the private and financial sectors as the main driver for change
   – We need new financial investment structures
   – Pay for results?
4. Key questions for scaling up
   – What is the market value of resilience?
   – How much is the industry willing to pay for resilience?
   – Who shall finance what and how?
THANK YOU

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