Supply Chain Climate Change Risk Assessment:
Danone’s Margarita Project in Mexico

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The Margarita Project

An initiative from Danone’s Ecosystem Fund to create a sustainable milk-sourcing strategy while improving the livelihoods of small-scale milk producers

“A new model of milk supply”
Achievements

_bullet Farmers’ empowerment: Provides full suite of services enabling participating farmers to increase their productivity, quality, and income

_bullet Some relevant indicators:
  - Increase the number of cows per stable
  - Yield increase
  - Better-quality milk (fat, protein, microbiology, somatic cells - mastitis)
  - Higher prices per litre
Objectives of the mandate

- Examine the **practical steps to build climate resilience** in Margarita’s dairy supply chain
- Identify **concrete adaptation options** for a positive contribution towards Danone’s business and sustainability targets, including carbon neutrality
- Provide the **foundations for developing an assessment process** that could be replicated across Danone’s Latin and Central American operations

“Margarita, a climate smart project”
Climate Risk Analysis of a Supply Chain

Climate change risk varies along the supply chain with impacts taking many forms:

- “Physical” impacts on assets and operations
- Reduction of the availability and/or increase of the price of certain inputs
- Decrease of the supplier workforce availability and productivity
- Possible regulatory and/or reputational risks
Gaining resilience leads to a competitive advantage in a climate change context:

- Introduces new products and technologies may result in more efficient production and logistical processes and cost reductions
- Contributes to the development of technologies and services can help other stakeholders gain resilience and reduce their emissions at a lower price
- Brings new market opportunities and provides an edge over competitors
- Builds a better corporate image
Methodological Approach to Risk Assessment and Management

**Step 1: Prepare**
- Map of the supply chain: Identification of key components and locations
- Analysis of climate data: Observed climate and mid- to long-term future projections
- Identification of potential climate risks for each part and the value chain: Literature review and interviews with experts
- Preliminary identification of potential adaptation options: Literature review and interviews with experts

**Step 2: Analyse, identify and prioritise**
- Analysis of the projected climate changes and their past consequences (participative risk identification and assessment)
- Identification of potential adaptation options
- Multicriteria analysis to select and prioritise the proposed adaptation options

**Step 3: Plan**
- Develop a concept note for each prioritized adaptation measure and identify the key enabling factors: Capacity building activities, institutional arrangements, etc.
- Elaborate a roadmap for an efficient implementation of the prioritized adaptation measures: Establish the financial arrangements (financing strategy) and generate the implementation strategy

**Step 4: Take action**
- Implement the prioritized adaptation measures
- Monitor progress, effectiveness and performance
- Adjust where needed
- Share your success
Margarita Project’s Supply Chain

• **Concentrated, homogeneous supply chain**, located in a small geographic area (and therefore **exposed to similar climate change impacts**)

• Except for chemical fertilizers providers and transporters, **all parties are agricultural producers**
Margarita Project’s Supply Chain

Margarita’s farmers

- Animal feed sellers (silage)
- Seed providers
- Fertilizer (organic or chemical) providers

Margarita’s farmers

Small scale dairy farmers:
- 28 dairy cows/farm
- 18 ha maize and pastures/farm

Transporters

Central repository

Danone production site
Margarita Project Area
Climate Data

Acclimatise
building climate resilience
Climate Change Projections

• Average annual temperature increase:
  • + 0.5 °C to + 2 °C from 2017 to 2039
  • + 0.2 °C to + 6 °C from 2040 to 2099

• Changes in total annual rainfall:
  • Maximum projected decrease - 23.32 % and maximum projected increase + 7.74% from 2017 to 2039
  • Maximum projected decrease - 40.42 % and maximum projected increase + 4.23% from 2040 to 2099

• Droughts - mean annual irrigation deficit between -5% and -15% for 2030

• Floods may occur in lowlands and valleys

• Medium risk of precipitation-triggered landslides due to regional topography
Climate Change Impacts on Margarita’s Supply Chain

• Literature review and interviews with experts and stakeholders to identify and assess impacts

• Main climate challenges:
  • Water scarcity, rising temperatures, more frequent and intense extreme weather events
## Climate Change Impacts on Margarita’s Supply Chain

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<th>Value Chain Components</th>
<th>Main Potential Impacts</th>
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| **Margarita’s Farmers** | Decrease in milk production and conception rate  
Additional manpower needed for alternative sources of water  
Higher risks of mastitis (leads to production reduction)  
Lower yields of forage plants and reduction of their quality  
Need to purchase more fodder crops from suppliers at higher prices  
Power cuts (milk refrigeration problems)  
Damage to productive infrastructures |
| **Suppliers** | Lower yields of forage plants and reduction of their quality  
Loss of income |
| **Transport** | Logistical challenges for milk collection and transport |
Climate Change Impacts on Margarita’s Supply Chain

- All the impacts identified reduce yields, increase costs, and augment the risk of cattle health problems

- No positive impacts have been identified

- The progress made under the Margarita project is likely to be halted and possibly reduced because of these impacts, unless adaptation actions are taken
Participatory Multicriteria Analysis

Prioritization Criteria:

- Capacity of proposed measure to respond to one or more key climate risks identified
- Probability of effective implementation of the measure in short term, given existing economic, technical, institutional, human capacities and willingness of farmers to apply it
- Cost-efficiency of the measure and existing possible financial options
- Co-benefits provided through the measure, including its contribution to GHG emissions reduction.
- Contribution of the adaptation option to a "transformational change" (measure has impact beyond a specific investment and contributes to a paradigm shift to achieve more resilient dairy farming)
- Possibility of replication and scaling up
Proposed Climate Change Adaptation Measures

“Threshold Effect”

• Minimum size needed (around 40 to 50 productive cows) for non-productive measures requiring high initial investments

• **Below the threshold**: measures aiming at reinforcing the financial and managerial sustainability of the farms, productive investments (additional cattle, milking parlors, more efficient stabling systems, etc.) and adaptation measures that do not need important initial investments can be introduced progressively
Margarita: A *Climate Smart Project*

Key resilient and low-carbon investment options for the Margarita Project:

**Water harvesting, storage and treatment systems:** install rainwater catchment systems to increase water available, even during periods of low or sporadic rainfall
Margarita: A Climate Smart Project

Key resilient and low-carbon investment options for the Margarita Project:

Farm reforestation: plant or protect trees and bushes to favour water infiltration and preservation, protect cattle from heat stress and solar radiation and capture and store CO2
Margarita: A *Climate Smart Project*

Key resilient and low-carbon investment options for the Margarita Project:

**Biodigesters**: manure and slurry management and treatment techniques to reduce GHG emissions, improve soil quality and moisture preservation, reduce chemical fertilizers’ costs and environmental impacts
Margarita: A Climate Smart Project

Key resilient and low-carbon investment options for the Margarita Project:

- **Installing solar panels** on farms reduces reliance on centralised grid supplies, provides greater resilience during extreme events’ disruption, decreases GHG emissions from conventional energy sources, reduces energy bill, and can provide shade and shelter for cattle.
Margarita: A *Climate Smart Project*

**Measures for Enhancing Resilience**

- Improve feed quality, using less fibrous forages and balanced formulas, and *adapt dietary patterns under heat stress conditions*
- Install *feeders and drinking troughs in the farmyards* to improve feed efficiency
- Surveillance and *early detection of infectious diseases* (mastitis)
Margarita: A Climate Smart Project

Measures for Enhancing Resilience

- Test and progressively introduce *agricultural practices to improve soil quality and preserve soil moisture*:
  - crop rotation (avoid monoculture of maize), no till / reduce till, leave harvest residues in the fields, cover crops
- Introducing *new cattle breeds and crop varieties more resilient to drought*
- Installing and/or using *early warning systems* for droughts, heatwaves, and fires
- Encouraging the *participation of farmers to agricultural insurance systems* (i.e. parametric insurance)
Accompanying Measures (Danone)

- Continue **awareness raising activities** around climate change impacts and possible solutions
- Propose **capacity building activities and pilot projects** regarding new practices and technologies for a better understanding of implications and needs (i.e. biodigesters, cover crops)
- Enable **institutional agreements** with public and private entities that **provide training and capacity building activities** for farmers about the new practices and technologies for farms
Margarita: A *Climate Smart Project*

**Accompanying measures (Danone)**

- **Establish commercial framework for more efficient access to new technologies**: Danone is negotiating with some firms working on solar panels and biodigesters to have advantageous conditions for their associate farmers.

- **Enable financial arrangements** to facilitate the access of Margarita’s associates to financial sources (grants and loans) to ensure more favourable financial conditions.

- **Allow institutional arrangements to enable effective implementation of some adaptation measures** (i.e. agreements with CONAFOR to promote reforestation measures).
Lessons Learned

• Early involvement of key stakeholders is essential for enhancing resilience of the supply chain and enabling transformational changes

• Key aspects for climate risk assessment of a supply chain:
  • **Nature and magnitude of climate change impacts** on supply chain and supplier’s ability to cope with these effects
  • **Flexibility and concentration of the supply**
Lessons Learned

• Adaptation measures for a more resilient supply chain:
  • Concrete adaptation measures to address climate change impacts
  • Adaptation options to **diversify and deconcentrate the supply**
  • Measures **favouring an enabling environment** for implementation of selected adaptation measures and having leverage to boost impacts towards more resilient supply chain
Muito obrigada pela vossa atenção!

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