Contribution of the Dairy Sector to Economic Growth and Food Security in Malawi

Scotland’s Rural College (SRUC), UK
Lilongwe University of Agriculture and Natural Resources, Bunda Campus, Malawi
The African Institute of Corporate Citizenship (AICC), Lilongwe, Malawi


Contact name: Dr Cesar Revoredo-Giha (cesar.revoredo@sruc.ac.uk)

Leading the way in Agriculture and Rural Research, Education and Consulting
Outline of the presentation

1. Introduction to the project
2. Milk production
3. Milk bulking groups
4. Dairy processors
5. Dairy distribution
6. Milk consumption
7. Conclusions, recommendations and discussion points
About the project

• The Department for International Development (DFID) and the Economic and Social Research Council (ESRC) partnered in a programme on economic growth in developing countries.

• The DFID/ESRC Growth Programme funds world class scientific research on issues relating to inclusive economic growth in Low Income Countries, with high potential for impact on policy and practice.

• This is a research project not a development project.

• We expect that the results and recommendations to be useful to the dairy supply chain.
About the project

• The project is multidisciplinary

• SRUC were partnered with Bunda College of Agriculture in Malawi and the African Institute of Corporate Citizenship (AICC), Malawi office.

• The project started in June 2012.

• It will finish at the end of May 2015.
Motivation behind the proposal

• The proposal was motivated by three facts:

1. The Malawi Government considered **dairy production a priority** within the livestock sector and continues, e.g. ‘Malawi Investment Projects 2014’.

2. ‘**Supply chains in disarray**’ have been identified as a barrier to growth for the agricultural sector.

3. They can be a **constraint to the achievement of food security in a country** because less than the optimal amount will be produced with a given level of resources and at **higher prices**. In addition poor creation of **employment**.
Motivation behind the proposal

• Reasons behind the malfunctioning of supply chains are various and they can be historical, some examples:
  – As in the case of industries born from **import substitution experiences**.
  – As the **result from structural reforms**, e.g., the case of the transition economies

• Because of this, supply chains can be plagued with:
  – Problems of **inefficiency**,  
  – High **transaction costs**,  
  – **Unbalanced power distribution along the chain**,  
  – Poor product **quality**.
Situation about production early 2011

Malawi: Production of milk 1961-2008

No a clear expansion trend and might be dependent on the policy implemented at the time.

Source: FAO
The logic of the project was based on the following facts (according to the literature up to early 2011):

1. Under utilisation of processing capacity;
2. Use of imported reconstituted powder milk;
3. Profitable processing sector targeting affluent urban population;
4. Poor quality milk leading to rejection by processors (17%);
6. Significant proportion of milk production sold as raw milk (“informal market”);
7. Malawi has the lowest consumption of milk per capita in Africa (estimated at 4.7 kg/capita/year).
8. Donors have been contributing to the development of the sector for several years.
Purpose of the project

• The principal aims of the project were to **evaluate two alternatives of development for the sector**:

1. To strengthen the formal dairy supply chain;

2. To foster micro-processing at the level of the milk bulking groups and selling directly to consumers.

• **However, the strategy of selling raw milk directly to consumers** came during the project.

• These **strategies compete with each other**.
Aim of the project

• Specific aim of the project was to provide an **assessment of the operation of the entire dairy supply chain to** identify factors hampering the sector’s contribution to economic growth and food security.

• Particular questions were:
  – How efficient is the production of milk in Malawi and what factors affect its expansion?
  – What factors affect the marketing of milk?
  – Do processors have market power on the buyer and selling side?
  – What is the role of retailers?
Methodologies and work done

• The methodology of project has involved several stages, some of which are:
  – Review of the operation of each of the chain stages;
  – Integration of results into a multimarket model to simulate the impact of different policy scenarios on food security indicators and sector growth;
  – Propose recommendations based on the quantitative and qualitative evidence and on the analysis.
Methodologies and work done

- The results presented in this seminar derive from:
  - Survey of 460 dairy producers;
  - Semi-structured interviews with 27 milk bulking groups (northern, central and southern regions of Malawi);
  - Interviews with most of the processors and several stakeholders (including donors);
  - Survey to retail shelves (retail audit to collect retail prices);
  - Interviews with 143 consumers;
  - Estimation of a demand system using the LSMS for Malawi 2010-11.
2. Milk production
Growth indexes for milk production, yield and milk animals, 1961-2012 (100=1961)

<table>
<thead>
<tr>
<th>Period</th>
<th>Milk Animals (Head)</th>
<th>Yield (Hg/An)</th>
<th>Production (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-2012</td>
<td>3.5%</td>
<td>1.2%</td>
<td>4.9%</td>
</tr>
<tr>
<td>1961-1969</td>
<td>6.1%</td>
<td>0.0%</td>
<td>6.1%</td>
</tr>
<tr>
<td>1970-1985</td>
<td>4.4%</td>
<td>4.4%</td>
<td>9.1%</td>
</tr>
<tr>
<td>1986-1995</td>
<td>-0.2%</td>
<td>-0.1%</td>
<td>-0.4%</td>
</tr>
<tr>
<td>1996-2005</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.9%</td>
</tr>
<tr>
<td>2006-2012</td>
<td>10.7%</td>
<td>0.8%</td>
<td>11.7%</td>
</tr>
</tbody>
</table>
Spatial Distribution, dairy cows and yield per dairy cows
Distribution of efficiency scores
Gross margins per month on dairy enterprises (2013 price averaged 85MK/litre)
Current adoption levels of improved practices (% of uptake)

- Purchase of crop by-products: 21%
- Use of concentrates: 36%
- Feed conservation: 40%
- Use of AI: 66%
- Use of vaccination: 82%
Explaining differences in efficiencies

**Significant variables**

- Years in farming (+)
- Household size (+)
- Breed (compared to Holstein)
  - Zebu (- -)
  - Zebu Cross (-)
  - Ayrshire (+)
- Region (comp to south)
  - Central (-)
  - North (- -)
### Farmer identified aspirations and constraints

<table>
<thead>
<tr>
<th>Top 5 Aspirations</th>
<th>Top 5 Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increase number of dairy cows</td>
<td>1. High cost of concentrate food</td>
</tr>
<tr>
<td>2. Produce more feed</td>
<td>2. Low market price of milk</td>
</tr>
<tr>
<td>3. Buy more feed</td>
<td>3. Low milk yield</td>
</tr>
<tr>
<td>4. Improve the grade of animals</td>
<td>4. Lack of fodder or roughage</td>
</tr>
<tr>
<td>5. Change farm management</td>
<td>5. Price of cattle feed</td>
</tr>
<tr>
<td>practices</td>
<td></td>
</tr>
</tbody>
</table>
3. Milk bulking groups (MBGs)
Conceptual Framework and pathways to growth
Social Capacity

• Private Entrepreneurs
• Farmer MBGs all have very similar structure
  – Sub committees
  – Business motivations

• Importance of buyers

• Mixed relationships with other MBGs / producer associations (PA)
• On going training needs
Technical Capacity

- Mix of equipment acquisition pathways
- Storage – generally NGO donor or processor
- Wastage issues
- Maintenance schedule variable
- Water / electricity supply
- AI issues (storage of straws)
Economic Capacity

• **Membership number / milk deliveries important**
  – Variable membership fees and annual costs
  – Variable MBG levy rates justified by access to benefits

• **Price received** (PAs play important negotiating role)

• **Access to finance**

• **Operational costs**
Structural Capacity

• Support from **Producer Associations**

• **Development of** Heifer rearing & Pass-on-programme

• **Functioning** AI centres / Liquid Nitrogen plants

• **Interaction** with Government
  – Extension / veterinary / AI technician/ bulls / training
  – Electricity supply issues
  – Road infrastructure

• **Inter-MBG** competition and capacity
Constraints and Aspirations

• Aspirations
  – Micro processing
  – Training of committee members
  – More farmers
  – 2\textsuperscript{nd} afternoon delivery option
  – Increase storage capacity
  – Solar panels
  – Housing for buyers
  – Increase no. of private MBGs
  – Higher yielding cows
  – Meeting room / buildings
  – Water – borehole / mains
  – Security (fencing)
  – Back-up generators
  – Feed processing

• Constraints
  – Lack of finance for investment
  – Lack of animals
  – Energy supply
  – Liquid N
  – Price setting
  – Quality / breed of cows
  – Input costs
  – Competition with other MBGs
  – Access to extension
  – Mains water access
  – Storage capacity
  – Farmer training
  – Membership numbers
4. Milk processing
Structure of the processing sector

- Processing in Malawi is limited in scale and extent.
- There are 3 types of processor:

  - **Commercial Dairies**
    - Lilongwe Dairies
    - MDI
    - Dairibord Malawi Ltd.
    - Suncrest Creameries
    - Operating below capacity
    - 40-50% in the South,
    - 30-40% in Central
    - Increases costs

  - **Privately owned small scale dairies**
    - Katete Dairy Farm
    - Sable Farming (also drawing from MBGs).

  - **Micro processors**
    - Limited in number
Processors operations

• The pattern of milk usage by processors indicates that:
  – 33% to pasteurised milk
  – 50% to UHT production (about 9% is exported)
  – 17% to other products (yoghurt, chambiko, etc.)

• **Pasteurised milk** primarily serves the urban market (where it is a legal requirement).

• **UHT** has much longer shelf-life
  – travels longer distances (e.g., to rural areas)
  – potential for export (foreign exchange earnings)
  – high margins
## MBG Deliveries to Processors (thousand litres)

<table>
<thead>
<tr>
<th>Year</th>
<th>Dairibord Malawi Ltd.</th>
<th>Suncrest Creameries</th>
<th>Sable Farming Company</th>
<th>Lilongwe Dairies Ltd. South</th>
<th>Lilongwe Dairies Ltd. Central</th>
<th>Lilongwe Dairies Ltd. Total</th>
<th>MDI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>4,153</td>
<td>1,829</td>
<td>--</td>
<td>4,734</td>
<td>841</td>
<td>5,576</td>
<td>417</td>
<td>11,973</td>
</tr>
<tr>
<td>2010</td>
<td>4,660</td>
<td>2,045</td>
<td>312</td>
<td>6,817</td>
<td>805</td>
<td>7,622</td>
<td>598</td>
<td>15,237</td>
</tr>
<tr>
<td>2011</td>
<td>5,987</td>
<td>2,121</td>
<td>466</td>
<td>7,260</td>
<td>1,288</td>
<td>8,548</td>
<td>416</td>
<td>17,538</td>
</tr>
<tr>
<td>2012</td>
<td>5,521</td>
<td>2,143</td>
<td>286</td>
<td>8,614</td>
<td>1,179</td>
<td>9,792</td>
<td>287</td>
<td>18,029</td>
</tr>
<tr>
<td>2013 1/</td>
<td>5,776</td>
<td>2,319</td>
<td>363</td>
<td>8,068</td>
<td>807</td>
<td>8,876</td>
<td>196</td>
<td>17,530</td>
</tr>
<tr>
<td>2014 2/</td>
<td>4,621</td>
<td>5,457</td>
<td>141</td>
<td>8,393</td>
<td>807</td>
<td>9,200</td>
<td>196</td>
<td>19,615</td>
</tr>
</tbody>
</table>

### Shares (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Dairibord Malawi Ltd.</th>
<th>Suncrest Creameries</th>
<th>Sable Farming Company</th>
<th>Lilongwe Dairies Ltd. South</th>
<th>Lilongwe Dairies Ltd. Central</th>
<th>Lilongwe Dairies Ltd. Total</th>
<th>MDI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>34.7</td>
<td>15.3</td>
<td>--</td>
<td>39.5</td>
<td>7.0</td>
<td>46.6</td>
<td>3.5</td>
<td>100.0</td>
</tr>
<tr>
<td>2010</td>
<td>30.6</td>
<td>13.4</td>
<td>2.0</td>
<td>44.7</td>
<td>5.3</td>
<td>50.0</td>
<td>3.9</td>
<td>100.0</td>
</tr>
<tr>
<td>2011</td>
<td>34.1</td>
<td>12.1</td>
<td>2.7</td>
<td>41.4</td>
<td>7.3</td>
<td>48.7</td>
<td>2.4</td>
<td>100.0</td>
</tr>
<tr>
<td>2012</td>
<td>30.6</td>
<td>11.9</td>
<td>1.6</td>
<td>47.8</td>
<td>6.5</td>
<td>54.3</td>
<td>1.6</td>
<td>100.0</td>
</tr>
<tr>
<td>2013</td>
<td>32.9</td>
<td>13.2</td>
<td>2.1</td>
<td>46.0</td>
<td>4.6</td>
<td>50.6</td>
<td>1.1</td>
<td>100.0</td>
</tr>
<tr>
<td>2014</td>
<td>23.6</td>
<td>27.8</td>
<td>0.7</td>
<td>42.8</td>
<td>4.1</td>
<td>46.9</td>
<td>1.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The table shows the distribution of the milk delivered to processors. Our estimation for 2014 indicates that three major companies receive 98.3% of the milk delivered, of which about 47% goes to Lilongwe Dairies.
Nominal and real weighted average price of milk paid to farmers by processors

It is important to understand farmers responses to prices and processors can only exercise buyer power if the supply is responsive.
Responsiveness of milk deliveries to changes in the prices

• Important factors:
  • Each processor faces its own dynamic.
  • Estimated supply showed strong trends and seasonal effects.
  • Specific shocks that affect the supplies of milk from MBGs.

• Responses of milk deliveries were found to be different for increases and decreases of prices paid, e.g.
  – Dairibord – limited response to price increases, strong response to decreases
  – Lilongwe – limited response to price decreases, strong response to increases
  – Suncrest – stronger response to both changes in prices
5. Milk distribution
Motivation for the work

Acceleration in the expansion of supermarkets in developing countries

Lower food prices + Better availability of foods

High retail margins

Higher food prices

Stagnated demand for dairy products

HOWEVER

To be tested
## Data and methods

<table>
<thead>
<tr>
<th>Wholesale (WP) &amp; recommended prices (RP)</th>
<th>Retail prices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Processors:</strong></td>
<td><strong>Retailers:</strong></td>
</tr>
<tr>
<td>Suncrest Creameries Ltd</td>
<td>People’s, Sana, Spar, Chipiku, Shoprite, Game, 7eleven, Shopexpress and Foodzone</td>
</tr>
<tr>
<td>Dairiboard Malawi Ltd</td>
<td><strong>Products:</strong></td>
</tr>
<tr>
<td>Lilongwe Dairy</td>
<td>Pasteurised milk</td>
</tr>
<tr>
<td>Sable Farming</td>
<td>UHT milk</td>
</tr>
<tr>
<td><strong>Products:</strong></td>
<td>Chambiko</td>
</tr>
<tr>
<td>Pasteurised milk</td>
<td>Yogurt</td>
</tr>
<tr>
<td>UHT milk</td>
<td></td>
</tr>
<tr>
<td>Chambiko</td>
<td></td>
</tr>
</tbody>
</table>
Findings

Retail and recommended margins are different.

Retail margins differ by processors’ products.

Retail margins are higher for the type and size of dairy products most consumed by low-income families.

Food security is negatively affected

<table>
<thead>
<tr>
<th>Table 1: Wholesale, recommended, retail margins</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Pasteurised milk - 250ml</td>
</tr>
<tr>
<td>Processor 1</td>
</tr>
<tr>
<td>Processor 2</td>
</tr>
<tr>
<td>Pasteurised milk - 500ml</td>
</tr>
<tr>
<td>Processor 2</td>
</tr>
<tr>
<td>Processor 3</td>
</tr>
<tr>
<td>Ultra-pasteurised milk - 250ml</td>
</tr>
<tr>
<td>Processor 4</td>
</tr>
<tr>
<td>Processor 1</td>
</tr>
<tr>
<td>Ultra-pasteurised milk - 500ml</td>
</tr>
<tr>
<td>Processor 4</td>
</tr>
<tr>
<td>Processor 1</td>
</tr>
<tr>
<td>Chambiko - 250ml</td>
</tr>
<tr>
<td>Processor 1</td>
</tr>
<tr>
<td>Processor 2</td>
</tr>
<tr>
<td>Processor 3</td>
</tr>
<tr>
<td>Chambiko - 500ml</td>
</tr>
<tr>
<td>Processor 1</td>
</tr>
<tr>
<td>Processor 2</td>
</tr>
<tr>
<td>Processor 3</td>
</tr>
<tr>
<td>Yogurt - 250ml</td>
</tr>
<tr>
<td>Processor 1</td>
</tr>
<tr>
<td>Processor 2</td>
</tr>
</tbody>
</table>
6. Milk consumption
Motivation for the work

Determinants with positive effect

Consumption of milk

Determinants with negative effect

High prices (as a result of high retail margins)

?
Scope of the analysis

- 143 real consumers were randomly approached and interviewed.

- The interviews were carried out in Lilongwe and Blantyre (in shopping centres and supermarkets).
Factors affecting the demand for milk

Determinants with positive effect
- Health
- Usage of milk
- Income increase
- Age: young consumers

Determinants with negative effect
- High prices
- Lack of availability
- Lack of information

Consumers’ demand, preferences & willingness to pay for milk
7. Conclusions, recommendations and discussion points
Conclusions - Prices

• Urban consumer demand is restricted by high retail prices but are willing to pay more for high quality ‘safe’ milk
• Retail margins are in excess of processors’ recommendations
• Processors set milk prices infrequently which affects their milk collections
• Falling real price supports expansion of the informal market
• Proliferation of MBGs offers greater price-seeking opportunities for farmers
• Input cost inflation squeezes farmers margins and affects supply stability
Conclusions - Efficiency

• Retail margins may limit market demand and make the whole dairy supply chain less efficient
• Milk quality, idle capacity, poor infrastructure, limited market affect the processors’ efficiency and competitiveness
• Variability in administrative costs in MBGs related to inefficiencies and services provided – affecting price paid to farmers
• Regional differences emerge in producer performance with the Northern region least efficient
Conclusions – Aspirations and Interventions

• NGOs and Government have differing aspirations which limit a clear pathway for development
• Urban consumers aspire to consume more fresh milk at affordable prices
• Processors want consistent supply of quality milk and demonstrate aspirations for market growth through investment
• MBGs have aspirations to develop and many of these are fuelled by anticipation of external funding
• Farmers and their associations have aspirations for herd expansion and improved technical performance through access to quality ‘inputs’
Recommendations

Business Environment
• Continue support for infrastructural improvements
• Improve data capture and use

Dairy Supply Chain
• More collaboration and co-ordination along the supply chain
• Agreed formula for price adjustment by processors
• Surveillance of marketing margins
• Improvement of quality control enforcement
• Investment in reliable energy and water supplies for MBGs
Recommendations

Dairy Supply Chain (contd)

• Analysis of implications of growing importance of private MBGs
• Expansion of advisory and farmer networks utilising demonstration farms and support for peer-to-peer networks
• Targeted expansion of trained smallholder dairy farmers
  – Continued support for the pass-on-programme
  – Appropriate breed selection and investment in heifer rearing
  – Targeted support to allow for expansion of best practice farmers
Milk production, deliveries to processors and the raw milk market

While milk production has increased at significant rate, deliveries to processors have been increase slowly. Since 2011 the proportion of “informal milk” has increased.
Final remarks

• The dairy sector in Malawi has the potential to contribute to economic growth, food security and to improve the livelihood of the poor

• However, it is our view that the Government of Malawi, donors and other stakeholders need to commit on an joint strategy for the dairy sector; so the results are coherent

• This is because public and international money is scarce and should be used efficiently
Discussion Points

We feel that there needs to be stakeholder consensus:

1. Should the guidance of the strategy be business development or poverty alleviation? Just poverty alleviation without business development will not develop the dairy sector.

2. Should the Government and donors focus on consolidating in the Southern and Central regions instead of trying to develop the Northern region? Or maybe just the Southern region?

3. What strategy should Malawi follow in terms of development?
   – Strengthening the formal supply chain
   – Moving towards micro processing at the level of the MBGs
   – Focusing on direct marketing of raw milk (Kenya strategy)

Given the stage of development of the dairy sector, these cannot be simultaneous.
Acknowledgements

• We would like to acknowledge support from the Dfid/ESRC Programme on Economic Growth in Developing Countries).

• We are grateful to all the interviewed stakeholders who gave us their time, particularly grateful to Mr. Herbert Chagona (MMPA), Mr. Jonathan Kaphela (CREMPA), Mr. Brian Lewis, (SHMPA), Ms. Candice Botha former VSO for information on a number of issues related to dairy in Malawi.

• We would like to thank materials from colleagues at SRUC, from Centre for Agricultural Research and Development (CARD) at Bunda College (University of Malawi), and African Institute of Corporate Citizenship (AICC), Malawi office.
Many thanks for your attention!