Food security and nutrition as basic indicators of socioeconomic sustainability in a context of innovation
The case of the Laiterie du Berger (LDB) in Senegal
Abdrahmane Wane (CIRAD-PPZS-ILRI), Jean-Joseph Cadilhon (ILRI) and Mamadou Yauck (CIRAD-PPZS)

Global overview
Farming practices in the West African dairy sector are changing with the increase in milk marketed. In Senegal, the LDB is a modern dairy plant collecting milk in pastoral areas. Set up in 2006, it had quadrupled quantities of milk collected by 2010.

The innovations brought by the LDB:
- Settling dairy farmers within a 50 km radius of the dairy
- Organization six collection routes
- Provision of animal feed through check-off recovered on future milk sales
- Extension team providing technical support to farmers on milking hygiene, dairy herd nutrition, veterinary advice, protected areas for grazing, water wells...

Main indicators of socioeconomic sustainability
- The Food Security and Nutrition Index (FSNI) is used as basic indicator for measuring socioeconomic sustainability of innovation impacts
- Exploration of additional indicators through focus group discussions:
  - Livelihoods of the producer households
  - Organization of business-to-business relationships within the value chain
  - Control of resources and incomes by different gender groups
  - Change in the mobility of producer communities

Major impacts of the LDB’s supply chain innovations
- The FSNI analysis has identified the main determinants of food and nutrition security:
  - Stabilization of dairy incomes during the dry season
  - Diversification of revenue sources
  - Building up a sizeable herd
- Producers are gradually moving away from local markets to supply the dairy
- Dairy incomes constitute more than half of global household revenue during the rainy season
- Supplementary feeding, better animal health and improved milk quality are becoming widespread among pastoral milk suppliers
- Mini dairy cow sheds have led to changes in transhumance practices: women are staying put with lactating cows and children while men still move around in search of grazing land
- Women have more time to concentrate on income generating activities
- Children have better access to school
- Dairy incomes contribute positively and significantly to the food security of pastoral households
- The LDB has played an important role on the NRM

Conceptual framework

Some results

<table>
<thead>
<tr>
<th>Food Security and Nutrition Indicators</th>
<th>Reduction of the quantity of meals</th>
<th>Reduction in the number of meals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>98%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>28%</td>
</tr>
<tr>
<td></td>
<td>92%</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>97%</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>90%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Food Security and Nutrition statistics

<table>
<thead>
<tr>
<th>Groups</th>
<th>Categories</th>
<th>Class size</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>Very low</td>
<td>108</td>
<td>0.61</td>
<td>0.07</td>
<td>0.50</td>
<td>0.76</td>
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<tr>
<td>Group 2</td>
<td>Low food</td>
<td>138</td>
<td>0.38</td>
<td>0.05</td>
<td>0.27</td>
<td>0.49</td>
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<td>Group 3</td>
<td>Marginal</td>
<td>121</td>
<td>0.16</td>
<td>0.07</td>
<td>0.00</td>
<td>0.27</td>
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<tr>
<td>Group 4</td>
<td>High food</td>
<td>78</td>
<td>0.92</td>
<td>0.08</td>
<td>0.77</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Way forward to improve methodology
Constructing additional socio economic indicators of sustainability: corporate social responsibility of the dairy towards its pastoralist suppliers; identification of the final product with the producers’ communities. Testing all indicators at the community and value chain levels to consolidate initial results.

Contact author: Abdrahmane Wane
wanea.r@cgiar.org • Box 30709 Nairobi Kenya • +254 20 422 3000

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