Determinants of vulnerability in mixed-crop-livestock farming systems - a 14 years retrospective A focus on results

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Determinants of vulnerability in mixed-crop-livestock farming systems - a 14 years retrospective
A focus on results

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Objective

To reduce economic vulnerability of farming systems

→ Define & measure vulnerability

→ Identify the explaining factors
Definition

Example of non-vulnerable system

Example of vulnerable system

« Disruption » if > -25%
**Definition**

<table>
<thead>
<tr>
<th>€/worker</th>
<th>Variability</th>
<th>Comparison with SMIC</th>
<th>Number of disruptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW VULNERABILITY</td>
<td>Low</td>
<td>&gt;&gt;</td>
<td>Low (±3)</td>
</tr>
<tr>
<td>MODERATE VULNERABILITY</td>
<td>Intermediate</td>
<td>&gt;</td>
<td>High (±5)</td>
</tr>
<tr>
<td>HIGH VULNERABILITY</td>
<td>High</td>
<td>&lt;&lt;</td>
<td>High (±5)</td>
</tr>
</tbody>
</table>

**Data**

Constant sample of 104 mixed crop-livestock farms containing
- structural,
- economic and
- organizational data

for a **14-year period** (2001-2014)

**DATA Sources** Farm Accountancy Data Network (FADN); Agreste.
1. Insights from farmers’ decisions analysis

More diversification on a larger area, implying more labour units

<table>
<thead>
<tr>
<th>Low vulnerable systems [n = 420]</th>
<th>Moderate vulnerable systems [n = 952]</th>
<th>High vulnerable systems [n = 84]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower energy, irrigation water and feed concentrates consumptions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A lower vulnerability goes hand in hand with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower energy, irrigation water and feed concentrates consumptions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Through a lower stocking rate despite a higher flock size</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Insights from production strategy evolution

Identification of three profiles “No evolution”, “Moderate evolution”, “High evolution”

Results: How to move toward less vulnerability?

• 54% of low vulnerable systems were already “adapted”
  ⇒ Low vulnerable farming systems with the profiles “No evolution”

• 24% of the most vulnerable systems have shown adaptive capacity but not sufficiently to be considered as “low vulnerable” farming systems
  ⇒ Vulnerable farming systems with the profiles “Moderate evolution”, “High evolution”

Production strategy evolution is not obligatory to be low vulnerable across years, BUT may be obligatory for some non-adapted systems
Results : How to move toward less vulnerability?

3. Insights from tactical adjustments analysis

Tactical adjustments : Identification of five profiles

• Of which 4 with tactical adjustments, based on
  → Self-consumption
  → Stocking rate & irrigation
  → Fertilizers and seeds consumption
  → Feed concentrates consumption

  « Flexible » farming systems
  61.7% have a moderate to high vulnerability level

• Of which 1 without tactical adjustments

  « Rigid » farming systems
  67.2% have a moderate to high vulnerability level

Low vulnerable farming systems apply to both “rigid” and “flexible” farming systems

Discussion & Conclusion

➔ Method : Perspectives for research and operational projects (farm advisers, etc.)

  • **Not focused** on one specific external stressor, but on all
    hazards that occurred during a given period of time
  • **Focused** on economic vulnerability, considering the farming
    system as a whole
  • Consideration of “static” and “dynamic” factors

➔ To be tested on other farming systems (specialized farms, etc.)