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

Inès Sneessens, Hanitra Randrianasolo-rakotobe, Loïc Sauvée, Stéphane Ingrand

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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

$/worker vs Time

Hazard

Example of vulnerable system

$/worker vs Time

Hazard

< Disruption » if > -25%

Variability

SMIC

Deviation
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

Low vulnerable systems \( n = 420 \)

Moderate vulnerable systems \( n = 952 \)

High vulnerable systems \( n = 84 \)

Results: How to move toward less vulnerability?

Low and moderate vulnerability may also be distinguished by the management of their intermediate consumptions

A lower vulnerability goes hand in hand with lower energy, irrigation water and feed concentrates consumptions

Through a lower stocking rate despite a higher flock size
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
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

- Of which 1 without tactical adjustments

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

- «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.)