An application of benefit-cost analysis to the forest sector: the economic impact of a pest disease in Uruguay

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Uruguay in South America
## Uruguay in figures

<table>
<thead>
<tr>
<th>Indicators</th>
<th>2015</th>
<th>2016</th>
<th>2017*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ GDP</td>
<td>0.4%</td>
<td>1.5%</td>
<td>2.4%</td>
</tr>
<tr>
<td>GDP (million USD)</td>
<td>53275</td>
<td>52420</td>
<td>55562</td>
</tr>
<tr>
<td>Population (millions)</td>
<td>3.47</td>
<td>3.48</td>
<td>3.49</td>
</tr>
<tr>
<td>GDP per capita (USD)</td>
<td>15366</td>
<td>15062</td>
<td>15906</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>7.5</td>
<td>7.8</td>
<td>8.2</td>
</tr>
</tbody>
</table>

*Estimated.
Forest Sector in Uruguay

- Forestry Law 1988

- Total area by species (effective area 2012): 1,545,053 hectares (55% native species, 28% eucalyptus, 11% pine, 6% others)

- Industries: pulpmills, sawmills. Export-oriented

- Forest sector contribution to GDP (2016): 3.6%

- Cellulose: 2nd product exported in value
The project

• Objective: to evaluate the economic impact caused by the introduction of *Teratosphaeria nubilosa* in Uruguay

• Hypothesis: the introduction of *T. nubilosa* in 2007 have had a negative economic impact on *Eucalyptus globulus* plantations and consequently for the national economy

• Method: economic assessment of the impact of the emergence of *T. nubilosa* in *E. globulus* plantations using a cost-benefit analysis at two levels: the producer level and the national level
Method: the economy level

• First study on economics impact of a forest pest

• Cost-benefit analysis: shadow prices

• Scenarios:
  • Base scenario: no pest
  • Scenario 1: lower harvest volume than base case
  • Scenario 2: longer rotation age than base case
  • Scenario 3: substitution of *E. globulus* by other eucalyptus species
Benefits and costs

• Costs (only explicit costs):
  • Plantation/Maintenance
  • Harvest
  • Transportation
  • Processing

• Benefits (only explicit benefits):
  • Roundwood (to free trade zones) and chips exports
Data

• Data availability a challenge in forest sector in Uruguay.

• Costs: No secondary information available ➔ interviews (producers and contractors)

• Benefits: exports. Pulpwood (free trade zones) and chips (local industry) ➔ Uruguay XXI (government)

• Shadow prices: account prices Planning and Budgeting Office (2012)
Key findings: Case 1 (lower harvest volume)

<table>
<thead>
<tr>
<th>Case</th>
<th>Yields m³/ha²</th>
<th>NPVE mill. USD</th>
<th>ΔNPVE mill. USD</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base_10¹</td>
<td>121</td>
<td>1071</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base_10_1%</td>
<td>120</td>
<td>1065</td>
<td>-6</td>
<td>-0,5%</td>
</tr>
<tr>
<td>Base_10_5%</td>
<td>114</td>
<td>1043</td>
<td>-28</td>
<td>-2,6%</td>
</tr>
<tr>
<td>Base 10_10%</td>
<td>102</td>
<td>1016</td>
<td>-55</td>
<td>-5,1%</td>
</tr>
<tr>
<td>Base 10_20%</td>
<td>82</td>
<td>965</td>
<td>-106</td>
<td>-9,9%</td>
</tr>
</tbody>
</table>

Note: ¹With base in a 10 years rotation, the harvest levels diminish in 1%, 5%, 10% y 20%.
²This is the yield of the first rotation. In the second rotation, assumed sprouts (80% yield).
Challenges and opportunities

• The use of the cost-benefit analysis method to estimate the economic impact of the forest pest *T. nubilosa* on the Uruguayan economy is considered an appropriate method. **Main challenge**: lack of data (scarce or incomplete)

• The estimates of the biological losses were more challenging than the economic estimates

• There is increasing interest in this type of studies in Uruguay
Acknowledgements

• INIA: FPTA funds, Project No. 332 (2012)
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• *E. globulus* producers and industries
• Uruguay XXI
• UdelaR, CSIC
Thank you!

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