IS PUBLIC INVESTMENT IN R&D VALUABLE?
THE ARC PPRI WEEDS RESEARCH DIVISION

Lowell Scarr
The Context

• ARC – Agricultural Research Council
  • South Africa’s lead Agri R&D Institute

• PPRI – Plant Protection Research Institute
  • Focussed research on managing plant disease, pests and invasive plants
  • Promoting commercial use of beneficial organisms
  • Improve resilience, production and sustainability of agricultural industry.

• Weeds Research Division
  • Research biological control opportunities for invasive alien plants
Invasive Alien Plants

Figure 1: Spread of *Campuloclinium macrocephalum*: 1960s (■), 1970s-1990s (●), 2000s (□).
(Source: Henderson, 2011).
The Problem

• What is the value of investing in biological control research?
  • Valuing research
  • Valuing the environment
  • How do we assign value?
The Method

• Descriptive approach, using Cost Efficiency analysis
  • Mix of qualitative and quantitative

• Chose and assess indicators
  • Common sense appraisal

• Interpret literature and data
  • Understanding the situation properly
# Cost Efficiency Analysis

<table>
<thead>
<tr>
<th>Period</th>
<th>Biological Research Budgeted Cost (x)</th>
<th>Biological Implementation Budgeted Cost (y)</th>
<th>Total Biological Budgeted Cost (x + y) = a</th>
<th>Conventional Budget Cost (z)</th>
<th>Total Control Budget Cost (x + y + z) = b</th>
<th>Biological as % Total Cost (a/b)*100</th>
<th>Biological Research as % Total Cost (x/b)*100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Nov 2013 – 31 Mar 2014</td>
<td>602190.16</td>
<td>245658.30</td>
<td>847653.00</td>
<td>2425801.79</td>
<td>25105670.96</td>
<td>3.38%</td>
<td>2.4%</td>
</tr>
<tr>
<td>1 Apr 2014 – 31 Mar 2015</td>
<td>1700688.69</td>
<td>563053.29</td>
<td>2263084.68</td>
<td>68865526.36</td>
<td>71128611.04</td>
<td>3.18%</td>
<td>2.4%</td>
</tr>
<tr>
<td>1 Apr 2015 – 31 Mar 2016</td>
<td>1811196.81</td>
<td>575230.60</td>
<td>2386863.30</td>
<td>69317063.82</td>
<td>71702802.70</td>
<td>3.33%</td>
<td>2.53%</td>
</tr>
<tr>
<td>1 Apr 2016 – 31 Mar 2017</td>
<td>1790343.94</td>
<td>622529.36</td>
<td>2411981.35</td>
<td>73060203.93</td>
<td>75467293.58</td>
<td>3.2%</td>
<td>2.37%</td>
</tr>
</tbody>
</table>

**Table 1**: Cost Efficiency Comparison between Biological and Conventional Invasive Alien Plant Control (All figures in 2014 $). All Figures are VAT inclusive.

Mean Biological control as % Total Cost = 3.27%  
Mean Biological Research as % Total Cost = 2.43%
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Means of assessment</th>
<th>Biological Control Assessment (Yes/No)</th>
<th>Conventional Control Assessment (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost efficiency</td>
<td>Does the work minimise cost of solving problem?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Long-term sustainability</td>
<td>Will the work result in a sustainable solution to the problem?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Employment creation and skills development</td>
<td>What is the extent and nature of employment opportunities produced?</td>
<td>Limited</td>
<td>Extensive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mainly high end researchers and managers. Some low skill positions for monitoring and evaluation.</td>
<td>Mainly low skill opportunities for previously unemployed. Specifically women and youth.</td>
</tr>
<tr>
<td>Advance in scientific knowledge or capability</td>
<td>Does the work produce advances in national scientific knowledge database and capabilities?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fairly extensive advances supported</td>
<td>Limited associated research and scientific development</td>
</tr>
</tbody>
</table>

Table 2: Set of indicators and means of assessment
Findings and Conclusion

• Societies need a healthy environment to flourish

• Development opportunity for Biotechnology industry

• Investment into Public Research is highly valuable

• Investment into the Weeds Research Division is highly valuable!
Relevance to IFAMA?

• More holistic approach to economic analysis is promoted
  • Consider environment as key ingredient to long term growth
  • Monetary figure often misleading

• Biotechnology as key area of development
  • More sustainable
  • Cheaper in the long run

• Move away from overreliance on chemical based inputs
Thank You

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