Climate risk in agriculture:
Questions from the finance sector

CRSPI presentation

Dr Peter Holt, Dr Nick Wood, Amelia Loder | 8 April 2019
Who we are

Energetics works with Australia’s governments and ASX200 businesses on strategies to address climate change
Our clients
Operating context and background
Introduction

The G20 Financial Stability Board (FSB) Taskforce on Climate-related Financial Disclosure (TCFD) is a private sector led, policy neutral working group, that has developed a set of recommendations on climate related disclosure.

Released in June 2017, TCFD has 11 recommendations broken into four broad topics.

Figure 1: TCFD’s core recommendations
Introduction: current state of risk assessment in Australia

Annual reports: What did ASIC find?
“Our review also indicated that many disclosures were too general and not comprehensive enough to be useful for investors.

For example, isolated, high-level statements such as (the paraphrased) ‘we have considered the impacts of climate change on our business’ do not provide investors with any meaningful insight as to the depth or extent of that consideration.”

Prospectuses: What did ASIC find?
“We found limited examples of companies explicitly citing and disclosing climate risk (either physical or transition) as a relevant risk factor. None of the prospectuses we reviewed expressly identified any physical climate risks.”
Key questions from the finance sector
Questions being asked by the finance sector

- What is the **chronic and acute physical climate change risk** to our agriculture portfolio?

- What impact will the physical risk of climate change have on:
  - Our **customers**:  
    - What impact will have on their **productivity? Revenue?**  
    - What **adaptative technologies/practices** are available? What **investment** is required?
  - Regions of operation:
    - How will this differ by **region**?
    - What is the future world view?
  - Our business
    - Impact on **risk profile, profitability and reputation**
    - Regulatory considerations
Our approach
Our approach

Risk driver
- Low winter rainfall
- Heat waves

Climate data
- 2040
- Monthly rainfall
- Wimmera region

Impact on yield
- -20% rain
- -30% wheat

Adaptive responses
- Early planting
- Mixed cropping and sheep
For example – grains and oilseeds
For example: Grains and oilseeds

Key drivers

- Temperature
  - Growing season temperature increase
  - Threshold measures >32°C (Heatwave frequency and length increase)
  - Frost increase or decrease

- Rainfall
  - Growing season rainfall:
    - April – October
    - November – March (Northern)
  - Drought frequency and length increase

- Other
  - Fire frequency and intensity
## Grains and oilseeds

### Chronic

<table>
<thead>
<tr>
<th>Climate driver</th>
<th>Parameter for assessment and comments</th>
<th>Data availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing season rainfall decrease</td>
<td>Key driver, granular data</td>
<td></td>
</tr>
<tr>
<td>Lag season rainfall decrease</td>
<td>Data not available for lag season</td>
<td></td>
</tr>
<tr>
<td>Growing season temperature increase</td>
<td>Key driver, granular data</td>
<td></td>
</tr>
<tr>
<td>Irrigation water availability</td>
<td>Limited data available, qualitative assessment focusing on policy</td>
<td></td>
</tr>
<tr>
<td>Evaporation and wind speed</td>
<td>Secondary driver, granular data</td>
<td></td>
</tr>
<tr>
<td>Increased CO2</td>
<td>Not available, more conservative not to include positive effect</td>
<td></td>
</tr>
<tr>
<td>Loss of biodiversity</td>
<td>Qualitative assessment</td>
<td></td>
</tr>
<tr>
<td>Sea level rise</td>
<td>High level quantitative assessment, coastal cropping land is limited</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Availability</th>
<th>5 km grid, 30 year average on 5 year time step</th>
<th>5 km or 100 km grid, 30 year average on 20 year time step</th>
<th>Direction and magnitude of change</th>
<th>Direction of change</th>
<th>Limited available</th>
</tr>
</thead>
</table>

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### Grains and oilseeds

#### Acute

<table>
<thead>
<tr>
<th>Climate driver</th>
<th>Parameter for assessment and comments</th>
<th>Data availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pests and diseases</td>
<td>Qualitative assessment</td>
<td></td>
</tr>
<tr>
<td><strong>Extremely hot day frequency</strong></td>
<td>Threshold analysis is available at a granular level</td>
<td></td>
</tr>
<tr>
<td><strong>Drought frequency and length increase</strong></td>
<td>Insights into future impacts by combining past impacts and future magnitude and direction of change</td>
<td></td>
</tr>
<tr>
<td><strong>Extremely cold day/night frequency</strong></td>
<td>Threshold analysis is available at a granular level</td>
<td></td>
</tr>
<tr>
<td><strong>Fire frequency and intensity increase</strong></td>
<td>Insights into future impacts by combining past impacts and future direction of change</td>
<td></td>
</tr>
<tr>
<td>Rain at harvest</td>
<td>Analysis of impact on quality</td>
<td></td>
</tr>
<tr>
<td><strong>Flooding frequency and intensity increase</strong></td>
<td>Insights into future impacts by combining past impacts and future magnitude and direction of change</td>
<td></td>
</tr>
<tr>
<td>Storm frequency and intensity increase</td>
<td>Insights into future impacts by combining past impacts and future direction of change</td>
<td></td>
</tr>
<tr>
<td>Local storm phenomena (hail, lighting, wind-gusts, heavy rain)</td>
<td>Data not available, regional percentage increase in intensity of daily total rain available for a high level analysis</td>
<td></td>
</tr>
</tbody>
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Process: Commodity assessments

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Adaptive responses
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This challenge is in assessing impact and adaptive response
Impact on yield
No mitigation
Impact on yield

In context

A16 Average climate adjusted TFP for all cropping farms, 1977–78 to 2007–08

A17 Average climate adjusted TFP for cropping specialist farms only, 1977–78 to 2007–08

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Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)
Adaptive response options

**APPROACH 1**
Stop

**APPROACH 2**
Alter current practices
Incremental adaptation
Small adjustments to farming operations keeping the essence of the current management system in place

**APPROACH 3**
Do something different
Transformational adaptation
Major and non-marginal changes to farming management systems to address climate change risks
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