MODELLING ADAPTATION TO CLIMATE CHANGE IN AGRICULTURE – THE PROCESS

Ada Ignaciuk
Trade and Agriculture Directorate
Organisation for Economic Co-operation and Development

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About a process that benefited two organizations – IFPRI and OECD

1) Who are we and how are we organized?
2) Why did we choose IMPACT?
3) What were the challenges and how they were solved?
4) What were the results?
5) Plans for future...
Who are we?

- Organisation for Economic Co-operation and Development
- The mission is to **promote policies** that will improve the economic and social well-being of people around the world.
- The OECD provides a **forum** in which governments can work together to share experiences and seek solutions to common problems.
OECD Membership is evolving…

OECD has currently 34 member countries

Members
Australia    Austria    Belgium    Canada    Chile    Czech Republic    Denmark    Estonia    Finland    France    Germany    Greece
Hungary     Iceland     Ireland    Israel     Italy     Japan       Korea      Luxembourg Mexico     Netherlands New Zealand
Norway      Poland      Portugal   Slovak Republic Slovenia   Spain       Sweden     Switzerland Turkey     United Kingdom United States

Accession & other candidates
Colombia    Latvia    Costa Rica    Lithuania

Key partners
Russia    Brazil    China    India    Indonesia    South Africa
Structure of the OECD

- Committee for Agriculture
  - Working Party for Agriculture and the Environment (JWPEA)
MODELING

Expert Meeting on modelling Agriculture and Climate Change.
Decision to explore AgLINK and IMPACT

February 2011

JWPAE: “…continue to work with IMPACT, exploring the possibilities of linking this model with ENV-Linkages.”

2008 Economic Aspects of Adaptation to Climate Change
2010 Climate Change and Agriculture – Impacts, Adaptation and Mitigation
2012 Agriculture and Economic Adaptation to Climate Change

April 2012

JWPAE: call for continuation of work on adaptation of agriculture to climate change

May 2012

COAG “…address topics relating to the adaptation of agriculture to climate change”
Formalization of our agreement

- The project was very small—a trial effort
- 1st idea - contract – however, we are not a formal partner with IFPRI and there were issues of money and intellectual property that needed sorting.

Solution:

- Good will and trust -
- We decided to work based on mutual respect
Had to use the earlier IMPACT 2 model, with no changes ....but agreed to a trial.
First results raised questions at the OECD.

Some questions and uncertainties
• Impact focuses on developing countries
• Issues concerning aggregation
• Issues concerning national data
Solution: only some serious work on the model could have changed it.
• IMPACT training
• OECD review the model
• IFPRI in the meantime decided to restructure IMPACT model code

• People component
Methodology: followed the development of AgMIP scenarios

- Socio-economics
- Emissions concentration
- Climate model
- Crop model
- Scenario name

SSP2
- Climate of last 50 y

SSP2
- RCP 8.5

IPSL

Hadley
- LPJML
- DSSAT
- LPJML
- DSSAT

Reference
- Scenario 1
- Scenario 2
- Scenario 3
- Scenario 4
Adaptation strategies

• Research and Development
  – Adoption of drought resistant maize and wheat (R&D)
  – Technology transfers (TT)

• Irrigation management
  – Irrigation efficiency (IEf)
  – Irrigation extensions (IEx)
  – Irrigation efficiency & irrigation extension (IEf & IEx)
Results of the collaboration

• OECD provided very useful testing of the IMPACT 2 model, focusing on results for OECD countries.
  – Based on this a revised document was presented to JWPEA -> “there is a scope for improvement”
• OECD was used as “beta tester” as IFPRI developed the IMPACT 3 model

.... And final result: “Modelling Adaptation to Climate Change in Agriculture” -> has been declassified.
### Results – yield effects

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### Yield Effects

- **Yield change** - % change compared to a respective climate change scenario

* -10%  0%  10%  20%
Results – price effects

*Price change - % change compared to respective cc scenario*
Main messages

• By 2050 the average yields of maize, wheat and rice may decline by 10%, 7% and 6% due to climate change. There are large regional differences.
• Autonomous adaptation is essential, but may not be sufficient.
• No measure fits all – therefore diversification of adaptation options are crucial – a) for risk reduction and 2) direct benefits.
• Additional investments in R&D and efficient water management systems are keys to smooth transition towards climate resilience agriculture
• Governments may consider supporting measures to increase water efficiency in agriculture as part of their adaptation strategies, although they need to be supported by other economic instruments such as water pricing or implementation of tradable rights and quotas, where relevant.
• Some lessons from this exercise
  – Both institutions benefited from this exchange
  – Key to develop common interests
  – It is all about people: successful collaboration requires trust and willingness to change things
  – Work on models requires time and effort => resources for model development are necessary
  – Review of models are very important (important to include external people)
How the results were then used to inform a policy dialogue in the OECD?

• JWPAE

• Follow up invitations from the delegates to say “the story” at their respective ministries

• An invitation from the policy journal to present a short summary of the work

• In other OECD’s products
  – Ag baseline of ENV Linkages based on IMPACT
  – Long Term Agricultural Scenarios project

• There is an appetite for more.
Future plans

• What are our future plans wrt IMPACT
  – Climate Smart Agriculture
  – Long term Strategies for Agriculture
Thank you!

Contact information:
ada.ignaciuk @oecd.org