

Senate Standing Committee on Economics
ANSWERS TO QUESTIONS ON NOTICE
Innovation, Industry, Science and Research Portfolio
Budget Estimates Hearing 2010-11
31 May 2010

AGENCY/DEPARTMENT: COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION

TOPIC: Adaptation responses for the agricultural sector in WA

REFERENCE: Question on Notice (Hansard 31 May 2010, E24)

QUESTION No.: BI-11

Senator PRATT—I also wanted to ask about the State of the climate snapshot—in particular, the implications of that report for Western Australia. I note that the snapshot found that about half of the observed reduction in winter rainfall in south-west Western Australia can be explained by higher greenhouse gas levels. I wanted to know the implications of the snapshot for planning an adaptation for climate change, particularly in Western Australia's south-west.

Dr Clark—Certainly. Dr Johnson's group covers both climate adaptation as well as water resources in the south-western part of Western Australia. Both of those questions—

Senator PRATT—I beg your pardon. Chair, I cannot hear the witness because of the conversation going on next to me.

CHAIR—Sorry. Please continue, Dr Clark.

Dr Clark—As I mentioned, Dr Johnson's group covers both climate adaptation and sustainable yields in terms of water resources for the south-west part of Western Australia, and I am sure he would be comfortable to provide any further detail you require.

Dr Johnson—Thank you, Dr Clark. Senator, you are correct—there are significant implications for the state of Western Australia. As Dr Clark indicated, they span across a range of sections—water, land use, biodiversity and infrastructure. We have not published, to the best of my knowledge, any specific studies on those issues, with the exception of water, and I would be happy to provide you with that information if you would like.

Senator PRATT—What are the particular implications for agriculture in south-west WA? I suppose, having observed these debates over some years now, it does seem that we are slowly coming to grips with being able to translate climate change information into information that enables us to make decisions at a community level.

Dr Johnson—Obviously, if the drying trend and the trend for increasing temperature increase, that will have significant implications for agriculture. As part of the flagship, we are working very closely with the Western Australian government and farming communities to develop adaptation responses for the agricultural sector in Western Australia. They are quite extensive. I would be happy to provide that information to you if you would like.

ANSWER

CSIRO has two ongoing research activities related to the implications a changing climate may have on agriculture in south-west WA:

1. Commencing in 2007, the Western Australia Climate Adaptation Program is a partnership between CSIRO, WA Department of Agriculture and Food, University of Western Australia,

Murdoch University and Curtin University of Technology. The program aims to provide the information, knowledge, tools and innovations to help enable decision makers to manage the risks and recognise the opportunities a changing climate will present to rural industries and communities in southern Western Australia. In doing so it will draw on the capability of all the partners to undertake priority research on climate change impact and adaptation that would be beyond any individual research institute. The activities in the program have close links to farmers and grower groups, the WA Growing Group Alliances, WA Farmers Federation and several state departments to ensure outputs from the program meet stakeholder needs (see brochure at **Attachment A**).

2. The Department of Agriculture Fisheries and Forestry has funded through its Climate Change Research Program a national project on *Developing climate change resilient cropping and mixed cropping / grazing businesses in Australia*. The project has nodes of activity in each state. The studies in the northern, central and south Coast regions of Western Australia will engage relevant farming systems groups with an initial emphasis on the northern region where there is a high level of interest in climate change and feasibility of adaptation options. The approach taken in the whole project is to:

- (1) identify vulnerability to climate change across Australia as measured by exposure to production risk and available adaptive capacity;
- (2) improve formal evaluation of climate change impacts and effective adaptation options across a number of locations through shared model development;
- (3) design and test appropriate regional adaptation practices and business designs, via desktop studies, that will provide resilience to projected climate change; and
- (4) evaluate the likely costs and benefits of adaptation options as well as investigate existing barriers to adoption.

The WA node will be involved in activities (2) through (4).

In relation to existing information, CSIRO has co-authored a report for the Australian Greenhouse Office (now Department of Climate Change and Energy Efficiency) titled *Adapting Australian farming systems to climate change: a participatory approach which* documents an extensive quantitative assessment of the benefits of specific adaptation options to climate change. The report is available at:

www.bcg.org.au/resources/Adapting_Australian_farming_systems_to_climate_change_final_report_web.pdf

CSIRO also recently released the *Adapting Agriculture to Climate Change - Preparing Australian Agriculture, Forestry and Fisheries for the Future* book which describes the causes and consequences of climate change and provides options for people to work towards adaptation action. Climate change implications and adaptation options are given for the key Australian primary industries of horticulture, forestry, grains, rice, sugarcane, cotton, viticulture, broad acre grazing, intensive livestock industries, marine fisheries, and aquaculture and water resources. Case studies demonstrate the options for each industry.

Further information regarding the climate change and agriculture more generally is available at: <http://www.csiro.au/science/resilient-farmers.html>

WA's Climate Adaptation Program

Adaptive capacity and resilience for Western Australian agriculture

The global climate has been changing and Western Australia (WA) is experiencing the impact now.

More changes are inevitable even if greenhouse gas emissions are capped quickly.

Likely effects in WA include:

- lower average winter rainfall;
- less run-off to dams;
- decreased aquifer recharge;
- increased variability between and within seasons;
- increased risk of prolonged drought;
- higher average temperatures;
- rising atmospheric carbon dioxide concentrations; and
- more extreme events such as hot days, storms and wild fires.

Western Australia's \$12 billion agri-food sector and related industries are vulnerable to these changes, which could cause significant production losses and damage agricultural ecosystems.

A Western Australian initiative

To address the challenge presented by climate change in WA the Climate Adaptation Program has been developed – a collaboration between the Department of Agriculture and Food Western Australia, The University of Western Australia, Curtin University of Technology, Murdoch University and CSIRO.

The Program will bring together the capability of all the partners to undertake priority climate change impact and adaptation research projects that will deliver outcomes beyond the reach of any individual research institute.

Linked to national and international research programs, including CSIRO's Climate Adaptation Flagship, the Climate Adaptation Program will deliver the information, knowledge, tools and innovations to help decision makers manage the risks and capture the opportunities a changing climate will present to rural industries and communities in southern Western Australia.



Department of
Agriculture and Food



Curtin
University of Technology



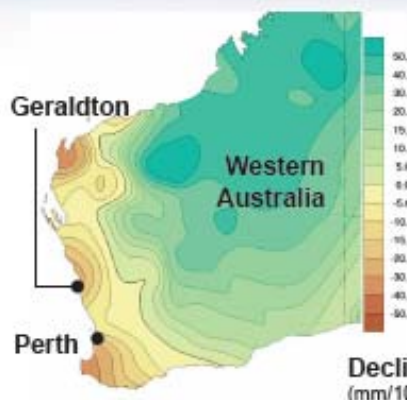
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CSIRO



Lower rainfall in the last 50 years in South West of Western Australia, indicate WA is facing the effects of climate change already. Source: Australian Bureau of Meteorology.

Climate Adaptation Program: proposed projects and contacts

| Project | Contact | Phone | Email |
|---|-------------------------------------|------------------------------|--|
| *Downscaled climate projections | Dr Bryson Bates Dr Steve Charles | 08 9333 6554 08 9333 6795 | bryson.bates@csiro.au steve.charles@csiro.au |
| Learning from the past | Dr Ian Foster | 08 9441 8109 | ifoster@agric.wa.gov.au |
| *Vulnerability of farm businesses and rural communities to climate change | A/Prof Ross Kingwell | 08 9368 3225 | rkingwell@agric.wa.gov.au |
| Managing mixed livestock and cropping systems in a more variable and changing climate | Dr Steve Gherardi | 08 9368 3130 | sgherardi@agric.wa.gov.au |
| *New land use systems/industries as a response to climate change | Dr Michael Robertson | 08 9333 6461 | michael.robertson@csiro.au |
| Animals that cope with change: embracing variability | Dr Dean Revell | 08 9333 6492 | dean.revell@csiro.au |
| Trade-offs from public investment in climate adaptation | Prof David Pannell | 08 6488 4735 | dpannell@cylene.uwa.edu.au |
| *Hydrology, soil conditions and nutrient cycling | Dr Neil Coles Prof Zed Rengel | 08 6488 1668 08 6488 2557 | ncoles@agric.wa.gov.au zrengel@agric.uwa.edu.au |
| *Other major socio-economic drivers | Dr David Bowran | 08 9690 2000 | dbowran@agric.wa.gov.au |
| *Biosecurity – impact on pests, weeds and disease | Dr John Scott | 08 9333 6647 | john.k.scott@csiro.au |
| *A virtual laboratory of the Northern Agricultural Region | Dr Senthold Asseng | 08 9333 6615 | senthold.asseng@csiro.au |
| *Analysis and prediction of critical events in response to climate | Prof Christoph Hinz | 08 6488 3466 | chinz@cylene.uwa.edu.au |
| Pathways to adaptation | Dr David Beard | 08 9525 9315 | dbeard@agric.wa.gov.au |
| *Adapting wheat to climate change in Western Australia | Dr Steve Milroy | 08 9333 6680 | stephen_milroy@csiro.au |
| One tonne per 100 mm season rainfall | Dr Steve Davies | 08 9333 6655 | sdavies@agric.wa.gov.au |
| *Crop adaptation to climate change | Prof Kadambot Sidique | 08 6488 7012 | ksidique@fnas.uwa.edu.au |
| *Improving seasonal climate forecasts for South West WA | Dr Senthold Asseng | 08 9333 6615 | senthold.asseng@csiro.au |

* received funding/commenced

Climate Adaptation Program

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