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Submission from the Minister for Agriculture, Food and Forestry, Western Australia to the House of Representatives Standing Committee on Primary Industries and Resources Inquiry into the role of government in assisting Australian farmers adapt to the impacts of climate change

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Introduction

Agriculture and farm-forestry play a major role in the Western Australian economy. In 2007-08 the gross value of agricultural production was estimated at $6.6 billion, with the value of exports being $4.2 billion. The agricultural sector supports around seventeen percent of WA's workforce and also has significant flow on effects to other sectors of the economy. The agri-food industry contributed more than $11 billion to the State's economy in 2007-08, and agriculture. In addition, more than 300,000 ha of tree crops have been established on WA farms in the past 20 years. Although harvesting has now commenced, an estimate of a value of this industry, separate from the broader forest industries is not available.

Climate change is acknowledged as a significant issue for agriculture in Western Australia, with potential adverse impacts due to projected increases in temperature and decreases in rainfall in agricultural regions.

While the Inquiry focuses specifically on climate change and the agricultural sector, it needs to be considered in the broader context with other major emerging issues such as population growth, the condition of the resource base, inputs costs, food and energy security, and regional development policy.

Climate change is only one influence on the agricultural sector. It is important to not obscure other changes causing adjustment in the sector. An example of this is a shift in some regions into cereal cropping due to the perception of greater profitability of crops versus sheep production. The prolonged period of decline in wool prices, an increase in crop prices combined with labour scarcity and new cropping technologies has resulted in a shift from sheep to crops throughout medium and high rainfall areas of the wheatbelt. The trend toward cropping typically favoured by younger farmers is a result of an increased familiarity with cropping enterprises and technologies. This has been a long standing trend and will probably continue, regardless of climate change.

Government has a role in researching and communicating the implications of climate change. It needs to devise response strategies for the short term and long term. It needs to support industries and farming communities with information to enable informed decision making, as well as to develop risk mitigation strategies for extreme events.

Adaptation responses need to be determined at a local level. Each business will have a unique response depending on where they are in the farm family cycle. Each district will be affected in slightly different ways and experience different degrees of variability. It is predicted that WA will suffer the biggest effects from climate change and thus its rural communities may need to make significant adjustment. While there is some transferability of adaptation research across jurisdictions, in order to determine specific adaptation responses for Western Australian agriculture, specific work needs to be undertaken here in Western Australia. Consequently there is a role for both State and Commonwealth investment in researching adaptation responses for both agriculture and forestry.

The Western Australian Government has a role in assisting agriculture and forestry to adapt through:

- Acting as an "information broker" to both translate and integrate climate change implications and provide guidance on management responses;
- Undertaking research and development that will maintain or increase productivity in a changing climate; and
- Ensuring land use planning and regulation takes into account climate change projections to maintain sustainable and profitable agricultural and forestry production while protecting and maintaining the natural resource base.

Following is an expansion against each of these points.

1. **Acting as an "Information Broker" to Both Translate and Integrate Climate Change Implications and Provide Guidance on Management Responses**

   The Western Australian Government has a role in providing information and devising strategic practices under climate change to enable farmers and foresters to make informed decisions about adapting to a changing climate. Information transfer is a key component that should be based on the best-available science for the unique soils and land use systems of WA.

   Understanding climate change is important to all land managers as it has and will continue to make a significant impact on current farming systems and practices. Decision support tools need to be better integrated with the wealth of web based knowledge systems across jurisdictions and disciplines. This would allow farmers to respond opportunistically to seasonal events in order to capitalise on good conditions and maximise profit, but also minimise any losses during suboptimal growing conditions (Department of Agriculture and Food 2008).

   The Department of Agriculture and Food (the Department) delivers to farmers crop forecasting and seasonal updates to assist their decision making and risk analysis for within the season and seasonal outlook. For example, work has been undertaken on decision aids and disease forecasting models to improve their reliability.

   This work aims to build climate risk management capacity of the supply network from researchers, advisers and farmers through the development and delivery of an integrated information package, tools and training that targets the needs of the network. AcCLIMATise is an outstanding example of a well planned extension project for capacity building across the farming community.

   The northern agriculture region has been identified as the first Western Australian agricultural region that is and will continue to be adversely affected by climate change. Over time the other regions will also be significantly affected. The Department in conjunction with the communities and agribusinesses in this region, developed the North Eastern Agricultural Region (NEAR) Strategy Plan. It provides a framework for action to help the community and businesses plan, prepare and adapt to climate change. Funding for the Plan is currently being considered by Government.

   A high level threat and vulnerability assessment of climate change at a regional and industry level in Western Australia is currently being undertaken by the Department. This project aims to provide information of a general nature to farmers about how climate change will affect their production systems.

Government has a role in assisting those disadvantaged by prolonged and protracted consequences of climate change to reduce pressure on the natural resource and provide options for producers to leave farming. The Department has developed a draft strategic plan on preparedness (drought), based on a risk management approach, in response to the Productivity Commission's inquiry on drought assistance.

The drought preparedness strategy assists farmers to improve their skills in self reliance and climate change management. The policy principle for WA's plan is to assist farmers to make the transition from receiving drought assistance to being drought prepared and develop pathways to resilience. A safety net that provides support for farm families severely affected by drought is an essential component of the plan. Government funding is directed to activities and programs that promote long term profitability and productivity of farm businesses. These policy principles will assist farmers structurally adjust while addressing previous impediments to industry productivity growth, protecting the natural asset base, farm families and communities. To implement the strategy, the Department works with farmers to promote, communicate and provide relevant information on drought preparedness for incorporation into farm management strategies.

2. Undertaking Research and Development to Maintain or Increase Productivity in a Changing Climate

A key priority is to undertake research to identify the impacts climate change will have on the Western Australian agricultural industry. As noted, it is crucial that any such research takes into account Western Australia's unique conditions, and is not generalized from other regions. Thus, Western Australia supports the development of national research networks, but on the proviso that adequate funding is available to undertake Western Australian specific work.

Analysis of the impacts of climate change has begun, with a significant focus on cropping in Western Australia. Further analysis is needed to determine the impact of climate change on the agricultural industry and the supply chain. For example, it is not clear what the potential effects of climate change will be on downstream processes or the supply chain. Analysis into the impacts on the export industry; food security and availability at a local, regional and national scale; type, location and size of infrastructure required; identification of potential market failures; and areas requiring structural adjustment is required. This includes research into how adaptive agriculture can assist regional and remote communities to remain viable under climate change (indirect and direct economies).

Characterising the socioeconomic impacts of climate change also requires investigation. This includes the effects on yields of agricultural products, the effects on global markets, regional economic impacts, gender and indigenous dimensions, employment (including where and to what extent the agribusiness, forestry sector and value chain is able to be profitable and support jobs and communities), and the impact of changing social values of agriculture as a result of climate change.

The Department has commenced investigating initiatives to work with the food industry and its associations through the provision of assistance, advice and support in managing climate change risks. The majority of WA's food industry is compromised of small to medium enterprises which take produce from primary agricultural industries and transform and value add for local and export markets. This sector is an important downstream process in the agricultural supply chain and the effects of climate change and climate change policy are unknown. The Department is developing a food strategy for WA which aims to build a framework for coordinating whole-of-government services to the food industry. Part of the strategy will be assisting the industry manage the implications climate change will have on their agricultural suppliers.

Collaborative effort in researching responses to climate change has been identified by the Western Australian Government as an effective method for generating outcomes in an efficient and timely manner. For instance the Department and FPC have become partners in the Cooperative Research Centre for Future Farm Industries (CRC FFI). The CRC FFI has a focus on researching how to maintain productive agriculture and forestry industries under a changing climate, and devising innovative new systems.

In addition, Agricultural Research Western Australia (ARWA), a research alliance involving the Department, Curtin University of Technology, the Commonwealth Scientific and Industrial Research Organisation, Murdoch University and the University of Western Australia has been established to assist the five Partner organisations to deliver high quality science and innovation which contributes to the economic, social and environmental success of Western Australia's agricultural, food and fibre sector .

The Climate Adaptation Program (CAP) is ARWA's best example to date of a collaborative approach to building a major science initiative in a high priority area, the outcomes, scale and impact of which are beyond the reach of any one Partner acting alone.

The objective of CAP is to deliver the information, knowledge and tools that decision makers require to manage the risks and capture the opportunities that climate change will present to rural industries and communities in south west Western Australia.

This will be achieved by collating historical information, conducting risk analyses for farm businesses and rural communities, developing new land use systems/industries and innovative management practices for mixed livestock and cropping systems, implementation of a virtual laboratory of land use management, integrated biosecurity strategies, and pathways to ensure practical implementation of the research.

Whilst the initial focus will be on the northern wheat-belt of Western Australia, a region which contains a rich set of farm business and rural community experience in adapting to climate change, the outputs and learning from CAP will have direct application elsewhere in the State, and will be highly relevant nationally and internationally.

Research and development into improved whole farm management and decision making especially for NRM issues is another key area for the agricultural sector under climate change. This includes the provision of information to farmers on possible diversification opportunities such as livestock production, agroforestry, whole farm adaptation, and research and development into new species and varieties that reflect appropriate thermal and vernalisation requirements and/or increased resistance to heat shock and drought.

Climate change will also have a significant effect on biosecurity risks (Robinson & Blenkinsop 2008). Biosecurity will increase in importance as climate change will enable many agricultural weeds, pests and diseases to flourish. A strategic analysis into key risks is required in order to prioritise investment in this area. Research needs to be conducted into the spread, impact, effect and type of diseases, invasive species and pests under climate change for various agricultural industries.

While there has been significant investment at a national level in developing climate models and predicting climate change, to enable agriculture and forestry to make informed adaptation decisions these data require further down scaling. A key requirement is the provision of estimates of climate change at the local level.

The Indian Ocean Climate Initiative (IOCI) was formed by the WA Government in partnership with CSIRO and the Bureau of Meteorology (BoM) to ensure that the climate issues of Western Australia are adequately addressed in national science; and information on climate change and variability peculiar to our region is effectively communicated to decision-makers and community. IOCI undertakes regionally focused research and decision-support on climate variability and change in the State.

IOCI Stage 3 (IOCI3) will enable 'downscaling' of the large global atmospheric circulation models used by CSIRO and BoM resulting in climate predictions that are substantially more useful for adaptation planning and decision-making at a regional and sub-regional level. Progress of the IOCI3 research is continuously communicated to policy makers and the wider community through the Department of Environment and Conservation's website.

3. **Ensuring land use planning and regulation takes into account climate change projections**

Land use planning needs to take into account climate change projections to maintain sustainable and profitable agricultural and forestry production while protecting and maintaining the natural resource base. In recognition of this, the Department is working in partnership with land use planning organisations to include climate change as a considertion in the planning system. As climate change is only beginning to be considered, its capacity to create conflict between land uses and activties is yet to be realised. As sectors begin to develop strategies to increase adaptive capacity in response to climate variability and climate change, conflicts may emerge around decisions to protect certain resources, assets or industries at the expense of others (Morgan 2008). Further research needs to be undertaken to minimise conflict and ensure prime agricultural and forestry land remains available, viable and sustainable amongst any potential land use conflict.

A key area for potential future conflict will be the demand for water resources on sectors that rely heavily on its availability. Sections of the agricultural industries require water resources as a key input for productivity. There is therefore a real need for research and development into appropriate technologies to conserve, harvest and manage limited water resources.

The implications of climate change on the interactions between farm management and other natural resource management issues, e.g. water resources, biodiversity and sustainable land management also need to be understood. An assessment is required of the impacts and synergies between possible climate change mitigation strategies (e.g. reforestation, renewable energy production) and the delivery of adaptation strategies in other sectors (e.g. water yield and quality, sustainable agriculture and biodiversity protection.) Mitigation strategies that are included in the Carbon Pollution Reduction Scheme (CPRS), such as integrated reforestation, provide the potential to assist farmers in adapting their farm businesses to climate change, by providing an additional source of income and also tackling land degradation issues such as salinity and erosion.

The provision of Government services will also be affected by climate change and appropriate planning needs to be undertaken. For instance, the cropping industry will likely see a significant change in both its production and geographic distribution. The bulk of the Western Australian cropping industry is located in the medium to low rainfall areas. Farms are generally large in size. With the shift in climatic conditions, the south west of WA will became more suitable to cropping. However, the shift in where crops are produced will occur in association of other land use activities. This may have implications for the State's export industry, food supply and agricultural sector.

The likely shift in regional crop production will have implications for grain storage and transport infrastructure, with declining use in some areas and the need to increased capacity in others. Ensuring appropriate infrastructure is available to support future agricultural and forestry production will be essential to maintain the State's primary industries.

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