SUBMISSION TO THE AGRICULTURAL COMPETITIVENESS TASKFORCE

RESPONSE TO POLICY IDEA 16 - INCREASING DROUGHT PREPAREDNESS

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Department of Agriculture and Food
GOVERNMENT OF WESTERN AUSTRALIA

GRDC Grains Research & Development Corporation
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Response to Policy Idea 16— Increasing drought preparedness

This policy idea involved supporting a strong and profitable farm business and agri-business sector by encouraging further action by government in a number of areas including:

a) Introducing accelerated depreciation from new water and fodder infrastructure;
b) Encouraging multi-peril crop insurance;
c) Improving climate information;

Key Points

- The Australian grains industry is severely vulnerable to periodic major droughts which are typically linked to El Niño- Southern Oscillation (ENSO) events.
- Most existing forecasting systems only forecast for the next three months which does not give enough lead-time for farmers to adjust and make appropriate decisions which relate to the following 6-9 months.
- Some significant economic opportunities arise from an opportunistic long-lead drought warning system developed within AEGIC, which needs further refining.
- Considerable extra costs in the order of tens of millions of dollars are passed on to grain growers because of the loss of fine resolution agricultural statistics data which is needed to underpin operational crop forecasting systems. The reinstatement of an annual agricultural Census is needed to address an agricultural data crisis.

The primary production sector contributes about 2.4% of Australian GDP (ABS 2014), however, including the support industries, the contribution of the agricultural industry is 12% of GDP (NFF 2012). Given the contribution of agriculture to Australia's economy, the impact of drought on GDP growth is measurable and significant. Recent significant droughts, including those triggered by El Niño events, are estimated to have reduced GDP growth in the year of the drought by 0.5 to 1.5% (Lu 2004, Horridge 2005, ANZ 2007, Productivity Commission 2009). With GDP growth averaging 2.8% since 2004 (RBA 2014), drought can have a significant impact on Australia's annual economic growth, as well as additional social and environmental impacts.

Major droughts in the Indonesian-Australian region are typically linked to El Niño events that make up one extreme phase of the El Niño-Southern Oscillation (ENSO) phenomenon. The prolonged El Niño drought of 1982/83 had a great impact on Australia as it caused crop failure, reduced farm cash surplus ($1.1 billion), reduced national employment (2%, 100,000 jobs) and contributed to conditions that were favourable for a severe dust storm and widespread bush fires, the latter of which covered 500,000 hectares, led to the death of 72 people, 300,000 animals and caused property damage worth $400 million (Alan and Heathcote 1987).

The ability to mitigate the economic effect of drought is currently limited through the short lead-times in recognising a high likelihood of drought occurring, and the long lead times for committing resources to the production and handling task. For example, in agriculture, especially cropping, 65% of the cost of production is incurred prior to the completion of sowing (AEGIC 2012), and hence prior to accurate indications of seasonal outcomes. However, where long term viability of primary production relies on periodic average to above average crops, the opportunity cost of not sowing is also high. This means that in most

cases, a farmer cannot afford to not sow a crop, though do so while exposed to significant risk of drought. This long lead-time also applies to the supply chains for commodity crops, where shipping and rail allocations must be made prior to accurate knowledge regarding the volume of grain that will be produced, and as such the magnitude of the handling task.

Various long range forecasting schemes have been developed, but these do not seek to predict the worst droughts and only give a probability of it being wetter or drier in the next three months e.g. Bureau of Meteorology POAMA model, Southern Oscillation Index (SOI) phase system.

Most existing indices (Pacific Ocean sea surface temperatures, SOI) may not indicate that a drought is on until late autumn/early winter after rainfall deficits have begun to appear such as in June/July 1982. The demand for forecasts is at its peak in early autumn when primary industries are committing resources for the following months or year. Useful predictions of crop yields would need to be available in February when computer models of ENSO are exhibiting their least accurate tendencies. This is also the period in which many farmers are making resource allocation decisions and seeking to access funding for their operational programs.

However, AEGIC research found that sea-level pressures over southeast Australia falls dramatically in winter/spring in the year before major El Niño events. An El Niño Prediction Index (EPI) based on this was able to predict the strongest El Niño events in the following year. Four of the most severe droughts to affect eastern Australia (1957/58, 1965/66, 1972/73, 1982/83) could have been predicted 9-7 months before planned seeding time and a year before harvesting. By the end of May/early June most of the major droughts to affect south-eastern Australia could have been determined by a threshold decline in a new MeanSOI index (1967, 1977, 1980, 1994, 2002/03, and 2008).

It is proposed that this AEGIC opportunistic drought forecasting system could prepare the Australian grains industry for the worst droughts and save considerable money with the right drought mitigation practices. With accurate long range forecasts, there is scope for limiting the downside risk prior to farmers committing resources to production, and in some cases, prior to farmers securing operating finance. Growers could significantly scale back operational plans in years where there is high probability of an El Niño induced drought, and sow with a higher level of confidence in years where there is a lower probability of an El Niño induced drought.

To put the value into context, where there is a 1% reduction in GDP growth due to a significant drought, this is equivalent to a $3.3b reduction in GDP for that year. A conservative estimate is that 5% of the economic impact of an El Niño induced drought may be mitigated based on the improved capacity of farmers to make better capital allocation decisions, the ability of farmers to limit their exposure to debt funding, supply chain operators to better organise the grain handling tasks and better management of government assistance to address social and environmental impacts. This would result in a $165m benefit to the Australian economy in the drought year. Though the detrimental impact of the drought year is transitory (Lu 2005; Productivity Commission 2008), this implies a significant benefit for the mostly rural based population within the agricultural industry.

Additionally, increased accuracy in predicting El Niño triggered drought may increase the willingness of producers to invest in years where there is low probability of El Niño drought. With finance and insurance sectors willing to trust in the El Niño forecasts, and allocate operating finance with lower risk premiums, there is potential to increase economic upside in these low risk years with farmers able to expand cropping programs. The combination of these two effects – limiting the impact of drought in high risk years and providing improved upside in low risk years – could see increased investment in productivity improving technologies on farm, providing sustained growth in total factor productivity, and an improved return to capital in the agricultural sectors.

In addition, the major grain bulk handling agency in Western Australia, CBH, admitted inaccurate crop production forecasts had cost growers tens of millions of dollars of extra variable costs. Acknowledged cost savings from improved crop forecasts to CBH include: 1) reduced temporary staff requirements at receiving points,2) reduced third-party hiring costs, 3) reduced double handling of grain, and 4) more compressed receive point times in small harvests. AEGIC has been developing operational models to predict grain production at a scale that is linked to the supply chain and grain receival points.

Unfortunately crop forecasting systems set up at a shire level across Australia have had to be shut down due to the loss of annual agricultural statistics data for four years in five. This cost saving to the Australian Bureau of Statistics is only of the order of $1 million a year. The data that is provided for four years in five is only at a broad regional level that is disconnected from the grain receivable network. It is impossible to calibrate and measure the accuracy of crop forecasting systems with the present Australian Bureau of Statistics data. The full census only happens once in five years and major droughts and flood events, like 2010, means that there is no realistic measure of average production. Measuring data once in five years is inappropriate in a highly variable environment. Even the data provided in the full census has many shires grouped together because the population in these shires is low, even though the grain production is very high.

A loss of high resolution crop forecasting systems has contributed to significant extra costs in the supply chain related to the movement of billions of dollars of grain (incurred for a saving of $1 million a year by the Australian Bureau of Statistics). Since Australia has the highest yield variability in the world it is essential that the frequency of the one in five year agricultural census is returned to an annual basis.

AEGIC can contribute to improved climate and crop forecasting information and provide national early preparedness for climate extremes. However, the integration of seasonal forecasts into crop production forecast needs to occur at a scale that is directly linked to the major infrastructure along the supply chain. A small re-investment in agricultural census data will enable better crop production forecasting systems that can contribute to greater efficiencies in storage, logistics and transport. This will benefit grain growers across the nation.