Climate Change in the Australian Pastoral Zone; the impacts, issues and tools available

Australian Government
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BESTPRAC

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Introduction

Bestprac, the pastoral based producer network supported by Australian Wool Innovation, has received funding through the FarmReady program to undertake the project 'Implementing new practices to manage climate change variability in the Australian Pastoral zone'.

This project involves a series of research processes and events to achieve the following objectives:

- Determine current level of knowledge, training needs, barriers to implementing practice change, current management techniques, producer perceptions of climate change and its impact locally, regionally and on the industry
- Research and compile current climate change research, information and tools relating specifically to the pastoral zone in SA, NSW, QLD and WA
- Inform pastoral producers of the best options available and the strategies others have implemented so they have knowledge to assist in effectively managing climate change
- To direct future training opportunities for climate change in the pastoral zone

A survey was conducted with 80 pastoral producers during 2009 as part of this project. This survey identified producers current perceptions and awareness of climate change, and the adaptations they are making to their business to reduce the impact of climate change. This survey has been quoted throughout the state based reports within this paper. This survey and report can be found in Appendix 1.

Producers are exposed to various tools and methodologies to help them improve their business performance and grazing techniques. The aim of this report is to determine the extent of tools available to support pastoral producers in understanding the impacts of climate change, both now and in the future.

This paper includes 4 state based papers that analyse the current tools available to pastoral producers in each state. It identifies any current gaps in the information available, and provides direction for the future training needs for pastoral producers in regards to adapting to climate change. It identifies the trends in the current environment between states and the future training needs required, at a national and state level to ensure producers are equipped with the necessary skills, knowledge and tools to continue farming in their current environment.

The pastoral region of Australia supports 1700 woolgrowers (Australian Wool Innovation 2009) in addition to lamb meat production, goat production and cattle production. The pastoral zone generally has been severely effected by drought throughout the past 10 years, and the extent of this drought varies between states and regions within states. The impact on the drought on pastoral businesses has resulted in many producers reassessing their current production systems, and ensuring business strategies are incorporated into production strategies to help mitigate the effect of drought on businesses.

There is much discussion as to if climate change is real or if the current changes in weather patterns and the drought experienced is an effect of cyclical patterns. Regardless of the opinion the producer holds, it is evident that a sound risk management strategy needs to be implemented to ensure the impacts of the changing climate are minimized to reduce negative effects, or capitalized on to capture opportunities. PIRSA (2009), says that 'to succeed, farm businesses will need to learn how to overcome the challenges and maximize opportunities. The keys will be preparedness, responsiveness and adaptability'.

The current impacts of climate change on farming enterprises are two fold. There are the current environmental impacts on farming, such as the increased occurrence of drought, floods and general changes in climatic conditions (albeit cyclical or permanent change), and the impacts of policy and legislation in regards to the Emissions Trading Scheme. This project aims to focus on the former and summarises the current messages pastoral producers are receiving in regards to their need to adapt to a changing climate, and the tools available to assist in this adaptation.

Key Findings and Common Themes Between States

There are common themes of key findings between states, and also key differences between states in terms of the range of resources and tools available to producers to aid in their adaptation to a changing climate.

The common theme between all states is the belief from government that climate change is real and will impact on the agriculture industry, whilst producers are still skeptical about climate change and its long term impacts on their businesses.

Research undertaken by Howden et al since 2006 has drawn strong conclusions of the potential impacts specific to the pastoral zone. This has focused on particular impacts on the wool industry industries, and the production implications of climate change. This research is relevant to all states.

Current and Historical Research related to Climate Change and Climate Change adaptation

Individual states are undertaking their own research and have developed their own priorities for R&D. Federal funding is focused at a national level, and centered on the cause and effect of increased green house gases on the Australian environment. The FarmReady program is aimed at developing processes and systems to help primary producers adapt to the changing climate and ensuring viability of their businesses in the future.

There appears to be little national research being undertaken within the pastoral zone, and most research on the pastoral zone is being undertaken on a state by state base. Most of the research undertaken on the pastoral zone has been done historically, with little current research being undertaken. There is some research being undertaken by MLA in Queensland, due to the dense population of beef cattle production, and the predicted implications of ruminant production on green house gas emissions.

Queensland and New South Wales appear to be the two states that have most actively embraced the need to equip producers with the necessary tools and processes and engage them in the climate change debate. Apart from FarmReady, there are few tools in Western Australia and South Australia that are focused at helping producers to adapt their businesses to the changing climate.

A lot of resources, both state and federal based are currently being applied to research in the field of the expected changes in climatic conditions. This research is being undertaken by state and federal departments, as well as industry bodies. What appears to be lacking is the application of this research into practical outcomes for producers.

Impacts of Climate Change-observed and predicted

'The impacts of climate change will differ from sector to sector, region to region and enterprise to enterprise. As with all business decisions, every proposed strategy should take into account each individual enterprise's particular circumstances (PIRSA 2009)'.

'The impacts of long-term climate change on agriculture could include more weeds, pests and diseases; changes in pasture growth and livestock carrying capacity; an increase in extreme weather events; and changes in rainfall patterns combined with higher temperatures (PIRSA 2009).

PIRSA (2009), reported that 'ABARE, in its National Assessment of the Vulnerability of Agricultural Industries and Regions to Climate Change, presents three broad risk management options for climate change adaptation:

1. Diversification – reducing risk through varying the sources of income, possibly including off-farm activities.

2. Consolidation – increasing efficiency by improving economies of scale so that extra efforts yield proportionately greater revenue.

3. Relocation – moving the entire farm enterprise to a different location, where climate change impacts are expected to be less or more manageable.'

PIRSA (2009) noted that although there are various tools available that 'suggest enterprise level mitigation and adaptation options, such activities should be assessed in the context of the broader, big picture business decisions'.

Each state paper addresses the observed and predicted impacts of climate change for their respective state in regards to the social, technological, environmental, economical and political impacts in the pastoral zone.

Social Impacts

All states noted that the social impacts associated with climate change are effecting community dynamics, and that the future impacts are likely to be consistent with the current trends.

The drought has shown impact directly on farming businesses, as well as rural industries and communities. Reduced stock numbers in all states has impacted on business profitability and therefore community structures and the services available. Decline in particular health and education services are a worrying issues to communities throughout each of the states, with younger families choosing to relocate to communities with greater services available.

The mining industry is impacting on labour availability, and agricultural based businesses are finding it difficult to compete against the salaries offered by mining companies. Although not necessarily a direct link to climate change, the drought has impacted on the ability of pastoral businesses to pay employees and therefore off-farm work is more attractive than on-farm work. These changes in employment also effect community dynamics. In Queensland, the mining boom is also seen as a positive as it provides the opportunity for the generation of off-farm income.

In Western Australia, succession planning has also been raised as an important social issue, as younger generations are finding off-farm employment a more attractive option than investing in the family farm. Sourcing skilled people to 'take over' properties in the future could be difficult.

To support these changes, agriculture based businesses may be forced to seek off-farm income as well as on-farm income to support the reduced income through primary production. Diversification of on-farm enterprises as well as off-farm enterprises are being investigated by pastoral businesses throughout Australia.

Social impacts of climate change, that are noted in all states, also include the proposed health risks associated with increased temperatures and decreased water availability.

The increased occurrence of mental health issues is also noted in all states. All state papers make reference to the current mental health issues in regional and remote areas, and predict that these are likely to increase as the impacts of climate change increase.

Technological Impacts

Keeping up with technology and employing the latest in technological advances will be vital in ensuring that pastoral properties remain viable in the future. Advances in monitoring systems, in particular regards to watering systems, have already reduced labour requirements and increased efficiencies on both large and smaller pastoral holdings.

Advances in technology to increase efficiencies and production in pastoral areas include new grazing management approaches, labour saving devices, livestock monitoring and handling and improved welfare. The Queensland paper has made particular note of the various forms of technology being utilised in pastoral businesses.

It will be important to measure and monitor the effects the implementation of these new technologies have on pastoral businesses and determine to what extent they contribute to the ongoing viability of pastoral businesses. It is also noted, that without significant changes in the rainfall received, it does not matter to what extent technology advances, without rainfall, continued viability in the pastoral region will be difficult.

The Western Australia paper has made note of the technological implications of increased rainfall in Western Australia, and the impact on soil and the ability to grow food in the future.

Environmental Impacts

The environmental impacts will occur at a global, national and local level. The summaries from each state noted similar changes in weather patterns, and the impacts that this will have on production.

As well as production impacts, changes will also occur in the variety of weeds and their distribution, which will require changes in management practices and abatement processes.

Lack of surface water run off will impact on the availability of stock water, which will also effect the potential for grazing particular regions and areas within states. This will have a compounding effect on production and viability of pastoral businesses.

Maintaining ground cover and biodiversity will be an ongoing challenge and the implementation of new grazing management techniques will be required to decrease the likelihood of erosion and loss of productivity in grasses and forage.

The New South Wales paper notes courses available, including Allan Savouy's Holistic Management, Grazing for profit and The Business of Farming, that have had positive impacts on land management in pastoral areas during the drought. It is also noted that in some areas, the processes and ideals of these training courses remain physically, socially or financially 'out of reach' for people within these communities.

Economical Impacts

Recent droughts in all pastoral areas of Australia has greatly impacted on the viability and profitability of pastoral enterprises. There are, of course, those producers who are able to capitalize on such events and have introduced new management techniques and innovations to ensure their ongoing viability. For others, however, the transition has been difficult and resulted in decreased profitability, and in some instances, sale of the business.

The economical impact on pastoral businesses per se in the future is yet to be estimated or quantified. The majority of research is currently focused on production based issues, and has not extended to the impact that the required changes in production will have on the business performance and profitability. This is a noted gap in all states.

The economical impacts on farm will be further exasperated into the greater rural community, including the surrounding district and service towns. Mitigation plans to help support the communities through this transition will be required to help lessen the effects of climate change on regional areas.

Political Impacts

Legislations and policy in regards to the Emissions Trading Scheme will effect agricultural operations, either directly or indirectly depending on legislation.

Queensland is being quite proactive in it's management of rural communicates, and although recent amalgamation of government boundaries has impacted on natural resource management and primary industries in the pastoral zone, positive and beneficial outcomes have been achieved.

The Queensland government has also responded to drought conditions through the development of a risk management and adaptation strategy policy to help primary industries manage climate variability and longer term climate change. The Queensland government appears to be leading the way in developing policy and tools that will aid in primary producers adapting to climate change, rather than all funding being dedicated to research into potential weather patterns and climatic changes.

In New South Wales, the government is responding through the Exceptional Circumstances drought relief system. This system, which is useful in some circumstances, is generally unable to provide an adequate response for a long period of drought. Rural services are still in decline, in particular health.

In South Australia, producers believe they are being impacted by government policy in regards to their flexibility in decision making. Producers feel that Government policy is increasingly geared toward industry consolidation and the provision of incentives for producers to leave the land. Producers believe there is a lack of business incentives to encourage them to remain on the land.

Tools, resources and strategies available to help producers understand and adapt to climate change.

'Better and earlier knowledge will allow farmers to make timely decisions on whether new money should continue to be invested in locations that seem to be severely damaged by climate change or whether it is better to find new livelihoods in less challenging locations' (Garnaut Climate Change Review, 2008).

PIRSA, 2009, noted that 'not all enterprises will be in a position to make the significant changes necessary to remain viable in this changing environment. 'Big picture' decisions will also be needed to put farm management and production decisions into the context of financial viability and the needs of individuals, families and communities.'

Each state has listed various training courses, tools and resources that are available to primary producers to aid in their adaptation to climate change. Some of these courses operate on a national basis, and some are state or regionally based.

The courses and tools available are diverse, and include pasture management, human resource management, financial management, and also production orientated. These tools are generally available through the help of federally funded resources, such as Farm Ready. However, as the PIRSA (2009) report suggests, the majority of these tools and resources available are based on production issues and do not necessarily translate into the economical impact of these decisions on-farm. It is noted that resources based on the economic viability of these decisions are currently scarce.

All states have made mention of the various programs available through the Federal Governments Farm Ready program, which provides funding to primary producers to access training courses annually. There are various courses available which allow producers to seek reimbursement of course training costs.

In South Australia, PIRSA and SARDI have developed a suite of tools aimed at primary producers, both for mixed farming and pastoral businesses, that outline possible implications and adaptation strategies for producers. SARDI produced the 'Climate Risk Seasonal Outlook Tool' for wool producers in the pastoral rangelands of SA in 2006, which allow producers to assess the likelihood of receiving rainfall, with associated pasture growth outlook maps.

In 2007, SARDI and PIRSA released 'A guide to climate change and adaptation in Agriculture in South Australia' and this has been followed by 'The Changing Climate; Impacts and adaptation options for South Australian primary producers' in 2009. These documents are aimed at equipping producers with the necessary understanding of how climate change may affect their businesses in the future, and adaptation strategies that could help mitigate these effects.

In Western Australia, there are numerous FarmReady courses available, as well as training courses such as Farming for Profit and Grazing for Profit. There are numerous websites centered on weather and rainfall predictions available (all listed in the Western Australia paper). The Western Australia paper also outlines various papers and resources available to both producers, consultants and the general industry.

In New South Wales, the Catchment Management Authorities are providing valuable support to land holders with assistance with the cost of implementing innovations which have a defined NRM outcome. There are various FarmReady accredited courses, and non-farm ready accredited courses that are also available.

A common theme across states is that there are not a lot of resources available for consultants or the general industry. Most of the tools that are available are focused at targeting producers.

Key Messages

The key messages that have been delivered in each state based paper are summarized below.

New South Wales

- Some producers are innovating to overcome challenges, but the majority will be questioning their viability in the future
- There are various programs available to aid in producers understanding the impacts of climate change on their grazing but data is still lacking in regards to the actual impact on the business viability and profitability
- Extensive research is being conduced in how the climate may change
- Research is aimed at scientists or producers, with a lack of data available for consultants or the industry generally
- There are already a number of observed impacts of climate change on the pastoral region, it is difficult to quantify the future impacts.
- There is uncertainty from producers as to if climate change is real, or if it is a cyclical event

Queensland

- There is a lot of literature that documents possible impacts of climate change on the pastoral areas of Queensland, but this is not currently supported by the necessary tools to assist producers in the adaptation
- The literature suggests that in the future, certain areas of Qld may be unsuitable for wool or meat production given the predictions forecast
- The mining industry is positively affecting rural communities in some areas, providing diversification of off-farm employment

Western Australia

- Research is based on the science of climate change rather than the implications for producers
- Majority of producer training is available only through FarmReady reimbursement grants-few other tools are currently available

South Australia

- Little research has been done on producer perceptions; main study done through the Bestprac network
- There are various issues currently facing producers, climate change is but one, with producers increasingly concerned about their current status
- Climate change is perceived as being something 'in the future' and not necessarily happening here and now
- Staying viable in the future is of great concern
- PIRSA has developed some programs that are extended to producers
- A lot of the adaptation research or initiatives are research based. Not many are aimed at equipping producers
- PIRSA has produced a paper that stipulates possible implications and adaptation strategies for producers

Recommendations

The state based papers have raised various issues and concerns in regards to preparing producers for the changes that are currently occurring and that will occur as a result of climate change. These changes will occur at both a production and business management levels. Producers will need to equip themselves and their business with the necessary skills and risk management strategies to ensure they are creating resilient businesses for the future.

Perceptions

It appears that the general trend is to think that climate change will occur in the future, and that changes aren't necessarily occurring in the present. Producers appear to be of the opinion that they will need to make future changes, rather than implementing change now. This demonstrates a lack of understanding of climate change by producers, and the need for consultants and support mechanisms to aid in the current decision making of producers. There is the possibility that producers will try to implement changes too late, if change does not start occurring now.

Action: The need for Service Providers to encourage the adoption of change in the present environment to better equip businesses to future change.

There is also the perception by some producers that the current weather patterns are 'cyclical' and there is much cynicism about climate change. Regardless of producers perceptions as to if climate change is real or not, action is required to ensure that producers are equipping themselves with the necessary skills and implementing risk management strategies to ensure their businesses are resilient in the future. There appears to be some resilience from producers to accept the need to change their businesses, both from a production base and management perspective, to ensure a successful business now and in the future. Current financial pressures make implementing change difficult.

Action: Ensure producers are equipped with the right information to make changes and understand the current weather patterns and changes.

Future Prosperity of Pastoral Businesses

A common theme that has occurred in all papers is the recognition that some pastoral based businesses will survive and prosper due to their ability to capitalize on current business strengths, and recognize the opportunities that are available, whilst for some businesses, the challenge is too great and will require restructuring out of agriculture.

It will be important that for these businesses where the challenge is too great, that there is the necessary support mechanisms in place to guide the transition out of agriculture. Federal Government grants are currently available for financial support, however, this financial support needs to be backed by a facilitated approach by consultants to ensure the process is managed and the right outcomes are achieved.

Action: To ensure the correct support mechanisms are available to producers if they exit agriculture.

For those businesses that survive and prosper, it is vital that support is available, and it is support that encourages new farming techniques and ideals, rather than the traditional farming techniques. Within this, Government policy will need to be flexible to ensure producers are allowed to implement new techniques, from a natural resource management perspective, as well as a business management perspective.

Action: Policy requires reviewing to ensure it is flexible to allow farming to be successful under new climatic conditions.

Generating off-farm income will be a key survival technique for some businesses. Given distance in the pastoral region, finding alternative employment can be difficult. Being innovative, and designing alternative methods of generating income from their current resource base will be necessary, in some cases, to generate this alternative income. Models, such as Enterprise Based Conservation, will become a tool to help deliver this need.

Challenges, apart from climate change, are also currently influencing the ability of pastoral producers to continue in their businesses. All states have noted that additional challenges, such as fluctuating market prices, availability of labour and increasing input costs are all influencing the viability of the business. It is important that Government, consultants and support mechanism continue to provide advice and support on the range of issues effecting the businesses, rather than purely focusing on climate change.

Action: Support includes advice and tools for the range of issues that are effecting pastoral businesses, and not just climate change.

Current Research

Much of the research focus by Government is on the climatic changes that can be expected from climate change. Although this is necessary information to quantify the extent of the changes that can be expected, research also needs to be focused on the impacts of these changes on pastoral businesses. Support also needs to be available to help producers understand these impacts, and guide them through a decision making process to change their practices to incorporate these changes.

Action: Ensure that resources are devoted towards modeling the impacts of climate change on pastoral businesses.

Action: Develop the necessary resources to ensure producers have access to information that details how their businesses could be impacted, and the actions they can implement to mitigate these impacts.

There is particular research that is focused on the pastoral regions, which provides a basis for understanding the impact of climate change on the rangelands. Continuing this research in all states will be necessary to ensure the viability of running a pastoral based business in the future is maintained.

Little research has been undertaken at a national level on the impacts on the pastoral industry, rather the research has been state or regional specific. This allows for more specific research at a local level, and for the outcomes of the research to be of greater relevance within the specific regions. This research is not occurring within all states however, so there is the possibility that some regions are not receiving the research support that other regions have received. Some areas within the pastoral zone could therefore suffer greater consequences of climate change as the research has not been undertaken in these regions.

Action: Where possible, ensure the information from specific regions is publicized to the pastoral region within Australia, so all producers are aware of the various information available.

Training Opportunities

Training opportunities are currently available through FarmReady, the Federal Government program designed to equip producers will the necessary skills to help overcome the challenges of climate change. There are various programs available to all producers in all states, and the reimbursement grant encourages producers to attend.

Not all producers will choose to receive their information in these workshops. Some producers prefer alternative mediums to receive their information. It must also be ensured that there are alternative support mechanisms available, as the workshops may not be enough alone to encourage and support producers through the change process.

Action: Ensure information is available through various mediums.

Action: Ensure support for change is provided along with the information.

Future Opportunities

Pastoral producers, along with consultants and industry representatives, have identified numerous opportunities that are available within the region. Such opportunities include:

- Developing alternative business models
- Ensuring the latest in technology is used to decrease labour requirements and increase efficiencies
- Exploring alternative enterprises
- Creating off-farm income

Alternative enterprise models can incorporate systems such as the Enterprise Based Conservation models, which encourage producers to stay on the property, manage the natural resources according to best practice management for conservation, being able to generate an income from primary production and also generating an alternative income source through recognition of appropriate land management.

It is models such as these that will provide enough flexibility for producers to remain on their land, whilst generating an off-farm income to support their on-farm income.

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