FARM-LEVEL ADAPTIVE CAPACITY TO CLIMATE CHANGE: THE ROLE OF FINANCIAL STRATEGIES AND FINANCIAL INSTITUTIONS IN AUSTRALIA

QUALITATIVE RESEARCH FINDINGS OF INTERVIEWS WITH AUSTRALIAN GOVERNMENT POLICY ANALYSTS

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Executive Summary

This report focuses on the policy objectives of Australian governments and their support for institutions who are engaged in agriculture's adaptation to climate change, in particular, their financial adaptation. The views of Australian federal and state government policy analysts were sought through extensive one-on-one interviews, with the aim of providing insight into the key policies that influence financial adaptation to climate change in Australia. The outcome provides both a broad perspective on the overall strategic direction of government policy within Australia as well as providing an industry perspective particularly in dairy and horticulture.

Government Policy

State and Federal Governments in Australia continue to redefine their role within the agriculture sector. Federal government policy has removed government subsidies to the agriculture sector (particularly through tariffs) and is in the process of realigning drought and water pricing policies. Traditionally, State Governments have been responsible for extension services aimed at supporting farmers to develop skills in managing a business within an increasingly complex environment, including their role in land stewardship[1]. The emphasis of extension services has been on enhancing farm productivity, although increasingly, emphasis is being given to enhancing profitability, with an eye on Australia's role as a major agricultural exporter to the Asian region.

The capacity of farmers to financially adapt to climate change is framed within a policy predisposition to treat agriculture differently from other

[1] Land stewardship as defined by Victoria's Department of Sustainability is the management of land to enhance, protect and restore biodiversity assets and ecosystem services.

industries on the basis of societal/equity concerns over food security and traditional views of rural life. The consequences, suggests one federal government policy analyst, is that the allocation of resources are given priority and provide a disincentive for innovation or adaptation.

The quest for better policy outcomes identified by one policy analyst involves three components: (1) a commitment to managing Australia's natural resources; (2) consideration of the potential for climate thresholds to be crossed; and (3) the social consequences of structural adjustment.

As farmers seek to exit agriculture, little support is provided by industry groups such as Dairy Australia. However, state and federal governments are supporting farmers through retraining programs, predominantly through the Rural Financial Counselling service. A new pilot project being conducted by the Western Australian Department of Agriculture and Food and funded by the federal Department of Agriculture, Fisheries and Forestry, is testing a package of measures designed to move from a crisis management approach to a risk management approach. The aim is to better support farmers, their families and rural communities in preparing for future challenges, rather than waiting until they are in crisis to offer assistance.

Economic Logic

The economic logic for policy intervention should be on the social and economic constraints to adaptation. This includes the role of government intervention and its ability to provide higher productivity and profitability for farmers. One policy analysts asks "are there genuine barriers to adaptation or are the options available influenced by market forces". The emphasis, he suggests, should be on the institutional capacity to adapt, with a focus on behavioural changes required to enable adaptation

Mitigation Policy

Agriculture is currently excluded from the Clean Energy Act 2011 (also known as the Carbon Tax) other than by providing offset opportunities. The OECD has developed a set of indicators to determine how much and in what form financial support is provided to agricultural producers, how this has changed over time, and how it can be compared across countries. The total contribution of greenhouse gas emissions will, in time, be factored into these indicators which assess the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers. Whilst production outcomes may benefit in the short-term from Australian agriculture's exemption from the Clean Energy Act 2011 through lower taxes and income from carbon sequestration activities, the long-term outcome is that it could discourage adaptive behaviour and lead to additional costs associated with international trade.

Water Policies

Water policy is integral to Australia's agriculture sector. Significant policy changes by the Victorian Government in 2007 resulted in the separation of water share from delivery and the right to use water. This 'unbundling' of water rights has created new water markets and expanded interstate trade but transferred the risk of managing water security and water allocation onto the farmer. This has important implications for the capacity of farmers to adapt. Farmers with a high risk threshold are comfortable in selling their water share at a high price and then buying it back when the market lowers, other farmers can almost flatten out the volatility and maintain the amount of water available from year to year. Water trading suits farmers who are prepared to take risks or are prepared to use the tools available to them, for other farmers who are more risk adverse, this can create additional stress.

Barriers to Adaptation

A range of barriers to adaptation were highlighted by policy analysts including: interest rate subsidies provided to farmers as part of the Exception Circumstances (EC) package of measures which delays farmers exit from unprofitable farms; the transfer of the risk of managing water security on to farmers, which was seen by one state government policy analyst as either too risky or expensive; and the exit price required for water allocations if a farmer chooses to exit their land.

Dairy Industry

Australian dairy farmers are reluctant to accept the science of climate change as they believe the effects will take place in 50 - 200 years. Despite this, there is strong evidence of changed management practices in response to climate variability. The two significant changes are the increased use of seasonal or split batch calving and the shift from perennial to annual pastures. The major benefit of annual pastures is the quality of the output and the ability to store excess fodder. Others include: the management of heat stress on cows; conserving energy in the dairy shed, including labour; increased water use efficiencies; and nutrient management practices. Opportunities are also being explored in relation to carbon farming initiatives, the installation of solar panels on dairy sheds and the capture of energy produced through effluent ponds.

Water has a significant influence on the dairy farmer's bottom line as there is an important link between cheap sources of feed (home grown fodder grasses), the grazing of cows and its translation into milk products. Irrigated dairy farms have the option of water trading, which provides greater flexibility during times of drought as the farmer can choose to buy in feed rather than growing it themselves. Acquiring additional water entitlements

can lead to increased levels of production, but importantly, water trading enables farmers to respond to market conditions.

Dairy farmers are also diversifying their income base to take advantage of high commodity prices, to counter fluctuations in the prices of commodities and to buffer changes in the exchange rate. These include raising heifers for the export market, growing contract fodder grasses or maize and even complimentary tourism. There is less evidence of an increase in off-farm income which can be a useful risk management tool when dealing with the vagaries of climate and markets.

Horticulture Industry

Whilst sections of the horticultural industry are considering the impact of climate change for their business, there is a high degree of variation in terms of the level of acceptance of climate change. However, there are examples, like Brown Brothers Wines, who are diversifying their business to guard against future climatic change by buying additional land in Tasmania. Current production practices, such as the purchase of drought tolerant varieties or through water use efficiencies, are driving decision making from a water perspective rather than a strategic response to climate change.

Many growers, impacted by the recent floods, appeared to have limited experience of dealing with the wet conditions. For horticulturalist considering climate change impacts there are considered to be three critical risks to respond to: an increase in annual variability of cash flow due to extreme events; the increased costs of managing climate variability and their ability to respond to risk; and choosing between ways to risk proof their farm (i.e. in terms of infrastructure, water allocations, crop sunburn protection, or

insurance. All of these risk proofing options mean that horticulturalist will face additional costs in relation to managing climate change/variability.

Keys to Financial Adaptation

A general component of successful financial adaptation to climate change suggests one federal government policy analyst is the amount of equity a farmer has in their business. Other components include the management skills of the individual farmer, their perception of risk and stage of life. Importantly, scale is seen as being of less significance. Whilst there are situations where economies of scale favour the larger farms, particularly in regards to the investment in infrastructure, smaller farms can also be profitable even if they are unable to access milk premiums through consistent supply. However, smaller farmers often forgo a drive to maximise profitability, in favour of a lifestyle approach to farming. The increasing administrative burden on farmers as a consequence of various regulations and legislation also needs to be factored into their ability to adapt.

Government and the Banking Sector

There is a role for governments to support banks, particularly where a large debt has been incurred by the farmer, as the abandonment of farms has social implications which are of great significance to rural communities.

State Governments are developing extension activities that target bankers and accountants with the aim of developing a greater awareness of the profitability and productivity of different scales of farm businesses. State Governments are also providing briefing to banks in relation to climate change projections and the banks have shown enthusiasm for the Strategic Plans and Farm Planning documents that have been developed as part of the pilot of drought reform measures in Western Australian.

As a consequence of the Global Financial Crisis (GFC), bank decision making in regards to lending practices for carry-on finance moved from regional management to head office management. The outcome was a more pragmatic but narrow set of quantitative rules being introduced that lead to decision making based on equity, asset levels and the last three years of production.

Banks also manage the exit of farmers from the industry, when farmers are no longer able to access carry on finance. Without proactive management of the situation farmers may have to make a quick decision on their future. The role of Government in this scenario is to provide information to farmers to assist them to make timely decisions on when to exit farming.

Government and the Insurance Industry

Farm insurance is used to minimise risks to the farm business, including the risk of some natural disaster (floods and droughts are excluded) or income protection insurance.

All of the interviewees agree that governments do not have a direct role in underwriting insurance premiums for farm businesses in regards to climate change/variability. They believe there is a clear role for the market to manage this risk. However, the role of Government, it was suggested, is to provide appropriate climate and other data that facilitates the private sector in its development of appropriate insurance products.

Whilst crop insurance products are common place within Australian grain and horticulture industries, the types of products available for the dairy industry are focussed on the protection of buildings and their contents as well as loss of income. Insurance was viewed by one interviewee as expensive and

not always value for money, particularly in horticulture. For example, premiums for hail insurance were considered high and physical investment (e.g. netting) was frequently used instead. Frost insurance was also not considered cost effective and growers tended to develop other strategies (e.g. helicopter warming). However, despite these comments the horticulture industry remains interested in the potential cost and benefits of insurance.

One of the key strategies aimed at reducing fluctuations in the price of commodities currently being discussed by Governments is the role of hedging. Commodity price hedging is more usual in commodity farm businesses e.g. wheat, wool, etc. Recently products include diesel input hedges and rainfall hedges. Theses products are designed to enable farmers to forecast and budget with greater accuracy and to improve control over what would otherwise be fluctuating margins.[2]

Finally, the Farm Planning process, part of the pilot of drought reform measures in Western Australia, is seeking to build farmers capability to plan more effectively and it has proven to be highly successful with farmers.

[2] Australian Bankers Association inc. Fact Sheet, http://www.bankers.asn.au/Default.aspx?ArticleID=900, 21 January 2012

Section 1: Introduction

This report has been commissioned by Landcare Research, a New Zealand Crown Research Institute working on a project funded by the New Zealand Ministry of Agriculture and Forestry – Sustainable Land Management and Climate Change Programme to inform the New Zealand Government on alternative farm financial strategies and financial products developed in Australia in response to climate change/variability. The research seeks to understand whether these alternative strategies could increase the capacity of farmers/orchardists to adapt to climate change in New Zealand.

With the aim of complimenting the other elements of this project undertaken by Landcare Research, this qualitative research was commissioned to ascertain the views of selected Australian Federal and State Government departments involved in agriculture, the management of extreme events and climate change on the role of finance institutions in agriculture's adaptation to climate change.

To this end, a series of individual interviews were conducted with policy experts who had expertise and an interest in financial adaption to climate change.

The overall aims of the full research project research are to:

1. Develop a conceptual framework of farm-level adaptation to the impacts of climate change through financial strategies and the role of the finance sector and other institutions (e.g. related government policies) in supporting adaptation.

2. Conduct interviews focussed on understanding the current financial strategies/structures of New Zealand dairy farmers and kiwifruit orchardists, the role of NZ financial institutions and of related NZ government policy to date.

3. Review published information on relevant Australian Federal and State Government legislation, programmes and reviews, for example, Exceptional Circumstances, the Climate Change Adjustment Programme, the pilot of drought reform measures in Western, Productivity Commission 2009 Inquiry into Drought Policy, etc.

4. Interview relevant Australian Federal and Victorian State Government departments involved in agriculture, the management of extreme events and climate change to ascertain their views on the role of finance institutions in agricultural adaptation to climate change.

5. Research the Australian context for dairy and kiwifruit in Victoria and identifying suitable Australian case study farmers, orchardists and financial contacts through industry contacts and our project partners.

6. Communicate to the Minister of Agriculture and Forestry for the purpose of agricultural adaptation policy development. The case studies will be published for the NZ agricultural and finance sector to promote education on best practice and stimulate the development of financial products and services that support farmers.

This report addresses aim 4 as outlined above.

Methodology

Qualitative research techniques were used to analyse a series of individual interviews that were conducted with policy experts. The individual interviews were designed to highlight the perspectives of three groups of policy experts: the first group included federal government policy experts in the area of climate change adaptation and agricultural policy; the second group included state government policy experts with expertise in the horticulture and the dairy industries; and the third group had expertise in drought management.

The unifying factor for each of the people interviewed was that they had expertise on the financial adaptation of agriculture to climate change. Four individual interviews were conducted in December 2011. **Table 1** provides a list of the Government Department of the individual interviews that were conducted.

Table 1: List of the Government Department of the individual interviewed.

Name of the Institution
Federal Government
Department of Climate Change
State Government of Victoria
Department of Primary Industries – Horticulture Sector
Department of Primary Industries – Dairy Sector
State Government of Western Australia
Department of Agriculture and Food

Three different perspectives are provided in the report. These were identified when the scope and number of interviews were being considered. The first

component of the interviews provides a Federal Government perspective that combines knowledge of agriculture and climate change through the expertise of the policy analyst. The three State Government perspectives provide industry insight, particularly in regards to dairy and horticulture, as well as an insight into a pilot project of the Australian Government's Department of Agriculture, Fisheries and Forestry, who in partnership with the Western Australian Government, are conducting a pilot of drought reform measures in parts of Western Australia.

The pilot is testing a package of new measures developed in response to the national review of drought policy. The measures are designed to move from a reactive crisis management approach to pro-active risk management. The aim is to better support farmers, their families and rural communities in preparing for future challenges, rather than waiting until they are in crisis to offer assistance.

The design of the interviews was informed by the Project Leader, Jonathan King in consultation with the researcher, Patricia Fitzsimons on the basis of a preliminary literature review. One hour interviews were conducted. Each individual interview was taped and a transcript prepared. An analysis of the transcripts of interviews was undertaken. The analysis provides a documented account of the relevant perspectives of the Australian Federal and Victorian and Western Australian State Government departments involved in agriculture, the management of extreme events and climate change in relation to the role of financial institutions in agricultural adaptation to climate change.

The rigour of the research was guided by a series of specific questions that were inturn directed by the overall intent of the project. The series of questions put to each of people interviewed are outlined in **Appendix 1.**

These questions relate to the capacity of farmers to financially adapt to climate change and related issues, it was effectively an invitation for them to reflect on and talk about a number of topics, including:

1. Successful strategies for farm-level financial adaptation to climate variability and extreme events;
2. The role of farmers in relation to building their financial capacity to adapt to climate variability and extreme events;
3. Current Government policy in relation to supporting farmers to adapt financially to climate variability/change;
4. Characteristics specific to agricultural industries (particularly dairy and horticulture) that may impact on their economic/financial adaptive capacity;
5. The role of governments in building farmer's capacity to adapt to climate variability;
6. The role of banks in relation to building farmers capacity to adapt to climate variability;
7. The role of insurers in relation to building farmers capacity to adapt to climate variability.

A range of analytical techniques were applied to the qualitative data to identify a series of themes and recurrent preoccupations. This process benefitted through the use of NVivo software which assists in sorting and arranging unstructured information.

The body of the report is structured into three sections. **Section 1** provides an introduction to the research by offering an explanation of the different contributors to the interviews and the rationale behind their selection. **Section 2** provides an analysis of the views expressed by the policy analysts

interviewed in relation to financial adaptation to climate change. The analysis is broken into a series of themes that provides structure to the questions that were put to those interviewed and **Section 3** provides conclusions to the analysis in **Sections 2**.

Section 2: Analysis of Interviews

Government Policy

Overview

A significant part of the complexity of the operating environment for Australian farmers is the volatility of climatic conditions. The delivery of sound ecological and economic natural resource management will become increasingly important to landholders and the community, given the projected climatic changes such as increasing temperatures and changes in rainfall patterns. Another part of this complexity according to one federal government policy analyst is in the incorrect framing of policy in relation to adaptation to climate change. The outcome of policy solutions is that more often than not, one sector is pitted against another, rather than providing solutions with multiple sectoral outcomes Some recent examples of policy interventions that are made in isolation include live cattle trade to Indonesia,[3] drought policy that provides interest rate subsidies to farmers, or coal seam gas exploration licenses where mining leases on agricultural land are causing concerns in relation to health and safety issues "This doesn't help rural people actually deal with their situation, it actually limits their capacity to adapt "

In terms of the overall direction of agricultural policy that has a bearing on the capacity of farmers to financially adapt to climate change, one Federal Government policy analyst feels that there is a predisposition to treat agriculture differently from other industries on the basis of societal/equity

[3] The Federal Government suspended all live cattle exports to Indonesia in June 2011 in response to a public outcry following the airing of an ABC television program that showed brutal slaughtering methods and inhumane treatment of the animals within Indonesian abattoirs.

concerns over food security or traditional views of rural life. "The perception has been formed that farmers are financially worse off than other sectors and are more susceptible to environmental risks. The consequence of this special role of agriculture within Australian society is that the allocation of resources are given priority, such as the building of new infrastructure for the storage of grain within townships or the upgrading of irrigation channels. These are interventions into the private management of risk and any sector that is treated in a unique way (including agriculture's exclusion from the carbon tax) has a disincentive for innovation or adaptation."

The federal policy analyst continues by saying, "We have got to the point in agriculture policy where we have removed pretty much all policy interventions. The only policy intervention in agriculture, specifically in dry land agriculture, is drought policy. However, there are still policies around water and water pricing for irrigation. This contrasts to the 1960s and 70s [when] there were marketing boards for everything. These boards set the prices of the commodities and provided permits to grow wheat. The idea behind it was not necessarily to control the production of wheat but to ensure food security which was a consequence of World War II. It was controlled to a ridiculous level and involved the development of associated infrastructure and institutional arrangements."

"There continue to be lobby groups in Australia, such as the National Farmer's Federation, that seek to influence policy. One of their key arguments [used to justify policies that distort market centred approaches] is concern for food security, but this is not a genuine risk for Australia. We therefore need strong political leadership in the face of these pressures."

The quest for better policy outcomes in agriculture, identified by one policy analyst involves three components: a commitment to managing Australia's natural resources; consideration of the potential for climate thresholds to be crossed; and the social consequences of structural adjustment.

Managing Australia's natural resources

The term Natural Resource Management (NRM) is unique to Australia and refers to the sustainable management of land, water and biodiversity. It is effectively seeks to provide an integrated approach to the way in which land is managed.

Farmers' stewardship of their land and their capacity to deliver public environmental benefits from that land will be affected by economic circumstances. Farmers will be well placed to complement their traditional activities by providing new environmental services such as improved water quality in catchments and biodiversity preservation, as well as carbon initiatives. Market based instruments will increasingly be used to achieve natural resource management goals. However, one federal policy analyst believes there are policy barriers to achieving these goals. "Mainstreaming agricultural and environmental policy has become impossible within Australia because these policies are not jointly administered. This [misalignment of policies] requires pretty radical reform."

Whilst he suggests that governments needs to consider situations that the free market cannot deal with, the pertinent point is that if these policies do not have alignment there are consequences for the capacity of farmers to adapt to climate variability/change. "Placing emphasis on natural resource

management outcomes would involve placing a value on environmental or ecosystem services which are not currently priced in the Australian domestic market" There are however, examples in both Europe (the Common Agricultural Policy promotes resource efficiency with a view to smart, sustainable and inclusive growth for EU agriculture and rural areas in line with the Europe 2020 strategy) and in the USA (the Food, Conservation and Energy Act 2008, provides funding for conservation and working lands) which highlight the way in which different governments price the environment, predominantly through subsidies to farmers.

The federal government recently passed legislation in regards to the Carbon Farming Initiative which provides the basis for a carbon crediting scheme whereby on-farm methodologies are developed for emissions offset activities. Landholders undertaking activities that conform to an approved methodology will generate carbon credits. These carbon credits could then be sold on domestic or international carbon markets, thus providing an additional source of income.

One federal government adviser suggest that the best policy response is to place a value on the environment as this acts as a driver for social change and ensures a reduction in environmental degradation. On the other hand, market liberalisation has encouraged farming to move into marginal areas and has lead to larger economies of scale, which acts as a driver for social change as well as environmental degradation.

The potential for climate thresholds to be crossed

"Every crop has resilience to incremental changes in climate. The big impact of climate change will be when thresholds are crossed and certain activities

can no longer happen." (Federal Government policy analyst).

One example provided by the policy analyst is the Goyder Line. The Goyder Line marks the delineation between land in South Australia which receives more than 300mm of rain annually and that which does not. In late 1865, South Australia's surveyor-general, George W. Goyder, was asked to survey the state's north and define the southern extremity of the great drought of 1864-65. It was thought that this would define areas which received enough rain to support agriculture or livestock. The Goyder Line highlights how farmers ventured inland and there was a point at which scientists identified a threshold. The policy analysts suggests that "The question that emerges for policy is: would it be in the public interest to move people and assist them with structural adjustment, including retraining and reallocating rather than waiting for generational change. In addition to the social consequences, what are the consequences for NRM when farming in areas with marginal outcomes?"

The social consequences of structural adjustment

Shifts in the prices received for farm commodities in the international market place underpin a changing rural landscape as farmers seek to improve productivity to compensate for falling prices. The consequences are changes in farming practices as well as rural communities. "The evidence of structural adjustment" says one federal policy analyst "is highlighted by the decrease in rural populations resulting from farm consolidations. The result is job losses, and the loss of sporting or social clubs. However, no Australian government has ever had a policy to structurally adjust downwards the number of farms and rural communities. The consequences are that over the last 30 years, the Australian Government has [by default] allowed structural adjustment to

happen as opposed to Europe which has proactively provided policies to ensure the stability of rural populations through the Common Agriculture Policy, which have provided additional income support to farmers for the provision of environmental goods and services."

One state government policy analyst suggested that, "On the whole you are certainly seeing fewer and larger farms. Whilst the majority of dairy farms are still run by families, there are increases in the number of corporate farms, some of which have overseas investors, but this still remains the minority."

Economic Logic

"The economic logic for policy intervention has to be around the social and economic constraints to adaptation. The discussion should include, can government intervention in the market [including the appropriate selection of a range of measures such as regulation and/or information options] result in higher productivity and profitability for farmers given the range of potential barriers to adaptation to climate variability/change and secondly [what are} … the range of [potential] policy options, some of which might make it better. However, there are unintended consequences to a policy that was set up for social purposes. For example, if you go looking at farmers' options to diversify, are there barriers or are their [options] just influenced by market forces? There are some instances, for example, irrigation schemes, where past government assistance is now capitalised into the value of properties, much the same as say [grain storage] silo facilities built in townships for community usage or railway infrastructure that is used to deliver farm products quickly and efficiently to ports for export. So you have to ask are there legitimate policy barriers or is it just a question of whether or not industry wants to

invest in infrastructure [for example, freight trains are now operated by commercial interests and due to a decade of drought, that infrastructure has been left to decay whilst some lines have been closed. As current conditions have changed and there is more grain for sale, the infrastructure is inadequate for current conditions].

In the past there was science logic for intervention– which presents us with a gap mentality. The current logic of public intervention has to be on social and economic constraints. The emphasis should include the institutional capacity to adapt, therefore an emphasis should be on behavioural changes required to enable adaptation." (Federal Government Policy Analyst)

Mitigation Policies

Agriculture is currently excluded from Australian mitigation policy, specifically as part of the Clean Energy Act 2011 (also known as the Carbon Tax). In 2009 agriculture emissions represented 15 per cent of Australia's total greenhouse gas emissions and livestock emissions accounted for 70 per cent of those emissions. Prolonged drought across Australia over the past decade led to a decline in animal populations and diminished crop yields, especially over the period 2006-2009. The breaking of the drought in southern and eastern Australia in 2010 means projections for the next decade are for strong growth in agricultural emissions, with re-stocking of the Australian livestock herd and recovery of cropping activities. Currently, there are no significant abatement measures in the agriculture sector. The commitment by the Australian Government to implement the Carbon Farming Initiative (CFI) provides a mechanism for crediting abatement in the land sector. It is expected to provide incentives for activities to reduce emissions from agriculture by allowing for export credits to international markets. If

proponents choose to do this, the abatement achieved would not be counted towards Australia's emissions reduction targets.

"The delay in adding agriculture to mitigation policies", says one federal policy analyst, "only defers the problem until a later date". Governments around the world provide support to agriculture in the form of transfers through a wide range of policy interventions. Many of these policies share the common feature that they transfer money to farmers, and thereby impact on production decisions, incomes, international trade and the environment. With the aim of monitoring and evaluating the level and composition of this support, the OEDC has developed a set of indicators, in particular the Consumer Support Estimate (CSE) and the Producer Support Estimate (PSE). The focus of the indicators is on how much and in what form support is provided to agriculture, how this has changed over time, and how support is compared across countries.[4] The total contribution of greenhouse gas emissions will, in time, be factored into the indicators as they assess the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers. This includes implicit and explicit payments in the form of tax exemptions.

The consequences of any exemption from mitigation policy, is that it impacts on a range of production outcomes, including international trade and the environment. "What would drive change in the long term", says one federal policy analyst "is a fundamental shift in social attitudes, including a cultural change that involves a realignment of the special role of agriculture within government policy."

[4] Refer to the document, OECD (2004) Agriculture Support, How it is measured, What does it mean, to be found at: www.oecd.org/dataoecd/63/8/32035391.pdf

Water Policies

Water policy is integral to Australia's agriculture sector. In Victoria the Water Act 1989 is the legislation that governs the way water entitlements are issued and allocated. The establishment of the environment's formal right to water in legislation was made under the Water (Resource Management) Act 2005 which created the Environmental Water Reserve which has an impact on Victoria's water sharing arrangements.

The Water Act 1989 defines water entitlements and establishes the mechanisms for managing Victoria's water resources. There are a range of entitlements that may be issued by the Minister for Water including bulk entitlements, environmental entitlements, water licences and water shares. Some entitlements to water are not formally issued but exist under the Water Act 1989 for domestic and stock purposes by virtue of an individual's private ownership of, or access to, land.

Attention was drawn by a number of the interviewees to policy changes made in 2007 by the State Government of Victoria in relation to water entitlements. One State Government policy analyst highlighted a key impact of these changes. "They separated more clearly water share from delivery and the right to actually use water, so it's a water use licence that became more clearly delineated, whereas before it was just a mess. It also means that temporary water users pay a share of using the delivery infrastructure, where as previously they got a bit of a free lunch; they just bought the water and didn't have to pay for using any of the channels. So that's probably made it a bit more equitable."

Unbundling water entitlements is aimed at improving the management and use of Victoria's water supplies. It honours Victoria's commitment to the National Water Initiative to improve how Australia measures, plans for, prices, and trades water. Water entitlements held by irrigators and diverters on regulated water systems in northern Victoria were unbundled on 1 July 2007. Unbundling extended to the Werribee/Bacchus Marsh and Thomson/Macalister water systems in southern Victoria from 1 July 2008.

All water-related entitlements are housed in the Victorian Water Register. These include around 38,000 water shares with a market value of more than $4 billion. Water trading enables available water resources to be put to their most efficient use. Unbundling has created opportunities to open up water markets and expand interstate trade in line with the National Water Initiative.

Entitlement holders in northern Victoria can carry over unused water allocations between irrigation seasons. Water authorities are responsible for administering the Water Act. In relation to Victoria, the Goulburn Murray Water Authority is responsible for the delivery of irrigation water to farmers in northern Victoria. A water use licence enables a farmer to:

1. Water shares: A water share is a legally recognised, secure share of the water available to be taken from a declared water system. Water shares may be high or low reliability, and are specified as a maximum volume of seasonal allocation that may be made against that share. A water share is often held in conjunction with a water-use licence and delivery share.

2. Delivery shares: A delivery share provides an entitlement to have water delivered to land in an irrigation district. When a delivery system is congested it provides a share of the available water flow.

The delivery share is linked to land and stays with the property, even if the water share is traded away.

3. Water-use Licenses: A water-use licence authorises water to be used for irrigation in a declared system, while a water-use registration authorises use for other purposes. Each water-use licence includes a number of standard water-conditions including an annual use limit, to ensure irrigation is carried out in accordance with the water use objectives as determined by the Minister for Water. A licence may also contain conditions specific to the location and circumstances of that particular licence. The licence (or registration) attached to a specific parcel or parcels of land, and runs with the land if the land is sold, unless part of the property is sold separately.

The volume of water available for allocation at any time is the volume actually held in storages, minus up-front commitments, the losses incurred by the storage and delivery of water (e.g. seepage and evaporation). The up-front commitments include urban water supplies, environmental flows, and carryover when it is permitted. The available water resources are assessed before the start of the irrigation season, and an announcement is made of the seasonal allocation available at that time. The available resources are then regularly reassessed during the irrigation season and any changes to the allocation are widely publicised. If rain has significantly increased inflows to the storages or reduced demand, the seasonal allocation is increased consistent with the above principles.

When seasonal allocations are low, the probabilities of future seasonal allocations are also published to allow irrigators to understand the chances of better allocations being available in the future.

Barriers to Adaptation

A range of barriers to adaptation were highlighted by the policy analysts interviewed. One of these was interest rate subsidies which are seen to prolong the pain of decision making in regards to leaving the farm. A second one was transferring the risk of managing water security or water allocation on to farmers, which was seen to be either too risky or expensive.

One State Government policy analyst suggested that interest rate subsidies for some farmers might prolong the pain and put off the decision making process to leave the farm. "I wouldn't know what sort of proportion of farmers would be in that category and what proportion of farmers genuinely require assistance and are still in the industry today. When I'm talking to policy colleagues, that's one of their particular points that they'll bring up, is it bad policy and should we be supporting the farmers who are going to get out of the industry anyway. It's a really tricky one."

Exceptional Circumstance (EC) Interest Rate Subsidies provide business support to farms that are considered viable in the long term, but are in financial difficulties due to an EC event. The subsidies are provided at 50 per cent of the interest payable on new and existing loans for the first year of an EC declaration and at 80 per cent in the second and subsequent years, up to a maximum of $100,000 in any 12-month period and $500,000 over five years.

Another barrier to adaption highlighted by a State Government policy analyst is her understanding that a farmer seeking to exit their land are required to pay 15 times the annual water allocation fee which she considers a large amount of money. "So if people are absolutely sure that they're not going to use it [their water allocation] it's a fairly big upfront cost that they have to try and come up with".

Dairy Industry

The idea of Climate Change

Climate change within the Australian dairy sector is seen, according to a state government policy analyst as being more of a subconscious idea, rather than one upon which to base decisions. When the media presents stories on climate change, the belief of farmers is that they are talking about effects that will take place 50, 100 or 200 years into the future which farmers do not see as being within their planning horizon. However, whilst there is strong evidence to show that farmers are sceptical about the science of climate change, there is evidence in most industries of a pragmatic approach to management of climate variability. One issue in regards to climate change and particularly the impact of extreme heat events is the effect of heat stress on cows. One State Government policy analyst advised that farmers are already installing sprinklers in their yards to spray the cows before milking to cool them down. In addition to this practice, larger operations are building feed paddocks with a roof which provides shade for the cows whilst providing for a mixed feed ration regime. Whilst the impact of heat exhaustion on cows is not currently widely researched there is increasing interest in this area, in particular, its impact on milk production.

Water and Productivity

The amount of rainfall received on dairy farms is an important determinant of the amount of home grown feed available. This is the cheapest source of feed, particularly if it can be grazed. So there is an important link between a cheap source of feed, the grazing of the cows and its translation into milk products.

The outcome is that water has a significant influence on the farmer's bottom line.

Irrigated dairy farms throughout Victoria have the option of either owning their right to water or buying a temporary permit that enables them to substitute water for the purchase of feed. This predominantly occurs in the northern irrigation district. The focus of the farmer is on providing ME or Metabolisable Energy which is developed either through the purchase of water to grow fodder or the acquisition of fodder to feed the cows to produce milk. This is distinctly different to other sectors, like horticulture, which relies solely on access to water on the property.

It was noted by one state government policy analyst that since changes in the water rules, there has been a shift in transferring the risk of managing water security and water allocation to the farmer, rather than institutions such as Goulburn Murray Water, who were responsible for managing resource allocation. "It's good for some farmers who have access to the carry over water they have been able to secure which can almost flatten out the volatility, to maintain the amount of water available from year to year. I have been to some farmer workshops and discussion groups where you see some farmers are quite comfortable when selling off their high reliability water share at an astronomical price and then buying it back when the price comes down. Whereas other farmers are feeling very uncomfortable about that as they have always had a high reliability water share. For others it's just part of an asset associated with the farm business and they'll buy and sell as required. So water trading has opened up a lot of opportunities for some farmers who are prepared to take a risk or prepared to use these tools that are now available to them."

Influence of Carbon Trading

There is interest in conserving the amount of energy used in the dairy shed. Prior to the introduction of the Carbon Tax, or discussions on the potential options for carbon farming, opportunities being explored for greater efficiencies were directed towards the dairy shed, particularly in relation to water use efficiencies and energy efficiencies that would have flow on effects for efficient milking practices. In addition, consideration was being given to the more efficient use of labour and nutrient management. The potential of carbon farming provides other opportunities that are currently being explored.

"There is probably a bit of innovation going on and you could say experimentation, which includes the installation of solar panels on the roof of the dairy sheds. Certainly farmers are interested in that sort of thing but I wouldn't say there was wide scale update at this stage, probably more, if it works then we might think about it." (State Government policy analyst).

Dairy Farm Diversification

The majority of farmers involved in a project being run by the Victorian Department of Primary Industries have a core interest in dairy farming. However, there are examples of farmers diversifying their income base to take advantage of high commodity prices in other areas, for example they may raise heifers for the export market, particularly when there is a demand from the Chinese market. Another type of diversification is through growing contract fodder grasses although there is not often enough labour available to achieve this. Diversification is motivated by opportunities to take advantage of emerging markets but also through the need to counter fluctuations in the

prices of commodities due to Australia's reliance on export markets and to buffer the changes in the exchange rate.

In the lower south west of Victoria, farms are generally smaller than in other parts of the state. Whilst predominantly dairy farmers, there are also viticulturalists, all of which are taking an environmentally friendly approach to farming. This area is increasingly attracting tourism by enticing weekenders to the farm, either through farm stays or other complimentary tourism. Whilst providing complimentary income, one State Government policy analyst wonders if this distracts from the overall performance of their farm.

Off-farm income is increasingly significantly in broad acre farming which can be equivalent to 40 per cent of the average farm cash income. Whilst the figure is lower in dairy and horticulture, multiple income streams are a useful risk management tool for farmers dealing with the vagaries of climate and markets.

Dairy Farm Management

The two significant changes that have taken place in the management of dairy farms are the shift in split batch calving and a shift away from perennial to annual pastures. The reasons for the shift relate to efficiencies on the farm as well as a response to climate variability. There is a move to split batch or all year calving as opposed to seasonal calving, where typically calving was undertaken in the spring. There are very few farms now solely reliant upon seasonal carving. Most farmers now calve in the spring and autumn. This highlights a shift in calving patterns, some of which could be related to not being able to calf, so the cows are being carried over to the next season, but

this is not always the case. There is also less reliance on perennial pastures as farms incorporate more annual pastures and crops. Whilst this requires more management skills to ensure a successful outcome the major benefit is in terms of the quality of the pasture. In addition, because the output from annual pastures is greater, there is the ability to store the fodder for use at a later date.

As a consequence of changes in dairy farm management, additional expertise is being sought to support the family farm business, for example, a herd manager has become an important addition to the advisory staff as well as additional labour to assist with a variety of other tasks. Share farming is a practice that is increasing as the owner of the farm assets, the land and buildings, can lease the farm to someone who builds the herd and milks the cows. One example, highlighted by a State Government researcher, is where the owners of the business (the farm) are not farm managers but have invested in the business so a farm manager is responsible for the running of the business. Whilst this is an unusual set-up it is not uncommon.

Exiting Farming

Questions remain about whose responsibility it is to support farmers who are seeking to exit the industry. During the 2006/07 drought this was of great concern as there was no support from the milk companies or Dairy Australia, who did not see this as their role. One State Government policy analyst saw that there was a role for Government to support farmers through retraining programs or providing assistance to move farmers into new careers, etc. However, as the focus of current Victorian State Government policy is to increase the profitability of farming, then support for farmers exiting the

industry is not its highest priority. This could be viewed as contrasting Federal Government drought initiatives which had previously provided assistance to farmers through the Exceptional Circumstances Policy (the EC provision provided interest rate subsidies and an income stream during times of drought). However, the new policy emphasis of the Federal Government is on building the capacity of farmers to manage climate variability/change through good strategic planning rather than crisis management. It includes the opportunity to discuss opportunities available outside farming as well as the provision of financial support that assists farmers in significant financial difficulty to sell their farms.

Financial Management in the Dairy Sector

A Pilot Project is being conducted in Western Australia to test a package of new measures developed in response to the national review of drought policy. The measures are designed to move from a crisis management approach to risk management. The aim is to better support farmers, their families and rural communities in preparing for future challenges, rather than waiting until they are in crisis to offer assistance.

Part II of the Pilot Project is focussed in the south west of Western Australia and incorporates an area where dairy farms predominate. Modules have been specifically developed that deal with financial management issues in the dairy sector. The aim of the module is for farmers to develop a three to five year strategic plan that provides a planning tool for farmers to monitor the results of their business. Data is collected to provide the basis for an analysis that determines the financial outcome for each season. The focus is on identifying any changes in behaviour – what they were doing differently now

as a result of evaluating the results against the planned outcomes and to determine if they were able to achieve the level of production they had anticipated. They key measurement is to determine what they did differently as a result of the strategic planning process, specifically, to identify what changed and what triggered that change and what was the result of that change.

In difficult financial situations, there is some flexibility in substituting inputs (previously mentioned in relation to buying in feed if there is no water available) or selling off cows, which whilst potentially incurring a loss at the time of selling, provides some flexibility in difficult situations which can later be rectified by replacing the cows when water availability resumes. This provides some opportunities not available with other commodities, for example, this is not possible with cropping.

Drought Policy

"Running a dairy business, or any sort of agricultural business, is like running a normal business, so you would think you'd be responsible for managing those risks and the variability just like any other business owner. Sure, there are extreme events that you could never imagine where, for the sake of the long term viability of the industry, it would be useful to have some sort of policies to help people through, but when I look back on the drought and some of the policies there, in some cases it was slowing down adjustment and some farmers should have got out earlier, it actually meant they were prolonging their demise and probably…. But in other cases… they're good managers, they're intending to have a long term future in the industry and it would help them get through the really tough times. I don't know how you

would tailor policy, but it's the same with any sort of policy, there are always adverse outcomes." State Government policy analyst.

A lot of it comes down to individual management skills as well as their perception of risk - whether they are happy to take risks, as well as their stage of life. For people coming into the industry they might be prepared to make more significant changes on their farm compared to someone who is nearing retirement and they are happy to see their equity eroded a little because they know they will only be in the industry a few more years. For example, in the north of Victoria, proposed changes to planning and development rules in relation to the subdivision of land have an impact on farmers and their planning horizons. Whilst there are rules in relation to the subdivision of land, it is an issue for some farmers as it provides a barrier for some to get out of the industry as they wait for the potential to benefit from changes to the planning regulations whilst for others who are seeking to stay they have an uncertain planning horizon.

Keys to Financial Adaptation

The Victorian Department of Primary Industries has been undertaking a case study in northern Victoria over the last ten years to highlight strategies that farmers have developed to adapt to climate change/variability.

One state government policy analyst advised that a general component of successful financial adaptation to climate change/variability is the amount of equity a farmer has in their business. "This is because in tough times, businesses with greater equity have room to move. For example, if they are

seeking to buy either feed or water it is less of an issue. If you were down to 30% equity there are far fewer options."

The issue of scale is less significant. In the Dairy Farm Monitor project, the policy analyst advised that there are a wide range of businesses in terms of size and profitability. "What might be considered small farms, i.e. between 100 to 200 cows, or large farms of over 500 cows, can all be profitable as there is not always a link between scale and profitability. For example if it is a grazing based system, a small farm could be equally profitable with a larger farm (much of which is to do with the farm manager). However, there are situations where economies of scale favour the larger farms, in particularly where marginal costs are lower due to the ability to spread fixed overhead costs over a higher level of production."

It is also harder comparatively for small farms to access capital. This was explained as follows: "For example, machinery costs for larger operators have the advantage. Scale is also relevant to the type of markets a farmer is supplying. Smaller farms tend to rely upon seasonal calving, which leads to a larger supply of milk in the spring and summer, but with less supply in winter and autumn. Milk companies need to ensure a consistent scale and timing of supply to their customers and generally, it is the larger farms, who can assure scale and consistency of supply across the year, and who will therefore receive incentive payments for certain production amounts and "out of season" production."

In the past small farms could be profitable even with the disadvantage of inconsistent supply, but this meant that farmers would avoid investing their own time/labour in maximising productivity and overall profitability, in favour of a lifestyle approach to farming. However, the policy analyst advised

that a lifestyle approach previously enabled the farmer to earn enough money to put children through school and/or saving for retirement. "More recently the dairy industry has changed and the lifestyle approach is increasingly becoming harder to maintain as an achievable outcome. With the increasing administrative burden on farmers as a consequence of various regulations and legislation, this needs to be factored into the overall management of the business."

Horticulture Industry

Financial Strategies for Adaptation

Some sections of the horticultural industry are considering the impact of climate change or at least the implications for their business of increased climate variability. However, according to one state government policy analyst, there is a high degree of variation within the industry in terms of the level of acceptance of climate change, "the logic of the argument put forward by the industry varies (as opposed to the actual science of climate change) and this affects the willingness of horticulturalist to consider the financial risks associated with climate change." He identified one example, in which Brown Brothers, a large wine company, established in the 1850s and based in north east Victoria, are diversifying their business through the purchase of land in Tasmania for viticulture. Their chief wine maker said "We're actively looking elsewhere, we're factoring in climate change as a given, so we are looking twenty years down the track to consider where we might be producing and what we're going to do and we're going to buy according to that as well as looking into the constraints, for example potential smoke taint from bushfires and those sorts of issues."

A state government policy analyst suggests that there is evidence that horticulturalists are factoring in, or are starting to consider, the increased risk to production of climate variability and responding accordingly, particularly in relation to water. However, he considers that there is a long way to go in relation to improving the way in which any reductions in water availability is managed by the farmers over the long term due to their inability to accept the science of climate change. "This does not mean that farmers are not responding to short term climate variability. An example of where adaptation is being considered is in relation to pre-budburst irrigation. The question arises in regards to whether or not irrigation is required at this point in the production process. So the emphasis is on short-term production outcomes, particularly in relation to how to deal with a reduction in water allocation. Therefore, current production practices are driving decision making rather than any long term strategic response to climate change".

The other side to increased climate variability, says a state government policy analyst, is that when there is a water event, such as the floods experience during the summer of 2011, many growers, particularly in northwest Victoria, struggled to manage the additional water because they had lost the experience or forgotten how to deal with the wet conditions. He advised that comments received from farmers included: "Dealing with drought and lack of water is easy compared to dealing with this".

The critical issue for horticulturalist in regards to climate change adaptation, as highlighted by a state government researcher, is to consider the risk management involved. He suggests that there are three components: an increase in annual variability which relates to cash flow risks due to an extreme event – bushfires, drought or floods; increased costs in terms of management costs and their ability to respond to risk; and choices about how

to risk proof their farm. The state government policy analyst outlines the following, "Risk proofing strategies include physical infrastructure (e.g. netting), buying additional water, sunburn protection (avoided through additional spraying of crops) or taking out insurance (e.g. for hail storm events). All of these risk proofing options mean that horticulturalist will face additional costs in relation to managing climate change/variability".

Institutional Adaptation

Role of Banks in Supporting Adaptation

Australia's banking industry is highly competitive. The question for this project is to what extent do lending practices reflect climate risk? One perspective highlighted by a state government policy analyst identifies the lending policies of banks in relation to agricultural enterprises as including an analysis of how to make the cost of lending funds low enough to ensure a successful business outcome or the successful expansion of the business given the risks associated with climate variability. The answer appears to lie in the ability of banks to have enough information on which to base their decision about the risk profile for the overall business in relation to climatic factors so as to determine the anticipated cost of lending. However, one state government policy analysts advised that whilst a number of tools have been developed by governments and NGOs to provide greater clarity with regard to climate projections, they cannot take the risk out of the business as all the models and the associated data contain a degree of uncertainty.

Banks play a significant role in relation to managing the impacts of climate change/variability through a focus on the financial side of agricultural businesses. The emphasis, as one state government policy analyst advised, is

on whether or not businesses can repay their debts when faced with significant impacts such as extreme events or whether or not the farmer wants to stay in the business and if so, for how long? There is interest in developing extension activities within the State Government of Victoria that target bankers and accountants.

The emphasis of these activities is on advising bankers and accountants in relation to the profitability of different types of farms relative to the scale of their operation. This includes whether or not successful enterprises need to acquire additional land and scale up their activities or whether they scale back their activities in order to consolidate the business. The emphasis has been on showing that the different decisions made can lead to profitable enterprises as it depends on the actual business and the commodity being produced. A comment received from a rural finance banker was: "Oh yeah, it's really good to understand more about the different enterprises because it's taught me not to have the blinkers on when talking to clients and to consider all the options on merit."

As one state government policy analyst suggested, "It can be frustrating for a farmer, who has been farming for a long time and who knows the business inside out to convince a banker that their current proposal is the right way to proceed when they don't have all the figures in front of them. It is also a difficult process for a banker, when dealing with someone's livelihood to say "I think it's time to go" and to outline the reasons why their business is not succeeding." Increasingly, State Governments are seeing that they have a role in educating banks on the unique features and structures of a range of farm business enterprises and the risks involved in making changes to farm business. This is clear from the State Government of Victoria policy document

Better Services to Farmers[5] which seeks to build relationships with institutions associated with farming, including banks, as well as through the Farm Monitoring Project[6] which provides valuable farm level data relating to profitability and productivity performance of dairy farm businesses in Victoria. The role of governments in building alliances with banks is also part of the newly initiated drought pilot project in Western Australia.

Banks are fundamental to the ongoing financial success of a farm, particularly through their supporting in times of hardship, through access to additional funds, either through the provision of an overdraft or through short term loans. As discussed, the Victorian Department of Primary Industries places emphasis on ensuring that banks have a good understanding of the complexity of farm businesses. One state government policy analyst advised that "whilst the majority of lenders have first hand experience of farming or have developed a good understanding of the complexity of farm operations, if the bank's relationship managers don't have the appropriate experience it can be disastrous for a farm business".

Two state government policy analysts advised that an emphasis of their extension work to the horticulture industry, in both Victoria and through the current pilot of drought reform measures in Western Australian, is on building their knowledge of banks as well as farmers in terms of financial risks associated with climate change/variability, particularly incremental production risks in relation to the supply of water, the increased cost of water and the development of strategies to manage these risks. One of the analysts advised that "it is important for horticulturalists to consider the options that

[5] State Government of Victoria, Better Services to Farmers policy document: http://www.dpi.vic.gov.au/agriculture/about-agriculture/strategy-and-policy/better-services

[6]Farm Monitoring Project (http://www.dpi.vic.gov.au/agriculture/about-agriculture/projects-and-activities/farm-monitor-projects/dairy-industry-farm-monitor-project)

they have available for water trading. Water is an asset on the balance sheet, although this can vary across Victoria depending upon the reliability of the water source. However, it is important to consider the options, for example, how to receive a greater share of the allocated water, the possibility of an acquisition from another irrigation district or the purchase of additional water rights".

Role of Government in Relation to Banks

One State Government researcher believes that there is a role for governments to support banks, particularly where a large debt has been incurred by the farmer as the abandonment of farms has social implications which are of great significance to rural communities. Financial counsellors, part of the Rural Financial Counselling service, were required to counsel farmers in the recent response to floods in northern Victoria. In addition, the Rural Finance Corporation (RFC), a specialist provider of finance to the rural sector, plays a major role in the development of rural Victoria as well as administering a variety of schemes on behalf of the federal and state governments, including the Natural Disaster Relief Scheme payments. The RFC has responded well to prior events, for example, through the provision of interest free loans during the recent floods as well as through the drought.

In regards to the pilot of drought reform measures being conducted in Western Australia, banks have shown enthusiasm for the Strategic Plans and Farm Planning process that has been developed as part of the Pilot. One retired bank manager who was part of the first stage of the Pilot assessment team conveyed to a state government policy analysts the following: "If only there was this level of documentation [strategic plans] available to assist

banks in making decision on whether or to lend". The Strategic Plans, suggest the policy analyst, provide banks with the ability to develop their own risk criteria by showing how the farmer is planning for his/her future. The plans can reveal how projected changes in income, for example a reduction in income for a period of time with the aim of investing in new infrastructure, can impact on the long term future of the business. This provides for a much greater planning horizon than just a twelve month cycle. Importantly, this quotation is made in regards to the planning horizon for gains. As the project is currently expanding into the dairy sector, we would find that the planning horizon is greater than a twelve month cycle.

The Western Australian Department of Agriculture and Food (DAFWA) has sought to keep banks informed on the advice they provide to the farming community with the aim of making better decisions in relation to climate change/variability. The emphasis is on having a two-way relationship whereby DAFWA advises, informs and educates the Agri-Banking sector concerning the realities of farming in varied climatic conditions and industry types and for DAFWA to be informed regarding the commercial realities of lending and financial risk assessment. This is undertaken on an informal basis, through workshops and briefings.

As a consequence of the Global Financial Crisis (GFC) decision making in regards to lending practices for carry-on finance went from regional bank management to head office management. The outcome was a pragmatic but narrow set of rules being applied to each lending decision, rather than a broad criteria that considered the farming history, the current context and projections for the future as well as the capabilities of the farmer and the fact that there may be six out of ten good years. "As a consequence" one state government research suggested, "decisions were based on equity, asset levels

and the last three years of production. The outcome was that some farmers did not appear to be a good risk and therefore could only borrow this much or the overdraft could not exceed that much".

The emphasis of DAFWA according to one state government policy analyst is on farmers who occupy the middle ground, those who require support in making decisions that have the possibility of pushing them out of farming. He advises, "They need banks to be supportive and this could be achieved through the development of criteria for decision making – how much a farm business is able to borrow, the terms of the loan and what makes a difference to the decision of the banks? Examples include the requirement to provide more than a production year cycle budget or a strategic plan similar to those designed by the pilot of drought reform measures or even a market analysis which highlights how their enterprise is geared to benefit from current markets such as the knowledge that canola has a good long term return or prices are currently high for barley and their enterprise is geared 60/40 to capitalise on these high prices. Importantly, it's about having a relationship with the bank so that when the farmer needs financial assistance there is some tangible evidence upon which to base a decision".

The role of banks can also be to manage the exit of farmers from the industry. After a number of years of drought, one state government analyst advised that some farmers reduced their equity to such a level that they were no longer able to gain carry on finance from the banks. The advice they received from the banks was that "The next good season, you sell the farm and you pay off your debt". The consequence is that farmers may have to make a quick decision on their future. The role of Government's in this scenario is to provide information to farmers to assist them to make timely decisions on how to exit farming so as to achieve the best possible outcome.

Role of Government in Relation to Insurance

Farm insurance is used to minimise the risk to the farm business, including the risk of natural disasters. Insurance cover is available for buildings and contents, farm property and machinery, theft, business interruption, business liability, machinery breakdown, road transit and farm motor insurance. It is also available for crop insurance providing income protection if crops are damaged though natural circumstances (for example, fire or hail) and for other crop-related incidents including reducing excess crops, revision of crop yield or agreed value of crop, and deferred payments. Generally, banks offer farm-related insurance products in partnership with an insurance company.

Farmers can also obtain income protection insurance, where if they are unable to continue farming temporarily or permanently, then monthly payments are made to ensure the farmers receive a monthly income. This income can then be used to meet ongoing living and business costs, or to engage other people to undertake the operation of the farm[7]

All of the government policy experts interviewed agree that governments do not have a direct role in underwriting insurance premiums for farm businesses in regards to climate change/variability. They believe there is a clear role for the market to manage this risk. Whilst Governments could regulate the industry by making it compulsory for farmers to purchase risk insurance, this is not currently on any party's political agenda, nor are Governments, either at State or Federal level, considering underwriting specific products such as multi-peril crop insurance because of the prohibitive cost. Simply put, even if Governments could afford the premiums they do they see subsidising premiums as their role. The most popular opinion amongst interviewees was that an appropriate role of Governments is

[7] Australian Bankers Association inc. Fact Sheet, http://www.bankers.asn.au/Default.aspx?ArticleID=900, accessed on 21 January 2012

providing climate forecasting to enable farmers to manage their risk appropriately. One federal government policy analyst concurs with this view but suggests that it is important for climate risks to be appropriately reflected in property values and insurance premiums. This comment reflects the way in which competing demands for land can alter the value of properties and therefore associated insurance premiums, if there is not enough scientific information available upon which to base a decision.

The role of Government, suggests one State Government policy analyst, is to provide data so that the private sector can develop appropriate insurance products, such as crop insurance to manage the risk of more extreme drought, bushfires, etc. However, the outcome for farmers is that they need to weigh up the size and the level of risk against their asset base in order to determine if insurance is the best risk management response.

Whilst crop insurance products are common place within Australian agriculture the types of products available for the dairy industry are focussed on the protection of the buildings and their contents, including machinery as well as loss of income. There is little emphasis on protecting against the death of livestock or a loss/decline in outputs i.e. milk and milk products. Livestock insurance is predominantly for feedlots or in the cattle industry. In addition to the dairy industry, one State Government policy analyst felt that insurance was expensive and not always value for money in horticulture. He advised that the cost of premiums for hail insurance are high and not always viable and that it was often better to place netting around the commodity for protection. Frost insurance was also not viable and growers tended to develop other strategies, such as using helicopters (a risk response practice to warm the air above the crop). However, even despite these comments the

horticulture industry remains interested in the potential cost and benefits of insurance.

One of the key strategies aimed at reducing fluctuations in the price of commodities being discussed in the pilot of drought reform measures is the role of hedging (an economic tool that creates a regulated commodities futures and options market to enable farm businesses to reduce the uncertainty of the price received from the sale of their commodities, typically associated with grains). The pilot program is seeking to identify the positive and negative consequences of implementing this strategy. Commodity price hedging is usually used in farm businesses that produce commodities such as beef, canola, corn, cotton, sugar, wheat, sorghum and wool, to reduce their exposure to fluctuating commodity prices. Recently products have become available that allow farmers to hedge inputs such as diesel as well as manage the risk associated with too little or too much rainfall. Commodity hedging usually works by fixing a price, range of prices, or set a price floor/ceiling up to three years in advance for the particular commodity. This enables farmers to forecast and budget with greater accuracy and improve and control what would otherwise be fluctuating margins.[8]

The pilot of drought reform measures provides to the participants examples of where hedging has been applied and discusses what can be gained and the associated outcomes. One State Government policy analyst involved in the pilot project observes: "We have found that [hedging] is one of those confidence things, if the farmer is confident in doing it and they're prepared to take the risk – for example the price goes up and they are locked into a lower price and they say "Well, I've made that decision based on what the season was doing and the prices were doing so we're comfortable with that."

[8] Australian Bankers Association inc. Fact Sheet, http://www.bankers.asn.au/Default.aspx?ArticleID=900, 21 January 2012

He goes on to say that the reverse of this scenario is also possible, "If there is an oversupply in world markets and prices go down, then regardless of the level of production, the farmer will not be able to capitalise on higher prices that could have been locked in early in the season".

There are commodity firms in Western Australia, according to one State Government policy analyst, who sell financial products which enable farmers to forward sell a certain commodity at a particular price e.g. for beef, canola, corn, cotton, sugar, wheat, sorghum and wool. He outlines the concept as follows: "Most agricultural consultants would say that it is a very good strategy to provide a guaranteed price. It is possible to sell 40% of your grain now at a particular price, which may go up or it may go down, but they have locked it in so that they have some certainty. Then the 60%, which will be influenced by the market price, might fluctuate higher, or at least they hope it's higher, but at least they have hedged their bets. However, there is a tendency to wait and see in terms of "what's my final production and what's my market price doing" as opposed to forward selling and hedging themselves."

Whether it is through hedging or through insurance, the role of Government it is argued, is to simply provide information so that farmers are well equipped to make good decisions. The Farm Planning process, central to the pilot of drought reform measures, is seeking to ensure that farmers have access to the knowledge they require to make good decision – where to go, who to ask, what to ask. Building this capability has proven to be highly successful as farmers are able to ask more specific questions of their agricultural consultants and to identify the key drivers of their production and then to consider a range of production scenarios.

"The aim is to get to a situation whereby farmers can bear acceptable risks that allow them to make sensible judgements", says a Federal Government policy analyst. Another State Government policy analyst suggested that the Farmers' Federation is lobbying for both Federal and State Governments to underwrite crop insurance with the aim of providing farmers with more certainty. However, he suggests, the key outcome of this strategy, if enacted, could have an impact on structural adjustment. "If a farmer fails as a consequence of climate change/variability, then the farmer will sell which tends to lead to the creation of bigger farms. Therefore, there is a cost to rural communities. The consequences of structural adjustment, as explained earlier, are one outcome that needs to be considered when determining policy. Do we wish to downsize rural communities? What is the cost to rural communities?

Section 3: Conclusions

Australian governments support agriculture's financial adaptation to climate change in a range of ways, either through market based mechanisms, such as water pricing policies or through extension activities such as the new pilot of drought reform measures being trialled in Western Australia. Federal and state government policy analysts highlighted their concerns in regards to the justification for on-going subsidies to the rural economy in particular interest rates subsidies or agriculture's exemption from the Clean Energy Act 2011. Whilst these policies may provide short-term support for agricultural industries, the long-term policy legacy may provide disincentives for adaptation and/or innovation within the industry.

The dairy and horticulture industries treat climate change as a subconscious issue but are pragmatically adopting adaption initiatives driven by a short term focus on water allocation, water trading or heat stress initiatives rather

than consideration of more long term strategic objectives. New water pricing reforms in Victoria have transferred the risk of managing water security onto farmers. Whilst this brings opportunities for farmers with a high risk threshold, this may bring additional stress to risk adverse farmers.

There are market tools available in the insurance industry but the uptake is limited, predominantly due to the high cost of the premiums and the exclusion of drought and floods.

Bankers are highly competitive and whilst generally understanding of the requirements of their clients, there is a role for government to work with banks in managing the exit of farmers from the industry, whilst also providing climate data and developing their awareness of the profitability of a broad range of farm enterprises. The drought pilot reform measures is providing a risk management approach to farm planning whilst encouraging innovation in the interaction between banks and governments around lending criteria.

APPENDIX 1

A.1 Focus Group questions

Interview questions prompts

We are interested in the roles of government, farmers, and finance institutions (banking and insurance) in facilitating **financial** adaptation to climate variability or climate change.

This project focuses on farm-level **Financial Adaptive Capacity** and acknowledges that it is one element of an interlinked system but that project scope is limited.

i. Can you tell us about your current role in DPI and your perception of the relationship between productivity and climate variability/change?

ii. What is your opinion on successful strategies for farm-level financial adaptation to climate variability and extreme events (floods, droughts)?

- Examples building savings/reserves to buffer cash flow shocks, access to capital for technological/ production adaptation, diversifying income through off-farm jobs or geographical diversification; managing market risks through insurance or hedging, etc.
- New examples – payment for ecosystems services, carbon farming, etc.

iii. What do you think is the role of farmers in relation to building their financial capacity to adapt to climate variability and extreme events?

Do you see any barriers or opportunities in the capacity of farmers to adapt?

- Drought Pilot Review stresses importance of farms having adequate financial resources to manage risks, strategic farm business planning, mutual responsibility, appropriate exiting.

iv. Can you tell me about current Government policy in relation to supporting farmers to adapt financially to climate variability/change and then your experience of how the emphasis of Government policy has changed over time?

v. Are you aware of any characteristics specific to the dairy industry that may impact on economic/financial adaptive capacity?

- Do these examples vary depending on industry, location, scale of farm enterprise? E.g. dairy is relatively capital intense, share milking options, water rights as assets tradable separate from land?

vi. Are you aware of any characteristics specific to the perennial horticulture industry that may impact on their financial adaptation to climate variability?

- Do these examples vary depending on industry, location, scale of farm enterprise? E.g. smaller entities, kiwifruit is sensitive to climate through quantity and quality, capital for irrigation, water rights?

vii. What do you believe is the role of government in relation to supporting farmers to financially adapt to climate variability?

- Management capability e.g. Drought Pilot Farm Planning programme
- Technological/production investment - Direct grants for preparedness e.g. Drought Pilot Building Farm Business Grants – market failure or picking technology winners?
- Welfare e.g. Drought Pilot income support with mutual responsibility
- Behavioural and cultural barriers – i.e. does historical adaptability of farmers lead to under estimates of future risks?

viii. What do you believe is the role of banks in relation to building farmers capacity to adapt to climate variability? Are there any barriers or opportunities?

- Do interest rate subsidies under Exceptional Circumstance impact on banks efficient management of their debt book/ entrench poor performance/maladaptation?

- Role of banks in encouraging debt increases and land prices?

Do you believe that government has a role in facilitating banks in their support for farmers to financially adapt to climate variability?

ix. What do you see as the role of <u>insurers</u> in relation to building farmers capacity to financially adapt to climate variability? Are there any barriers or opportunities?

- Multi peril crop/stock insurance against disasters is more prevalent in the USA/Canada, should it be developed in Australia?
- Insurance for land values or land remediation post adverse event
- Weather hedges?

Do you believe that government has a role in facilitating insurers in their support for farmers to financially adapt to climate variability?

- Market failure – e.g. adverse selection/moral hazard re insurance
- Regulatory barriers/Government failure e.g. is Federal/State drought support impeding uptake of private insurance.

Are there any other organisations that you believe could play a role in facilitating farmer's financial capacity to adapt to climate variability?

E.g. rural finance counsellors, accountants, farm consultants?

Do you believe that the government has a role in supporting any of these organisations in their support for farmers to financially adapt to climate variability?

CLOSING QUESTION: Do you have comments arising from this session?