



# Incentives, Information and Drought Policy

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It is very difficult if not impossible to design an efficient and fair drought policy that relies on retrospective revelation of information, as attempted by the current National Drought Policy. Better policy must take account of: hidden information (adverse selection); hidden actions (moral hazard); lack of 'persistence' in government responses; and how drought policy interacts with other policy instruments such as tax concessions for the agricultural sector. The private insurance sector faces similar problems, and deals with these by providing incentives for truthful revelation of type, rather than 'one size fits all', by offering a 'menu' of contracts. This approach could be applied to drought policy.

Australia is the only continent where the overwhelming influence on climate is a non-annual climatic change, the 'El Nino Southern Oscillation' (Flannery 1994). There have been 11 major droughts recorded since 1864 (Botterill & Fisher 2003). Drought events have had a profound influence on the Australian landscape and primary industries.

Agricultural producers bear much of the financial damage caused by drought and can manage this risk by using both on-farm and off-farm measures. However, over the latter half of the 20th century, governments have been drawn into providing assistance to farmers adversely affected by drought. In effect, all Australian taxpayers (through governments) now share some drought risk with primary producers. Lack of government adherence or 'persistence' to pre-existing policies encourages lobbying by farmers, by implicitly rewarding behavioural change that leads to government assistance. It can also be argued that, by not rewarding drought preparation, drought assistance has had adverse impacts on the environment and animal welfare.

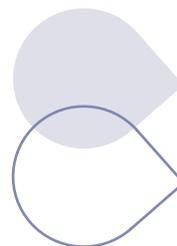
The aim of this paper is to examine drought policy as an economic and political problem, and to highlight key features of a more efficient and equitable response and use these to evaluate current drought policy and commonly

suggested alternatives. The focus is on business assistance to agriculture producers and some steps are taken towards developing a completely new approach, based on contracts between farmers and government.

## Background

Most economic assessments conclude there is no economic efficiency case for governments to provide drought assistance (Freebairn 1983). Drought assistance can be thought of as a level of free 'insurance' for farmers. While a lack of an efficient insurance market for risk might be seen as constituting market failure (Newbery & Stiglitz 1981; Stiglitz 1988), market failure is only a necessary, not a sufficient, condition for government intervention. The benefits of intervention must also outweigh any costs. It seems highly unlikely that the government can allocate drought assistance in a way where benefits exceed costs.

However, significant public funds are allocated to farmers during droughts. During the 1982–83 drought, approximately \$1 billion was paid to producers. The 2002–03 drought was estimated to result in payments of over \$655 million by the Commonwealth Government from 2002–03 to 2004–05 (Productivity Commission 2006).





Total state government spending on drought assistance exceeded \$170 million over the same period. In total, over \$1 billion has been allocated by the Commonwealth Government for drought assistance payments (both business and welfare) as a result of the 2002–03 drought (Australian National Audit Office 2005; Botterill 2003a; Prime Minister of Australia 2005).



The intention of the National Drought Policy (NDP) was to provide assistance to viable farms in temporarily severe financial situations through interest subsidies, and to assist farmers unable to meet day-to-day needs of the farm family through household assistance (ARMCANZ 1992). Farmers became eligible if their property was within an ‘exceptional circumstances’ declared area. Exceptional circumstances declared areas can apply for ‘welfare assistance’, called Exceptional Circumstances Relief Payments, and/or ‘business assistance’ or Exceptional Circumstances Interest Rate Subsidies (Department of Agriculture, Fisheries & Forestry 2005; Prime Minister of Australia 2005). The Department of Agriculture, Fisheries & Forestry (2005) stated that exceptional circumstances are declared if a drought event:

- is rare and severe (i.e. a 1 in 20–25 year event)
- causes a severe downturn in farm income over a prolonged period
- is not seen as predictable or part of structural adjustment.

Access to assistance is provided to all farmers meeting eligibility criteria regardless of differences in the extent to which drought preparation was undertaken (Martin et al. 2005). This is despite governments providing considerable extra assistance before droughts for farmers to prepare for them. For example, the Federal Government alone has spent over \$1 billion on business preparation programs through the Agriculture Advancing Australia (AAA) initiative since 1997 (Truss 2004).

It is widely recognised that the NDP did not work well during the 2002–03 drought. There was criticism from the Commonwealth that the states were tardy in making applications for exceptional circumstances assistance (Truss 2002). Stakeholders believed assistance was not provided early enough and that the exceptional circumstance application process as a whole was seen as too demanding and complex (Drought Review Panel 2004). Despite its principle of ‘self-reliance and assistance only in rare and

severe exceptional circumstances events’, governments were pressured to provide assistance earlier than the NDP prescribed. Before areas were drought-affected enough to be exceptional circumstances declared, the Federal Government introduced *prima facie* and interim income support. The New South Wales (NSW) Government introduced transport subsidies, and the Victorian Government introduced Farm Business Support Grants (Bracks 2002), all in response to intense media interest and pressure from farm groups and the broader community.

Reviews of drought policy during the 1990s recommended against interest rate and transaction-based subsidies (Drought Policy Task Force 1997; McColl et al. 1997). The recent policy review led by Peter Corish, President of the National Farmers’ Federation, also recommended that business subsidies cease by 2010 (Agriculture and Food Policy Reference Group 2006).



Thus, although economists will continue to argue drought assistance is not justified, there is a high likelihood it will continue to be provided in the future. So, because it is difficult to distribute equitably and causes economic efficiency costs, there is a ‘second-best’ case to improve the way assistance is provided.

## Drought Policy Design

Where governments become involved in providing assistance, some explicit or implicit agreement forms the basis of risk sharing between individuals and

government. Under ‘principal-agent’ theory, the principal (e.g. government) wants to make some arrangement with an agent (e.g. farmers) that defines the way risk is shared and priced (Laffont & Martimort 2002). This framework is useful for thinking about how government might formulate an agreement with farmers to define how drought risk is managed. The question is what kind of incentives will encourage farmers to manage drought risk and how should they be offered?

The major impediment to the development of efficient and fair agreements is that the principal does not have access to all the information required to achieve its objectives – the asymmetric information problem. Information asymmetry complicates drought policy design by introducing the problems of adverse selection and moral hazard.



### Adverse selection

‘Adverse selection’ is providing the wrong farmer with the wrong type of assistance due to a ‘hidden information problem’. Farmers hold private information about the financial impact of drought on their business, their capacity to withstand drought, precautions taken to offset droughts and so on. The government does not know this information. When these two parties seek to enter an agreement, such as to provide drought assistance, asymmetric information means the uninformed principal (i.e. government) is vulnerable to manipulation by the agent (i.e. the farmer) – i.e. adverse selection. This is exaggerated when farmers

have incentives to misrepresent the group they belong to (their ‘type’) or their private information in order to gain an ‘information rent’ – i.e. the ability to use their superior information to gain a windfall profit from the government.

Economic theory and experience in the insurance industry show it is possible to provide incentives that encourage individuals to reveal their type. For example, in health insurance, different types of coverage are offered to appeal to low health-risk (low-cost, low-benefits) and high-risk individuals (high-cost, high-benefits). The incentives are the cost and benefits: a low (high)-risk individual is unlikely (likely) to use most benefits so would prefer a low (high) cost and benefit contract. As a result, individuals are likely to reveal their health risk when buying insurance because this is consistent with their expected future needs.

The existence of adverse selection, or the potential for this to occur, must always be assessed against the objective of the drought policy, not the criteria used to target the assistance. Current drought policy targets business assistance to those with high levels of debt, but this may not necessarily be strongly correlated with need. Providing assistance to farmers in genuine need is the objective against which the success or otherwise of a drought policy, in terms of adverse selection, should be measured.

### Moral hazard

In addition to the hidden information problem and its impact on targeting assistance, the government may not have information about private actions farmers take in order to prepare for drought. This is called the moral hazard or hidden action problem. Moral hazard is a problem with most contractual arrangements if the principal cannot effectively monitor the actions of the agent and cannot reward (penalise) individuals who do (do not) complete the actions contracted. Moral hazard is likely to be particularly important where agents operate in remote locations, such as farms.

Moral hazard will be an important consideration in developing efficient drought policy, particularly in designing incentives for individuals to undertake ‘preventative actions’ (e.g. drought preparation).

Moral hazard can be addressed by incentives for the agent to bear some risk. When farmers bear some drought risk they have incentives to take necessary actions to limit the



costs of drought to themselves. If producers bear little drought risk, they are likely to take less care in preparing for drought, and there is a higher likelihood of them seeking drought assistance. Moral hazard problems will also be magnified if drought assistance is not linked to investment in drought preparation measures.

### Persistent government response

Persistent government response to drought policy is another key feature affecting whether any given policy will be efficient and effective. ‘Persistence’ is defined as the ability of an individual, business or government agency to ensure future actions comply with the terms of an agreement (Salanie 1997). For drought policy, government persistence means government being able to refrain from changing eligibility rules and entitlement in the face of political pressure. Government persistence can affect the outcome of drought policy through credibility in both enforcing the policy and in implementing a more efficient drought policy. Without persistent government response to maintain drought policy, producers may not invest in drought preparation because they believe government will be generous when a drought occurs. Botterill (2003b) provided an account of how government persistence collapsed during recent drought events.

## Evaluating Current Policies Against the Design Criteria

In the following section the Victorian Farm Business Support Grants, the National Drought Policy and proposed alternatives (i.e. Higher Education Contribution Scheme approach, insurance and menu of contracts approach) are evaluated against adverse selection, moral hazard and government persistence.<sup>1</sup> The evaluation examines if the policy encourages or discourages the incidence of these incentive problems. Each criterion is then observed and assessed to determine whether it ‘corrects’ or ‘fails’ to correct adverse selection, moral hazard or government persistence.

### Farm Business Support Grants

In the 2002–03 drought, assistance was provided to Victorian farmers in the form of cash grants, i.e. Farm Business Support Grants (FBSGs), because exceptional circumstances assistance was perceived to be provided ‘too slowly’. These grants were for up to \$20,000 per farm to assist individuals who met eligibility criteria (Stoneham et al. 2004). Eligibility

was based on demonstrable impact of drought: a decline in gross income of 33% or more in 2002–03, and actual or projected loss in that year’s trading results. Even though cash grants are widely perceived to offer a more neutral form of assistance than input transaction subsidies, there remain significant targeting and incentive issues.

In 2004 the Victorian Department of Primary Industries commissioned the Australian Bureau of Agricultural Resource Economics (ABARE) to estimate the empirical magnitude of these, by surveying farmers who received FBSGs and non-recipients (includes rejected applicants and non-applicants). These allowed determination of evidence of adverse selection and moral hazard but not government persistence. Table 1 presents physical and financial information on recipients and non-recipients (i.e. unsuccessful applicants and non-applicants) of FBSGs.

### Evaluating against adverse selection

Assistance was provided to farmers with higher net asset values. Recipients of cash grants had, on average, over 50% more land than non-recipients and nearly 30% higher total farm capital value.

Recipients also tended to be less cautious. Their characteristics included: lower equity (recipients had 9% lower equity than non-recipients); lower liquid assets (recipients had more than \$100,000 less total liquid farm assets); fewer public shares (nearly \$50,000 less) and lower bank savings (nearly \$20,000) than non-recipients; and higher total opening and closing farm debt (recipients had over 80% and 100% higher respectively than non-recipients).

The combination of lower liquid assets but higher net assets with also higher farm debt suggests that recipients had the financial capacity to prepare for drought. In this case, higher farm debt is not an accurate measure of need if net assets are also considered. The contrary could be argued: farmers that are able to borrow relatively more debt can do so because banks believe these farms are good investments (Carroll 2003). It would be extremely difficult to argue that banks would willingly loan funds to poorly performing farmers if their aim was to maximise shareholders’ value. Given the evidence and the preceding argument, it would seem logical that FBSGs have been poorly targeted towards farmers who had the capacity to prepare and withstand drought. Hence, FBSGs, by not taking account all relevant information, have failed to correct the adverse selection problem.

<sup>1</sup> A fourth important design criterion is ‘incentive compatibility’ - incentives provided through drought assistance policies must be compatible with those provided through other policies such as those relevant to the environment, animal welfare and taxation. Constraints on length prevent detailed discussion in this paper but some analysis is provided in Stoneham et al (2004).

**Table 1:** Analysis of Victorian Farm Business Support Grants: 2002–03.

Parameter	Recipients		Non-Recipients		All	
	Estimated Mean	RSE <sup>a</sup>	Estimated Mean	RSE <sup>a</sup>	Estimated Mean	RSE <sup>a</sup>
Population	2,057		13,611		15,688	
Sample Size	39		199		238	
<b>Physical</b>						
Area Operated, Opening (ha)	790	18	520	5	555	5
Area Operated, Closing (ha)	795	18	527	5	562	5
Area Cropped, Average (ha)	306	22	138	9	160	9
Sheep, Opening (no.)	976	22	1,142	12	1,120	11
Sheep, Closing (no.)	801	22	1,036	14	1,005	13
Beef Cattle, Opening (no.)	32	78	116	14	105	14
Beef Cattle, Closing (no.)	33	84	107	14	97	14
Dairy Cattle, Opening (no.)	175	6	70	8	84	6
Dairy Cattle, Closing (no.)	164	6	70	7	82	5
Stocking Rate, Opening (DSE/ha) <sup>b</sup>	11.8	.	12.45	.	12.36	.
Stocking Rate, Closing (DSE/ha) <sup>b</sup>	10.66	.	11.68	.	11.49	.
Stocking Rate, Average (DSE/ha) <sup>b</sup>	11.29	.	12.17	.	12.03	.
<b>Financial (\$)</b>						
Total Capital, Closing	1,936,152	10	1,461,499	6	1,523,820	5
Land Capital, Closing	1,480,727	10	1,155,497	6	1,198,198	5
Opening Value of Livestock	202,802	10	177,124	6	180,495	5
Closing Value of Livestock	169,648	8	117,601	8	124,434	7
<b>Liquid Assets (\$)</b>						
Total Farm Liquid Assets	44,802	15	149,107	26	135,412	25
Opening FMDs <sup>c</sup>	742	93	17,459	23	15,264	23
Closing FMDs <sup>c</sup>	1,292	77	20,064	15	17,599	15
Shares Public Company	23,717	20	71,239	56	64,999	54
Bank Savings	10,868	30	30,386	36	27,824	34
<b>Debt (\$)</b>						
Total Farm Debt Opening (\$)	263,461	15	144,960	12	160,851	10
Total Farm Debt Closing (\$)	317,159	13	155,303	12	177,008	10
Equity, Closing (%)	82	3	91	1	90	1

<sup>a</sup> RSEs are a measure of an estimate's sampling error, expressed as a percentage. Survey participants are farmers eligible to participate in ABARE's annual survey program for broadacre and dairy industries. Participants must have an Estimated Value of Agricultural Operations of more than \$22,500.

<sup>b</sup> Dry Sheep Equivalent (DSE) is a stocking rate measure where a sheep is equivalent to 2 DSE/ha, beef cattle 10 DSE/ha and dairy cattle 20 DSE/ha (Floyd 1999; DPI 2005).

<sup>c</sup> Farm Management Deposits (FMDs).

Source: ABARE 2004

## Evaluating against moral hazard

Assistance was also provided to farmers who did not prepare for drought. Recipients of FBSGs had much lower levels of Farm Management Deposits (FMDs) and liquid assets than non-recipients (Table 1). This is despite having the financial capacity to generate surplus cash to invest in liquid assets and FMDs.

In terms of overall on-farm management, there is ambiguous evidence of moral hazard. Recipients had generally lower stocking rates despite having larger dairy herds. This is probably because recipients generally have larger farms. Both recipients and non-recipients de-stocked, but the former did so at a higher rate for sheep and dairy (nearly 18% and over 6% more de-stocking respectively) but ran more beef cattle (over 3%).

It is not surprising that there is no conclusive evidence of moral hazard (apart from significantly lower total farm liquid assets). By definition, moral hazard is not detectable, but this does not mean it does not impose significant costs. For example, the scope for moral hazard is one reason private insurers are reluctant to provide drought assistance (Goodwin & Smith 1995).

One way the FBSGs may encourage moral hazard is by inadvertently penalising applicants who have high levels of liquid assets. One of the eligibility criteria excludes farms with off-farm assets in excess of one year's operating expenses, in a normal year (Stoneham et al. 2004). This may discourage farmers from diversifying on-farm risks by investing in off-farm assets and limits farmers' options to prepare for drought. As a result, there may be strong incentives to engage in moral hazard because non-financial mitigation strategies may not suit all farmers. However, further research is required to identify opportunities for moral hazard and how such opportunities affect the cost of drought policy.

## Evaluation of the National Drought Policy

Similar results at the national level, that adverse selection and moral hazard are a problem, were reported by Martin et al. (2005). They used ABARE survey data for 2002–03 and 2003–04 for exceptional circumstances declared farms as at 30 June 2004 to document the amount of drought assistance

received by different types of farmers. Farms with low or no debt, who were financially conservative and had relatively high levels of liquid assets, received much less assistance.

On average, farms in exceptional circumstances declared areas that had no debt during 2002–03 to 2003–04 received \$1,300 in non-interest subsidy business assistance and \$2,300 in welfare (i.e. exceptional circumstances relief payments) in total. In contrast, farmers with debt received \$23,100 in business assistance (both interest subsidies and others) and \$16,400 in welfare (Martin et al. 2005). Farmers who received business assistance had closing net assets in 2003–04 of less than \$1.7 million (with an equity ratio of 79%), whereas farms with no debt had net closing assets of over \$1.6 million (with an equity ratio of 100%). It is not clear why a farm with a relatively lower equity ratio is more in need than a farm with no debt (or less debt) in the same exceptional circumstances declared areas.

The point is that business assistance appears to be targeted to farms with relatively higher debt, rather than to be based on an actual measure of need. Furthermore, the value of bank deposits, shares and other liquid assets for interest subsidy recipients rose to \$61,700 from \$48,100, representing an increase of over 20%. This suggests that recipients were not in financial hardship if the value of liquid assets grew during the drought, even if the interest subsidy was included. Similar to the Victorian FBSGs, this suggests that adverse selection is a feature of the NDP.

These results are not surprising when the NDP is judged against the three design criteria and found to fail each one (Table 2). The key reason that the NDP is ineffective is that government attempts to find out about farmers' eligibility for assistance during the drought. In these circumstances farmers will be reluctant to reveal private information that would disqualify them from receiving assistance (adverse selection) and may even alter behaviour so that they become eligible for assistance (moral hazard). Farmers who prepare for drought are not rewarded for their efforts, at least in terms of drought policy, and there are incentives for farmers to lobby for more assistance and easier access to assistance. It is very difficult, if not impossible, to design an efficient and fair drought policy that relies on retrospective revelation of information. A completely new approach to drought policy is needed and several alternatives have been discussed over the years.

**Table 2:** Evaluation of the National Drought Policy.

National Drought Policy (NDP)	
Description	Assistance provided for 'exceptional circumstances' (EC) including welfare and business assistance. Areas are EC-declared for two years by the Australian Government following applications from state governments (collaborating with interested parties) and assessments by the independent National Rural Advisory Council.
Adverse Selection	Fails: <ul style="list-style-type: none"> <li>The NDP relies on retrospective assessment of private financial information by a third party. It may be difficult to fully elicit or evaluate 'need'.</li> <li>Geographic location is not a good indicator of whether any individual producer is actually affected by drought, leading to the 'line on maps' controversy (Botterill 2003b).</li> </ul>
Moral Hazard	Fails: <ul style="list-style-type: none"> <li>Eligibility criteria create incentives for producers to take actions to improve eligibility for drought assistance and disincentives for farmers to become self-reliant and prepare for drought.</li> <li>Eligibility criteria create perverse incentives to use political pressure to gain assistance within and outside the policy.</li> <li>Farm viability tests tend to reward risky managers and penalise those that prepare for drought.</li> <li>Different treatment of asset classes distorts investment decisions before and during droughts.</li> </ul>
Government Persistence	Fails: <ul style="list-style-type: none"> <li>Successive Commonwealth &amp; state governments have been unable to persist with the 'self-reliance' objective of the NDP. The onset of drought has triggered political pressure from producers' lobbies and the community for more generous assistance.</li> </ul>

## Alternatives to the NDP

### Higher Education Contribution Scheme Approach

Recently there has been some support for a scheme similar to the Higher Education Contribution Scheme (HECS) being implemented for farmers so that they could take out loans during droughts and pay them back when times were better (Chapman 1997; Botterill & Chapman 2002; Kelly et al. 2004). While the underlying justification for HECS is that capital markets have limited information about students on which to base lending decisions, this does not hold for farmers.

Primary producers can secure finance at prevailing market interest rates, and financial institutions are generally willing to provide finance to producers considered profitable in the long-term (Carroll 2003). Those not considered profitable will not be loaned money because they would be unable to repay the loan. Such producers would be unlikely to pay back a HECS loan from government (unlike students, who have future income earning potential). In short, there is no capital market failure. HECS-type loans as an alternative drought policy are analysed in more detail in Table 3.

**Table 3:** Evaluation of a HECS Approach.

HECS	
Description	HECS is an income-contingent loans (ICLs). The amount of debt repaid by the farmer each year depends on the level of gross farm receipts.
Adverse Selection	Fails: <ul style="list-style-type: none"> <li>Would provide no incentive for producers to reveal capacity to invest in drought preparation (loans would be provided on the basis of gross farm receipts).</li> </ul>
Moral Hazard	Fails: <ul style="list-style-type: none"> <li>Would weaken incentives to self-insure because of easy access to concessionary debt.</li> </ul>
Government Persistence	Fails: <ul style="list-style-type: none"> <li>The combination of an ICL and EC declaration is unlikely to strengthen government persistence to maintain ICLs as stated and may accentuate lack of persistence because producers would have incentives to lobby for more attractive terms.</li> <li>Successful lobbying efforts would undermine any positive efficiency gains from using banks to monitor and enforce income contingent loans and may even discourage their participation.</li> </ul>

**Table 4:** Evaluation of multi-peril crop insurance.

Multi-peril Crop Insurance	
Description	Payouts are triggered by agreed yield shortfalls.
Adverse Selection	Fails: <ul style="list-style-type: none"> <li>Systemic risk makes multi-peril crop insurance attractive to bad drought risks since these 'types' benefit whereas good drought risks do not.</li> </ul>
Moral Hazard	Fails: <ul style="list-style-type: none"> <li>Producers can reduce management effort (and influence yields) in order to gain an indemnity payment.</li> </ul>
Government Persistence	Fails: <ul style="list-style-type: none"> <li>The higher a producer's assessment of the likelihood of effective lobbying for extra assistance, the less interest they will have in private alternatives.</li> </ul>

## Insurance

Insurance is the logical risk mechanism to manage drought risk and the various forms of this are analysed in Tables 4 and 5. Multi-peril insurance is unsuitable because premiums will be high due to the systemic nature of drought risk (Goodwin & Smith 1995). Moral hazard and adverse selection problems, leading to high transaction costs, have proven insurmountable for any crop insurance schemes attempted. In other countries, the payouts from multi-peril insurance schemes range from 1.6 to 4.5 times greater than premiums collected (Hazell 1992; Sigurdson & Sin 1994; Goodwin & Smith 1995).

Rainfall insurance reduces moral hazard and adverse selection problems, lowering transaction costs (because the trigger is independent and reliable), but introduces basis risk (imprecise correlation between income and the dependent variable, in this case rainfall), and this can reduce its attractiveness to farmers (Hertzler 2004).

Weather derivatives and yield index insurance offer scope to address some basis risk (Hertzler 2004). Weather derivatives can be constructed from any climatic event (including rainfall and temperature) provided reliable data exists. Transaction costs and systemic risk problems will be lower than rainfall insurance. Yield index insurance contracts employ a non-linear relationship between rainfall and yield to estimate a yield function on which contracts are based. More research is needed, but weather derivatives/yield index insurance appears to be the best potential private-sector risk management products for the future.

Although insurance products offer some interesting possibilities to manage risk, these products do not fill the policy vacuum. Farmers will continue to lobby for assistance and governments will respond, which will damage the feasibility of, and incentives for, commercial risk management products. A broader drought policy framework is needed to encourage farmers to use commercial risk management products and/or self-insure.

**Table 5:** Evaluation of rainfall insurance, weather derivatives & yield index insurance (YII).

Rainfall Insurance, Weather Derivatives and YII	
Description	Rainfall insurance: uses a predetermined rainfall event to trigger a payout. Weather derivatives: payout determined from an agreed climatic event, including too little rainfall or extreme temperature recorded at weather stations. Sold by financial institutions (e.g. banks) rather than insurance companies. YII: employs a non-linear relationship between rainfall and yield. Instead of receiving a set payout when rainfall is less than some defined trigger, YII employs a contract that translates rainfall into yield based on non-linear increments.
Adverse Selection	Corrects <ul style="list-style-type: none"> <li>Climatic data forms the basis of premium calculations. Provided there are climatic data for specific areas over a sufficient time, these premiums will be actuarially fair in regards to climate risk.</li> </ul>
Moral Hazard	Corrects <ul style="list-style-type: none"> <li>No scope for producers to alter behaviour to qualify for insurance payment.</li> </ul>
Government Persistence	Fails <ul style="list-style-type: none"> <li>As for multi-peril crop insurance</li> </ul>

Drought policy can be improved by both improved policy mechanism design and better institutional arrangements to manage government persistence.

## A New Contract-Based Approach

A more efficient and fairer drought policy framework can be developed by drawing on ideas from the economics of information, with salient features of modern risk management woven in, to deal with adverse selection and moral hazard.

The private insurance sector faces similar information problems that confront governments in drought policy. They deal with these problems by providing incentives for truthful self-selection into a menu of contracts rather than 'one size fits all', and by offering incentive compatible contracts. This approach could be applied to drought policy by developing a menu of contracts:

1. Contracts for those farmers who consider they have long-term prospects of being profitable.

Inducements would be provided to encourage farmers to self-select into efficient classes of contract. Well-designed incentives would induce farmers who consider themselves to be profitable in the long-term to self-select into contracts that make them better off. In this case the inducement could be either a subsidy on premiums for commercial risk management products (rainfall insurance/weather derivatives/yield index insurance) or subsidising investment in liquid assets. Farmers could choose a mixture of insurance products (offered by private firms) and investments according to their circumstances.

2. Contracts for those who consider that they are unlikely to be profitable in the long-term.

Long-term unprofitable producers would self-select into this option which would offer assistance through special welfare benefits or an exit/structural adjustment grant. The selection of the contract would reveal the producer's type to government, allowing assistance to be targeted efficiently and equitably based on need, thus solving the adverse selection problem.

Incentive contracts also deal with moral hazard by providing incentives for profitable producers to manage drought risk themselves. Furthermore, monitoring and enforcement is not required since producers have an incentive to self-insure some drought risk (this is despite the non-verifiability of moral hazard in the context of drought). In Table 6, the menu of contracts approach is evaluated against the three criteria developed previously.

Besides being more efficient, this approach should result in budget savings to government. Further analyses are needed to determine the minimum subsidies and relative subsidies, required to induce producers to self-select into the appropriate contract.

Although contracts appear to offer many advantages they could be ineffective without persistent government response. It is doubtful that governments would introduce legal restraints to prevent opportunistic actions in response to lobbying. Clauses could be included in drought contracts to explicitly state that government will not provide any further drought assistance but credible monitoring and enforcement mechanisms would be required.

**Table 6:** Evaluation of the menu of drought assistance contracts approach.

Menu of Drought Assistance Contracts	
Description	Offer different contracts to appeal to viable and non-viable producers. Rewards tied to risk management and self-reliance in contracts for viable producers. Non-viable producers provided with social welfare payments and/or exit assistance.
Adverse Selection	<p>Corrects:</p> <ul style="list-style-type: none"> <li>• Viable producers encouraged to self-insure by being rewarded for depositing surplus cash for drought preparation or purchasing insurance.</li> <li>• Non-viable producers unable to misrepresent their type because of lack of surplus cash to invest.</li> </ul>
Moral Hazard	<p>Corrects:</p> <ul style="list-style-type: none"> <li>• Incentives to manage risk through tax benefits or subsidies for drought preparation.</li> <li>• No incentive to under-invest because tax benefits increase with level of preparation.</li> </ul>
Government Persistence	<p>Ambiguous:</p> <ul style="list-style-type: none"> <li>• Requires careful institutional design to eliminate non-persistent government response.</li> <li>• Choice of contract may be unaffected by non-persistent government response because there may still be incentives to prepare for drought.</li> </ul>





Another option might be to introduce prohibitive penalties within the taxation system to reduce incentives to lobby. For example, farmers who self-selected into the viable farmer category and received subsidies or tax incentives, could be penalised if they accepted drought assistance. However, if each farmer was provided the same amount of drought assistance regardless of circumstances, this would mean there would be no benefit from manipulating contract choice to gain more government assistance (Ha et al. 2005). As a result, if a government could constrain itself to providing truly 'equitable' assistance, then even if they could not commit to providing additional assistance, these contracts will still provide incentives to prepare for drought and to self-select into the appropriate contracts (Stoneham et al. 2004).



Reputation is important to government persistence; players of the game observe the other players past behaviour and decide their strategies based on this. In the drought context, both state and federal governments have developed a reputation for being unable to credibly persist with an efficient drought policy. The nature of the 'exceptional circumstances game' is biased against government persistence, and governments have no credible way to signal persistent response (Ha et al. 2005).

## Conclusion

Drought policy is a complex problem for which there are no simple solutions. The main reason for government intervention is on a second-best basis. Without a formal drought policy, there will always be political pressure from producers to provide drought assistance. By formalising drought policy, government can define the 'rules of the game' to reduce the economic costs of drought policy and to improve the distribution of any assistance given. To achieve these objectives it is imperative that drought policy is designed to provide producers with incentives to prepare for drought and to provide governments with incentives to credibly persist with a second-best policy.

Some solutions to drought policy examined here are or have been inefficient and inequitable because they do not take explicit account of asymmetric information and the implications for adverse selection, moral hazard and persistent government response.

What is proposed is a framework that explicitly accounts for the information problems that plague drought policy, by drawing on techniques developed in commercial risk markets

and economic theory. A menu of contracts would be provided to appeal to farmers in different financial, life-cycle stages and other relevant situations, carefully designed to encourage farmers to self-select into efficient classes of contract.

Further quantitative analysis is required, including experimental economic testing, to discover (actuarially) the appropriate menus of contracts. Persistent government response is addressed in part by the introduction of 'contracts' but more work is required to ensure this would be sufficient.

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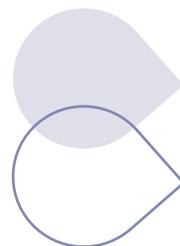
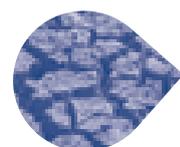
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## Note

Views expressed in this paper are those of the authors and not necessarily those of the Victorian Government. Use of any results from this paper should clearly attribute the work to the authors and not to the Departments of Primary Industries, Sustainability and Environment, or Consumer Affairs Victoria, nor to the Victorian Government.

