



## RISK MANAGEMENT IN AGRICULTURE: WHAT ROLE FOR GOVERNMENTS?

Recent years have been tumultuous in the agricultural sector. Price volatility has increased, with sharp swings in product and input prices. Markets have been affected by macro-economic disturbances, disease outbreaks and adverse weather events such as floods and droughts. The latter may become more frequent through climate change. With agricultural policies that are more decoupled from production and prices, farmers are now more exposed to market forces than in the past.

Risk management in agriculture is now an essential tool for farmers to anticipate, avoid and react to shocks. An efficient risk management system for agriculture will preserve the standard of living of those who depend on farming, strengthen the viability of farm businesses, and provide an environment which supports investment in the farming sector.

### Recommendations

- **Government policies should take a holistic approach to risk management**, assessing all risks and their relationship to each other, and avoiding focussing on a single source of risk such as prices. Governments can help farmers to assess and manage their own risk by providing information and training.
- **Agricultural risk management policies should focus on catastrophic risks** that are rare but cause significant damage to many farmers at the same time. Contingency plans should define in advance the procedures, responsibilities and limits of the policy response.
- Subsidized insurance is one way of providing disaster assistance but it tends to crowd out the development of private insurance markets and has not been successful in preventing additional *ad hoc* assistance being granted after the event.
- **Facilitating good “start up” conditions – information, regulation and training – should be the primary role for the government in the development of market-based risk management tools** such as futures, insurance and marketing contracts.
- **Government policies should not provide support to deal with normal risk.** Managing normal risk should be the preserve of farmers themselves. Minimum intervention prices or payments that are triggered when prices or returns are low may even be counter-productive as they tend to induce more risky farming practices.

## Layers of risk

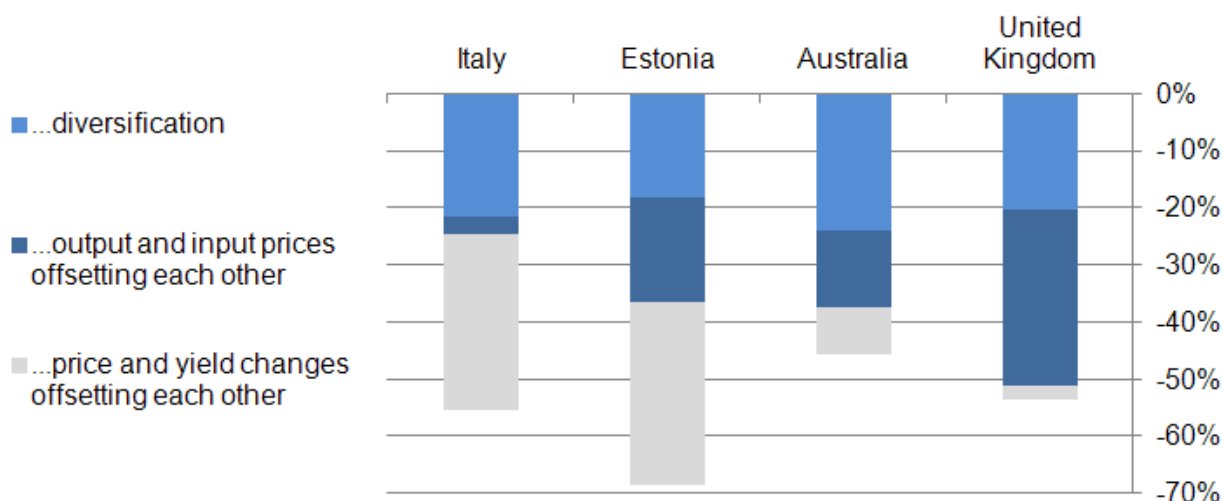
There are different layers of risks in agriculture which require different responses:

- *Normal* variations in production, prices and weather do not require any specific policy response. They can be directly managed by farmers as part of normal business strategy.
- At the other extreme, infrequent but *catastrophic* events that affect many or all farmers over a wide area will usually be beyond farmers' or markets' capacity to cope. A severe and widespread drought is one example. The outbreak and spread of a highly contagious and damaging disease is another. Governments may need to step in.
- In between the normal and the catastrophic risk layers lies a *marketable* risk layer that can be handled through market tools, such as insurance and futures markets or through cooperative arrangements among farmers. Examples of such marketable risks include hail damage and some variations in market prices.

## Risks and policies in agriculture are interconnected

OECD studies show that risks in agriculture are interconnected, sometimes compounding, sometimes offsetting each other. For example, if the prices of inputs (e.g. fertilizer) and outputs (e.g. agricultural commodities) move in the same direction the impact on net returns is reduced. Production risks can be partially offset by price movements, as when crop yields are low but prices are high. It is the net risk effect on income that matters, and income variability can be significantly reduced thanks to these interconnections.

### Farm income variance is reduced by...



Decomposition of the variance of income of arable crop farms. The reference level of risk is the calculated variance in the counterfactual case of zero correlations, co-variances and diversification. Based on time series of individual farmers.

Risk management *should not concentrate on any one risk factor or any one solution*. Diversification is nearly always a good strategy to reduce risk, and that also holds for reducing the risk of policy failure. A broad approach is needed that recognises how different sources of risk, different strategies and different actors, public and private interact. A look at some examples of unsuccessful policy approaches illustrates how governments must recognise the interconnectedness of agricultural risks and focus on a holistic approach to risk management in agriculture.

#### *Crowding out farmers' risk management strategies*

If there are policies in place that are linked to production and price risks, farmers will not see any need to develop their own strategies, nor will private sector, market instruments develop in the absence of demand. Government payments, as well as production and price-linked policies, affect farmers' risk exposure, but they also change farmers' risk management behaviour (See box).

#### **Policies that induce more risky farming practices**

Minimum intervention prices for cereals in the European Union induce farmers (in the United Kingdom and Spain) to concentrate on crops with high returns, thereby reducing diversification. These policies are only effective in reducing the variability of returns when the intervention price is low enough; beyond that level there may be no reduction in income variability. The same crowding-out effect is found for insurance subsidies provided in Spain and Canada: production tends to concentrate on insurable commodities.

Income payments that are linked to the evolution of prices or returns also induce more risky farming behaviour. For instance, Canada's AgriStability is found to reduce the demand for insurance and increase specialization. Highly decoupled payments, such as the Single Farm Payment in the European Union, are found to have a very small crowding-out effect. Similar results are found for Canada's AgriInvest programme. These policies do not affect income variability very much but they do provide a stable stream of income that facilitates saving and borrowing as needed.

#### *Stabilising prices?*

Governments have often assumed that the answer to farming risk lies in stabilising prices. In fact, by doing this they may actually increase the variability of income and have the opposite effect. For farmers in many OECD countries years of low prices are also years of better yields. Statistical analysis shows that this correlation matters because it reduces income variability. Price stabilization undermines this natural risk reduction link. Price policies may actually induce more risky behaviour on the part of farmers because the guaranteed price lets them specialize in products or methods that are not well adapted to their particular circumstances. The higher the intervention price, the larger the probability of the net effect being an increase in income variability for some farmers.

Price interventions will isolate farmers from underlying market fundamentals such as high prices that signal a negative supply shock or low prices that signal over-supply. Governments end up carrying the entire burden of risk management at high cost to consumers and taxpayers because their actions have crowded out the efforts of farmers themselves and the private sector.

## **What role for farmers, the private sector and governments?**

Because of the specificities of risk exposure, institutions and history, there is no optimal set of risk management policies to fit all countries or farmers. Each has to develop a strategy that reflects their own situation, capacities and institutions. Nevertheless, some principles can guide the development of those strategies.

### *Normal risk*

Within the normal risk layer, farmers are responsible for managing their own business risk. The set of risk management strategies is decided at the farm or household level, particularly for frequent “normal” small risks in production, prices and weather. This is because farmers know best about their individual risk environment and how much risk they are willing to carry.

Diversification is a key element in risk management in all sectors, including agriculture. It is not an old fashioned or outdated risk management strategy. Diversifying on and off farm is likely to be an efficient risk management strategy, particularly if farmers are well informed about all their possible choices. Of course, farmers need to trade-off the gains in terms of reduced variability of returns with losses from reduced scale economies. The best combination of tools will be specific to each farm.

Governments may need to play a role within the normal risk layer by encouraging farmers to develop their own risk management strategies. Training programs on how to use risk management techniques including good farming practices, the role of diversification and the use of futures and insurance can improve farmers’ ability to assess and manage their risk using a variety of market and on-farm tools.

Income tax and social security provisions can be adjusted to the needs of farmers. For example, paying taxes on average taxable income across a few years can help farmers to cope with incomes that are quite variable from year to year. Tax incentives for saving may also encourage farmers to smooth income flows from year to year.

### *Marketable risk*

Some types or levels of risk can be dealt with using market instruments. Some large, export-oriented farmers, cooperatives and downstream industries make direct use of futures contracts in order to hedge their price risk. Many more farmers benefit indirectly from the price discovery mechanisms that these markets offer.

Production and marketing contracts between farmers and the downstream industry or cooperatives is another important and increasingly sophisticated risk management tool. There is a role for government in making sure that the legal system properly underpins the development of these contracts, allowing enough flexibility and security of transactions. Governments can also help in training farmers and their organisations so that they are better able to use these instruments themselves.

Where there is sufficient convergence of interests, farmers can act collectively (e.g. the so-called levy organisations in New Zealand and Australia) to generate services necessary for risk management and implement collective risk management strategies. Integration of producer and industry organizations in the risk policy process like the Product Boards in The Netherlands can contribute to policy efficiency,

knowledge of risk management tools and techniques, and a clearer division of responsibilities between government and private business for risk management.

### *Catastrophic risk*

Governments have an important role to play in managing catastrophic risks. These are defined as large but rare events that cause very significant damage over a wide area and to many producers, to the extent that neither individual producers nor available market instruments are able to cope.

When a disastrous event such as extreme weather or a disease outbreak occurs, the government will come under social, media and political pressure to take action. A set of procedures and a clear delineation of responsibilities between government and producers, defined as part of a contingency plan, are needed to manage such pressures and for the good governance of disasters. They should include explicit triggering criteria and a definition of the types and levels of assistance. Getting the balance right between rules decided in advance and discretionary decisions made after the event is important. Otherwise, hasty recourse to *ad hoc* decisions will undermine the contingency plans.

Governments also need to avoid creating moral hazard, for example that farmers fail to take certain precautions because experience has taught them that whatever happens the government will step in. Pre-determined frameworks and plans exist in different forms for outbreaks of plant and animal diseases in all OECD countries and could also be developed for natural disasters.

That said, the definition of the boundaries between risks is a major governance challenge. The boundaries between the three risk layers depend on the specific risk profile and the institutional and policy framework that prevails in individual countries and regions. OECD studies of Australia, Canada, the Netherlands, New Zealand and Spain found that boundaries are seldom well-defined in government rules, and policies often encroach on the normal and marketable risk layers.

In general, policy reforms on risk management should focus on making the available systems more efficient rather than creating new institutions. They should build on existing information and institutional arrangements, and enforcing access to information. The risk management system has to be understood as a long term investment in a clear arrangement that defines the responsibilities of farmers, government and markets, and allows the evolution and development of appropriate solutions in different risk layers.

#### **Catastrophic risk: The experiences of New Zealand and Australia**

The On-Farm Adverse Events Recovery Framework in New Zealand is an integral component of wider government disaster assistance to local communities. Farmers are eligible for various types of assistance, ranging from initial emergency response and psychological help to more general types of aid as provided by the New Zealand social welfare system. The experience of New Zealand shows the importance of a balance between pre-determined rules and post-event decisions for provision of relief assistance. It has allowed the government to explicitly delimit its responsibility in advance of any catastrophic event, as well as to tailor assistance according to the severity of the event when it occurs. This eases political pressures and simplifies the decision-making process to provide assistance in the event of catastrophes.

Australia's experience with its drought policy underlines the need to continuously improve governance of catastrophic risk. Exceptional circumstances (EC) have been declared more often than the one every 20-25 years original condition. The triggering mechanism has not worked properly due, among other reasons, to climate change and lack of cost sharing between different levels of government. Experience

with the two main policy measures available within the Exceptional Circumstances scheme has been very different: the relief payment has been appropriately framed within the general social security system, while the interest rate subsidies, granted to all loans, have proven to be inefficient. Based on this experience Australia is currently revising its drought policy through a pilot program. Australia's bio-security partnership arrangement for animal and plant diseases has shown the importance of putting in place frameworks and cost-sharing agreements.

### **Information is the key to successful risk management**

One of the biggest problems in designing risk management instruments, whether by the private sector or the government, is what economists call information asymmetry. Put simply, farmers have good information about the circumstances of their business and are very well placed to assess risk – but the private sector and governments do not have access to the same level of information. There are incentives for farmers to disclose this information in ways favourable for their tax bill, payments or insurance indemnities. This makes it difficult for a private or government-assisted scheme to make the initial calculation about the type and frequency of risk that can be insured.

If government interventions in response to a catastrophe are based on pre-defined criteria, information is crucial for triggering and determining the scale of the assistance. Here too there can be serious information problems that get in the way of a strict application of pre-determined protocols. Governments can have difficulty identifying the scale of the event and the resulting damage, while there is strong public pressure to intervene rapidly. Pre-determined protocols have to recognize this difficulty and ensure that decisions are based on available relevant information. Some governments try to manage catastrophic risk with insurance because insurance companies have the means and knowledge to evaluate damage rapidly. Support to insurance is also one of the two risk management measures included as exempted measures in the green box of the WTO Agreement on Agriculture: “payments or support to crop insurance for natural disasters”, and “income safety net” stabilization payments.

#### *Drawbacks of subsidized insurance*

Public support for crop insurance to assist farmers after a disaster has the advantage of a formal contract with the financial participation of farmers, expert evaluation of damage, and relatively quick payment of indemnities. However, experiences in several countries, such as Canada, the Netherlands, Spain and the United States, shows that supported insurance does not fully replace *ad hoc* assistance and that difficulties persist in delineating the boundary of catastrophic risks eligible for subsidies.

Experiences in Canada and Spain also show that subsidized insurance programs have not, as sometimes intended, led to the development of a private market for crop insurance. Governments should facilitate the creation and sharing of information and databases that improve the assessment of risk by farmers and insurers, to help overcome this obstacle to the setting up of viable, insurance mechanisms. This could enhance competitiveness in the insurance industry and open up possibilities for public-private partnerships and the development of innovative insurance policies such as weather index insurance. These partnerships should focus on information while insurance subsidies shift away from non-catastrophic risks that could be covered by unsubsidized market-based tools or by farmers' business strategies. If the insurance system is not able to differentiate appropriately between disaster assistance on the one hand and market enhancement on the other, insurance can become just another mechanism of farm support and a source of rent to the insurance industry, rather than a risk management tool.

### **Insurance and agricultural risk management: The experiences of Spain, Canada and the Netherlands**

Spain has developed a sophisticated insurance system based on a public-private partnership, and premium subsidies. Public/private partnership has helped to start up the insurance market through demand incentives and information sharing and pooling. After more than three decades in operation, the system has provided a stable framework to deliver relief assistance, but it has also shown its limitations in not allowing for more competition among private companies for the non-catastrophic risk layers.

Canada's AgriInsurance is directly managed by the provincial governments giving no role for private insurance companies. In both Spain and Canada, subsidized insurance has not deterred *ad hoc* disaster assistance.

The policy focus in the Netherlands is placed on planning for catastrophic risks which are beyond the coping capacity of individual businesses and industry. In recent years, the Dutch government has made consistent efforts to shift away from *ad hoc* responses to catastrophes, promoting public-private partnerships and supporting the development of plans to deal with catastrophic risks. This includes the operation of a Livestock Veterinary Fund and the introduction of several insurance schemes, including recent subsidized multi-peril crop insurance co-financed with EU funds. This has to be part of a long term strategy because it can take several years before these instruments prove to be efficient.

#### *A large amount of information is needed for income stabilization payments*

Income stabilisation schemes like AgriStability in Canada bring their own set of information problems. It is hard for governments to get timely and accurate information about farm income – and there is also a moral hazard issue which induces farmers to engage in more risky behaviour. The income tax system is the most powerful instrument that OECD countries have in overcoming asymmetries in income information, but may not be enough. Income stabilisation can be counter-productive as a risk management tool due to these information asymmetries and because it interferes with normal farm risk management decisions, displacing market responses and blurring the boundaries between catastrophic, marketable and normal risk layers. Countercyclical payments based on more observable indicators (such as prices) overcome the information problem but they do not target farmers with low income and also crowd out farmers' strategies. Income stabilization and countercyclical programmes are socially acceptable ways to support farm income, but they are not efficient risk management tools.

### **Canada's stabilization of farm income**

The Business Risk Management (BRM) programs in Canada are very comprehensive and include AgriStability, a programme that attempts to stabilize individual farm income. It is an income stabilization payment that has shown the information limits of targeting support to individuals with reduced whole farm margins. Canada has developed a sophisticated combination of databases including detailed tax files and supplementary program information. However, this has not avoided payment delays and adjustments, showing that the asymmetric information problem has not been solved despite significant efforts by the government.

## Looking ahead

Risk management is and will be a key driver of policy in agriculture. Climate change is likely to increase the probability of extreme events. Catastrophic risks affecting agriculture will continue to require government action to ensure quick recovery. This is particularly the case for risks and risk management strategies involving externalities like pest and disease risks. The challenge ahead is separating this legitimate policy objective of assistance to disasters from the management of “normal risks” and the provision of general income support to agriculture.

Applying this framework to emerging economies and developing countries, expected to be most affected by climate change, will require significant adjustments. These countries have specificities in their risk and institutional profiles. Moreover, governments are likely to have different priorities such as food security objectives rather than income stabilization.

The OECD is already undertaking work on these areas: animal disease risk, risk management by farmers under climate change, and managing risk in emerging and developing economies with a focus on food insecurity.

## Further reading



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### Managing Risk in Agriculture: Policy Assessment and Design

What are the implications of risk management for agricultural policy? Drawing on OECD case studies and workshops, this book looks at management principles and guidelines for policy design in agriculture, as well as quantitative analysis of risk.

The book features five case studies of agricultural risk management policies:

- **Australia** – managing droughts and bio-security
- **Canada** – business risk management policies
- **Netherlands** – planning for catastrophic risks
- **New Zealand** – the adverse events framework
- **Spain** – the public-private insurance system

## More information

For the latest news and publications about OECD work on risk management in agriculture, visit our website: [www.oecd.org/agriculture/policies/risk](http://www.oecd.org/agriculture/policies/risk)

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