SESSION 3

Addressing off-farm impediments to global food security

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Abstract

The riskiness of agricultural production has been increasing this century, but so too have global market and policy uncertainties faced by farmers, agribusinesses and agrifood traders. In addition to short-term geopolitical contributors to which producers in the agrifood system have to become more resilient, there are long-term concerns with climate change (CC) and biodiversity loss and the responses of various governments and international agencies to those concerns. Farmers are among the worst-affected producers but are also significant contributors to greenhouse gas emissions and biodiversity losses. Adapting to global warming and more-extreme weather events, and to new policies aimed at mitigating CC, is challenging many farmers, while some other farmers will see new opportunities such as being paid to contribute to CC mitigation. Better outcomes, in terms of reductions in global food insecurity, malnutrition, CC, biodiversity loss and extreme poverty, require policy reforms in at least three areas: (i) less government intervention in national markets for agrifood products and purchased farm inputs, to ensure better use of the world's agricultural resources, (ii) more-widespread taxing of greenhouse gas emissions, and (iii) better markets for and policies affecting the services of natural capital so as to generate more (and more-appropriate) public investments in agricultural research and rural infrastructure in developing countries, and more public-private collaboration to up-scale innovations pertinent to the needs of farmers and agribusinesses there.

The title of this talk deliberately complements the title of Professor Umberger's talk on on-farm issues. I will discuss the sorts of issues that farmers *cannot* themselves directly affect but that they want to see improved. I have three key messages.

First, in my view not only has the riskiness of agricultural production been increasing this century, but also global markets and policies have become much less certain. Yet farmers and agri-businesses are having to survive in this more uncertain world.

Second, if we're going to boost global food security and generate more sustainable food systems, as everybody says we must do, and enable our farmers to be more resilient and climate-smart, then we need: (i) better markets for the services of natural capital; (ii) more public investment in agricultural research and in rural infrastructure in developing countries to get food from farms to consumers; and (iii) more public–private collaboration, to up-scale innovations that are already available but not yet being used to satisfy the needs of farmers and agri-food businesses in developing countries.

Third, the returns from these types of investments – that is, investments in research for development (R4D), in rural infrastructure and in upscaling innovations – will be enhanced if there is less government intervention in national agricultural markets, as that will ensure we'd be using the world's existing agricultural resources better than we do now.

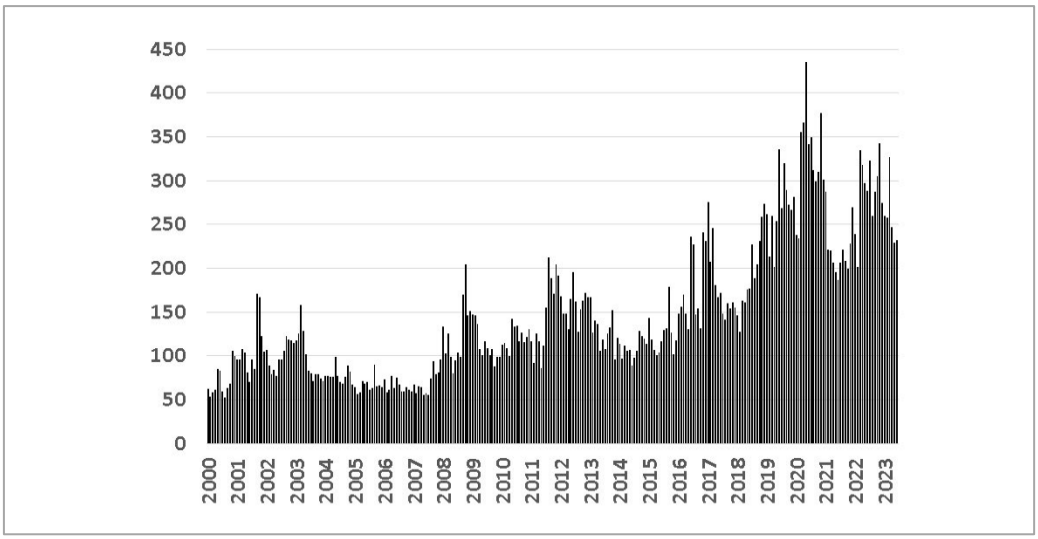

Figure 1. Global index of uncertainty in economic policy. *Source:* www.policyuncertainty.com

1. Riskiness and uncertainty

My first message is about not just the riskiness but also the uncertainty of farming. There have always been risks in farming and in trading. Agriculture is a climate-driven activity and therefore of course there are fluctuations because of seasonal variation, and also because international prices, international interest rates and exchange rates vary over time. True, those risks have increased during this century. That is, in statistical terms, their probability distributions have widened. We have seen this before, in past history, and farmers learn over time how to deal with them. However, now both markets and policies are also less certain. We don't know what their probability distributions look like now. Only with more time can we learn about those things, and thereby reduce the amount of uncertainty and shift them into the 'risk' category.

Market uncertainty is about how globalisation or the digital revolution affects the probability distributions of income and employment contributions. Those consequences are quite difficult to predict. Baldwin (2019) gives a good sense of how we cannot even imagine how services activities are going to change over time with globalisation, and goods markets as well.

There is *technology uncertainty*, because researchers are responding to the changes in climate that we're living with, and also to changes in consumers' preferences (such as wanting substitutes for meat and dairy, and demanding that goods be produced more sustainably). Firms are going to try to meet those new demands in order to continue to satisfy their customers.

The third area of uncertainty that has increased has to do with *policy*. The speed of globalisation and of the ICT revolution is leading countries to respond by imposing unpredictable trade restrictions in a push towards anti-globalisation and populism in their governments. Figure 1 shows the changes over the past 23 years in a global economic policy uncertainty index (vertical axis), extracted from the website https://www.policyuncertainty.com . The blip around 2007–2008 was the global financial crisis. Then uncertainty increased a decade later around Brexit and a little later even more so as Donald Trump went into office.

Looking historically, more populist governments came into power in the 2010s than in any previous decade back to 1900. Figure 2 shows countries with populist governments since 1900. Those governments are a mix of left-wing and right-wing, and both types of regime have adopted wasteful economic policies. This rise of populism is a worry because it leads to economic nationalism, and trade protectionism, and to less multilateralism, and therefore slower economic growth globally (Funke *et al*. 2021). Yet we need *faster* economic growth to reduce poverty; we need *more multilateralism* to generate more of the kinds of global key public goods that can help us reduce climate change, reduce losses in biodiversity, and reduce the risks of communicable health diseases such as COVID-19 (since that pandemic won't be the last one).

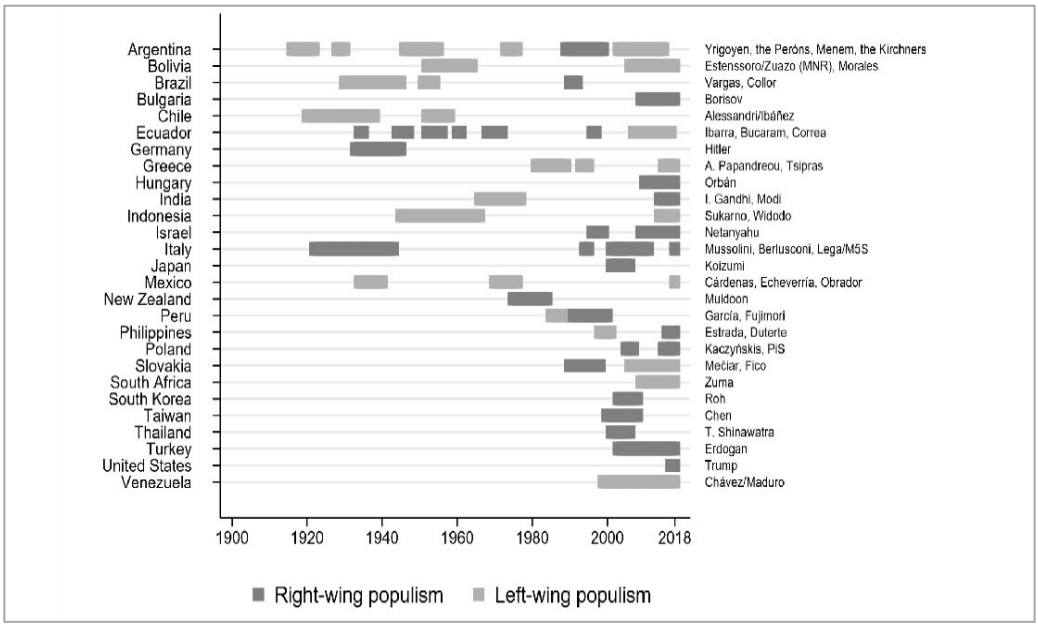

Figure 2. Populist governments since 1900. *Source: Funke* et al. *2021.*

Sources of much of this increase in uncertainty have been talked about both in the Sir John Crawford Memorial Address last night and earlier this morning. For instance,

- China is now more assertive and less reliable as a trading partner;
- Russia, a major exporter of grains, fertilisers and hydrocarbons, has disrupted those markets through its recent aggressive interventions, particularly in Ukraine; and
- The United States, during the Trump era with its populist President, triggered tariff wars not just with China but also with close partners of the US, and undermined the World Trade Organization, the Intergovernmental Panel on Climate Change and the World Health Organization. With a US election coming up next year it's possible that Trump will be President there again.

As a consequence of all this, there is a much-heightened risk of international conflict and, as discussed earlier this morning, conflict affects food security. The situation doesn't seem to have improved even under the Biden administration.

2. Better global food security and a more sustainable food system

The second take-home message from this talk is about trying to see how we could improve markets for natural capital (farmland and irrigable water, for instance), how we could improve government decisions on public investments, R&D and infrastructure, and how we could get more public–private collaboration in upscaling agri-food technologies.

(i) Better markets for the services of natural capital

Efficient use of the available **farmland** requires secure property rights. That doesn't mean taking rights away from Traditional Owners: in Fiji, for example, Traditional Owners have secure holds on their land. If they don't want to use that land, they can lease it out to somebody else who does want to use it. Having efficient markets for that is what is important.

Equally important and much less well developed globally (although we are gradually doing a good job of it in Australia) are markets for **irrigation water**, where again property rights need to be established for both sale and lease, along with good policies for altering the annual allocations according to how seasons change. It is often said that there are water crises around the world, but those crises occur because we don't price water properly. If we price water, instead of giving it away or giving away the electricity to pump that water – as India does – we wouldn't have such a crisis with water. *Water* is not rare or in short supply. What *is* in short supply are good institutions and policies to ensure it is allocated and used efficiently.

For **fertiliser and pesticides**, we can obviously replace subsidies with taxes on those polluting inputs. That would certainly save us over-using those fertilisers, often at great waste to the farmers who don't realise they are using too much.

Also needed are markets for sequestering **carbon** in soil. We are working on that here in Australia and in other countries, but those developments need to be spread more globally to help mitigate climate change.

Markets for **other ecosystem services** – e.g. tree planting to reduce loss of biodiversity – are also very underdeveloped. Twenty years ago, the Europeans and then the Japanese talked about multi-functionality of agriculture. It was seen by Australia and others as simply another way of protecting agriculture, by giving subsidies for doing environmental things. But now, even in Australia, we have moved to understand that natural capital markets do need to be developed, to make sure we don't waste that natural capital, and to look at that also as one of the possible ways of solving problems such as too much carbon in the atmosphere.

(ii) More public investment in agricultural research and in rural infrastructure in developing countries

More public investments in agricultural research and rural infrastructure are sorely needed in many developing countries. One of our colleagues, Phil Pardey (who gave the Overview paper at the 2022 Crawford Fund conference), and others have measured the extent of that under-investment by looking at what the marginal rates of return would be to further investment there. Generally, especially in developing countries, there is a huge gap that could be filled with more expenditure (Rao *et al*. 2020). Obviously, the international agricultural research system is one way in which we could do that by attracting larger amounts of money into that system.

It's desirable to get more research done, and not just for the producers' benefit. Unlike in Australia – where most of that benefit would go to producers – food in developing countries is not much traded internationally. That is, most is sold within the domestic market. If investments lowered the cost of producing that food, or of moving it from farm to urban markets, then consumers also would benefit: a win–win for food security in those countries for both urban and rural people.

(iii) More public–private collaboration, to up-scale innovations that are pertinent to the needs of farmers and agri-food businesses in developing countries

Public–private collaboration could up-scale innovations that are pertinent to small farmers in developing countries. I will mention just two initiatives here.

- USAID has a Development Innovation Ventures program that is supporting innovators and researchers to test out new ideas, to take strategic risks, to build confidence in what works, and to advance the best of those with evidence of their impacts, cost-effectiveness, and viable pathways to scale and to sustainability.
- Building on that, at the University of Chicago, Michael Kremer (who is a Nobel Laureate in development economics) has allowed the Innovation Commission for Climate Change, Food Security and Agriculture to be set up there (see https://bfi.uchicago.edu/project/the-commission-on-innovation-for-climate-change-and-food-security/). More information in this initiative is to be announced at COP28 in December 2023.

This new Commission is trying to do two things: (i) to support adaptation innovations that are difficult to up-scale commercially, by bringing in public sector money for that; and (ii) to encourage private sector mitigation innovations, by offering an advance market commitment. The latter type of system is already in use to encourage development of vaccines. This commission would pay somebody to innovate something only if and when the innovation is shown to be successful, thereby sharing the risk. The innovator has to put in their own money to prove their idea is valid, and only if it works out well will they be granted money to cover their costs and presumably give them some profit.

3. Less government intervention in agri-food markets

My third message is that the returns from the ideas I have just mentioned would be enhanced if we had fewer distortions to agricultural incentives around the world. In many national markets, farmers are supported in some activities but not in other activities, and that is a distortion within that country. And if governments are overly protecting all of agriculture in their country, then that is a distortion against the farmers in the rest of the world.

There is good reason for getting rid of those interventions. Without them, we will get prices right and thereby make better use of existing resources and have a better base from which to use new prospective technologies.

At the moment, agricultural policies are very price-supportive in Europe, though less so than in the past. The same is true in north-east Asia and to a lesser extent in the US, and also in some emerging economies including China. These policies tend to be price-based, which means the richest farmers get the largest proportion of the producer benefit while the poorest consumers are hurt most because those people spend the largest share of their income on food.

Within the World Trade Organization there have been efforts to try to reduce subsidies to agriculture (and also to reduce industrial subsidies). But it turns out that reducing farm subsidies is

not going to help very much. We have just revisited work we did about 20 years ago looking at the extent to which global economic welfare could be enhanced by reducing distortions to agricultural incentives. In that work (see Anderson *et al*. 2006) we found that 93% of the global economic benefit would come from reducing market import restrictions, and only about 5% would come from removing domestic subsidies (and 2% from removing export subsidies). Since then, particularly in Europe, policies have been switched away from import protection and towards direct subsidies to farm households.

We thought that switching would have had big effects, but a recent revisit suggests that the situation hasn't changed very much. It appears that still about 90% of the global economic welfare cost of these policies is due to restrictions to agricultural imports and only 10% or less of the cost is due to domestic agricultural subsidies (see Anderson *et al*. 2023). The various tariff and non-tariff barriers to international farm trade hurt countries like Australia, and they also hurt all those potential agricultural-exporting countries in the developing world.

Those trade barriers tend to fluctuate through time. That is not helpful for farmers, because they can't guess what's going to happen next year. If there's suddenly a spike in international prices, some countries will put on export restrictions and others will lower their tariff barriers. Each of those policies exacerbates the international price spike, *and* they offset each other so that there's no alleviation to the domestic price, which still spikes upwards. while there's a bigger increase in the international price (Martin & Anderson 2012; Jensen & Anderson 2017). Countries doing nothing face more instability. Thankfully, that lesson seems to have been learned by policy makers and their advisers. Cary Fowler this morning (Fowler, this Proceedings) said that the US, for example, has been encouraging countries not to do that in the current price spikes we have seen. Nonetheless, as Figure 3 shows, there have been a lot more of these spikes in this past decade or so than there were in previous decades.

Reducing price-distorting policies would improve global economic welfare, and they would alter activities within the agricultural sector to where they could best make use of existing resources.

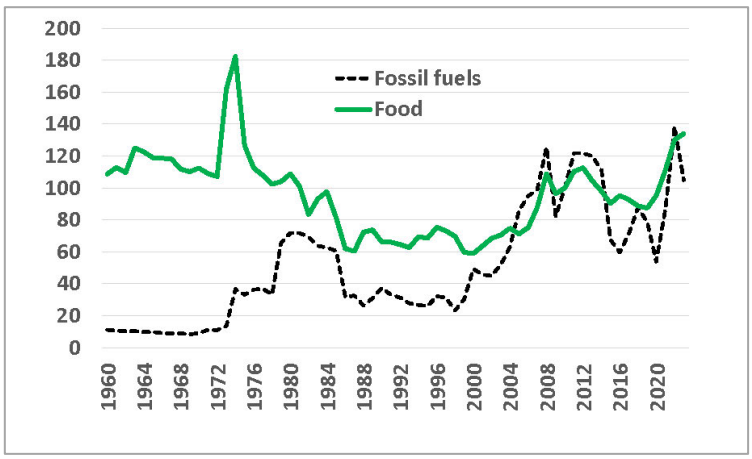

Figure 3. Real international food and energy prices are spiking more frequently this century.
Source: World Bank Pink Sheets, to July 2023.

However, they wouldn't boost global overall food availability very much (Gautam *et al*. 2022). There's been a lot of effort by the World Bank and IFPRI over this last couple of years to look at how we could boost global food and nutrition security, and sustainability of food systems, with other methods: that is, by repurposing the current assistance to agriculture so as to boost global food and nutrition security and gain better economic, environmental and social outcomes for the money being spent.

Policies that support agricultural market prices tend to be not only very inefficient but also inequitable, as well as anti-trade on average. They are biased towards the least-competitive farm industries in each country, and they shrink world trade. That then increases the volatility of international trade quantities and prices.

If agricultural market price support could be lowered, that could lower the environmental costs of supplying the world's food. By becoming more open to trade, those countries would not only reduce price instability but also boost economic growth and reduce poverty in agrarian economies by boosting demand for farm outputs.

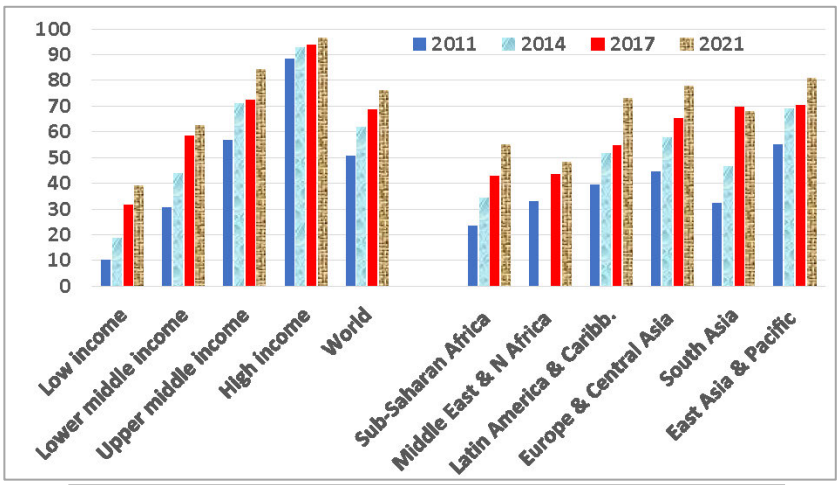

Figure 4. Share (%) of adults with a bank or mobile-money account.
Source: www.worldbank.org/en/publication/globalfindex

4. Other ways to reduce poverty

Direct payments are possible now in developing countries, in a way that wasn't possible until a decade ago. Now, like farmers in rich countries who all have bank accounts, more and more people in developing countries hold either a bank account or a mobile money account, thanks to the IT revolution. That has made it much more possible for governments to pump money into individual peoples' accounts to help a particular region. In Figure 4, the first set of columns show that in low-income countries a decade ago only 10% of adults had one of these types of accounts, but now 40% have them. In the lower-middle-income countries, the proportion has gone from 30% to over 60%. So, this idea of supporting households directly is not only possible, it also bypasses possible corruption from the village leader or whoever, who previously might not have diverted money that was due to particular poor households. This solution can address poverty very directly. The government can then focus its spending on something more efficient than farm price support programs – such as building rural infrastructure or expanding agricultural research investments.

5. What else is wrong with current agricultural policies?

As we know, farm production itself is contributing to some of today's major global problems, particularly greenhouse gas emissions (IPCC 2020) and biodiversity loss (Dasgupta Review 2021). As well, farmers themselves need to be incentivised to reduce both.

One way they can do that is through carbon trading. Making carbon taxing more common, and emissions trading more common including across borders, can facilitate the opening up of this. But there's a new OECD paper that came out last week that looks at the challenge in front of us as we seek to improve environmental impact reporting. Australia is just now getting into that process. Other countries have hardly started. Deconinck *et al*. (2023) has a comprehensive list of the things that need to be done to meet that particular challenge.

Of course, farmers need to adapt to climate change as well. We've heard a lot about that because climate change is lowering their productivity (especially in the tropics). It's also raising consumer prices of food and it's adding to the volatility of quantities and prices of agricultural outputs. Hence R&D has to be focused on generating more climate-smart innovations to deal with that issue.

6. Implications for the Crawford Fund

Finally, what are the implications of all this for the Crawford Fund? What it has been doing is fantastic. Their volunteers, as they retire, get out there and complement the sort of work that ACIAR is doing in our neighbourhood, and that's certainly contributing to agricultural growth and to reducing poverty (World Bank 2007; Headey & Hirvonen 2023).

But perhaps the Crawford Fund could be thinking a bit more about whether its people could contribute to the policy area too, for example by disseminating alternative policy options in developing countries where current policies are wasteful or where tighter environmental standards are required to retain market access abroad.

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Emeritus Professor Kym Anderson AC FAAEA FASSA DFAARES DFESA has contributed to economic development in the overlapping fields of international trade and political economy, with a strong focus on agriculture and products of importance to developing economies. His work and outputs, prodigious and varied, have been widely recognised for their quality and significance, in Australia and abroad, including by leading international agencies. Kym is the George Gollin Professor Emeritus in the School of Economics and Public Policy and formerly foundation Executive Director of the Centre for International Economic Studies at the University of Adelaide, where he has been affiliated since 1984; and he is an Honorary Professor at the Australian National University's Arndt-Corden Department of Economics where he was a Research Fellow during 1977–1983 and a part-time Professor of Economics during 2012–2018. He has held senior research leadership positions at the World Trade Organization and the World Bank; and a large number of significant research advisory positions, including in Australia. He is highly respected internationally for his knowledge, understanding and leadership, with an excellent citation rate that indicates his international leadership in agricultural economics. Kym has also played major roles on the ACIAR Commission and Policy Advisory Council and has chaired the Boards of the International Food Policy Research Institute (IFPRI) and the International Centre of Insect Physiology and Ecology (ICIPE).