



Speaker Summary Note

Session: High-Income Countries

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Title: Reflections → Leveraging agriculture to improve nutrition and health outcomes

It is a great privilege to be here. Thank you to the organizers and hosts for inviting me. I will touch on four theme areas: (1) getting diagnostics right; (2) establishing priorities and remedies based on the likelihood (or frequency) and severity of prospective system shocks; (3) anecdotes and musings on whether and how to reduce vulnerability and rebuild resilience in our agri-food eco-systems and value-chains; (4) avoiding capture and the creation of “gatekeepers” and bottlenecks wherever possible. This draws on my experience in East and South East Asia as well as in the OECD economies of Canada and Australia.

(1) Getting Diagnostics Right

Getting the diagnostics right is of fundamental importance to the design and delivery of “remedial measures.” Ill-conceived “prescriptions” may do more harm than good.

I have long been impressed with the structured approach friends and colleagues in the veterinary, epidemiology and plant pathology fields use to deal with health and environmental risks. Their application of Hazard Analysis at Critical Control Points (HACCP) framework is something that—with some adaptation to encompass markets and infrastructure—can yield useful risk mitigation and management strategies and insights for the challenges confronting us in terms of improving nutritional and health outcomes for the poorest households on the planet.

In the current context, it is important to differentiate between: (a) causes and drivers; (b) symptoms; (c) consequences. Depending on their nature, frequency and amplitude of their impacts, risks are typically best dealt with by either directly addressing their root causes or the driving forces behind them *ex ante* and/or by dealing with their consequences *ex post*. Focussing on symptoms rather than causes can result in sub-optimal outcomes, wasted resources and, in some instances, actions which actually exacerbate matters in the longer run. There has been a lot of focus lately on the issue of volatility—which is indeed problematic—but which is more of a symptom of challenges elsewhere than a cause or a consequence; an over-preoccupation with volatility can actually be a distraction from constructive effort elsewhere.

(2) Establishing Priorities Based on Source, Likelihood and Severity of Prospective Shocks

Recent stresses within the world's agri-food complex have arisen as a result of the confluence of: (1) supply side shocks arising from a variety of sources; (2) rising affluence and standards of living in emerging economies; (3) prolonged under-funding of agricultural research; (4) patchy or inadequate infrastructure and/or value chains; (5) new technologies that increase the linkages between food, fibre and fuel markets and competition for natural resources and commodities; (6) income shortfalls; and (7) misguided policies.

In the context of stress placed upon the world's food systems and markets, it should also be noted that because food is a necessity—actual demand changes are moderate and gradual regardless of whether we are in a boom or in a bust cycle. Consumers may substitute cheaper food items for more expensive items and, in wealthier economies, eat out less. But consumers cannot delay food purchases indefinitely as they can with discretionary purchases. While demand-side events do impact upon price levels over time, they do not typically impact as directly or as much on volatility as supply-side phenomena or policy choices do.

Within risk assessment and risk management frameworks, some assessment of (i) the likelihood of a certain kind of event, and (ii) the severity or magnitude of impacts or consequences of such an event are the dimensions of concern that will inform priority setting with respect to whether or not action might be warranted. In the case of supply shortfalls, for example, do they arise from (examples only, not exhaustive):

- infectious diseases
- water scarcity
- infrastructural bottlenecks
- land/soil degradation or depletion
- waste or misallocation in the value chain or distribution system?
- invasive species
- flooding and other natural disasters
- weather / climate shocks
- misguided policies or incentive systems

To what extent can we establish likelihoods for the above events? What is the nature and severity of their consequences? Do they fall within the range of things we can influence or control or are they simply things we have to accept and react to? Are their impacts static and once-off (e.g., a poor crop year) or are they dynamic in nature (e.g., an infectious disease)?

(3) Reducing Vulnerability and Promoting Resilience in Agri-Food Systems

Given the relative importance of supply side phenomena and policy choices on volatility and system stresses, more precision is needed about the nature and origins of such phenomena if pre-emptive or remedial measures are to be contemplated and well-designed. Shocks to the system can come from a number of sources. For illustrative purposes, I will briefly discuss potential shocks relating to water resources and wheat production. I will also touch briefly upon the issue of conceivable disruptions and waste in the distribution system and in the value chain.

Water. Together with the land or soil, water is a key resource used in agri-food production worldwide. In many countries (if not most), however, water is undervalued as a resource. The incidence and amplitude of water-related stresses appears to be on the rise. Important agricultural regions in China, India, Mexico, Australia, Africa, the U.S., and elsewhere are already experiencing serious water scarcity. Global water requirements are expected to increase by 40 percent over the next 20 years. If trends continue, by 2025 competition between urban, industrial, and agricultural water uses will constrain both economic growth and agri-food production. Consequently, the importance of managing water resources well is also rising.

While undervaluation is problematic under the best of circumstances, it is particularly worrisome when water is scarce as it results in over use, depletion or degradation of the resource. Because of price distortions, extraction technologies are favoured over water conserving approaches. In extreme cases, this can result in over abstraction of aquifers in some localities and salinization and water-logging elsewhere. To avert serious shortfalls in crop production (not to mention ecological disasters) and some attention must be paid to improving crops' tolerance to drought and extreme events and by improving water governance through appropriate pricing and aligning infrastructure, institutions, entitlements, obligations and incentives.

Staple Crops (Wheat). The production and yields of wheat, corn, rice, soybeans and most other agricultural crops are very dependent on weather related events (temperatures, precipitation). There is some evidence that the incidence, timing and amplitude of weather events is changing. To name just a few “events” that are increasing in frequency and amplitude:

- *Temperature above 30°C for more than 8 hours* → can reverse vernalization
- *Water stress* → can impact upon flowering, pollination, and grain-filling
- *Excess soil moisture* → can cause water-logging, increase risk of fungal infestations

Obviously, one approach to such emerging challenges is to engage in crop-related research and extension activities geared directly to such extremes of temperature, drought and water-logging.

Another conceivable strategy is composite seeding. To deal with variation in weather and agro-ecological conditions which affect plant growth, some scientists have started experimenting with something which, loosely translated, might be called “composite seeding”. In North-East China, for example, instead of planting just one wheat variety on a particular plot of land, they plant a collection of seeds from different varieties but with the same range of gluten and protein levels. Depending on the kind of year they have from an agronomic perspective, the varieties best suited to the rainfall and temperature conditions will predominate. While the results are still tentative, I understand that this cluster approach has reduced yield variability and concurrently raised yields by ~ 15 to 25 percent on average since they started experimenting with it. But, obviously, this would pose a challenge for systems with a strong attachment to strict interpretations of “product integrity” varieties/classifications.

This approach will obviously not be satisfactory for specialized seed producers. However, for food and feed production and consumption, it is an approach that we may want to consider in the event that the frequency and magnitude of weather events and agronomic conditions increase. But it may require a re-calibration of our thinking and approaches to crop production, grading, processing and other value added activities.

Disruptions to the Distribution System. The recent volcanic activity in Iceland—though far from the worst of its kind—disrupted trans-Atlantic movements of people, services and goods, causing some folk to reconsider certain features of the hub-and-spoke model of distribution.

Policy Design Considerations. In supporting agriculture and farming, perhaps we need to ask whether and which among our policies and programs promote practices that are resilient from an economic, agronomic and ecological perspective. When production losses are incurred and compensation is paid, do we inadvertently foster complacency in the face of shocks or environmental damage? Are there any policies and programs which encourage “stickiness” with respect to a tendency to keep farming the same crops when other crops might be more environmentally benign or less susceptible to environmental oscillations?

(4) Avoiding the Creation of Gatekeepers and Bottlenecks

Avoid Gatekeepers and Bottlenecks. While typically well-motivated, administrative approaches tend to be more lethargic, prone to preferential access and capture, preclude choice in the methods for achieving objectives, and susceptible to the creation of rents that run counter to society’s interests. They often result in rationing or queuing behaviour and inadvertently encourage wasteful lobbying, all of which affect poorer households disproportionately.