Food Security

Where are we today

and what’s coming down the track?

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Prevalence of hunger ...

% of world population

World hunger again on the rise, driven by conflict and climate change, new UN report says

815 million people now hungry – Millions of children at risk from malnutrition
So we know the *current* global food security ‘situation’

- Insufficient cals Insufficient nutrs ~ 1 billion
- Excess cals (incl. many with insufficient nutrs) > 2.5 billion
- Insufficient nutrs ?3 billion
- Sufficient cals Sufficient nutrs ?3-4 billion

➢ “Triple Burden of Malnutrition”
Different, overlapping forms of malnutrition the ‘new normal’ (IFPRI 2015)
We also know the current global environmental ‘situation’

- Soil 33% degraded
- Fresh water 20% aquifers overexploited
- Biodiversity 60% of loss
- Marine resources 29% over-fished; 61% fully-fished

And 24% of total GHG emissions

And pollution: chemicals, plastics, litter, …
And we know the current concerns about animal-human interactions

- Links between human and animal prophylaxis, e.g. AMR
- Increasing risk of disease emergence with the rapid changes at the A-H interface.
And we have a host of *current* ethical concerns

- Child labour
- Animal welfare
- Workers' rights
- Inter-generational legacy
- Food waste
- Farmer welfare and safety
- ...
But what’s coming down the track?
Marked regional differences in demography trends
Plus increasing wealth

$6,000 – $30,000
And we know that per capita daily dietary kCal demand increases with wealth

Tilman and Clark, Nature 2014
Food System Challenge

Achieving food security for a growing, wealthier, urbanising population while minimising further environmental degradation and maintaining vibrant food system livelihoods and enterprises.

against a background of

- natural resource depletion
  - and
- reduced agrobiodiversity
  - and
- many stagnating rural economies
  - and
- changing climate
  - and
- a host of social, geopolitical, economic and cultural changes
A further growing concern

“zero chance that the world can meet the target set by the UN for halting the climbing obesity rate by 2025”

... Lancet, 2016
“Stream Trains”
Easily perceived drivers and trends that will influence change - direct and indirect

“Black Swans”
Rare and/or unpredictable events that have a big impact

But what about other trends – and shocks?
## Food System Stresses and Shocks

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| **Stress**  
*pressure or tension exerted on a system*  
*Steam Trains* | **Shock**  
*sudden surprising event affecting a system*  
*Black Swans* |
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Technology Innovations to Enhance Resilience

“Innovation with a Purpose: The role of technology innovation in accelerating food systems transformation

Prepared in collaboration with McKinsey & Company

January 2018

“food systems are riddled with inefficiency and ineffectiveness”
Policy and Institutional Innovations to Enhance Resilience

- Reform subsidies for agricultural inputs and staple crops
- Promote sustainable, nutritious, and healthy diets, inc. urban horticulture
- Leverage innovative financing
- Promote effective governance mechanisms
- Enhance monitoring and accountability with data
- Launch a scientific assessment platform for food systems (IPFS?)
Looking ahead...

**Extrapolated calorie consumption**

(Indicative; not to scale)

The environmental consequences of meeting this demand under current food systems and consumption trends are dire.

Costs of triple burden of malnutrition (direct, indirect and lost work days) currently 11% global GDP.

The current global cost of the 425m diabetics is $825b/yr; 700m diabetics anticipated.

Demand

Manage Demand

Meet Demand

kcal/person/day consumption

2000

2018

2028

2040

Billions of people

1 2 3 4 5 6 7 8 9 10
Different motives, different agendas ...

But synergies should be possible: will need multi-actor design and delivery – including business.
Managing cereal demand: plausible actions by 2030

50% more cereal cals/person/day, despite harvesting 15% less/person

Nature of food ‘loss’

‘Current’ data (in red) from FAO; & Luo, 2013

What are the obstacles?

Political, economic, social, technical
Reduce ‘unnecessary’ overconsumption (SDG 12.3)

... exists when all people, at all times, have physical, economic, and social access to sufficient food to meet their dietary needs and preferences for an active and healthy life.

“enough for a particular purpose; as much as you need”

... OED

What are the obstacles?

social, economic, political, technical
Why is it so hard to make progress?

- Complex adaptive system, many interactive ‘drivers’ and feedbacks
- Set of dynamic actors and activities
- Interactive socioeconomic and environmental outcomes
- Wide range of power and vested interests; fragmented governance

However...

- Many policy, fiscal, social and technical options for change
- Multiple options for cooperation among actors
- Many plausible futures
- Many great careers in food system analysis and management
Food Security

What’s coming down the track?

And which are the bigger challenges?