Food Systems Training to address Global Food Challenges

The Need for “Food Systems Thinking”

John Ingram
Food Systems Programme Leader
Environmental Change Institute
University of Oxford
Prevalence of hunger ... % of world population

15 September 2017, Rome

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
... ?3 billion people suffer from Vit A, Fe, I, Zn and/or other micronutrient deficiencies: “Hidden Hunger”

About a third of the global population is Zn-deficient (Barrett and Bevis 2015)

At least half of children worldwide aged 6 months to 5 years suffer from micronutrient deficiency (CDC 2017)

About one in five people in UK has low vitamin D levels (NHS 2016)
Food security...

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

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

... OED
And so – by definition – a further ~2.5 billion of us are also ‘food insecure’ due to changing diets!

**Global:** 33% of adults are overweight or obese.

**Australia:** 60% of adults are overweight or obese.

**England:** 14% of Yr 6 children overweight & 20% obese.

**Shanghai:** Over 200,000 (14%) children are obese

Overall global food security ‘situation’

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

➤ “Triple Burden of Malnutrition”
Different, overlapping forms of malnutrition the ‘new normal’ (IFPRI 2015)
There are also concerns about animal-human interactions ...

- Animal welfare
- Zoonotic disease extent, impact, spread
- Links between human and animal prophylaxis, e.g. ABR
... and we also know that current Food System activities significantly affect the environment.

- 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
Updated ‘Planetary Boundaries’ concept and contribution of Agriculture activities

Biosphere integrity

Genetic diversity

Climate change

Novel entities

Stratospheric ozone depletion

Atmospheric aerosol loading

Freshwater use

Land-system change

Functional diversity

Ocean acidification

Biogeochemical flows

Phosphorus

Nitrogen

Campbell et al., 2017
Steffen et al., 2015

Role of agriculture

Beyond zone of uncertainty (high risk)
In zone of uncertainty (increasing risk)
Below boundary (safe)
Boundary not yet quantified
The environmental consequences of meeting this demand with current food systems and consumption patterns are dire. Impacts on non-communicable diseases (e.g. CVD, Type 2 Diabetes) will be massive. The global cost of the 425m diabetics is $825b/yr; 700m diabetics anticipated if trends continue.
Food System challenges are interconnected.

To achieve food security for a growing, wealthier, urbanising population while minimising further environmental degradation

\textit{against a background of}

- natural resource depletion
  \textit{and}
- many stagnating rural economies
  \textit{and}
- changing climate
  \textit{and}
- social and socio-cultural changes
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

=> Rich research agenda
But need to understand range of stakeholder interests in any given research agenda

How will climate change affect food security and land use in Southern Africa?

Science Agencies
- e.g. NRF, NSF

Development Agencies
- e.g. USAID, FAO, CARE

Policy Makers
- e.g. SADC, national ministers

Resource Managers
- e.g. farmers, range conservation NGOs

Private Sector
- e.g. processors, retailers, traders

Improved CC/food security science

Improved livelihoods & reduced vulnerability

Improved food security & env policies

Improved food production & nat resource mgmt

Improved food system efficiency & sustainability

Natural Scientists
- e.g. climate change
- agriculture
- hydrology
- land degradation

Interdisciplinary Science Questions

Social Scientists
- e.g. governance
- markets and trade
- resource tenure
- social capital
Today and Tomorrow

- **Current Situation**: Increasing and systemic failings in food systems

- **Upcoming Situation**: Problems will be exacerbated unless more effective and efficient food systems are urgently developed and implemented

- **Skills need to be enhanced** for all actors in the food system to improve food security and environmental outcomes
How does ‘Food Systems Thinking’ help?

• Provides a interdisciplinary view as disciplinary approaches can fail to address issues or spin-off further problems

• Integrates a collective understanding and co-ordinated response from a variety of different stakeholders

• Theories and methodologies help to organise the debate and identify trade-offs and synergies
So what to do about it?

Need a workforce trained in concepts and tools, and able to implement interventions leading to better outcomes for food security, environment and enterprise.

- Based on understanding of range of food system actors and motivations, activities, outcomes and complexity
- Equipped with ‘hard’ and ‘soft’ skills
‘Food Systems Thinking’

A pioneering consortium of higher education institutions to deliver collaborative training and learning in the holistic study of food systems
IFSTAL Goal

To create a cohort of Masters and PhD graduates equipped to address food systems challenges by framing their specialist understanding gained through their degrees within the broader social, economic and environmental contexts.
What does IFSTAL offer?

- A collaborative, cross-university food systems training programme
- Provides any postgraduate student with enhanced skills to address food security/environmental challenges
- Is voluntary, and does not impinge on contact time
- Is not assessed but sits alongside and supports postgraduate learning and research
- Certificate of participation
How does IFSTAL work?

1. **Student-Student interaction** underpinned by an on-line resource

- **4 “Units”** over the autumn and spring terms
  1. Introduction to the Food System
  2. Introduction to Systems Thinking
  3. Methods for Analysing Food Systems
  4. Engendering Food System Change

- Networking, participation and access to content via a **Virtual Learning Environment (Portal)** and face-to-face follow-up workshops
How does IFSTAL work?

2. Student-Workplace interaction

Throughout the year:

- Away-days
- Symposia
- Placements
- Careers workshops
- Summer School
  - Workplace challenge
  - Soft skills

=> Internships

=> Job opportunities
What’s in it for students?

Interdisciplinary learning
✓ Exposure to cutting edge ‘food systems’ thinking
✓ Network of faculty and fellow students across institutions
✓ Contact with a range of experts from the workplace

Increased job prospects
✓ Engagement with food sector practitioners
✓ Opportunities for
  ➢ dissertation placements
  ➢ work-related summer school
  ➢ post-graduation internships
✓ Membership of a graduate food systems network
What’s in it for universities?

- Student enrolment: an attractive ‘free’ option
- Student satisfaction: getting more out of their degree
- Employability: links to workplace and increased university visibility
- Innovative interdisciplinary blended and digital teaching: latest pedagogy
- Global engagement: wide networking leading to both teaching and research collaborations
What’s in it for employers?

- Well-rounded, interdisciplinary post-graduates skilled in food systems thinking
- People able to work effectively on ‘systemic’ issues and risks
- Enhanced professional capability based on soft skills development
- Access to an alumnus of ‘food systems thinkers’ engaged across the workplace
- Opportunities to network with peers and academics
Phase I: Oct 2016 – Sep 2018
> 1000 students from 45 departments

Phase II: from October 2018
extending to developing world

“To have people who have a sense of their role within the system and how they can collaborate with other actors is probably the most important skill that can be developed.”

IFSTAL Workplace partner