

Interdisciplinary exchanges

HOSTED BY THE UNIVERSITIES OF SHEFFIELD, NEWCASTLE AND LEEDS

In April, Interdisciplinary Exchanges held its second workshop, hosted by the University of Newcastle, which focused on the issues of food security, poverty and biodiversity. Here we review the main themes and debates that emerged from this workshop.

Workshop Speakers:

Prof. Tim Benton

University of Leeds, UK
Government Champion for

Dr. Jahi Chappell

Institute for Agriculture &
Trade Policy



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Food security, poverty and biodiversity

Food security has risen in prominence in recent years, reflecting the intersection of a broad range of research investigating food production, environmental, development, free trade, and food sovereignty. Food security represents a consensus framing around which these areas converge (Candel *et al.*, 2013). Given the multiple research perspective (and priorities that each of these brings to the issue), food security must be conceptualised as a **transdisciplinary issue**.



Defining and framing food security is a constant challenge, however. A focus on food security at different levels (international, national, local or household), concentration on either more or less developed countries, or the context of climate change are examples of how this

transdisciplinarity includes multiple framings of food security, and different strategies and priorities for action. Given the multiple interests, contexts and trade-offs involved in decisions affecting the overlapping areas of food security, we could conceptualise it as a ‘wicked problem’ with no simple solution (O’Brian *et al.*, 2008).

As our speaker Tim Benton emphasised, there are ‘winners’ and ‘losers’ in decisions around land-use that affect food security. Converting land for palm oil production, for example, may bring significant private gains to its investors, but public losses in terms of food production and nature conservation. Similarly, prioritising large farms for efficient production and global food systems is advocated for food security by some and seen by others as a form of land-grabbing jeopardising small-holder agriculturalists’ security.

What does recognising this complexity mean for appropriate

action? Should our **priorities** lie in securing subsistence for the rural poor (two thirds of the poorest African people rely on agriculture; Pretty *et al.*, 2011), on securing access to healthy food, or perhaps on facilitating commercialisation to increase food availability (OECD, 2013)?

Whilst it is common to see food security as an issue of sufficient production to supply a growing global population (Pretty *et al.*, 2011), the issue is much broader in reality: Our speaker, Jahi Chappell, drew parallels with Amartya Sen’s (1981) work on the socio-politics of famine to argue that we need to consider the ‘Five As’ of Food Security:



Here we explore these dynamics of land, nature, people and food to identify opportunities and priorities for research

The Unseen Side of Food Security: Consumption & Waste

The classic framing of food security issues is one that describes population growth leading to an increase in demand for food, putting pressure on our existing food and agriculture systems. This view emphasises a need for increased production, which drives a focus on agricultural yield and intensification to meet rising demand. In this workshop, we debated the utility of this framing, and explored the complex dynamics of global food systems, including consumption and waste.

At the workshop, both speakers highlighted the need to consider food security not only in terms of producing enough food for the global population, but also inequalities in where that food goes, and how much of it is simply never used (food losses amount to 1.3 billion tonnes annually, estimated at 30-40% of global food produced; Charles *et al.*, 2010), alongside different causes and huge inequalities in wastage: food waste from the European Union and North American annually is equivalent to the total amount of food produced in Africa.

However, reducing consumption and waste requires an in-depth understanding of the drivers of demand for food, and recognition that this is tied into multiple factors, including processing and storage capacity, legal frameworks for food products, market forces across multiple scales, cosmetic factors, food-type preferences and



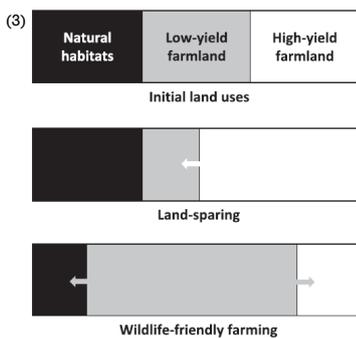
cultural values. For example, wide margins of safety on food 'use by' dates lead to large amounts of edible food being discarded.

Furthermore, taking action to reduce consumption and waste, calls for research to build links with studies of values and incentives to understand what strategies would induce people to change their diet, consume less and throw less food away.

One potential strategy would be to implement strategies similar to the Payments for Ecosystem Services in the environmental sector. In theory, such strategies would help to internalise the externalities of food, revealing the true cost of different food options (socially, environmentally and medically). Adding a price supplement on meat to cover the environmental costs attributable to methane contributions to climate change, for example, could incentivise reduced consumption. In reality, however, such a strategy raises large questions, not just of practicality and management, but also of inequality and ethics, particularly as access to healthy food is already identified as an issue for poorer groups.

Land Sparing and Land Sharing: An Oversimplification?

In recent years, there has been much discussion within the fields of agriculture, food security and biodiversity conservation over the relative merits of 'land sparing' and 'land sharing'. The former is a strategy to intensify food production on existing agricultural land and prevent conversion of 'spared' conservation land to agricultural use. The latter is also known as wildlife-friendly farming and aims to maintain populations of wild species on land used for food production (Phalan *et al.*, 2010).



This debate is closely tied to the broader framing of increasing population and demand for food as forcing trade-offs between conserving nature and feeding the hungry. Phalan *et al.*, (2010, 2011) argue that the optimal strategy for balancing biodiversity and food production is land sparing, whilst critics

maintain that this dichotomous debate is unhelpful, and that it oversimplifies the complex factors that shape land use change and food security. Here there are also important links to our discussion of the productivist framing of food security (see also Fischer *et al.*, 2014), and this is a topic we have been exploring further (see Kathryn Green's forthcoming blog). A key question for research is:

How do we re-evaluate land sharing/sparing debates in light of a 'post-productivist' framing of food security?

Tscharntke *et al.* (2012), argue that land sparing encourages intensified, large-scale agriculture, which ignores the fact that the backbone of food security in developing countries is smallholder agriculture (90% of farms are under 2ha, and 50% of the poor in developing countries are smallholders). Furthermore, they argue our strategy for food security should emphasise improving these farmers' resilience and risk management, rather than a focus on efficiency and yield. A second priority for research, therefore is:

What are the links between land sharing/sparing and sustainable agriculture/intensification to support rural livelihoods?

Going Forward with Food Security: Priorities and Questions

This workshop brought a broad range of academic and practitioners together, helping to highlight the multiple perspectives, priorities and challenges of addressing food security issues. Moving forward is a challenge however: Candel *et al.*, (2013) argue that the multiple framings of food security are themselves part of the problem as it leaves us with no clear political vision, leading to inaction.

Alternatively, Garnett (2014) identified three main perspectives for taking action that encompass the multiple interests and stakeholders in food security research: Efficiency; Demand Restraint; and Food System Transformation. We argue that, whilst none of these are a 'silver bullet' solution to food security, each makes an important contribution, although the challenge remains to bring these areas together in meaningful ways.

We also argue that food justice should be a key component of this framework for action. Food sovereignty, the principle that farmers should decide on their own food production systems, rather than imposing a global system upon them is a growing area of research (see Candel *et al.*, 2013) with strong links to calls for the transformation of food systems, research on the trade-offs created by globalised food supply systems.



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A key question for future research, therefore is:

What policy and regulatory mechanisms will make food ethical for both people and wildlife?

The rights and roles of rural farmers, particularly in developing countries intersects with another of our key themes from the workshop: knowledge. We need to consider what types of knowledge are valued in food security debates and what information can be shared to improve security and support rural livelihoods. Here, 'joined-up thinking' between the different areas of research involved in food security is vital. Climate change scientists and researchers in climate change adaptation, for example, need to work with agronomists and local people to understand the

context of land use, agricultural production, livelihood decisions and local needs and priorities.

We also call for further research and recognition of the politics of food security, whether that is the politics involved in trying to encourage dietary changes, how to farm their land, or where to conserve their land for biodiversity. This first step in recognising the socio-politics and trade-offs in food security is vital, but it still leaves us with many questions. Each of these issues is political and involves significant negative externalities (Charles *et al.*, 2010). Assessing the full environmental costs of methane and nitrous oxide associated with increasing agricultural production, or of ecosystem disruption due to marine harvesting, for example, present complex challenges (Charles *et al.*, 2010).

Food security will not be achieved just by throwing more money at agriculture or more fertiliser at the ground

There are, however, also significant opportunities to harness the complexity of food security and look for synergies and 'win-win' outcomes between the different areas. We identify the following priorities for this research:

1. Health and nutrition links with access to healthy food and overconsumption
2. Livelihoods and sustainable agriculture. There are several examples of successful yield increase through sustainable intensification (see Charles *et al.*, 2010). How do we successfully link these to securing farmers' livelihoods, poverty reduction and food security?
3. Agronomy and resilience. How can we develop synergies between agricultural and livelihood heterogeneity to achieve food security?

Finally, we face the challenge of understanding and tackling the complex, transdisciplinary issue of food security across local, national and international scales. Food systems increasingly span multiple levels and operate within a globalised economy, and this requires food security debates to be integrated with the rapidly-developing field of research on multi-level governance (Eriksen *et al.*, 2009). It is vital to realise that the nexus of food, biodiversity and poverty reduction that we explored in this workshop (and all the interrelationships this involves) is multi-level, driving processes and generating impacts across levels and contexts.

Interdisciplinary exchanges

References and Further Resources:

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Fischer et al., (2014) Land sparing versus land sharing: moving forwards, *Conservation Letters*, 7 (3): 149-157

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Tscharntke et al., (2012), Global Food Security, Biodiversity Conservation and the Future of Agricultural Intensification, *Biological Conservation* 151: 53-59

Picture Credits:

(1) www.globalfood.cam.ac.uk; (2) www.blackburn.gov.uk; (3) Phalan et al., (2010: S63); (4) www.un.org; (5) www.rio20.iboninternational.org; (6) www.stockholmresilience.org; (7) www.circleofblue.org; Word Art courtesy of www.wordle.net

www.interdisciplinaryexchanges.org



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Workshops in the series:

Community-based natural resource management (Jan 2014, Sheffield)

Food security, poverty and biodiversity (April 2014, Newcastle)

Local adaptations to climate change (Leeds, September 2014)

Payment for Ecosystem Services (Leeds, November 2014)

Natural resources and environmental conflicts (Sheffield, March 2015)

Final review and strategic planning (Location tbc, July 2015)

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