Towards a Real Sustainable Agri-food Security and Food Policy: Beyond the Ecological Fallacies?

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Introduction: into a new era

Since the food price hikes of 2007–08, and the continuing volatilities in global food supply and demand, there has been a significant growth in policy reports and statements regarding the problems of global food security.1 This has rightly reinforced the Research Councils’ (RCUK) decision to make this one of their ‘grand challenges’, and has recently led to a new synthesis published by the United Kingdom Government Office for Science entitled The Future of Food and Farming: Challenges and Choices for Global Sustainability.2 It is not necessary here to reiterate all of the main arguments as to why this is now a renewed and pressing international policy issue, but it is a good moment to begin to assess the general policy landscape and framing of the debates, given, as I shall argue below, some significant gaps or missing links are emerging in the ways in which main arguments and solutions are being posed.

One key question (which I and Ina Horlings have recently posed in an article in Global Environmental Change),3 is why is it proving so difficult to arrest the twin problems of resource depletion and climate change vulnerabilities by developing more sustainable and ‘place-based’ agricultures? To answer this question we have to go beyond the rhetoric of many of the major reports now before us and address the more prosaic question of what are the obstacles to adaptive change necessary within the agri-food sector? Once we more clearly identify these, it may be easier to see how we might then begin to examine the potentialities and opportunities for adaptive changes which could lead to both more sustainable and productive agri-food systems.

It is argued here that these opportunities and potentialities indeed will have to be ‘place-based’, and as such will not lend themselves to generic or globalised ‘one-size-fits-all’ solutions associated with genomic technological fixes or generalised notions of ‘sustainable intensification’.4 One of the problems with most of the recent policy statements is that they have not addressed the issue of context-dependent sustainable ‘place-making’, and they have tended to assume, albeit with scattered attention to some selected case studies of ‘good practice’, that the answers as well as the solutions to the current unsustainability of agri-food lies in addressing the aggregate problems rather than those which are more spatially specific. Agriculture will have to return to being what it was: a more embedded, connected and localised activity largely serving and being served by its city regions.

If one of the obstacles in our thinking about both the problems and solutions concerning unsustainable food lies with the dominant aggregated conceptualisations of the problems—a sort of ‘ecological fallacy’—another is the failure to really appreciate agriculture as an interdependent and integrated component in complex human, cultural and ecological
systems. For too long, and in the advanced world especially, we have, both in policy and academic terms, tended to treat agriculture as a separate and independent sector. This secular way of seeing agriculture is now coming back to haunt us as we now witness how it is inextricably linked to the wider ecologies and cultures of place. It is constantly articulated, for instance—not least by the now disbanded Sustainable Development Commissions’ final statement on food policy—that global agriculture accounts for about 70 per cent of all fresh water extracted for human use (via irrigation systems), and that the food system is a major source of land, forestry, fisheries and water degradation, with 15 out of the 24 world’s ecosystem services being degraded or used unsustainably according to the Millennium Ecosystem Assessment. Livestock farming gets an even worse press in these debates as it accounts for 40 per cent of the United Kingdom citizens’ agriculture water footprint and 57 per cent of agriculture carbon and methane emissions.

These sort of aggregated and sectoralised statistics certainly indicate the size and proportional nature of the problem of the unsustainability of many conventional agricultural practices. But they should also indicate the inherent multifunctional role in which agriculture could play in potentially adapting to these unsustainabilitys. Such ‘facts’ about the negative contribution of conventional agriculture to the wider and severe problems of resource depletion and carbon emissions should indeed serve as a significant ‘wake-up’ call for scholars and policy makers in that these demonstrate the explicit interdependence and integrative potentials of agriculture to affect its wider ecologies and social systems in profound ways. As empirical evidence suggests from many parts of the world (see below), sustainable agricultural systems can provide far wider sets of positive social, economic and ecological benefits for more sustainable communities and regions. In this sense we should reject the assumption that agriculture is in any sense a ‘declining industry’. Hence any ‘solutions’ to these unsustainabilitys will indeed need to adopt a much more integrative as well as spatially based approach. We thus can no longer divorce agriculture from the wider social and ecological spaces in which it is created, or the complex interdependencies it helps to sustain.

I thus want to argue here that we now urgently need to move beyond these aggregated and sectoralised ecological fallacies in our attempts to deal with creating more sustainable, diverse and place-based agri-ecological systems. Whilst we clearly must not lose sight of the macro-global picture, we also need to realise that in order to imagine and plan realistic alternatives it is necessary to adopt a more creative eco-economy paradigm which re-places, and indeed relocates, agriculture and its policies into the heart of regional and local systems of ecological, economic and community development. This is no more clearly exposed at the moment than in the ‘Arab Spring’ in the Middle East, where the current uprisings are underlain by growing food and water shortages, price hikes and fast growing populations in countries like Yemen and Syria. Saudi Arabia is actively purchasing land and water rights elsewhere in order to cope with pending water and food shortages. Some regions of China are following this course of action, leading to internationalised ‘land and resource grabbing’ as palliatives to impending shortages. The irony is that the more governments and scholars recognise the need to make a transition in agri-food to low carbon alternatives, the greater the international ‘race-to-the-bottom’ competition intensifies to find exploitable palliatives for the agri-food ‘growth machine’. Yet, as the saying often goes about charity, the solutions and priorities should start at home.
by recalibrating and reframing more integrated and embedded notions of agri-food into regional and local systems.

The current food debate is thus dominated by aggregated and sectorialised ‘bio-economical’ solutions which still tend to side-step and deny the embedded nature of agri-food. This is a sort of active process of ‘unknowing the known’ and creates and maintains a set of key ‘missing links’ in the framing of policy debates. What is underestimated, are the social, cultural, political and spatially embedded aspects. These include:

- **Socially**, we have seen a large decrease in recent decades of agricultural employment, farm enterprises, and a loss of farmers’ freedom with more dependency upon privately regulated global markets, retailers, privatised research and policy measures. This means in many regions that at just the point when a sustainable transition is necessary in their agri-food systems, many local communities have lost or reduced the social and skill capacity to mobilise such changes. Rebuilding the social and knowledge/skill capacities to create sustainable alternatives becomes limited and, in many cases, constrained by generic techno-science solutions.

- **Culturally**, ‘the environment’ has been reduced to a series of concerns about resource inputs, waste and pollution emissions, reducing cultural needs and non-anthropocentric values (such as reflected in the concept of ‘wilderness’), to monetary terms (as can be seen as reducing these inputs into different packages of ‘environmental goods and services’). The culture of ‘agri-culture’ itself, expressed in craftsmanship and a large variety of farming styles, has become more marginalised as the influence of external agencies such as privatised extension services and bio-economic scientific research became more dominant.

- **Politically**, a ‘hygienic mode of regulation’ has become dominant in agri-food in the form of bureaucratic forms of environmental safeguards, risk management and instruments. Private and public forms of regulation have led to a schematisation which creates new regulatory barriers to market entry for many smaller producers and processors. Such regulatory costs tend to stifle cooperative innovation and ecological knowledge sharing, whilst creating market barriers for smaller producers.

- **Spatially**, agricultural production has been decoupled from space and place. This is visible in the form of more footloose production systems (for example, ‘mega-farms’), internationalised food transport, ‘lean’ logistics and traceability, and the deconstruction and fragmentation of food into different but standardised, value-added components. This gives the super intensive producer, processor and corporate retailer the power to exchange their commodities worldwide, using globalised standards, and making many small farmers more vulnerable to global markets.

**Towards a sustainable agri-food eco-economy?**

To address these ‘missing links’ we can postulate a process of ‘real ecological modernisation’ and ‘sustainable growth’, which reinserts these key links and is embedded in the different contexts of space and place. Table 1 provides an overview of the differences between the dominant food paradigm (what I call the ‘bio-economy’) and a ‘real’ ecological modernisation of agriculture (‘eco-economy’)—that is, one which overcomes both of the ecological fallacies mentioned above.

This includes an increasing and large variety of sustainable farm practices and systems based on agro-ecological principles, which take the form of: organic
agriculture; urban and peri-urban agriculture; conservation agriculture or zero-tillage; low-input agriculture; agro-forestry; and aqua-culture. The question remains, however, if these practices can in fact really ‘feed the world’? Whilst we must recognise that ‘solving’ food security involves as much concern with allocation as it does with production, nevertheless it is important to examine if there is a basis of reliable and scientific evidence that suggests that eco-economic practices and processes can contribute to food security as well as food sovereignty. And if there is, what are the impediments for mainstreaming these eco-economic processes? There are indications in the international literature that local-scale food systems are more sustainable because they have ‘tight feedback loops’ linking consumers, producers and ecological effects, which enables positive adaptive responses to negative effects. This suggests that locally embedded food systems are more resilient, and they do not necessarily deny meeting

Table 1: Competing paradigms for ecological modernisation in agri-food policy

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Dominant food paradigm: bio-economy</th>
<th>Real ecological modernisation of agriculture: eco-economy</th>
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</thead>
<tbody>
<tr>
<td>Economic regulation and control</td>
<td>Corporatisation; productivity-(yield-) oriented; aggregated framing of food crisis; maintenance of the cost-price squeeze for local producers</td>
<td>Place-based-agri-food networks; integral approach between production of food and interdependent ecologies; food security linked to networks of local and regional actions</td>
</tr>
<tr>
<td>Technological</td>
<td>Technology development as economically driven</td>
<td>Technological generation as a demand-driven process</td>
</tr>
<tr>
<td>Ecological</td>
<td>Ecological and genetic engineering (industrial ecology) designed to reduce externalities through ‘sustainable intensification’</td>
<td>Based on agro-ecological principles linked to ecological space and place; local knowledge creation</td>
</tr>
<tr>
<td>Social–cultural</td>
<td>Dependency; scientification; rational man–nature relation; loss of farmer freedom/agricultural employment</td>
<td>Sovereignty; autonomy; synergy between man and nature; demand-driven research (mode 2 science); labour- and skills-intensive</td>
</tr>
<tr>
<td>Spatial</td>
<td>Globalised; export-oriented; use of external resources; locational criteria for production footloose and/or associated with proximity of inputs; shortages in inputs ‘solved’ by extending international corporate property rights</td>
<td>Locally embedded in the community; endogeneity; use and reproduction of local resources; locational criteria embedded in terroir and its multiple branding</td>
</tr>
<tr>
<td>Political</td>
<td>Top-down steering and regulation; unidirectional communication by extension services; power concentrated at multinationals and large retailers based upon notions of ‘free-trade’ and the minimisation of ‘state-aids’</td>
<td>Enabling policy; participatory approaches; influence of communities in agri-food networks; regional governance facilitating network and consortia development; new innovation sharing and collaboration; self-sufficiency in the context of fair trade</td>
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wider international and fairer trade commitments.

During the international conference on organic agriculture and food security in 2007 in Italy it was stated that organic agriculture could produce enough food on a global per capita basis. A recent Food and Agriculture Organisation (FAO) analysis, based on more than fifty cases in the United States and Europe, and just over a dozen studies in developing countries, showed that organic farms are more economically profitable, despite frequent yield decrease. Higher outcomes are due to premium prices and predominantly lower production costs. These conclusions can also be drawn from studies in developing countries, but there higher yields combined with high premiums are the underlying cause of higher relative profitability.

A survey of the University of Essex has described 286 agro-ecological projects in 57 countries. Their results showed that sustainable agriculture has led to an average 93 per cent increase in per-hectare food production. The relative yield increases are greater at lower yields, indicating greater benefits for poor farmers and for those missed by the recent decades of modern agricultural development.

Some of the most path-breaking examples of sustainable agriculture can be found in developing countries of Africa, Asia and Latin America. The ‘Ensete’ agroforestry system for example, is a 5,000 year-old farm system practiced by the Gedeo people in the highlands of Southern Ethiopia. It is able to produce a large variety of products such as Ensete (a high-quality food), one of the best coffees of the world, honey, timber and a superior race of highland sheep. The perennial cropping system has a good resilience against droughts thanks to the Ensete plant, which captures water with its fan-shaped leaves and fibrous root system which also prevents erosion.

In Brazil, there are now some 15 million hectares under ‘Plantio Direto’ (also called ‘zero-tillage’). Many of the Clubes Amigos da Terra (literally ‘friends of the land clubs’) have been closely involved in this transformation. ‘Zero-tillage’ means no mechanical soil disturbance, permanent soil cover and judicious choice of crop rotations. The approach led to higher yields in crop production, a decline in labour costs, a diversification into livestock as well as agro-processing, which in turn resulted in improved food security for small farmers.

In China, sustainable agricultural development is more government-led. There has been a rapid expansion of self-identified organic agricultural products in rural areas—for example, there is the experiment in the Fushan village of 224 farm households. This has steadily derived benefits for the wider rural economy as well as the farms themselves. Analysis of the soils has shown improvements in the state of soil structure and nutrient composition due to the development of applying biogas residue. This also led to large reductions in fertiliser applications and increases in crop yields.

From ecological fallacies to real sustainable growth

There is enough evidence at a case study level to severely question the legitimacy of the bio-economic paradigm as the only or indeed dominant answer to the new mode of global Malthusianism and ‘sustainable intensification’ which it now vibrantly articulates. However, this legitimacy will not be seriously challenged if the debates remain at the aggregated global level without critically confronting or transcending both the problems of scale, diversity, context dependency and the sanctity of generic (‘one-size-fits-all’) technological solutions over more place-based technologies and knowledge systems.

Eco-economical approaches could ‘feed the world’ and thereby contribute to a ‘real
green revolution’, but this requires a more radical shift and widening of the debate amongst scientists and policy makers about fostering new types of diverse and embedded agri-food economies. This is a shift which many groups of urban consumers are now demanding. Indeed, the current economic recession and financial crisis, coupled with the growing food crisis, is giving further impetus to alternative agri-food movements. This involves rethinking established market mechanisms and organisations, more innovative institutional flexibility on a regional scale, interwoven with active farmer and consumer participation, and a redirection and widening vector of science investments to take account of translating often isolated cases of good practice into mainstream agri-food movements.

It also needs to recognise that the onset of bio-economic models can in themselves marginalise the capacities for eco-economies to flourish and to ‘scale-up’ in particular places. The times are now urgent for this rethinking and debate, and they need to critically inform more effectively the growing legitimacy of bio-economic solutions as to why more and more people are going hungry, on the one hand, and becoming obese, on the other. In macro-economic and policy terms, these issues are now of such global and local concern that they will require national and international government bodies to proactively incorporate agri-food security and sustainability into foreign, international development and treasury macro-economic policy rather than ‘ring-fencing’ them to their rural affairs or agricultural departments.

Notes

1 This article is based upon a more extensive review of literature and research on agri-food initiatives and policy which is recorded in: I. Horlings and T. K. Marsden, ‘Towards the real green revolution?’


3 Horlings and Marsden, ‘Towards the real green revolution?’

4 Foresight, The Future of Food and Farming, p. 35.


8 I. Horlings and T. Marsden, ‘Towards the real green revolution? Exploring the conceptual dimensions of a new ecological modernisation of agriculture that could “feed the world”’, Global Environmental Change, vol. 21, 2011, pp. 441-52. Ecological fallacies occur when broad statistical inferences are made about a defined spatial unit. In this context I argue that the term applies to much of the current debate about bio-economic solutions to food security in that generalised inferences are made about the benefits of generic approaches and technologies with regard to agriculture. This tends to hide the spatially embedded and diverse nature of any agricultural practice, while at the same time assuming there are only neutral market effects about imposing generic solutions.


13 T. Kippie Kanshie, *Five Thousand Years of Sustainability? A Case Study on Gedeo Land Use (Southern Ethiopia)*, Heelsum, Tree-mail, 2002.