How new is the world food crisis?

Thoughts on the long dynamic of Food Democracy, Food Control & Food Policy in the 21st century

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Introduction

We meet at a timely moment, the day after April 1st which was re-named Financial Fools' Day by protestors this year in London, in honour of bankers. While we meet here in Ithaca, the world's political leaders meet at the G20 in London. When the Washington Consensus is crumbling, what will replace it? Never has the juxtaposition of food and macro-economic politics been clearer, or the need to clarify futures more pressing. Entire structures and directions which have been drilled into food systems, countries, growers, consumers for decades are overtly in a more fluid state. The nervousness and shock is as much psychological as material.

In this paper, I want to explore the enormity of the current challenge to food policy. Almost everyone thinks existing policy approaches are not fitting. There is a squeeze on land, people, health, environment, politics, finance. You name the sector and it is involved. No wonder policy solutions are being proffered from all and sundry: GM on the one hand, dramatic dietary change on the other. It was awesome to see rising alarm flow through governments and companies in 2005-08 as world food commodity markets rocketed.(FAO 2007a; FAO 2008a) A long arranged conference by the FAO for June

2008 took on the aura of high level political drama. Would political leaders rise to the occasion? Would solutions flow? Would analysis be fit for purpose? A mix of fine and bland words emerged. A final communiqué was given.(FAO 2008b) Everyone departed. But already world prices were dropping. Crisis over? Not a bit of it.

Crisis is an over-used word. In everyday discourse, its meaning covers a spectrum from, at one end, irritation with normal states of (minor) difficulty to, at the other end, melt-down and reconfiguration. It can mean different things to different people.

So why, like everyone, do I still use the word? I look up at my shelves at home and spot Daniel Bell's 1960 'The End of Ideology',(Bell 1960) and Alvin Gouldner's 1970 'The Coming Crisis of Sociology',(Gouldner 1971) Those date me! But on home territory, we have Paul Roberts's 2008 'The End of Food: the coming crisis in the world food industry'.(Roberts 2008)

In truth, when I see or hear the word crisis I almost always have to ask myself if it is warranted. It needs to be approached with some caution. Everything depends on what is meant. The clarification invokes not just theory and ideology but also diverse of disciplines and coverage of facts. A crisis in one sphere may look normal to outsiders or to disciplinary purists.

Etymology (e.g. Brewer's) teaches us that originally the word crisis referred to the 'ability to judge'.(Brewer 1923) Hippocrates, the ancient Greek father of medicine, taught that the physician needed to note the ebbs and flows of diseases, paying especial attention to the critical days, or points when the balance of 'humours' (those mystical entities which were deemed to drive illness) would shift into either health or ill-health. Crises were thus key points; what we today, post-Gladwell, might call tipping points.(Gladwell 2000) Hippocrates, known today as much for his oath – including its stricture first to do no harm – subscribed to the notion that citizens (not slaves of course) should go to Asklepieions, places where people should commune with nature, rest, swim, eat, relax, partake of cultural events and generally invest in prevention rather than cure.(Hippocrates 2005) Hippocrates is often credited with beginning to put medicine onto a rational route, separated from religion; but his core notion was of balance. Illness, he argued, occurred when balance was destroyed.

The *Asklepieion* model is intriguing, different to modern tourism with its pursuit of the new, the unknown, the institutionalization of escape. Tourism, as we know, delivers nothing of the sort. We depart in pursuit of the new, carrying the baggage of that we wish to escape from, only to have to return to it anew. This paradox was captured by Hans Magnus Enzensberger in his essay on tourism.(Enzensberger 1958) Why did Thomas Cook found modern mass tourism in England? The railways enabled it; industrialism drove it by generating the desire to escape the grind and pollution of urban life. This was the time prior to the discovery of bacteria when miasma theory ruled, the belief that air spread disease.(Johnson 2006) Yet the irony is that the process of desiring to breathe differently and go to beautiful places began the alteration of what people first found exotic and desirable. The Grand Tour for the super rich turns into mass tourism, driven

by entirely understandable motives our actions become the problem. Our going alters what we seek to imbibe.

Part of the difficulty the developed world now faces is that no escape is possible. Although NASA recently launched its Kepler rocket to find one, the problems we know today are here, now and on this planet. (This is not to say that the super-rich and élite will not once again lead the fantasy that there is a nirvana to which we can depart to relax and recreate.) Politically, existentially, there is only this planet, this food system, this set of social relations. We have to face them because we are them; they are our responsibility, some more than others.

The Greek past is pertinent to this conference, not least since we meet today in Ithaca, a town named after the ancient and beautiful Greek island, home to Odysseus, he who wandered after the fall of Troy, yearning to return home, and whose tales come down to us via Homer's Iliad and The Odyssey. The odyssey reminds us that the meeting which draws us here is far from a word game. All over the world there are meetings and exchanges exploring what is going on. The realities stretch our understanding and certainly the policy solutions on offer. Much of our thinking is now going to be tested. Our analyses are judged in the harsh light of credibility. Our policy recommendations, if noted at all, are going to be reviewed and tried in real life, not just journals.

1. This is serious: for people, planet and progress

The world of food, as we all know, has entered a new and potentially dangerous phase, not least because it is so dependent on the state of finance capital markets, trade, and international as well as domestic politics. But I do think we need to be careful about proclaiming the crisis is wholly new or unexpected. I don't think it is on either count, as I will explore below. The signs were long there.

The dominant narrative is that the food system of the last half century has been a great success, and that the sooner it can be returned to business-as-usual the better. It is important to acknowledge the basis for this belief. Real advances were made: more food for more people cheaper, etc. That celebratory story deserves to be taken seriously.(Dyson 1996) Of course, too, we now know that it came at a tremendous cost. Environmental, social and health costs have been externalized, possibilities threatened by short-termism. But subscribers to the dominant narrative do not regret how food policy was shaped by macro-economic forces and bowed to dominant free market ideology. The few radicals who anticipated crisis and argued that the current food order cannot continue were nuisances; irritating but not to be taken seriously.

And then in the last three years, seemingly from nowhere – according to the dominant narrative - the world of food started looking into an abyss. An awesome set of barriers seemed to emerge before humanity: population, competition between food and biofuels, climate change. World commodity prices went stratospheric.(FAO 2007a) The language became apocalyptic (reminiscent of extreme extrapolations of the Club of Rome in the

1970s).(Meadows and Club of Rome. 1972) Armageddon loomed. Options look to a choice between minimal and bleak. Nowhere beckoned except the politics of constraint.

In the 1971-74 price crisis – then as now sparked by oil spot prices - the seeds of its by-pass had already germinated elsewhere. As political transformation was being discussed at the Rome World Food Summit, new approaches to farming and technologies were being rolled out, notably the Green Revolution. This story gives ample hope to those who today again seek a technical solution to social problems.

I too am hopeful if sober. I don't see technologies are providing magic bullets. The narrative I write here, which I suspects binds us at this conference, is that what matters is the interface of people, planet and public health. My colleagues and I have outlined our own analysis in our recent book: *Food Policy*. (Lang, Barling and Caraher 2009; Lang and Heasman 2004) So where is the hope? Is not the evidence of the current food system's unsustainability so overwhelming? Of course it is. But just as the word 'crisis' is multi-layered, so the word sustainability covers much. I use it here to indicate the nexus of environmental, social and economic attributes in food. Making food systems sustainable requires complex changes. Measured in this way, the food system is in real trouble. It's not just poised on one but various cliff edges!

My hope lies in the mobilization of events and social movements. These suggest that millions know the awesome challenges ahead and are not taking them lying down. Even those who want to return to business-as-usual cannot avoid the harsh data about living beyond our planetary limits. Of course there are climate change deniers, but as Bob Dylan sang 'you can fool some of the people some of the time but not all of the people all of the time.'

The problems are complex but they are not irresolvable. They can be addressed; they are not immutable. The key to much ahead lies in the word 'we'. Who is the 'we' here? The rich world? The poor or disenfranchised? The over- or under-consumers? The farmers or the consumers? Answering these questions is why we need to debate the dynamics within the food world. All the thinking that social and natural sciences have done in recent years now needs to be brought to bear on what is unfolding. The stakes are high.

2. The current seismic shift is the latest in a long line

Any assessment of today's food system – and its state of precariousness and if so, for whom - needs to acknowledge the long view: Table 1 gives a really long view, based on the fact that settled agriculture is widely agreed to have started around 10,000 years ago. (Lang 2006) Over that period, a series of changes has happened, each having different dominant modes of production and characteristic patterns of culture and health.

Table 1. 10,000 years of agricultural and food revolutions, and their links with farming, culture, and food-related health

Era/revolution	Date	Impact on		Implications for Food-related health
		Farming	Culture	
Settled agriculture	From 8500 BCE on	Decline of hunter-gathering; greater control over food supply but new skills needed	Fixed human habitats; division between "wild" and "cultivated"	Risks of crop failures dependent on local conditions and cultivation and storage skills; diet entirely local and subject to self-reliance; food safety subject to herbal skills
Iron age	5000–6000 BCE	Tougher implements (ploughs, saws)	Emergence of technology; spread of artistic expression	New techniques for preparing food for domestic consumption (pots and pans); food still overwhelmingly local, but trade in some preservable foods (e.g., oil, spices)
Feudal and peasant agriculture (not in some regions, e.g., North America)	Variable, by region/continent	Spread of enclosed land (parceling up of formerly common land by private landowners); use of animals as motive power; marginalization of nomadic practices	Division of labor; settlement around land-based production and village systems	Food insecurity subject to climate, wars, location; peasant uprisings against oppression and hunger
Industrial and agricultural revolution in Europe and U.S.	Mid-18th century	Land enclosure; rotation systems; rural labor leaves for towns; emergence of mechanization	Growth of towns; emergence of industrial working class with no access to land; rise of democratic demands	Transport and energy revolutions dramatically raise output and spread foods; improved range of foods available to more people; emergence of commodity trading on significant scale; emergence of industrial working-class diets
Chemical revolution	Begins in 19th century in developed world, spreads thereafter	Fertilizers; later pesticides; emergence of fortified foods (e.g., Liebig's beef extract)	New applications such as packaging; emergence of large-scale food processing; population gradually increases with wealth	Significant increases in food production; beginning of modern nutrition; identification of importance of protein; beginnings of modern food legislation affecting trade; opportunities for systematic adulteration grow; scandals over food safety result
Mendelian genetics	1860s; applied in early 20th century	Plant breeding gives new varieties with "hybrid vigor"	Beginnings of biological science in everyday life, e.g., enzymes	Plant availability extends beyond original "Vavilov" area; increased potential for variety in the diet, in turn increases chances of diet providing all essential nutrients for a healthy life

The oil era	20th century	Animal traction replaced by the tractor; spread of modern, intensive agricultural techniques	Car use and supermarkets rise; emergence of large-scale food processors; modern mass consumerist food culture and brands take off	Less land used to grow feed for animals as motive power; rise of impact of excess calorie intake leading to diet-related chronic diseases; discovery of vitamins stresses importance of micronutrients; increase in food trade gives ever wider food choice
Green Revolution in developing countries	1960s and after	Systematic plant breeding programs on key regional crops (rice, potatoes) to raise yields	Concentration of farming in larger holdings and more commercialized, intensive agriculture	Transition from underproduction to global surplus with continued mal-distribution; over-consumption continues to rise
Modern livestock revolution	1980s and after	Growth of meat consumption creates "pull" in agriculture; increased use of cereals to produce meat; farming feeds the nutrition transition (adding burdens to health and environment)	Rising incomes as more low-income countries achieve affluence; meat consumption rises (in meat-eating cultures); food suitable for humans (e.g., soya) is redirected to animals	Rise in meat consumption associated with Nutrition Transition; global evidence of simultaneous under-, over-, and mal-consumption; beginning of the end of the 1940s production-focused policy consensus that increased output will, if guided by science and if distributed fairly, end most food-related health problems.
Biotechnology	End of 20th century	New generation of industrial crops; emergence of "biological era": crop protection, genetic modification, genomics	Debate about drivers of progress, patent ownership; consumer information becomes central to management in "risk society"	Uncertain as yet; debates about safety and human health impacts and whether biotechnology will deliver food security gains to whole populations; investment in technical solutions to degenerative diseases (e.g., nutrigenomics)

Source: Lang 2006 (Lang 2006)

Arguably, if we are to understand the mess of current food and health policy, we need to scan even further back. Human physiology – how our biology works and responds to its environment and food intake – was biologically formed a few hundred thousand years ago.(McMichael 2001; McMichael 2003) Part of the 'crisis' today is actually that while producing more food, the 20th century phases of change – the application of Mendelian genetics, the oil-based industrialisation, the 'Green Revolution', the livestock revolution, and now the emerging biotechnologies (given in Table 1) – all assumed that human progress would follow from producing more food.

In fact, we now know the limitations of the great policy formula produced by mid 20th century food science. Progress can be measured by various indices: health (e.g. longevity, incidence of diet-related disease); food security (e.g. affordability, availability, accessibility); or happiness (well-being).

Back in the mid 20th century, the architects of agricultural reconstruction post World War 2 argued that their experience of problems in the 1920s and 1930s need not have happened.(Brandt 1945) Science could resolve the scourge of hunger and mal-distribution. It could improve and bolster the productivity of animals and the soil.(Stapledon 1935)

A common formula underlay their thinking:

Capital + Science + Waste reduction → raises food output → Progress

A number of provisos were injected into this mid 20th century thinking. The first proviso was limited faith in market mechanisms. Men and women raised on late 19th century laissez-faire had seen its nemesis. They now knew – and Keynes articulated the macro-economics for them – the limits of marketisation. Keynes had prophesied World War 2 as the result of seeds sown at Versailles Treaty that ended World War 1. Justice and economics are linked, he (and others) argued. If justice binds people generally, nowhere is this more apparent that with food. Equitable distribution required social *mores* to triumph over profits: 'need over greed'.

The second proviso was that even in an ideal world, events could unravel the best laid plans. Food welfare would be needed to ease out the booms and slumps of production. In the 1950s, the core form this took was to build and maintain buffer stocks.(Shaw 2007) This made sense to those who had seen the Great Depression (dustbowls in the USA; farm recession almost everywhere) and World War 2 (famines alongside degradation). That experience also spawned the long line of policy thinking and development of Food Rights. This begins with the magnificent but loose aspirations of the 1948 Universal Declaration of Human Rights,(UN 1948) and becomes tighter but enormously longer with the FAO's 2004 Voluntary Guidelines on Food Rights.(FAO 2004), the apogee of this thread of work so far.

But whatever developments had happened, by the end of the 20th century, the optimism and tough-but-tender motivations that drove the reconstruction from the 1940s had been weakened. Neo-liberalism held sway from the mid 1970s but could not come up with

adequate answers to questions unfolding by the 1990s. The story of how neo-liberals rolled back the macro-economic understanding of markets' limitations has been brilliantly told elsewhere.(Cockett 1994) Farm support systems in the developed world faced their ire persistently, particularly the hypochrisies over subsidies and protectionism. But neo-liberalism as applied to food systems took different very forms across the globe. It didn't capture the USSR or China which had different ideologies and problems, or even India for more complex reasons. Yet just over a decade ago, in the 1994 GATT , neo-liberals thought they were poised to reform the bastions of food and farming.

A radical critique cut across this familiar policy divide. Seen through the lens of developing countries, the farm support systems of rich societies were gross.(Watkins 2001) The OECD's not so gentle war on subsidies was right.(OECD 2002; OECD 2003; OECD 2005) The massive subsidies did and do distort the pursuit of progress: to get farming to bow to the dictates of market forces. Nothing irritated the main economists as much as the defense that farming is different, that it needs special attention, that an easing of booms and slumps and economic cycles justified state action and intervention.

3. Dominant food policy is lost for direction

What the high priests of neo-liberalism failed to acknowledge, however, and still do, was that the core production-oriented formula was actually fraying at the edges, and now is not fit for purpose. Today's 'crisis' is actually a failure not just of production but of policy. The way of thinking about the relationship between people, food systems and the planet was awry. By the end of the 20th century, although policy rhetoric was still focused on production – witness the language at the FAO June 2008 conference(FAO 2008b) - problems were no longer just matters of farming or land care, vital though those obviously are. Problems are manifest right across the supply chain: from the baronial control that giant retailers exert, (Burch and Lawrence 2007; Raven et al. 1995; Reardon et al. 2003) to the still under-researched power of foodservice.

Most obviously, a mixed picture of consumption had emerged, distorting human biology, but reflecting social change.(Egger and Swinburn 1997) Food prices had come down in so many societies and marketing had emerged in almost all societies as a dominant force shaping and responding to consumer demands, to the extent that entire economies were being distorted. This generated unsupportable health burdens as well as serious environmental threats. Social gradients in food use had not been levelled by the productionist policy effort. They remained, with gross inequalities determining life expectancy both as 'old-style' hunger and malnutrition,(FAO 2008d) and 'new style' obesity and diet-related non-communicable diseases.(Murray and Lopez 1996; WHO 2002) Food, having been offered as a means to resolve social inequalities,(Boyd Orr and Lubbock 1953) had become its perpetuator. Changed supply chains had delivered a co-existence of under-, mal- and over-consumption,(Gardner and Halweil 2000) with massive effects within and between societies.

The subtle changes in policy thinking about food have been rightly mapped and explored. Maxwell and Slater, for instance, have suggested that this represents a change of focus from 'old' (1970s) to 'new' (2000s) concerns.(Maxwell and Slater 2003) Their view is that modern food policy thinking came of age in the 1970s with the response to the 1971-74 food crisis, made urgent by famines in the Sudan and Bangladesh, and the price hikes caused by oil dislocation. This is when the International Food Policy Research Institute (IFPRI) was founded – to be a policy change agent to accompany the offerings of the CGIAR science-based institutions.

My own understanding of the development of 20th century food policy thinking is that modernity did not start in the 1970s. Table 1 suggests deeper roots.And we must not just focus on the farm and its surrounding dynamics. How can we ignore the huge impact of nutrition not just in animal husbandry but also social welfare? Fortification, for instance, has been highly significant in providing practical help for welfare relief programmes.

In *Food Policy*, we propose that there have been at least four phases of dominant policy thinking about the relationship of production to health and well-being, in just the last 60 years.(Lang, Barling and Caraher 2009)

The first was the productionist approach, which emerged in the 1940s and 1950s, and may be characterized by the formula given on page 3 above. This was based on practical application of earlier scientific advances, ranging from applied soil science (e.g. how to maintain rather than 'mine' soil structures) to nutrition (e.g. Gowland Hopkins' discovery of vitamins in the 1920s for which he won the 1920 Nobel Prize for Physiology or Medicine). Its focus was on agriculture, with the state as the key driver of change. The goal was health through abundance. The approach wobbled considerably in the early 1970s with the first great oil shock but was 'saved' by the emergence of green revolution technology pioneered in the late 1960s.

The second phase was characterized by the erosion of notions of statist support as the key driver for raising production and its replacement by the strictures of market efficiency and fiscal rectitude. This emerged in the mid 1970s. The emphasis on development remained – with food policy being couched as a problem of lack of food, lack of resources, lack of capacity – but the emphasis in policy thinking turned to market rather than state-led (if not executed) delivery, ushering in the era of structural adjustment programmes, and the Washington Consensus.

The third is what we have just come out of: the slow realization of market failure and the documentation of serious public health and ecological difficulty. There are, for instance, now more people globally suffering obesity and overweight than hunger. While this evidence piled up, societies were tantalized to indulge in unparalleled consumerism, in theory due to liberalisation. There was thus a schism between on the one had equitable development and individualized consumerism. Yet gradually, criticism championed by single issue perspectxives - health, safety, environment, social justice - coalesced to suggest a bigger picture: that the world did face absolute limits, that neither the earth nor human health could be ceaselessly mined.

We thus stand on the brink of a new phase, the fourth since World War 1. My colleagues and I see this as shaped by the challenge of ecological public health – how to address the linkages between discrete levels of existence. Taking the example of obesity and overweight, we have mapped how subtle changes have the extent to which changes in four levels of existence have reshaped humans' relationship to eating. Obesity cannot be understood as the workings of a 'fat gene' (or the tweaking of the thrifty genotype) any more than it can be blamed solely on unscrupulous marketing.(Lang and Rayner 2007) It is the combination of actions across the material world; the biological and physiological world; the social world of human interaction and societal relations; and the cognitive or life world – the world of consciousness and cultural understanding – which delivers creeping overweight and thus health costs and healthcare pressures. The crisis – if we use that word – is a crisis of the distortion of the relationship between those levels of existence in food.(Waltner-Toews and Lang 2000)

What is at stake today is the location of humans in the delicate layer of biomass that surrounds the planet. Our relationship to that environment and the material and biological worlds is inextricable and unavoidable. These are not 'out there' factors; we are eating them!

Humans have have never before lived in an era where climate change threatens all notions of progress, or where the extent of water stress might reshape what is grown and consumed where. We now do. The aspirations articulated by the Brundtland report back in 1987, for instance, cannot now be avoided.(Brundtland 1987) The battle of ideas then was won by neo-liberalism. Two decades for preventive action have been squandered.

Acting now is not optional. It is change of direction or take the consequences. While politicians are focused on the 'credit crunch' - actually the demise of the derivatives fantasy money where lottery finance masqueraded as banking – ironically captains of 'big industry' are becoming more mindful that climate change threatens their long term survival, too.

4. The 20th century food system was in stress already

Whether we agree with my depiction of the four phases above, few disagree that the 20th century witnessed remarkable changes – revolutions - in the food supply. There were unprecedented integration, control systems and leaps in productivity, as measured in labour and capital use. The resultant restructuring has revolutionized – there is no other word appropriate – the context and reshaped, or threatened to reshape many, many sectors. It is good to remind ourselves of the depth and range of changes that have been unleashed in such a short time. They include:[1]

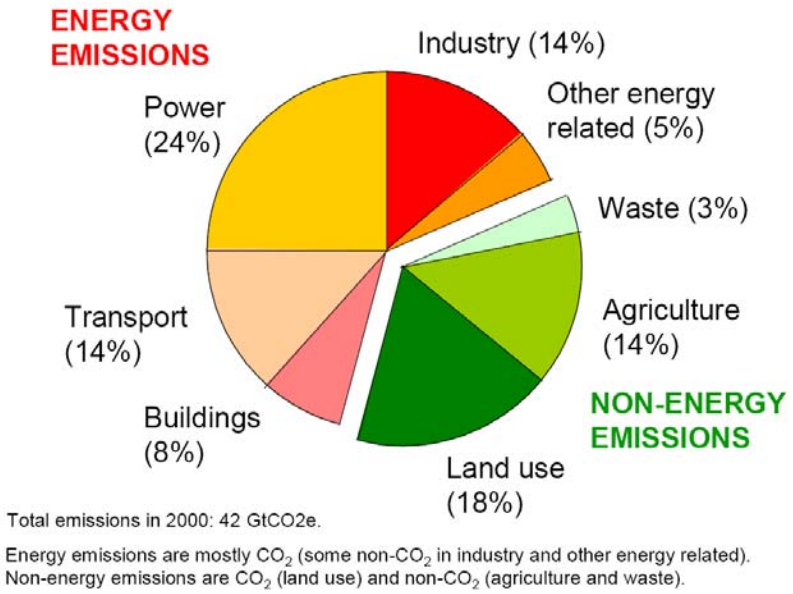
[1] This is adapted from Lang, Tim. 2003. "Food Industrialisation and Food Power." *Development Policy Review* 21:30-39.

- how food is grown – for example, mass use of agrochemicals, hybrid plant breeding;
- how animals are reared – for example, factory farms, intensive livestock rearing, prophylactic use of pharmaceuticals to increase weight gain;
- the pre-eminence of biology in technological change – as applied to plants, animals and processing;
- food sourcing – for example, a shift from local to regional and now global supply points
- food culture – for example, the blurring of the notion of seasonality and a tendency to monoculture on mass farms belying the biodiversity on the supermarket shelf;
- means of processing – for example, use of extrusion technology, fermentation, wholesale use of cosmetic additives to disguise products and yield consistency;
- use of technology to shape quality – the goal of mass production to deliver consistency and regularity (uniformity) is now focused on the development of niche products with 'difference';
- the workforce – for example, a dramatic shedding of labour on developed-world farms but a retention of pools of cheap labour (immigrants) to do the manual tasks such as grading and picking; also a strong push to 24-hour working;
- marketing – a new emphasis on product development, branding and selling has accompanied a dazzling display of apparent choice, with thousands of products vying for attention;
- retailers' role – they have emerged as the main gateways to consumers, using contracts and specifications to gate-keep between primary producers and consumers;
- distribution logistics – for example, use of airfreight, regional distribution systems, 'trunker' (heavy lorry) networks, satellite tracking;
- methods of supply chain management – for example, centralisation of ordering, application of computer technology, application of batch /niche production to mass lines ('flexible specialisation');
- moulding of consumer tastes and markets – for example, mass marketing of brands, the use of product placement methods, huge investments in advertising and marketing and the targeting of particular consumer types;
- level of control over markets – for example, rapid regionalisation and moves towards globalisation, and the emergence of cross-border concentration.

The result of these manifestations is that we can no longer talk of agriculture as the be-all-and-end-all of food systems. Today is not a crisis for farming, though it is that too, but for entire food supply chains and for the viability of food cultures. Now, if not before, policy has to be built on whole food systems analysis.

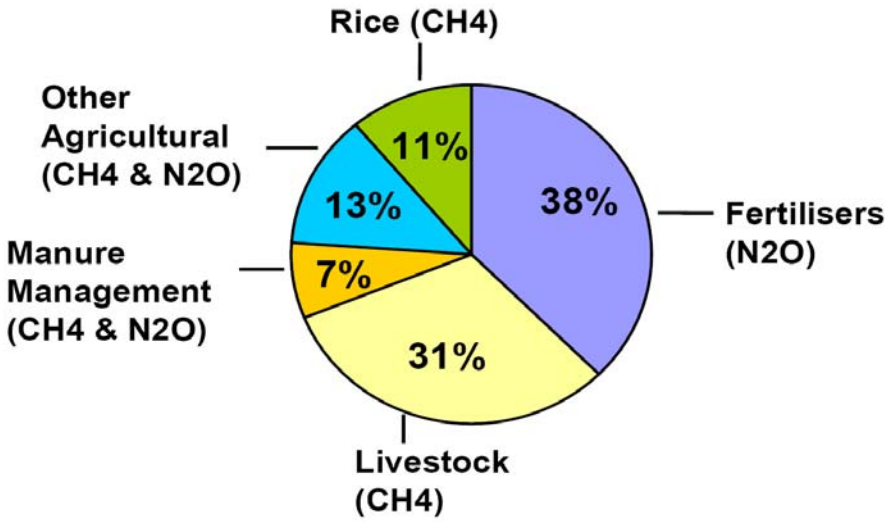
To take just one criteria by which we must judge food systems, climate change, we know that agriculture is high in policy attention but not alone. Although 14% of total greenhouse gases are associated with agriculture,(Stern 2007) and although life cycle analyses suggest that farming may be the biggest source of impact from consumption, it is by no means its sole source.(Tukker et al. 2006) Figure 1 gives the main sources of GHGs in general. Figure 2 gives the breakdown within agriculture.

Figure 1. Greenhouse emissions, by source: Agriculture's impact within total climate change emissions, 2000



Source: Stern Report, using WRI CAIT data.(Stern 2006)

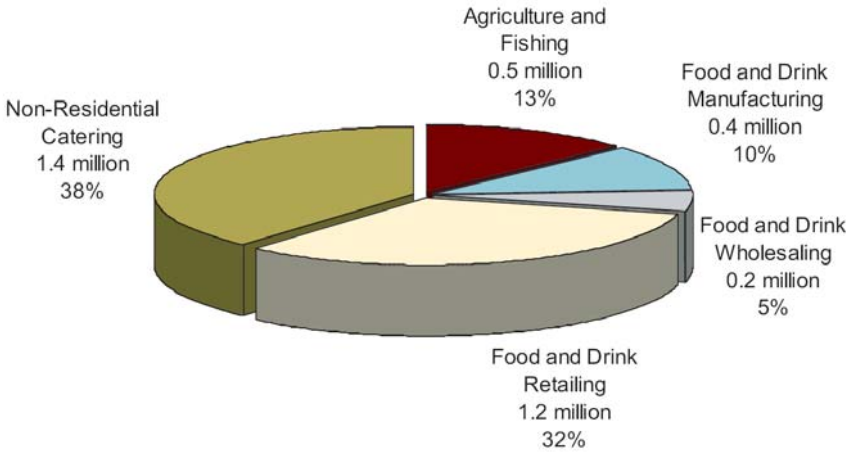
Figure 2. Non-CO_2 sources of GHG emissions from agriculture



Source: Stern Report.(Stern 2006)

Similarly, although farming is the world's largest employer, off-farm labour in the developed world's food system now dwarfs farm labour. Figure 3 gives, as an illustration, food employment in the UK. Note how small agriculture now is, relative to retail or foodservice (catering). For decades, 'progress' has been defined by the powerful to be the reduction of the proportion of the total labour force working on the land. In rich countries' food systems, there is now an huge dependency of jobs, skills and wages in off-farm processing and value-adding.

Figure 3. Employment in the food chain in 2007: the example of Great Britain



Source: UK Dept for Environment, Food & Rural Affairs 2008 pg 16(Defra 2008b)

The New Fundamentals

So how can we conceive of this new era? On what basis should we think about the future of food? Like us all, I have been struggling to make sense of the picture over the last decade or so. Colleagues and I have come to characterize the contemporary picture as having to address what we call the New Fundamentals.(Ambler-Edwards et al. 2009; Barling 2008; Barling, Lang and Sharpe 2008) It seems to us that a number of core factors need to be addressed – all at once. How and whether this is done is the core terrain on which the politics of food for the coming era will be fought. The New Fundamentals will reshape what and how food is grown, moved and consumed everywhere, whatever the terrain, country and politics, whether in developing or developed world.

My own interest is mostly on the latter, not just because I live there, but because the rich world is so often held up to be the archetype of efficiency and benchmark for progress.

As is now clear, those pretensions of defining progress are wearing thin. Indeed, part of the current crisis is about how to unleash the imagination and political structures which unlock thinking is about how to define other versions of progress, and how to silence the mantra about growth. Growth and wealth creation have meant the exploitation of nature and the material world, whereas we now are realizing the case for living within environmental limits. Ideologically, part of the task for food politics is to reclaim the word 'growth' from economic fundamentalists and to return it to its proper biological function.[2]

Climate change.

Evidence about climate change has been building for years but its implications for food capacities are immense. The Millennium Eco-Assessment firmly placed this on the agenda,(Millennium Ecosystem Assessment (Program) 2005) and more recently the issue lay at the heart of the reports of the International Agricultural Assessment of Science, Technology and Development, co-sponsored by the World Bank, various UN agencies and other stakeholders.(IAASTD 2008) The final IAASTD report suggested complex effects of climate change throughout world agriculture, ranging from water stress to the spread of invasive pests. Regions will be affected differently according to latitude, altitude and topography. Similar comprehensive assessments are required for the entire food supply chain.

The implications for food culture are considerable. The European EIPRO study, for instance, found that food, drink, tobacco and narcotics (lumped together) accounted for an estimated 20-30% of the environmental impact of all consumption by European consumers. Meat and meat products (including meat, poultry, sausages or similar) was the largest contributor, accounting for 4-12% of the impact on global warming of all consumer products.(Tukker et al. 2006)

Water

Agriculture is the greatest user of water worldwide, accounting for an estimated 70% of potable water use, with livestock playing a significant part in that.(Clarke and King 2004) The Intergovernmental Panel on Climate Change has suggested that globally aquifers for large cereal-producing land areas are under stress. This could herald the curtailment or perhaps the end of such production in areas such as parts of the USA and Australia.(Intergovernmental Panel on Climate Change 2007) Within Europe, the south east of Spain which feeds much horticultural produce to the UK, is likely to be in water stress.

[2] My colleague on the UK's Sustainable Development Commission, Tim Jackson, has this week published his *magnum opus* on this issue, which I recommend: Jackson, Tim. 2009. "Prosperity without growth?: the transition to a sustainable economy. http://www.sd-commission.org.uk." London: Sustainable Development Commission. http://www.sd-commission.org.uk

New ways of auditing embedded water within food products will be needed by policy makers. One methodology has been championed by Dutch researchers.(Chapagain and Hoekstra 2006) They have calculated, for instance, that one 150g beefburger (in the Netherlands) contains 2,400 litres of embedded water, if full account is taken of the water used to grow grain, feed and water the cow, wash equipment, process and sell the product. Prof Tony Allan of the SOAS, University of London has developed the notion of 'virtual water' to identify how products are traded within and between countries already water-stressed.(Allan 2003) Using Allan's thinking, MacGregor and Vorley of the International Institute of Environment and Development have suggested that 189 million m^3 of virtual water is imported to the UK each year through green beans from Africa.[3] Each bean stem 'uses' four litres of virtual water; this from a country exposed to water stress. If that water is potable, morality issues are raised: is water which might otherwise improve sanitation and health of indigenous people being colonised to provide out-of-season vegetables for rich countries, or is this helping improve living standards and development? I think it certainly has neo-colonial tendencies.

Biodiversity and eco-systems support

By 1995, the FAO was estimating that since 1900 about three quarters of the genetic diversity of domestic agricultural crops had already been lost.(FAO 1995) The world's natural fisheries are now seriously depleted, with 52% of wild stocks "fully exploited" according to the FAO's classification.(FAO 2007b) An example of why this matters is that nutritionists simultaneously continue to persuade consumers to eat more (not less) fish. Even if consumers turn to 'sustainable' fish, is there enough to feed 9 billion people by 2050? Few think so.

On biodiversity generally, the FAO summarises the core argument for preserving and enhancing it thus: "[w]hen natural diversity is lost, so is irreplaceable genetic material, the essential building blocks of the plants and animals on which agriculture depends. These plants and animals are the result of 3,000 million years of natural evolution - and 12,000 years of domestication - and selection."(FAO 1995) A more immediate rationale is that biodiversity within crops also protects against disease.

Energy and non-renewable fossil fuels

An estimated 75% of the fossil energy used annually globally is expended by developed country populations. About 17% of that unequal share goes on the production, processing, and packaging of food products.(Pimentel and Pimentel 1996) On farms, the availability of cheap and plentiful petroleum has been a key factor in the 20th century rise of productivity. The internal combustion engine and oil-driven machinery replaced animals as motive power, releasing not just horses and oxen but humans from hard labour. The number of horses and mules on US farms, for instance, plummeted from 12

[3] James MacGregor and Bill Vorley of IIED, personal communication, data presented at an IIED/DfID seminar November 2006

million in 1945 to 2 m in 1960 while the number of tractors doubled.(Effland, Dimitri and Conklin 2005)

But oil-dependency is not just in farming. Food is trucked, shipped and flown increasing distances. In the UK, food supply chains now accounts for about one fifth of total energy use.(Smith et al. 2005) In 1989-1999 there was a 90% increase in UK road freight movements of agricultural and food products between the UK and the rest of Europe.(Jones 2002) The food systems accounts for over a third of all UK road freight. Since 1978, the annual amount of food transported in the UK by Heavy Goods Vehicles (HGVs) has increased by 23%, and the average distance for each trip has increased by over 50%, according to the UK government.(Smith et al. 2005) One in four trucks on UK roads is moving food; and one in two of those is empty, according to the industry itself.(IGD 2008) As large supermarket chains consolidated, the distance consumers drove to the shops grew (as did their obesity). From 1985/6 - 1996/8 average UK travel to shop distances increased 57%.

An entire pattern of food supply chains has emerged due to cheap oil but this is now threatened by looming peak oil, the point at which oil supplies finally begin to drop. The use of agriculture to fill the gap through biofuels has spread alarm among food observers.(FAO 2008c) Optimists, however, are certain that more oil will be discovered or created from tar-based sources or technical efficiencies (downplaying the climate change impact). While increased efficiency could postpone peak oil, it will not remove it. The era of western food and farm efficiency reliant on oil is probably coming to an end.

Population growth

One does not need to be a neo-Malthusian to note that there is a real challenge for food systems in population growth but the politics are delicate. It is an issue seized on by deep greens and proponents of GM as the new technical fix alike. Current world population is c 6.7bn and projected to rise by over 25% by 2050.(UNFPA 2007) This increase of 2.5 billion is equivalent to the total size of the world population in 1950, and it will occur mostly in less developed regions, whose population is projected to rise from 5.4 billion in 2007 to 7.9 billion in 2050. In contrast, the population of the more developed regions is expected to remain largely unchanged at 1.2 billion, and would have declined, were it not for the projected net migration from developing to developed countries, which is expected to average 2.3 million persons annually.

Some calculations have estimated maximum world grain capacity at 3300 million tonnes per annum, 60% more than today, which suggests a looming gap between food production capacity and global population.(Frey and Barrett 2007) This is the stark issue: more people to feed, equitably and healthily. Such prognoses suggest that there is likely to be renewed economic and moral pressure on Europe – a region not expected to be catastrophically constrained by climate change, compared to Africa – to maximize food production.

In the last half century, world food production has risen remarkably and has been the success of productionism in that output has kept ahead of demand.(Smil 2000) But difficulties lie ahead. According to FAO figures, measured as kilos per capita, the growth of availability of main crops such as grains, soy, potatoes – which rose admirably from the 1960s due to investment in new farm systems – began to level off from the 1990s.(Butler and Oluoch-Kosura 2006; Lang and Heasman 2004) Urbanisation is rising (taking more land and requiring more feeding from urban and rural growers). In 1975 the world's urban population was 40% of world total. By 2005 it was almost half. This puts a further burden both on remaining rural populations to feed the urban masses and on the urban population to recognize its reliance on the primary food labour force.

Waste

One factor which could feed more mouths is the reduction of food which is wasted. The affluent are in this respect a big problem. Despite the promise of post war science to reduce waste, its form and function has merely changed. Rich consuming societies are big wasters. In the UK in 2007, for instance, consumers threw away 6.7 million tonnes of food. Annually, according to the UK government body, approximately one third of food purchased is thrown.(WRAP 2008) Only a fifth of this waste is unavoidable – peelings, cores, bones. The avoidable waste occurs due to a combination of factors such as excess purchasing, marketing (e.g. 'buy one get one free' offers), obeying cautiously set 'sell-by' or 'eat by' dates, large portion sizes, plate waste and price incentives.

Whatever the reason, the net effect is embarrassing if not shameful. Nearly one quarter of the 4.1 million tonnes of avoidable food waste in the UK is thrown away whole, untouched or unopened. Of this, at least 340,000 tonnes is still in date when thrown away. 1.2 million tonnes is left on plates. The wasted food is valued at £10.2 billion, £420 per year for the average UK household; £610 per year if the household has children. Such figures indicate the extent of the need to reshape consumer culture - not just production - and to re-skill people at the very least not to jettison waste. Ethics which value thrift, household management and combine nutrition with domestic economy – presented as 'old fashioned' – now look more interesting for the ecological public health age.

Land

Land use globally is astonishingly varied, shaped by terrain, climate, tradition etc. But the last 60 years have seen pressures to intensify and exploit the land, a model of progress which cannot easily continue. Historically, urbanisation has often been by seashores or estuarial plains with rich soil.(Crawford and Marsh 1989) Rapid and extensive urbanization today continues to cover prime land with housing. There is fierce competition between uses for land: food, fuel, carbon / water sinks, biodiversity, amenity, transport, identity, etc. The growth of mega-cities will place still more demands on land when it is already know how deep urban footprints already are.

One calculation for London, for example, found that the city's total footprint is estimated to be 48,868,000 global hectares (gha) or 6.63 gha per capita. If this was globally equitable – i.e., if it reflected London's portion of the world's 'bio-capacity' – this would be 1,210,000 gha or 0.16 gha per capita.(Lyndhurst and Greater London Authority. 2003) London's food accounted for 41% of the footprint. To turn this into its global fair share would require Londoners each to consume 70% less meat, eat more than 40% local seasonal unprocessed food, and cut waste by one tonne a year.

Shifting from the current to a healthy diet would reduce the footprint of the average UK consumer from 0.82 gha to 0.64 gha per person.(Frey and Barrett 2007) This same study found that meat consumption accounted for 46% of the impacts of the conventional diet, followed by dairy products (9%) and alcoholic drinks (8%).

Soil

Soil is the base for food production and civilization. Unless soil health is protected by good management and conservation, food production halts, yet according to the UN Environment Programme (UNEP) globally nearly 2 billion hectares (ha) of land are affected by human-induced soil degradation. Within Europe, assessments have identified problems such as sealing (under roads, house, concrete), erosion, contamination, acidification, and degrading.(European Environment Agency and UN Environment Programme 2000)

The European Agricultural Conservation Foundation has estimated that soil erosion and degradation caused by conventional agriculture affect approximately 157 million ha (16% of Europe, roughly three times the total surface of France).(ECAF 1999) Average soil erosion rates in Europe are judged to exceed the average rate of soil formation, with most EU countries affected. In the Mediterranean – from which the UK derives much horticultural produce – soil erosion is deemed "very severe". In 2007, the Environment Agency published a report on pollutants in soil, finding higher levels in urban than rural soils, in part suggesting the legacy of industrial pollution. Soil dioxins, for instance, grew in 1880-1980 but have dropped by 70% since 1980 reflecting both de-industrialisation and the effectiveness of controls.(Environment Agency 2007)

Labour

Agriculture is still the world's largest employer with 40% of the world's population employed in agriculture, largely at a subsistence level.(Halweil 2000) Of the approximately 1.1 billion men and women working in agricultural production in the mid 1990s, nearly half did so on a waged basis.(FAO 1996) Millions of these workers earned the lowest wages in the rural sector, lower even than the amount required to subsist. Farming is both hard work and hazardous.(Hurst, Termine and Karl 2005) Globally, agriculture accounts for at least 170,000 occupational deaths each year, half of all fatal accidents. Even in a rich country like the UK, the farm is the most dangerous place of

work, if measured by the likelihood of the worker being killed while at work.(Health and Safety Executive 2008)

Although the value of food production in 2000 was only about 3% of gross world product, the agricultural labor force accounts for approximately 22% of the world's population, half the world's total labor force, and 24% of GDP in countries with per capita incomes of less than $765 (the low-income developing countries, as defined by the World Bank).(Millennium Ecosystem Assessment (Program) 2005)

In the UK, the agricultural labour force was just under 700,000 persons in 1984. By 2007 this had shrunk to just over 500,000. Within this movement, there had been a shift from full time to part-time workers. In 1984, they were 21% of the total; by 2007 they were 43%. In 2004, the number of part-time workers exceeded full-time workers for the first time (excluding seasonal workers and salaried managers). The proportion of seasonal and casual workers has remained relatively stable over this period. The average age of farmers has risen to 58 years in 2005, with 30% over 65 years. Only 3% are under 35 years of age. Farm wages are historically low but have improved although they are still about four fifths of the average industrial wage.(Defra 2008a) UK farm work relies considerably on temporary workers – as do most developed countries' perishable food industries. In the UK, one study estimated that in any month there were an average of 99,460 directly recruited temporary workers on farm enterprises and 125,254 recruited by labour providers (such as gangmasters).(Williams 2005) This gave a total of 224,713 and included students on the Seasonal Agricultural Worker Scheme.(HM Revenue and Customs (UK) 2008)

The labour question is hugely important and essential for any improvement in developed country food policies, yet governments and NGOs too often bury their heads in the consumerist sands.(Lawrence 2004; Lawrence 2008)

Dietary change and public health

The nutrition transition is a term used to describe a process which happened many decades ago in developed countries and is now rolling out in many developing countries. It refers to the shift from reliance on simple staples to greater use of high-value-added processed foods and meats, dairy and soft drinks.(Popkin 2002) It is linked to changes in controls within supply chains from primary producers to processors and retailers. It accelerates the incidence of diet-related non-communicable diseases.

The evidence about the impact of inappropriate diets on health has been known for decades, arguably since the great US epidemiologist Ancel Keys's Seven Countries study.(Keys 1970; Keys 1980) The consumption of high levels of fatty, sugary, processed (salty) foods and a lower than desirable consumption of fruit and vegetables, combined with a decline in physical activity, are associated with a wide range of non-communicable diseases. These include: coronary heart disease, diabetes, strokes, and some cancers.(WCRF / AICR 2007; WHO 2002; WHO / FAO 2003) The problem is that this

evidence has failed lamentably to be translated into agricultural policy.(Lang 2005; Lang, Barling and Caraher 2009; WCRF / AICR 2009) Farming is overwhelmingly judged by quantitative output rather than by other 'multi-functional' attributes.

This market failure is systemic but it was not always so. The productionist policy focused on quantity for good reason. It was evidence-based in its time, centering on 1930s evidence about deficiency.(Boyd Orr 1936; International Labour Office 1938; Vernon 2007) Today, however, the nutritional epidemiological picture is different. Under-, over- and mal-consumption co-exist. The nutrition transition and tendencies to 'westernise' raise mortality and morbidity from non-communicable diseases.(WHO 2002)

As China, for instance, has become more affluent and urbanised, the same effect has been documented even though, by western standards, it starts from the basis of having very low fat intake.(Chen et al. 1991) Such data are why, since the 1990s, the World Bank and World Health Organisation have been troubled by the enormous health care costs attributable to dietary factors.(Murray and Lopez 1996) Rocketing obesity alongside continued hunger has come to symbolise this complex new picture.(Foresight 2007; Surgeon General 2001; WHO 2000)

5. These 'new' problems add to the 'old' ones for policy

The issues raised here are matters for scientific inquiry and also for fierce ideological debate, but ultimately for political processes. They go to the heart of power. The tricky thing for policy-makers about the above issues is that they almost certainly cannot be addressed as single issues but must be addressed comprehensively and collectively because of a tendency to 'knock on' to each other. To act on water stress, for example, by investing in desalination plants, as is happening in a big way in oil-rich Middle East - there's even a new plant being built in the UK! - merely adds to carbon load (because such plants are energy intensive) and hence climate change. Going for single solutions may even accelerate their critical condition.

The appeal to policy-makers to go for change by 'small, single steps' is great; but the effectiveness is small and slow. It's system change that looks to be needed.

As though the problems were not daunting enough in themselves, all the above fundamentals need to be woven into the fabric of 21st food policy alongside existing challenges. The salient ones include:

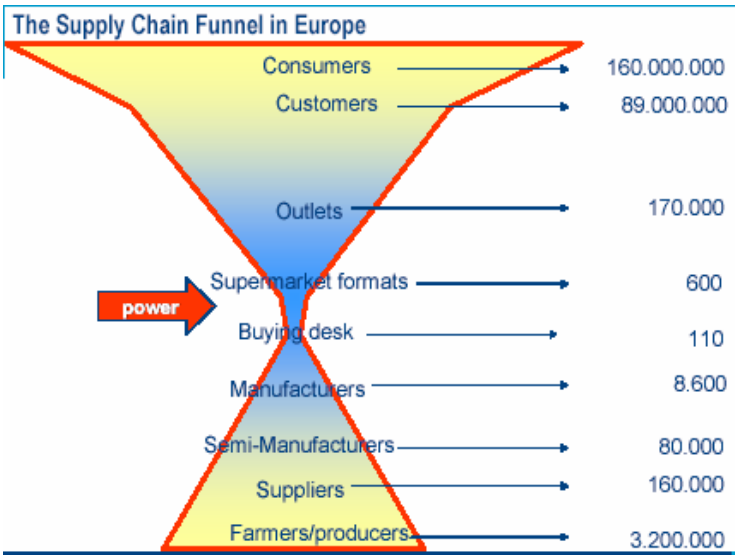
- serious inequalities within and between countries;
- unparalleled concentration of control within and across food sectors;
- the emergence of global food corporations whose power and influence dwarfs many nation states;
- public institutions which are weak before the above and which are imbalanced.

Just take the latter. The harsh truth is that UN bodies are weak compared to the World Bank, the IMF or the WTO. The UN 'family' of institutions is also unequal internally and lacks strong leadership and co-ordination. The Standing Committee on Nutrition is an honourable exception and was created to try to get improved linkage, but it still lacks leverage. Its mandate is to "promote cooperation among UN agencies and partner organizations in support of community, national, regional, and international efforts to end malnutrition in all of its forms in this generation."(Standing Committee on Nutrition 2009) It can 'promote' but not deliver.

How might we get the change that is needed? In public health, from the 1980s, there has been a strong line of argument that such is the change in dietary behaviour needed that only 'pacts with the powerful' can deliver. It is a seductive argument: powerful levers are needed, *ergo* go to whomsoever has that power. In modern times, in developed – and now developing countries too – that power has been seized by retailers, the gate-keepers of complex supply chains.(Burch and Lawrence 2007; Raven et al. 1995) This was brilliantly captured in Grievink's hour-glass or funnel model of the European food system (see Figure 4).

His work for Cap-Gemini was conducted when the EU had only 15 Member States (now it is 27). The column on the right gives population (out of the EU then total of 250 million). Grievink put the word power into his model. But of course, retailers' actual power varies according to the level of development – most extreme in richer countries – but globally retailers have come to rival the previous and still hugely powerful baronial class, the giant processors. Power shifts are continuous, of course; it may change again. Table 2 is a schematic summary of the shifts in power in food systems over the last century.

Figure 4. Power in the European Food System, 2003



Source: Grievink 2003(Grievink 2003)

Table 2. Shifting domination in 20th century Western food value-added chains

Period	*Farmers*	*Manufacturers*	*Wholesalers*	*Logistics*	*Retailers*	*Foodservice*	*Marketing*
≤ 1900	**Dominant**	Minor	Major in a few trades	**Dominant**	Very Minor	Dominant (domestic)	Minor
1900 1950	Declining (except WW2)	**Dominant**	Major in many trades	Declining	Minor	Declining (except WW2)	Emerging (USA only)
1960 1970	Rebuilding (subsidized)	**Dominant**	**Dominant**	Rebuilding	Emerging	Minor	Emerging
1980 2000s	Declining	Declining	Rapidly Declining	Linked to retail dominance	**Dominant**	Emerging	Important
2000-2010	Returning?	Uncertain	Minor	Squeezed	**Dominant**	Uncertain	Important

source: adaptation of von Schirach-Szmigiel 2005 (von Schirach-Szmigiel 2005) in Lang, Barling & Caraher 2009 (Lang, Barling and Caraher 2009)

The evidence suggests that pacts with the powerful have not delivered dietary change. Indeed there are numerous illustrations of how the very process of trying to negotiate health deals leaves health sidelined.(Nestle 2002; Nestle 2006a) A study we conducted for the WHO of how the largest 25 food companies in the world had responded to the WHO's World Health Agreement of 2004 (an intergovernmental strategy) suggested very light response to the diet-related crisis. Corporate responsibility has not extracted enough change.(Lang, Rayner and Kaelin 2006)

But is the crisis facing us now something that can be resolved by a few twiddles of dials or switched levers? The processes are too complex and diverse. In all societies the factors now shaping food culture, for example, seem almost beyond anyone's control. Attempts to rein in advertising power in shaping demand is belated, despite convincing evidence that ads do shape children's behaviour.(Hastings et al. 2004) If controlling TV or print advertising seems to be beyond regulatory authorities' wit, who is even talking of controlling viral marketing? The genie is out of the bottle.(Macmullan and Consumers International 2009)

Equally, who seriously can expect biotechnology to provide the magic bullet which subscribers to the success story of the Green Revolution hope for? The potential for a 'people's GM' is theoretically just possible; Cuba's announcement of that direction requires watching.(Israel 2008) But in a world where biotechnology is largely shaped by the interests of a handful of powerful commercial giants, bulwarked by patents and intellectual property rights, the dynamics have been framed already.(Tansey and Rajotte 2008) That doesn't mean that strong public interest terms of reference might still not deliver ecological rather than financial gain, as one strand of socially responsible biotechnology scientists argues. But the chances of doing so have been diminished. Cotton and soya being the greatest use of GM planting symbolizes the distortion of that particular line of scientific endeavour.

6. Direction through the competing demands

The picture given above is sobering. The pessimists smell impending catastrophe. Yet there is a serious body of analysis suggesting that ways through seemingly immense difficulties are possible. In 2008, the IAASTD countered the magic bullet approach with its analysis.(IAASTD 2008) The WHO's Commission on Social Determinants of Health, which reported last year too, has a similarly sober but positive direction of travel. Small issues like reducing social inequalities pays of in general health and well-being.(Commission on Social Determinants of Health 2008) In 2009, UNEP has argued its case on food and the environment,(UNEP 2009) and the World Cancer Research Fund (AICR in the USA) published it policy report on how to tackle the convincing evidence it produced in 2007 about how, at the population level, dietary change plus appropriate physical exercise can significantly prevent incidence of cancers.(WCRF / AICR 2007; WCRF / AICR 2009)

NGOs, as ever, have been pouring out analyses and policy solutions. Among my currernt favourites are that strand of hardy souls who try to eat diets produced within definable geographical limits – the Vancouver Island 100 Miles Diet, the Fife Diet.[4] While recognising that geography is not the arbiter of ecological appropriateness - hothouse grown foods are energy / carbon intensive – the informal findings suggest that people eat more simply, cook more (but is this gender-equalising?) and waste dramatically less.(Blythman 2009)

How can we build on these offerings? How can we capture the collective direction of travel that comes from this outpouring of good work by good people trying to articulate the public good?

To summarise these all is a task in itself, but my reading of this thinking suggests solutions which:

- *Accept there are complexities.* They aim for solutions which do not trade off wins in one sector for losses elsewhere. We cannot, for example, create food systems which are low carbon but high in embedded water.
- *Are multi-sectoral and comprehensive*: They take a whole systems approach. Changes cannot be left to developing new market niches. Wholesale change is required which gives new ways of policy integration from local to global.
- *Involve multi-agency action*. This is not just across governments, society, and the supply chain. If the food system is so inextricably linked with humanity's ecological footprint, all has to be re-shaped. This needs leadership and vision.
- *Prepare for significant change*. There are gains not just pain ahead. The challenge is to ensure that as many people as possible engage in that process, covering farm, processing, logistics, retail, catering, and right through to consumption.
- *Build capacities*. The ecological health era requires us to ensure that the capacity of the environment (soil, land etc), economy (skills, work etc) and society (institutions, culture etc) are resilient and able to adapt.

Rather like the 1930s scientists whose frustration at what they saw is still, today, palpable,(Boyd Orr 1943; Ostry 2006) contemporary observers, participants and activists face a yawning gap between evidence, policy and practice. Food and farm policy language often makes reference to 'evidence-based policy', yet this term disguises a multitude of real relationships. Some policies are evidence-based. Others may be in denial of evidence, based on partial evidence, despite evidence, or in flagrant opposition to evidence. The position we are in today is where there is ample evidence from diverse food-related intellectual sectors but a failure of that evidence to be translated into policy and necessary behaviour change.

There are a number of key blockages here which the current 'crisis' might well remove.

The first is endless genuflexion before markets. The speed in 2008-09 with which big countries and big capital turned to state funds to bail out the financial mess of derivatives

[4] http://www.vancouverislanddiet.com/ ; http://fifediet.co.uk/

and ‘funny money’ should not be forgotten. The rule of ‘markets rule’ is over, as is the old policy saw of markets *versus* dirigisme. Across the political ideological divides, corporate welfare has broken the previously pre-eminent rule. The Washington Consensus, first articulated by Williamson, is crumbling.(Williamson 1989) This opens up possibilities for different relationships between state and capital, and state, supply chains and society – whichever characteristation of the power blocs one prefers.

Secondly, the rhetoric of consumer choice is unbundling. This always was limited, but now more than ever is in difficulties. Many an action in food policy was restricted by ‘let the consumer decide’.[5] Now there is recognition that the challenge is both more harsh and more subtle. As one policy-maker said to me recently, it is “how to get people to want what we know they need to want but don’t currently want, yet would want if only they knew!” The problem is that leaders don’t appreciate what ‘ordinary’ consumers do, that the problem is how to juggle competing demands. Do they eat fish (good for health) or not (fish stocks are crumbling)? What is a low carbon diet? What is a sustainable diet? Is that the same as a healthy diet? Marion Nestle is a rare nutritionist in that she has tried to walk through this issue.(Nestle 2006b) The pressure is on public authorise, supply chains and consumers as how to change culture from that driven by the pursuit of value-for-money to one that incorporates values-for-money.

Thirdly, we need to face the gap between evidence, policy and behaviour. I don’t see ‘evidence-based policy’ as anything but one ideal. The realities of politics means that endlessly decisions have to be taken despite or with only partial evidence. Sometimes good decisions can be taken with no evidence at all, and long term gains can be won despite short-term failures. So the evidence-policy-behaviour/practice relationship is complex and should not be fetishised. In the UK, interesting thinking on how to generate change across the sectors has been conducted by the Sustainable Development Commission and National Consumer Council. This outlined the need to shift discourse from either making or enticing people to change, to facilitating change, calling this the ‘I will if you will’ approach.(National Consumer Council and Sustainable Development Commission 2006) This is actually the kind of approach adopted by the original (1840s) co-operative movements; unity in action to reshape supply chains in the end users’ interests, subject to their democratic accountability.(Redfern 1920)

Fourthly, the argument that minor adjustments are all that is needed is looking thin. Big changes are needed. Take the issue of meat and dairy consumption. The FAO Livestock’s Long Shadow report itemised the huge water, land and feed requirements of animal husbandry worldwide.(FAO 2006a) Tony McMichael and colleagues have shown how dramatic the change required in meat consumption for rich countries like the US and EU is. Currently, such countries consume c 250 g per person per day, with the world average 10 g/p/d. For health and ecological reasons, this needs to drop to 90g with not more than 50g coming from red meat from ruminants.(McMichael et al. 2007) This is big change.

[5] Consumer choice and the right to information are both core Consumer Rights in the international consumer movement: Consumers International. 2006. "Consumer Rights." London: Consumers International.

In *Food Policy*, my colleagues and I have argued that **the new era needs new overarching goals**.(Lang, Barling and Caraher 2009) (pp46-54) It must:

- achieve sufficiency of production on ecological terms – carbon meshed with calories;
- prevent diet-related ill-health (from hunger to obesity) within sustainable systems;
- harness all the sciences, not just the 'natural' sciences to address how food is produced, distributed and consumed;
- re-frame what is meant by progress by shifting consumer aspirations;
- lower food's impact on the environment;
- put sustainable food systems at the heart of international development;
- deliver the above through democratic means, building movements that hold food systems to account and shape needs appropriately.

7. The recipe requires Food Democracy

I have discussed elsewhere my thoughts on the long struggle for food rights and my reservations about the notion of food sovereignty.[6] I was born in the year of the Universal Declaration of Human Rights and subscribe to its ethical appeal. The slow translation of abstract food rights into some meaningful, legally resonant terms is a testament to great effort by people and movements around the world. It is one of the shining cases for persistent incrementalism by activists in pursuit of the public good.

Although the FAO defines the right to food as the "situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life",(FAO 2006b) the reality is wholly different. Nor is this much-cited definition adequate any more (an issue to which I return below). The picture we know to be true is of gross waste, inequality, environmental threat and public health missed opportunity. The question we have to ask is whether the notion of food rights is helpful in confronting this situation.

My answer to this question is that more emphasis needs to be given to the role of social movements in confronting and altering contemporary dynamics. Part of this answer means more attention to Food Democracy – not just pressure from 'below' in society but the activation of mass participation and societal engagement in food systems – than on Food Rights. And more attention on Sustainable Food Systems than on Food Security. Declarations such as the Nyéléni Declaration are hugely important as glue which brings movements together,(Nyéléni Declaration 2007) but I am not sure more sovereignty is what is needed. Sovereigns are top-down; they imply and exude control rather than democratic accountability. I am not splitting hairs here. The words are important.

[6] See chapter 8 (particularly pp 280-3) in Lang, Tim, David Barling, and Martin Caraher. 2009. *Food Policy: integrating health, environment and society*. Oxford: Oxford University Press.

Admirable and doggedly effective though the Food Rights movement has been in getting to the 2004 Voluntary Guidelines, one of the lessons of food history is that rights are only valuable if they are used and incorporated into demands by the people and at-risk populations themselves. It is the movement not the right which matters. Rights matter if people believe in them. Rights, on their own, do not feed people any more than food being available ensures that all are fed. The key factor is whether people actively demand and pursue those rights, as Amartya Sen and Jean Dreze showed.(Sen 1981; Sen 1999) The struggle to enshrine Food Rights has been an important rallying cry for decency within food policy, a set of criteria against which governments and the food system can be held to account but it is food democracy which is the real goal.

Only two countries - Brazil and South Africa - have placed the 'right to food' in their constitutions. The South African Constitution contains three references to food and nutrition rights and requirements to legislate such rights. At his inauguration in 2003, Brazilian President Luiz Inácio "Lula" da Silva launched *Fome Zero* (Zero Hunger), a national zero hunger policy, now institutionalized at both national and programme policy levels. Such top-level state delivery of programmes on food poverty or insecurity is rare, and is a testament to the long years before winning the election in which Brazilian social movements held governments and societal values to account. *Fome Zero* illustrates how improvements take struggle, dedication and hard work. There are powerful social forces unhappy to loose control and for whom charity may be less threatening than redistribution or resource reallocation.

The modern Brazilian experience is particular to that country's politics, culture and history, but in the West too hunger and poverty were major national issues in the 20th century, a rallying cry for progressive groups. In the UK for instance, the dietary consequences of poverty brought together an alliance of interests ranging from women campaigners (Spring Rice 1939) to medical interests and unemployed workers.(Brockway 1932) They worked hard to build a political consensus around the value of welfare reforms, food safety nets and the need to give ordinary people more dignified lives. The indignity suffered by poor people due to cash shortages and poor quality diets was a persistent theme,(Hannington 1977 (1936); Paulus 1974) in contrast to the emphasis on efficiency and national, military and morale factors being articulated by others.(Curtis-Bennett 1949)

I have used the term 'food democracy' to articulate this citizens perspective, arguing that this requires engagement, action, volition and a societal ethos.(Lang 1998) This is a long process. Applied to my own country, England, the drama is particularly long (see Table 3 for some key moments). We should have no illusions that sorting out the food crisis or challenge of today is an easy or quick fix matter.

Food democracy is a ceaseless task, spanning conventional social movements such as trades unions, churches, voluntary organisations and community groups. It means that

Table 3. Some events on the long English Food Democratic road, C14th to C21st

Date	*Event*	*Actors / issue*
1381	Peasants' Revolt	John Ball, Wat Tyler, Jack Straw led peasants in a march on London; almost succeeded but were tricked and defeated
C17th & 18th	Sporadic outbursts about land rights	e.g. resistance to drainage of Fens and wetlands and other common spaces from which people fed themselves
1770s – 19th	Enclosure Acts	Latest of long bout of annexation of common lands by land-owners; an early example of privatisation sanctioned by law.
1795 – 1830s	Speenhamland	A system of poor relief run at the local level to compensate if grain prices went low. Paid by landowners. Culminated in 1834 Poor Law Reform report which set up workhouses instead, trapping the poor into grinding poverty. Object of mass unrest.
1819	'Peterloo' massacre	15 protesters killed by troops at a mass rally in Manchester on 16 August calling for right to vote, and angered by hunger following the end of Napoleonic Wars and introduction of Corn Laws designed to keep food prices high. Led to mass protests.
1832	Tolpuddle Martyrs deported to Australia	Earlier bans on trades unions and workers organising to improve wages had been lifted but 6 farmworkers in Dorset country were arrested for forming a Friendly Society in protest against dropping wages. Their deportation led to massive outcry and they were reprieved in 1836.
1830s	'Captain Swing' riots	Luddism – an outbreak of violent breaking of new agricultural machines (e.g. threshers) judged (rightly) to be a threat to employment
1846	Repeal of Corn Laws	Repeal of the 1815 Importation Act which kept cheap food out of England by imposing tariffs. Subject to mass meetings. Spawned long tradition of UK state policy commitment to cheap food.
1820-1870s	Anti Adulteration Campaign	Long struggle to clean up food and ensure that food should be "of the nature, quality and substance demanded." Began with Accum's 1820 exposé of food frauds and only finally won with a legal amendment in 1895. Process renewed in 1980s (see below)
1905	Royal Commission on Supply of Food and Raw Material in Time of War	Reported on an inquiry into threats to food supply exposed in part by poor malnourished state of recruits to fight in a war against the Boers of South Africa. Exposed risks of Imperial supply routes, as well as poor diets shown by the Departmental Committee on Physical Deterioration Report of 1904.
1906	Education (Provision of Meals) Act	Enabled local authorities to levy a small sum from householders (rates) to create a school meals system in each Borough (locality). Few Boroughs activated this option till women were wanted for waged work in World War 1. Not made a universal benefit till 1944. Nutrition standards repealed in 1980 and returned in 2002
1930s	Hunger Marches	Organised by working class and trades union movements in protest at lack of jobs, welfare and food.
1930s	Co-operative Women's Guild investigation into hunger	Concluded that incomes were so low that it was nigh impossible to eat adequately
1947	Agriculture Act	Popular agitation played its part in encouraging post-war Labour Government to rebuild food production, not least since the Empire had been almost entirely dissolved.
1955	End of rationing	As deeply unpopular after World War 2 as it had been accepted as just and fair in it. Health has been improved by more equitable distribution and rights. Particularly benefited the poor, but resented as 'top-down' control in peacetime; but it lasted longer in peace (10 years) than in war (7 years).
1990	Food Safety Act	Result of food campaigns from the 1970s and 1980s about new adulteration and safety standards. Echoing much of the mid 19th campaigns.
2000	Food Standards Act	Created a new Food Standards Agency after campaigners – with public backing – argued for need for independent scientific body not influenced by food industry lobbies.
2002	Abolition of Ministry of Agriculture, Fisheries and Food (MAFF)	First created in 1879, popular outcry against perceived 'agency capture' led to MAFF being replaced by a new Dept for Environment, Food & Rural Affairs.
2006	School food nutrition standards reintroduced	New standards introduced, 25 years after they were removed in 1980 and after decades of campaigning to get new ones back.

Source: Lang, Barling & Caraher *Food Policy* 2009 pp 285-6 (Lang, Barling and Caraher 2009)

organization and co-ordination become key factors in effectiveness. Pursuit of goals, with the means to do so, is what characterized the influence of powerful corporate and state bodies in food policy-making. It is thus essential for the public interest that food consumers become food citizens, implying their membership of society, with rights and responsibilities. Citizens have capacities beyond those of consuming goods and services, and similarly, society is more than simply a marketplace.

8. Sustainability is food security

The history of food policy is a tale of means not just ends. How we deliver sustainability or food security matters as much as that they are achieved. Equally who does it is critical to its suitability. This is the complex world. It means we strive not just for multi-functional agriculture but also for multi-level governance and multi-criteria food policy. The FAO's definition of food security given above fits the classical focus of food security on affordability, availability and accessibility.(Defra 2006) But in fact food security is inextricably woven into the sustainable development and social justice agenda, whereas dominant perspectives keep these apart.

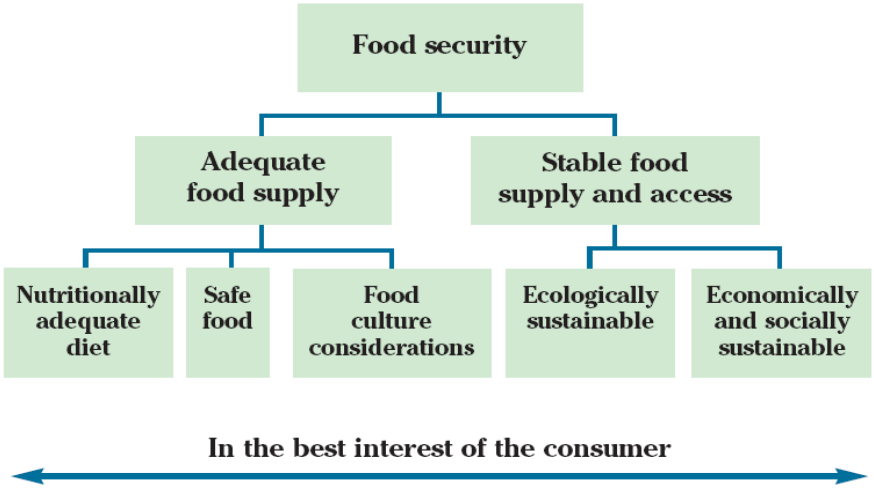
The term food security has at times hovered on being rendered almost meaningless. When governments can use it but denude it, when it covers such a diversity of meanings (see Table 4), it is perhaps time to be more specific. This is the looseness from which Oshaug and Haddad have tried to rescue it, proposing *de facto* a return to core values – the linkage of people, nutrition and environment. This is expressed in their illustration given in Figure 4.

Table 4. Some associated meanings in the Food Security discourse

Phrase	*Referring to…*
Food security	availability, affordability, accessibility etc
Food nationalism	self-sufficiency, autarky
Food defence	feeding in dire circumstances
Food control	the actions of state (e.g. rationing)
Food resilience	capacity to withstand shock
Food risks	factors which threaten goals
Food sovereignty	ensuring societal control
Food democracy	full social engagement
Food capacity	capability to produce
Community food security	local food systems

Source: author

Figure 4 Food security as bonding health, culture and supply



Source: Oshaug & Haddad (Oshaug and Haddad 2002)

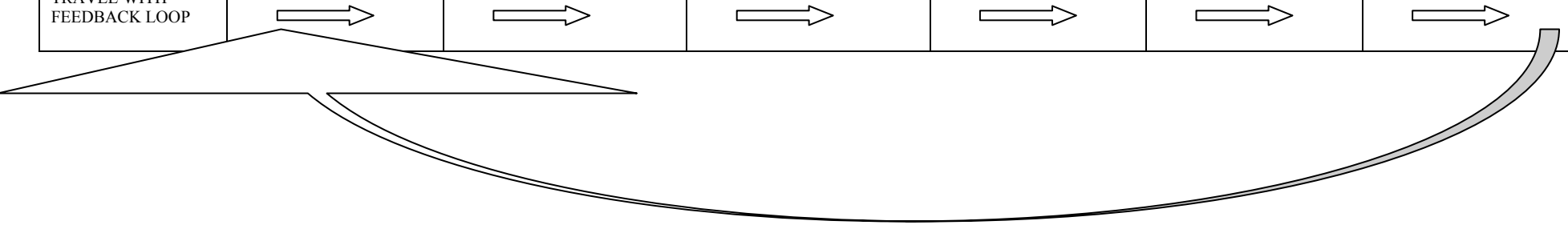
If that is the aspiration, how can it be translated for the 21st century, appropriately for the challenges outlined here? My own conclusion is that food security can only mean sustainability. To what other meaning of 'security' can we subscribe? But what does this entail? How can it be translated?

To put it formally, food security actually requires the deployment of measures in pursuit of policies to promote a food system, locally, nationally and globally:

- where the core goal is to feed everyone sustainably, equitably and healthily;
- which meets culturally appropriate goals of suitability, availability and accessibility:
- which is diverse, ecologically-sound and resiliant in the face of increasing environmental, economic or social volatility and creates robust and sufficient supply systems and stocks;
- whose principles and mode of operation can be maintained for the long term, thereby enhancing not just protecting the land's productive capacity; and
- which builds the capacities and skills necessary for future generations.

In *Food Policy*, we have translated this into a flow chart (see Table 5). This attempts to capture the constant process that policy-makers need to start, melding evidence, policy and practice.

Table 5. New Goals for Food & Health Policy in an Era of Ecological Public Health
Source: Lang, Barling and Caraher 2009, chapter 2 (Lang, Barling and Caraher 2009)

A new direction of travel is emerging shaped by…	***…evidence on problems in issues such as these…***	***….requiring action by institutions covering these supply chain sectors….***	***…using policy levers ('soft' to 'hard')….***	***…to alter behaviour by food system actors…***	***… using managerial measures to reshape….***	***…in line with new ecological public health goals to deliver***
ISSUES	• Water • Energy • Climate change • Land use • Human health • Social justice • Labour process • Demographics • Food availability & stocks	• Agriculture & rural affairs • Environment • Health • Social welfare • Trade • International development • Foreign affairs • Industry • Finance	• Labelling • Education • Public information • Endorsements • Welfare support • Product standards • Licensing • Subsidies • Competition rules • Taxes & fiscal measures • Bans • Rationing	• Input industries • Agriculture • Transport & infrastructure • Processing • Distribution and logistics • Retail • Catering & foodservice • Traders	• Standards • Labour process & skills • Markets & products • Production and processing • Distribution • Full cost pricing • Life cycle analysis • Culture: from niche to mainstream • Targets/metrics	• Sustainability (social, environmental and economic) • Energy efficiency, waste – minimisation and closed loop systems • Capacity building (for nature, people & economy) • Resilience to shock • Eco-dietary advice • Fairness and equitable access • Confidence & trust • Accountability (political & financial) • Evidence-building for policy
COMMENTS	*Interdisciplinary thinking is required to face competing evidence*	*The challenge is to improve co-ordination across these interests with all actors in the food system:. Companies, Governments & NGOs*	*Policy has suffered a 'lock-in' which favours 'soft' interventions and focuses on consumers rather than upstream prevention*	*Globally, retailers and traders tend to hold power but the situation varies by country and sector*	*These are managerial foci*	*These are the new directions of travel for the food system; but subject to constant feedback loop and scrutiny….*
DIRECTION OF TRAVEL WITH FEEDBACK LOOP						

Conclusion: normality is not normal

I was and am wary about over-use of the word crisis. But the attraction is there, and what else is appropriate to use?

The terrain is certainly moving, in both emotional and physical senses. Seismic shifts might be a better metaphor. There is certainly much slipping in food's many layers: political, environmental, health, production, etc. There is also much noise as the tectonic plates grind and buckle. Some voices shout louder than others. Noise, however, is not necessarily an indicator of pain. It is often the silent who feel it worse, as they go under.

That's why clarifying the indicators of dynamics is not just an academic interest; it is vital politics, public health and ecology. 'Going under' suggests swimming and movement; one can drown or sink, which reminds me of Stevie Smith, a wonderful English woman poet, whose most celebrated poem from a collection of the same name, I put at the end of this essay.(Smith 1957)

Her wit is of the pessimistic bent, which I do not share. But unless action occurs on unprecedented scale to address the challenges sketched here and by many observers, it may be warranted. We need to prevent this. The 'we' is all of us, multiple actors in all sectors, all countries. Our task is to stop the normal becoming permanent. Today's crisis is both normal and abnormal, predictable and unpredictable, rational and irrational, understandable and beyond belief. A culture that thinks it is normal to get into a car to get to food from a hypermarket with 30k items and then eat inappropriately for health and ecology is historically pathological. But we know this, so can chart ways forward not just downwards into some abyss.

Stevie Smith - Not Waving But Drowning (1957)

Nobody heard him, the dead man,
But still he lay moaning:
I was much further out than you thought
And not waving but drowning.

Poor chap, he always loved larking
And now he's dead
It must have been too cold for him his heart gave way,
They said.

Oh, no no no, it was too cold always
(Still the dead one lay moaning)
I was much too far out all my life
And not waving but drowning.

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