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The political economy of food systems reform

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Abstract

Modern food systems as they have developed over the past half-century are unsustainable: their health and environmental impacts, as well as their failure to reduce rural poverty in developing countries and the power imbalances in food chains, are a concern to a growing number of activists. However, the mainstream system is highly path-dependent, and resistant to reform. Change can be expected neither from government action, nor from business initiatives alone, and grassroots innovations led by ordinary people have a limited impact. Only by connecting these different pathways for reform by food democracy can lasting food systems reform be achieved.

Keywords: food and agriculture, sustainability, transition theory, political economy of food systems

JEL classification: A13, D7

1. Introduction

Starting in the 1930s in rich countries, modern food systems have gradually developed to become more industrial. With a view both to achieving economies of scale and to reducing the labour-intensity of production, they have favoured a type of farming that relies heavily on external inputs and that cultivates single crops on large areas. Priority has been given to the production in large volumes of a relatively narrow range of commodities, essentially as raw materials for the food processing industry, rather than of a large diversity of foods. The specialisation of various bio-regions into certain types of production was encouraged, rather than the ability of each region to satisfy most of its own food needs, a process further accentuated by trade liberalisation and the growth of global supply chains. Uniformity has been preferred to diversity, and efficiency has been preferred to resilience.

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This article discusses the impacts of this approach, and the conditions under which an alternative approach could be pursued. There is now broad agreement that the food systems we have inherited from the past century are not sustainable, but the direction of reform remains heavily disputed. The article starts with a reminder of the context in which the modern food systems emerged (Section 2). It then reviews the various impacts of industrial food systems as they have developed since the post-World War II era (Section 3). Next, it identifies the obstacles to change: it argues that the inertia of the existing regime may be attributed to a number of mutually reinforcing factors, that together form a system – a set of distinct, but inter-related elements, that have co-evolved over the years (Section 4). Different pathways through which reform could be achieved are considered. The article examines successively the potential role of governments; the combination of 'green capitalism' and of 'critical consumerism'; and the role of 'grassroots innovations', that start from citizens' initiatives (Section 5). The article concludes that food democracy has a vital role to play to overcome the various impasses these various pathways face (Section 6).

2. The origins of modern food systems

The food systems of today derive to a large extent from choices made in the early post-World War II years. The main challenge at the time could be summarised in the most simple of terms: the world had to produce enough to keep up with the rise in demand for foodstuffs. The rate of population growth reached its peak in the 1960s, with an estimated global average of 2.5 per cent annual increase in 1965, almost double what it is today, and total fertility rates at around 4.5 during that decade (UN, 2015). In 1968, Paul R. Ehrlich predicted in his best-selling book, *The Population Bomb*, that under a business-as-usual scenario, entire regions would be facing starvation, as agricultural output would be unable to catch up with demographic growth combined with the shifting diets linked to urbanisation (Ehrlich, 1968). The world, it seemed to many, was on the edge. In much of the developing world, yields per surface area had been stagnating for decades (Fuglie *et al.*, 2012), and it was precisely there that overpopulation was threatening and that the ability for governments to make up for food deficits through imports was weakest. Indeed, when, in 1972, bad harvests in what was then the USSR, combined with the first oil shock the following year, led the real prices of food commodities to skyrocket suddenly on international markets – as the USSR quietly bought all the grain reserves that they could capture and as the price of fertilisers suddenly peaked – the doomsday predictions of the neo-Malthusians seem to turn into reality.

Population growth and insufficient productivity growth were threatening the ability of entire regions to feed themselves, and with rising prices, basic food commodities could be out of reach of the poor: the answer was to produce more. This was the mindset that shaped the choices made in the late 1960s and early 1970s, inaugurating a trend that lasted for 40 years almost without interruption. The specific responses were different from region to region, but the general approach was similar all over: thanks to a combination

of technological advances and public policies, including the use of subsidies to farmers, outputs were raised, and prices driven down. In Europe, this was the vision that shaped the Common Agricultural Policy (CAP) launched in the early 1960s. In the United States, it was Earl Butz, President Nixon's Secretary of Agriculture, who launched a massive programme to encourage the production of grain, corn especially, in the American countryside, most notably by introducing direct payments to farmers compensating for the otherwise low payments they would receive for their crops in situations of overproduction (Pollan, 2006: 51–53). Farmers were encouraged to grow more and faster, and told not to worry about the risk of gluts in the markets – if the prices were not sufficient to cover the costs, the government would intervene and make up for the difference.

Though overproduction was initially limited to rich countries, it was in South Asia that the risks associated with overpopulation were considered to be highest. Countries such as India, Pakistan and the Philippines had among the highest fertility rates of the world; this moreover was also the region where pro-communist sentiment, it was felt, would grow if no solution was found to the massive rural poverty. The term 'Green Revolution' was applied to the attempts launched in 1965–1966 to boost agricultural production in these countries, through the introduction of new 'high-yielding' varieties, particularly semi-dwarf wheat and rice varieties, the extension of irrigated land, a massive increase in the use of chemical fertilisers and mechanisation (Borlaug and Dowswell, 2004). The significance of the Green Revolution was at least as much political as it was agronomic: the governments had decided to make boosting agricultural productivity a priority, and they framed the questions of hunger and malnutrition, primarily, as a *quantitative* problem – as a mismatch between supply and demand, that technology, combined with public policies in support of farmers, would be able to addressed.

3. The impacts of the technological revolution in agriculture

By their own standards, the revolutions in food systems that were launched in the 1960s and 1970s were a spectacular success. The yields increased massively during the following decades. While the rates of population growth continued to decline beginning in the late 1960s, the total output per hectare of agricultural land continued to grow steadily, at about 2.1 per cent per year over the past 50 years. This allowed agricultural production to increase calorie availability per capita without significantly expanding the areas under cultivation: in 1961, the world population of 3.5 billion people was fed by cultivating 1.37 billion hectares of land (or 4.5 billion hectares including pastures for raising livestock); 50 years later, when the population doubled to 7 billion people, only 12 per cent more land – a total of 1.53 billion hectares (or 4.9 billion hectares including pastures) – was used for cultivation (Fuglie *et al.*, 2012; Alston and Pardey, 2014: 123). This is a significant achievement. The rate of agricultural productivity growth has been slowing down significantly since 1990, however, once we

remove China from the global picture (Alston and Pardey, 2014: 131–133), suggesting that we may be reaching a plateau in total factor productivity (TFP) in high- and middle-income countries. Moreover, questions are now emerging as to the sustainability of the approach pursued through the industrialisation of the food systems (FAO, 2017). Four concerns in particular emerge.

3.1. Health impacts

Despite the impressive increase in agricultural output per capita, the absolute number of undernourished people remains at about 800 million: we have managed to reduce the proportion of undernourished (about 12.9 per cent of the world's population today, down from 23.3 per cent in 1990–1992), but certainly not to eradicate hunger (FAO, IFAD and WFP, 2015). *Calorie intake* alone, moreover, the indicator for undernutrition in the official data on hunger, says little about *nutritional status*. Lack of care or inadequate feeding practices for infants, as well as poor health care or water and sanitation, also play a major role. And food intake itself cannot be assessed solely on the basis of its energy content: even when food intake provides a sufficient amount of calories, inadequate diets can result in micronutrient deficiencies such as a lack of iodine, of vitamin A or of iron, to mention only the deficiencies that are the most common in large parts of the developing world. Globally, over 165 million children are stunted – so malnourished that they do not reach their full physical and cognitive potential – and 2 billion people lack vitamins and minerals essential for good health, a phenomenon colloquially known as 'hidden hunger' (Bioversity International, 2014). Providing infants with better nutrition would have considerable multiplier effects: it has been calculated that for any dollar spent on reducing stunting, 44.50 USD could be expected in returns, as a result of improved earnings in later life (Hoddinott *et al.*, 2012). Despite these warnings, politicians have often looked the other way.

This is true of course of low-income countries where undernutrition is the major concern. But it is true also in middle- and high-income countries. In the United States itself, 12.7 per cent of households are 'food insecure', meaning they cannot afford adequate food for themselves or their families and live on poor diets (USDA, 2016). Children born within these families may not be starving, but they are not adequately nourished. Obesity itself, that we long thought confined to high-income countries, is now of concern to a large range of middle-income countries facing a 'nutrition transition' such as Mexico, Brazil or South Africa: changing lifestyles – more urban, more sedentary – combined with a switch to so-called 'Western diets' – richer in processed foods that are energy-rich and include heavy doses of saturated fats, sugars and salt. These countries face a 'triple burden': hunger is not eradicated, malnutrition rates remain high, and obesity numbers are rising fast. Already today, overweight and obesity cause every year more premature deaths (about 3.4 million) than undernutrition kills children (3.1 million).

By 2030, it is estimated that 1.1 billion people (one person in eight) will be obese (Kelly *et al.*, 2008; Black *et al.*, 2013; Ng *et al.*, 2014).

The evolution of food systems is directly responsible for these health impacts. Malnutrition during infancy puts children at risk of overweight and obesity in adult life: children who are poorly fed during pregnancy develop super-enzymes in order to absorb the minimal amount of food they are used to eating. Later in their lives, when they grow up and have regular access to high-caloric foods, those super-enzymes keep on working, resulting in a significant risk of obesity (Stuckler and Siegel, 2011). But supply-side factors linked to the agricultural policies and the globalisation of food chains also played a role: for instance, the sudden availability of vegetable oil (particularly soybean oil) at low prices on the world market led to the rapid increase in vegetable oil consumption (and thus of fats in diets), and the high subsidies going to large grain producers, providing the food processing with large volumes of cheap inputs, is directly responsible for the increased reliance on processed foods (Hawkes, 2006; De Schutter, 2012).

3.2. Environmental impacts

Not only did the productionist approach neglect its impacts on health; it also grossly underestimated its environmental impacts. The spread of monocultures, though they allowed mechanisation, resulted in a significant loss of agrobiodiversity: crop species such as indigenous leafy vegetables, small-grained African cereals, legumes, wild fruits and tree crops, are now gradually disappearing as they are displaced by the production of rice, maize and wheat (Jacobsen *et al.*, 2013). Indeed, biodiversity loss, for which the spread of industrial agriculture is chiefly responsible (FAO, 1997: 33; 2010: 15–16), is the domain in which the world has move furthest beyond the 'safe operating space' for humanity (Steffen *et al.*, 2015). Largely as a result of unsustainable farming practices, an estimated 33 per cent of soils worldwide is moderately to highly degraded due to erosion, nutrient depletion and loss of organic matter, acidification, salinization, compaction and chemical pollution (FAO, 2015). The resulting loss of natural soil fertility forced an ever greater reliance on chemical (nitrogen-based) fertilisers to maintain yields (Loveland and Webb, 2003), but this in turn polluted freshwater (Parris, 2011); and as phosphate and nitrogen water pollution reach the oceans, natural fertilisation processes are stimulated, spurring algae growth that absorbs the dissolved oxygen required to sustain fish stocks (Paerl and Huisman, 2012; Chislock *et al.*, 2013).

Moreover, modern food systems are now a chief contributor to the growth of greenhouse gas emissions. In 2005, it was estimated that agriculture accounted for approximately 10–12 per cent of total man-made greenhouse gas emissions, in the form of nitrous oxide from the use of fertilisers, methane from flooded rice fields and livestock, and carbon dioxide from the loss of soil organic carbon in croplands and, due to intensified grazing, on pastures

(Smith *et al.*, 2007). But it is not agricultural production alone, it is food production more broadly – food processing and packaging and the logistics of food distribution – that consumes large amounts of energy: approximately 2,000 litres per year in oil equivalents are required to supply food for each American, which accounts for about 19 per cent of the total energy used in the United States (Pimentel *et al.*, 2008). Indeed, the production of fertilisers, herbicides and pesticides, the tillage, irrigation and fertilisation, and the transport, packaging and conservation of food all require considerable amounts of energy, so that in total, as much as one-third of greenhouse gases from human activity is linked to how food systems developed (HLPE, 2012; Vermeulen *et al.*, 2012; FAO, 2017). Not only is food production itself threatened by the pressures it exercises on the ecosystems, including by the apparently uncontrollable growth of emissions responsible for global warming; it also has developed a huge dependency on fossil energies – the gas needed for the production of fertilisers, the oil needed for machinery and the processing and transport of food – which makes it unsustainable.

The industrial livestock sector, more than any other, stands as a symbol for this kind of productionism – polluting, creating ill-health, and favoring the production of large amounts of cheap calories over everything else (D'Silva and Webster, 2010; Lymbery and Oakeshott, 2014). In all regions, as incomes rise and as people migrate to cities, they consume more meat: per capita consumption of milk and dairy products almost doubled since the early 1970s, and consumption of meat tripled (Alexandratos and Bruinsma, 2012). So production in turn must increase. The famous 'CAFOs' – the concentrated animal feeding operations – long thought to be a purely American phenomenon, are now mushrooming in all world regions. Every year, larger parts of corn and soy production go to feeding animals, and the expansion of pastures and feed crops is a major source of deforestation especially in Latin America. Over one-third of the world's cereals are already being used as animal feed, and following current trends, this will rise to 50 per cent by 2050. Yet, meat produced according to industrial processes that feed animals on grain present a string of problems (Tukker *et al.*, 2011). It results in large volumes of waste that cannot be easily disposed of. Because animals get sick in overcrowded factories, massive doses of antibiotics are included in feed, so that consumers' bodies gradually become less resistant to antibiotical treatment (Ventola, 2015). Already today, some 700,000 people die annually of drug-resistant infections (FAO, 2017: 60), and as antibiotics use is bound to increase in low- and middle-income countries, this prepares a global health crisis to which the use of biocides in food processing (as disinfectants, as food and feed preservatives, or as decontaminants) also contributes (Capita and Alonso-Calleja, 2013). Overconsumption of meat in affluent countries – the average US citizen consumes 120 kg per year – is also associated with obesity and chronic diseases including type 2 diabetes, cardiovascular diseases, and, as confirmed by experts from the WHO's International Agency for the Research on Cancer (IARC) based on a review of 800 epidemiological studies, certain types of cancer (Bouvard *et al.*, 2015).

3.3. Rural poverty in developing countries

Perhaps many of these problems associated with productionist approaches might be excused if they benefited those who depend on agricultural production for their livelihoods, many of which are poor households living in the global South. Instead, the production patterns are badly skewed against these small-scale farmers, so that the current system results in massive inequities. Production increases during the period 1960–2000 went hand in hand with regional specialisation in a relatively narrow range of products, a process encouraged by the growth of international trade in agriculture. The benefits were concentrated in the hands of large production units and land-holders at the expense of smaller-scale producers and landless workers. Monocultures not only reward economies of scale and allow for mechanisation; they also give a premium to the largest land-holders who are better positioned to achieve efficiency gains under this model. Whereas the 1980s encouraged a 'liberalisation' of food markets (accelerated by 'structural adjustment' in the indebted poor countries), the process was strongly biased in favour of the North: overproduction in the highly subsidised farming sectors of rich countries put downward pressure on agricultural prices, relegating many small farmers to subsistence agriculture for their own consumption (as they were not competitive on markets), and accelerating rural-to-urban migration (Stein, 2011; FAO, 2016). Because of male out-migration from rural areas, small-scale farming, largely dependent on family labour, is increasingly in the hands of women: the mobility and time constraints women face, as well as discrimination in access to land, inputs and farm extension services, further restrict the potential for productivity improvements (De Schutter, 2013; Slavchevska *et al.*, 2016).

This is the trap into which many low-income countries (and the majority of the countries classified among the 'Least Developed Countries (LDCs)') are caught. These countries are still primarily agricultural, yet, in part because they have to repay their foreign loans in hard currency, they export a narrow range of commodities and therefore find themselves highly vulnerable to price shocks on international markets for these products (UNCTAD, 2010: 4 and 8). The volumes of their food imports have soared, the combined result of population growth and of a lack of investment in local agricultural production and food processing to meet local needs: many have become net food importers in the early 2000s, in some cases while still maintaining their position as net exporters of agricultural products (Valdés and Foster, 2012: 6–9). When the prices of agricultural products suddenly increased in 2008 in the wake of higher oil prices and speculation on the derivatives market of agricultural commodities, both stimulating, and stimulated by, policies in rich countries supporting the increased use of grain and oilseed for biofuels production (Wright, 2011, 2014), LDCs discovered that they were caught in a vicious cycle. They had failed to invest in their own farmers to satisfy local needs: if there was any investment at all, it went to a narrow range of commodities such as cocoa, tobacco or cotton for export. As a result, to feed the

urban poor, they had no choice but to depend more on food aid or to import more food products, thus making it even more difficult for their own farmers – increasingly facing dumping of heavily subsidised foodstuffs on their own domestic markets – to make a decent living from farming. In effect, the import of low-priced food products functioned as a substitute for improved wages for workers in the non-agricultural sectors, and for the establishment of social protection floors for all. This was perhaps a convenient solution so long as the prices of basic food commodities remained stable or were declining. However, with higher and increasingly volatile prices (Díaz-Bonilla, 2016), this has now become a recipe for social and political instability. It is this trap that these countries are currently trying to escape from, by reinvesting in agricultural production to satisfy local needs.

3.4. Power imbalances in food chains

The trends above, which have increased poverty and inequality in rural areas in the global South – where the majority of hungry people in the world are located – have been in part magnified by power imbalances in globalised food supply chains. Commodity buyers (wholesalers) are larger and more concentrated than previously. They seek to respond to the requirements of their food industry clients by increasing vertical coordination, thus tightening their control over suppliers. The processing industry also is rapidly consolidating. After an initial period during the 1980s and early 1990s during which the parastatal large-scale processors were dismantled, this sector has been increasingly globalised and dominated by large transnational corporations. Global retailers and fast food chains, finally, are expanding (Schwentesius and Ángel Gómez, 2002; Reardon *et al.*, 2003). They reach currently also to China, India, Russia, Vietnam and increasingly Southern and Eastern Africa (Kearney, 2010 and 2015). These retail chains are also diversifying from processed foods to semi-processed foods and, increasingly, fresh produce.

Large retailers tend to prefer to source from large wholesalers and large processing firms, leading to what has been called a 'mutually reinforcing dual consolidation' (Farina *et al.* 2005): by sourcing from larger wholesalers and processors, retailers reduce transaction costs and have access to a diversity of product types in a 'one-stop shop'; the invoicing system is formalised, allowing the retailers to discharge their accounting obligations for value-added tax accounting and product liability; and the packaging and branding of products is superior to that which smaller processors or wholesalers would be able to achieve (Reardon *et al.*, 2010). In addition, large buyers can obtain from the sellers a number of concessions that reflect their dominant buyer power, such as discounts from the market price that reflect the savings made by the seller due to increased production, or the passing on to the seller of certain costs associated with functions normally carried out by the buyer, such as grading of the livestock or stocking of shelves. This not only makes it more attractive for the retailers to source from these

dominant buyers, since they may benefit from this superior buyer power that such larger suppliers have. It also further strengthens the position of the dominant buyers, who can acquire a competitive advantage over less dominant buyers in the downstream markets, leading to the acquisition by the larger agribusiness firms of dominant positions on both the buying and selling markets (Dobson and Inderst, 2007; United Kingdom Competition Commission, 2008, para. 5.27).

Due to these self-reinforcing mechanisms in which buyer power grows by the very fact of being exercised, the expansion of global supply chains leads to an increased concentration in the food production and distribution chains (Gibbon, 2005). As part of the process of vertical integration that characterises the agrifood sector as a whole, both wholesalers and retailers seek to secure stability of supply, an objective they achieve by long-term arrangements with producers, or 'contract farming'; or by relying on techniques such as preferred supplier lists (Eaton and Shepherd, 2001; da Silva, 2005; De Schutter, 2011a). At the same time, procurement is increasingly centralised, as the procurement-shed (the area from which companies source) expands from the national to the regional and global networks. And more trade occurs intra-firm, with Cargill in Argentina selling soy to Cargill in Europe for example, rather than inter-firm or inter-country (Vorley, 2003: 2).

The so-called 'modernisation' of global supply chains described above – what some call, less euphemistically, the ascendancy of a corporate food regime (McMichael, 2009) – thus tends to increase the power imbalances in the food chain (Carstensen, 2008). A narrow set of large firms increasingly act as gate-keepers to the high-value markets of rich countries, weakening the position of small-scale suppliers of raw agricultural products (Hendrickson *et al.* 2008; Anderson, 2009; Oleinik,2011), and in many cases excluding them from access to modern supply chains. The larger producers have easier access to capital and thus to non-land farm assets such as storage, greenhouses or irrigation systems. They can more easily comply with the volumes and standards requirements that the agrifood companies – the commodity buyers, the processors, and the retailers, depending on which sources directly from the producer of raw materials – seek to impose. Thus, unless they organise themselves into cooperatives or unless they are otherwise supported in the acquisition of such assets, small farmers can only compensate for these disadvantages by their lower labour costs (provided there is some substituability between capital and labour, which depends on the crops concerned), or because they are a less risky sourcing option to the buyers, since the larger farmers have more market options and thus can be less reliable (Codron *et al.*, 2004). The disturbing consequence is that small farmers pay a high entry fee into global supply chains: because of these structural obstacles they face, they can only compete by a form of self-exploitation for instance by agreeing to low wages for those (often family members) working on the farm, and they often find themselves locked into a situation of high dependency towards the buyer.

4. The obstacles to change

The trends documented above and the impacts at various levels – on public health and on the environment, on rural poverty in the developing world and on power imbalances in increasingly globalised food chains – make the need for reform urgent. Yet, it is easy to see how the various components of the food systems have co-evolved and have now become mutually supportive, resulting in a strong path dependency on past choices. Investments in research and development and in infrastructure have been made in the interest of export-led agriculture, benefiting primarily the largest agrifood corporations controlling global supply chains, or (increasingly) by these private actors themselves (Naseem *et al.*, 2010): in contrast, the needs of small-scale farmers, producing food crops to feed their own communities or to serve local markets, have been largely neglected. This concerns the development of new plant varieties, in which rewarding private plant breeders by a strengthening of intellectual property rights regimes has largely become a substitute for the funding of public research centres (De Schutter, 2011b; Howard, 2015). But it also relates to the building of communication and storage facilities, to agricultural machinery, or to the dissemination of agricultural knowledge by extension services. One particularly disturbing implication of this bias in developing countries is that the dissemination of technology and the provision of services have been ignoring the specific needs of women, who face time and mobility constraints and poor access to credit, despite the increased role women play in agricultural production in a context of rapid agrarian transition (De Schutter, 2013: 28–31 and 35–36).

The dominant actors who largely direct investment in agriculture also occupy strongly dominant positions in food chains. Concentration of power is increasing at different segments of the chain: whereas large commodity traders emerged already in the latter part of the 19th century, we have witnessed further concentration in recent years particularly in the agrochemical sector supplying inputs to farmers and in the retail sector (Sheldon and Sterling, 2003; UNCTAD, 2006; Basic, 2014). Overall, 20 companies accounted for 90 per cent of the sales of agrochemicals in the late 1980s; by 2002, their number had fallen to seven (Lang, 2004), and the recent planned mergers between DuPont and Dow Chemicals and Bayer and Monsanto will further accentuate this trend. In the seed industry, such concentration is the result of progress in biotechnology and of the patenting of genes or DNA sequences, obliging seed companies to resort to mergers and acquisitions in order to overcome the 'patent thickets' and further innovation (De Schutter, 2011b). As noted above, similar developments take place in the retail sector, with global retailers, using their superior logistical abilities and bargaining power in upstream markets, now supplying the urban middle class in emerging economies (Reardon and Berdegué, 2002; Reardon *et al.*, 2003, 2010).

This economic dominance of major agrifood companies often translates into disproportionate influence in the political process. The literature seeking to relate agrifood policies to the nature of political decision-making is still in

its infancy (Swinnen *et al.*, 2000; Anderson, 2010; Rausser, Swinnen and Zusman, 2010). However, even in well-functioning democracies in which governments would be expected to focus their policies on the expectations of the 'median voter', the 'second best' to the 'public interest' for which there is no consensual definition, a range of factors suggest that the dominant players of the mainstream system will, in fact, play a key role in shaping policy, and that their interests will disproportionately weigh in decision-making.

As labour costs have risen, not only in high-income countries but also in transition economies (Das and N'Diaye, 2013), and as subsidies have kept the prices of fossil energy artificially low (UNEP, 2012), large-scale agricultural production, heavily mechanised and highly dependent on external inputs, remains more competitive than production developed on smaller farms practising a more diversified type of farming. For various reasons, governments may therefore be tempted to support that type of farming. They may seek to encourage exports, as a means to improve their trade balance and (for poor indebted countries) to have access to foreign currencies and to pay back their sovereign debt. Or, as Robert Bates and Michael Lipton have shown, they may be biased towards serving the needs of the urban poor, not only to buy their political loyalty (the urban poor are better equipped to mobilise in protest against high food prices), but also because workers can be paid relatively low wages in the manufacturing sector as long as food prices remain low : the interests of small-scale farmers are easily discounted in such a context (Lipton, 1977; Bates, 1981; Bates, 2005). The situation in high-income countries is almost opposite, but the end result very similar: there, the expectation of cheap food on the side of consumers, combined with the strong ability of farmers to lobby for the preservation of their interests, leads to a system in which high subsidies remain in place, mostly rewarding the larger-size farms. Although the costs to the taxpayer are high and although the negative externalities, unaccounted for in the price of food, are considerable, it would barely be possible for politicians to campaign on a platform of higher food prices, even in the name of a better remuneration of farmers for their produce and of the consumers having to pay the 'real' price of food, integrating the health and environmental impacts.

This presumption in favour of industrial farming is further strengthened by the resurgence of a neo-Malthusian discourse. Demand continues to increase due to population growth and changing diets linked to urbanisation and rising incomes. The competition for the use of farmland and water is increasing between food, feed, fibre and fuel. Against that background, this neo-Malthusian discourse warns about the environmental stresses on food production and the plateauing of agricultural productivity in many regions (Ehrlich and Harte, 2015a, 2015b). The advocates of this discourse themselves insist that the mismatch between supply and demand and the growing risks of scarcity linked to climate disruptions and other pressures on the ecosystems are only part of a much more complex equation, in which political choices related to fair distribution play an equally if not more important role. Nevertheless, the narrative about the urgency of 'feeding a growing planet'

by boosting production has been rather successfully invoked by the dominant agrifood system players, in order to justify the maintenance of their position (IPES-Food, 2016: 49–50 and 54–55). Warnings by international institutions that global agricultural production would need to increase by 60 per cent by 2050 to satisfy rising demand (FAO, 2013) were soon picked upon by the global industry: citing a global population of 9 billion in 2050, Monsanto argues: 'To feed everyone, we'll need to double the amount of food we currently produce' (Monsanto, 2015), and Cargill identifies the need for 'a boost in global food production to meet the world's growing demand' (Cargill, 2015).

This narrative builds on a myth – that large-scale, mechanised monocultures are more productive than smaller-size production units relying on more diversified forms of farming. In fact, starting with Sen's studies on the productivity of smallholder farmers in India (Sen, 1962, 1966), research has highlighted an inverse relationship between the size of production units and productivity per hectare (Barrett, 1996; Eastwood *et al.*, 2010): although some authors have attributed the finding of such an inverse relationship to errors in land measurement (Lamb, 2003), researchers from the World Bank have more recently concluded that 'the empirical validity of the [inverse relationship] hypothesis is strengthened, not weakened, by the availability of better measures of land size collected using GPS devices' (Carletto *et al.*, 2013: 258). Though the prowesses of industrial agriculture practised on large monocultures are regularly boasted, this generally relies on productivity measures that focus either on total yields for specific crops, on productivity per worker, or on TFP; or it is based on cost–benefit analyses that incorporate neither the many social costs (to public health, to the environment or to rural development) of large-scale monocultures, nor the benefits small farms practising more sustainable forms of agriculture may provide (see per analogy, for a critique of traditional cost–benefit analysis to compare conventional agriculture with organic agriculture, Flores and Sarandón, 2004). Small farms relying on diversified agroecological systems are generally more labour-intensive, relying to a greater extent on family labour (which also significantly reduces the cost of supervision of labour), and they produce a diversity of outputs, some of which are reused on the farm (such as fodder for animals): though these farms are generally not competitive, they are technically efficient in the use of resources, and beyond a certain size the total output per hectare is in fact quite high (IPES-Food, 2016: 56). Yet, the narrative of scarcity – and of the urgent need to 'scale up' food production – is dominant, and appears to favour the solutions preferred by the larger agrifood industry players.

Finally, the influence of dominant actors of the mainstream food systems on the direction of research and development and their political influence are both maximised by lifestyle evolutions. Consumers today – since a generation at least in rich countries, and more recently among the growing middle class in emerging economies – have little time to spend buying food and cooking, they have gradually been accustomed to relying on processed or

ultra-processed foods (tellingly referred to as 'convenience' foods), and the globalisation of food chains and the year-round availability of various foods imported from different world regions on supermarket shelves has removed relations of production and consumption from their local embeddedness (Giddens, 1990). Much has been written in recent years about the 'consumerist turn'. This refers to the fact that supply is increasingly driven by demand: the food industry is guided by the preferences expressed by consumers, so that we would be witnessing a shift from a 'from farm to fork' process to a 'from fork to farm' relationship (Spaargaren *et al.*, 2012b: 18–19). However, progress of 'green' and 'ethical' consumerism notwithstanding, the tastes and consumption habits of of the average consumer remain those that years of industrialisation and globalisation have shaped or, in developing countries, by the attractiveness of the Western diet.

5. Reform pathways

It seems therefore that we are caught in a vicious cycle: although the current system is deeply unsustainable, its various components have co-evolved and are mutually reinforcing, and they have come to form a coherent whole with a strong in-built inertia (Figure 1).

Moreover, neither politics nor critical consumerism alone seem capable of breaking the cycle. It is therefore tempting to turn to grassroots innovations – 'citizens-led', or 'bottom-up' – as an alternative pathway to reform. Each of

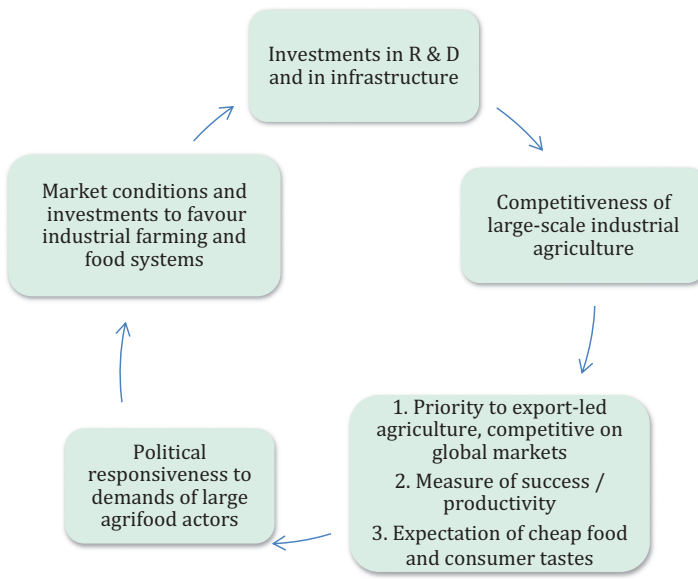

Fig. 1. The mutually reinforcing components of the mainstream food system.

these pathways to reform is discussed below, and their respective promises and limitations highlighted.

5.1. Political reform

Governments have an important role to play in aligning economic incentives with the requirements of sustainability, by the imposition of Pigovian taxes forcing the internalisation of negative externalities. They could also support good practices, and reward the ecosystem services provided by sustainable agricultural production: attempts at valuing such services or, conversely, at 'full cost-accounting' of the impacts of industrial food systems, prepare the ground for such interventions (TEEB, 2015). Governments could also tackle imbalances of power in food chains. Though lessons from past historical experiences are mixed, democratically governed farmers' cooperatives could allow smaller-size farming units to have better access to certain public goods and to strengthen their bargaining position vis-à-vis both input suppliers and buyers – establishing what J.K. Galbraith called a 'countervailing power' (Galbraith, 1952). And they could use competition law to address the question of concentration or abuses of dominant position, including by prohibiting certain specific forms of abuse of buyer power (De Schutter, 2010).

However, the political economy issues referred to above provide little hope that these opportunities will be fully seized by governments: in addition to the capture of politics by the dominant actors of the mainstream food system, any serious attempt at reforming food systems that could lead to an increase in the price of food would meet with strong opposition, as cheap calories have until now functioned as a de facto substitute for redistributive social policies that would allow all families, including low-income families, to have access to healthy diets. As to competition policy, its use will be limited as long as 'consumer welfare', narrowly defined as access at an affordable price to a large range of foods, remains the most important factor taken into consideration in using the legal tools available to public authorities (De Schutter, 2010).

It is even less clear that governments are very effective in reshaping consumer behaviour, by encouraging a switch to more sustainable diets – diets that are healthy, that reduce the ecological footprint of food, and that ensure food producers and other actors in the food systems are equitably rewarded for their work. In addition to ideological objections to what may be perceived as a paternalistic attitude of the State, the tools that public authorities may seek to use in order to effect such behavioural changes have a limited impact. Information about risks associated with unsustainable types of food production, particularly environmental risks, shall be processed by various groups of the population in order to reduce the cognitive dissonance between the data they are provided and the cultural values they adhere to (Kahan *et al.*, 2007). The so-called 'white-male' effect in risk perception is such that, for those occupying a dominant position in society, more and better information

improving their scientific literacy or their numeracy shall not lead them to assess risk in accordance with the warnings of scientists, in areas such as climate change where the risk tends to be underestimated: on the contrary, it seems that they will rather use this gain in understanding to strengthen their scepticism, as if unwilling to recognise information that runs counter to their interests (Kahan *et al.* 2011). While this may be comforting to the individual (and may be said, therefore, to be 'rational' from the individual's point of view, as the discomfort of cognitive dissonance is minimised), the consequences for society are clearly sub-optimal, presenting us with a collective action problem which Kahan *et al.* (2011) have called the 'tragedy of the risk-perception commons': it calls for a science of communication about risk that can take into account the fact that we live in culturally diverse and pluralistic societies, and that each sub-group within society may have to be addressed differently for the social norms within the sub-group to evolve (Higgs, 2015).

Another limitation of public action to influence eating behaviour is that, as anticipated many years ago by what social psychologists labelled 'reactance' theory (Wicklund, 1974) – the theory according to which individuals resist adopting conduct that they perceive to be imposed on them from without – researchers now insist on a shift of attention from extrinsic to intrinsic motivations. The work of Richard Ryan and Edward Deci provides perhaps the most explicit attempt to demonstrate the importance of intrinsic motivations in explaining individual behaviour (Ryan and Deci, 2000a, 2000b; Moller *et al.*, 2006). The so-called 'self-determination theory' they pioneered emphasises that lasting behavioural change depends on individuals acting on the basis of their own values and deeply held beliefs, or the self-image they wish to maintain in their own eyes, rather than external rewards or penalties. Interventions 'from above', whether in the form of top-down regulation or in the form of economic incentives, may be insufficient to disrupt the routines in eating behaviour and to bring about the change at the desired scale.

5.2. Green capitalism

If solutions cannot be expected to come from governments, should we count on business actors to lead reforms towards sustainable food systems? There is no shortage of examples of regime actors, at different segments of the chain, advertising their commitment to more sustainable practices (Oosterveer and Spaargaren, 2012; Pattberg, 2012; Hajer *et al.*, 2015). They know that the first movers will be rewarded by certain investors and, increasingly, clients. For corporations who wear a recognisable brand moreover, their reputation is a major asset that deserves protection. There are, however, two major limitations to what can be achieved through this channel.

First, to the extent that the emphasis is on voluntary initiatives by companies, acting on their own motion, the argument that such initiatives from dominant economic actors can bring about a transition to sustainable food

systems relies largely on a 'business case' for responsible business conduct. This is not entirely without foundation, considering the progress of socially responsible investment, of ethical consumerism and, increasingly, of shareholder activism: Hartmann (2011) reviews the results of four mathematical meta-analyses that tend to show a positive relationship between CSR practices and a company's financial performance. However, if that is indeed the argument, it may imply – or be understood to imply – that where it is not profitable to invest into sustainability policies, companies shall not do so: they may not go further in the implementation of such policies, in other terms, than what appears economically sound. Socially responsible conduct might come to be treated like an investment decision among others: before engaging in such conduct, the company will seek to assess the anticipated benefits and related revenues relative to the costs, in the same way that it makes such assessments for other investment choices. As such, the potential for voluntary initiatives is inherently limited. As noted by the authors of the *Responsible Competitiveness* report published in December 2005 following 2 years of research on the relationship between responsible business behaviour and competitiveness, 'individual businesses cannot go against the grain of the market. Being responsible sometimes does and sometimes does not pay. (…) While the growing significance of intangible assets has created opportunities for leveraging responsible business practices, the intensification of competition and the short-termism of investors constrain such practices' (Zadek *et al.*, 2005).

The 'business case' itself is, moreover, a fragile one. Any credible demonstration that there exists a 'business case' for socially responsible practice would need to carefully distinguish between the different initiatives which might be adopted by a company to improve the sustainability of its practices, and between the short-term and the longer-term impacts. It would also have to consider the cost of such policies being implemented in the first place. Such implementation may impose, for instance, burdens of a bureaucratic nature on the company, require training of the human resources personnel, or expose the company to more searching scrutiny by civil society organisations, as when a code of conduct is adopted and publicised. (Paradoxically, since consumers' reactions are more significantly impacted by negative than by positive CSR information, given that consumers assess a firm's conduct from the reference point of an ethically sound behaviour and weigh 'losses' more heavily than 'gains', a firm may have more to lose by advertising its pledge to conduct itself ethically, at the risk of being more closely scrutinised, than by making no pledge at all – since only 'exceptionally positive behaviour' would be valued and rewarded by consumers (Hartmann, 2011, citing Kahneman and Tversky, 1979 and Creyer and Ross, 1997)). More importantly, to a large extent, the 'business case' builds on certain presuppositions about the motivations of consumers, employees or candidate employees, investors or public authorities, which may or may not be widespread, and which – in any particular setting – may or may not translate into a behaviour which rewards the best practices and sanctions the worst.

Second, the very proliferation of initiatives and associated labels may do more ill than good. Considerable asymmetries of information exist between the actors adopting these labels or boasting to conform with the best practices of the industry, and the average consumer. Consumers find themselves in a situation comparable to that of the (by now proverbial) buyer of used cars – Akerlof's 'lemons' (Akerlof, 1970) – if the individual consumer cannot really tell credible commitments from empty promises, the market actors will be tempted to opt for the least costly, and generally less constraining, option. If a number of initiatives and labels appear on the market and the consumer is unable to differentiate between them, the best practices will gradually be crowded out by the worst.

Whether it takes the form of the imposition of transparency requirements on corporations, in order to allow socially responsible investors and active shareholders to exercise vigilance on their activities (Blumberg, 1973; Branson, 1976; Williams and Conley, 2005), the monitoring of labelling initiatives in order to avoid consumers being misled, or the enforcement of codes of conduct, public authorities have a major role to play to ensure that voluntary initiatives by the private sector shall make a real difference in practice – something else, and something more, than an attempt at 'greenwashing' the company's reputation. Without the hand of the State, 'green capitalism', even though it may be fuelled to a certain extent by 'critical consumerism', may not bring us very far.

5.3. Grassroots innovations

Because of these various limitations that public action and business initiatives (the latter combined with critical consumerism) face in their attempts to drive the transition to sustainable food systems, researchers have emphasised the potential of citizens-led social innovations. In the agrifood sector, such innovations include for instance community-supported agriculture (CSA), in which people contribute to support local farmers by entering into direct producer-to-consumer marketing schemes, although they might have access to the very same products by less expensive and more convenient means; the joint management, by members of the same neighbourhood, of collective vegetable gardens; or fair trade schemes (Hinrichs, 2014). Depending on the theoretical framework used, these innovations are referred to as social innovations for sustainable development (Seyfang and Smith, 2007; Kirwan *et al.*, 2013), or (in the so-called 'multi-level perspective' on transition theory) as 'niche innovations', that must be nurtured and protected in order to provide alternatives to the mainstream regime following a crisis (Geels, 2011; Spaargaren *et al.*, 2012a).

Although individuals sometimes participate in such initiatives on the basis of purely interested motives, motivated primarily on health considerations (Fonte, 2013), most studies highlight that altruistic factors are predominant: people are ready to take part in CSA schemes, to expend time and labour

cultivating vegetable gardens, or to pay a premium for fair trade goods, because they care about the environment or about social equity (Bougherara *et al.*, 2009). Though the rewards to the individual are real, they are either a mere byproduct (for instance, participation in CSA schemes appears to have a positive impact on diets (Alaimo., 2008; Hale *et al.*, 2011; Allen *et al.*, 2016)), or they result simply from the 'warm glow' effect – in other terms, the satisfaction that individuals derive from contributing to the common good. In other terms, these social innovations either bring about their own rewards to individuals or are based on altruistic motivations, thus overcoming the collective action problem that is so often seen as an obstacle to pro-environmental behaviour.

What is the potential of these grassroots innovations for food systems reform? One possibility is that the grassroots innovation simply coexists with the mainstream regime, not temporarily but for a long period of time, thus creating a form of 'sociodiversity' within the food systems. On the one hand, this may create the risk of providing the government with a convenient pretext for delaying action to improve the sustainability of food systems: why, after all, should it intervene, if discontented individuals set up their own solutions, and if neighbourhoods or broader communities develop alternatives that satisfy their desire for fresh and healthy foods, at the same time strengthening social links between the participants (McClintock, 2014)? On the other hand, however, such a sociodiversity can be deeply subversive, obliging all actors in the food system to rethink their position, and to take responsibility for it: instead of escaping such responsibility in the name of the 'system' being so inert and beyond any ability for any single actor to change, each individual henceforth shall have to face the reality of different ways to produce and to consume, all equally viable, so that his or her choice inescapably becomes political.

Beyond this coexistence scenario, transition theorists see different ways citizens-led social innovations could interact with the mainstream, and potentially transform it (Geels, 2011). We may rank these possibilities from the more modest or 'reformist' to the more ambitious or 'revolutionary', and as Geels (2011) does, relate these various possibilities to different profiles of activists developing these innovations (as mapped in Dahle, 2007). The most reformist scenario is one in which the niche innovation is simply coopted within the mainstream regime, because it provides the regime actors with a convenient solution to local problems: this is what Geels labels 'reconfiguration'. Although it may occur that, once adopted, the innovations 'trigger subsequent adjustments,which change the regime's basic architecture' (Geels, 2011: 32), this scenario is essentially one in which the mainstream regime absorbs the innovation in order to perpetuate itself. Given how the regime is configured, with a number of components that are separate but mutually supportive as a result of their co-evolution, it is a very likely possibility.

A more transformative scenario (referred to as 'transformation') is one in which pressures from factors exogenous to the system, for instance resulting from the biophysical environment or from economic shocks, lead the

incumbent actors to rethink the system, while seeking inspiration from niche innovations without co-opting them as such. The niche innovations, in this case, may have triggered learning by the regime actors, but without displacing them: in fact, the regime emerges in an even stronger position than before the crisis. In the presence of pressure from the 'landscape' (the exogenous factors which have been referred to), another possibility however is that the regime is forced to change more fundamentally, so that a new regime configuration shall have to emerge. This may result either from a crisis leading to a breakdown of the regime ('de-alignment and re-alignment'), or from the pressure exercised by a niche innovation that cannot be co-opted without a fundamental realignment within the regime ('technological substitution'). Agroecology, as a set of agronomic techniques reducing the need for external inputs and prioritising diversity on farms (and interactions between plant varieties and between plants, trees and forests), is precisely such an innovation (Gliessman, 2007; De Schutter and Vanloqueren, 2011): in order for such a type of farming to develop on a large scale, it would be necessary to rethink whole aspects of the current food systems, including in particular the globalisation of food chains and associated trade and investment regimes, the use of subsidies, research and development efforts and the logistics (to facilitate local storage and processing) (IPES-Food, 2016).

6. Conclusion: Food democracy

Putting aside the possibility of a crisis of a magnitude such that the mainstream food regime shall be wiped out entirely to be replaced by something else – a 'de-alignment and re-alignment' scenario that is neither the most realistic nor the most desirable, given the human costs likely to be involved until a new equilibrium is found – we have a choice between maintaining and promoting 'sociodiversity', or working to ensure that promising niche innovations that prepare the emergence of more sustainable food systems shall influence regime transformation. Food democracy has a key role to play in this regard (De Schutter, 2014). Food democracy does not mean simply that elected politicians should work in the service of the public interest, and that they should be protected from capture. It means, rather, that specific bodies should be established, in which various stakeholders of the food systems construct a diagnosis of the food systems on which they depend and develop proposals for reform (Schiff, 2007; Carlson and Chappell, 2015). Food policy councils of that sort have developed since the 1980s in the United States and Canada, and they have emerged more recently in the United Kingdom. They have been institutionalised in a number of Latin American countries, Brazil taking a leading role in this regard. Many are established at the local or municipal level, often at the initiative of municipal authorities; others have been set up as initiatives of civil society; and some States show examples of food policy councils established at national level.

This development is important and promising, because of the potential for food democracy to overcome the obstacles to reform identified above.

Recommendations emanating from food policy councils can both broaden the imagination of elected politicians and ensure that they will be held accountable if they fail to consider solutions that have been successfully experimented with in certain settings. Such recommendations can also support local grassroots innovations, to ensure not only that they will be protected and nurtured, but also that they can be made viable and self-supporting by a gradual transformation of the market context and of the regulatory framework. In that sense, food democracy both supports representative democracy (making it more responsive to the demands of the public), and allows the flourishing of social innovations from which alternative food networks can emerge.

As to the individual consumers, they may choose to express by their purchasing practices their concerns about the direction and impacts of the mainstream food system – opting, for instance, for fair trade or organic products presented on supermarket shelves, or prioritising local or regional products ('voice'). They may invest time and energy in creating alternatives to the mainstream system, as actors in grassroots innovations ('exit'). And they may set up, and participate in, deliberative instances that institutionalise food democracy, to create the necessary link between the citizens' demand for change and the response of the political system ('vote'). It will take a Hirschman to study the interactions between these components of contemporary food activism (Hirschman, 1970): that is a task for tomorrow.

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