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The Sustainable Diet Question: Reasserting societal dynamics into the debate about a Good Diet

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Abstract.
This paper locates the notion of Sustainable Diet as the latest iteration in the long-term policy question: What is a 'Good Diet'? It reviews why there is tension over broadening the notion of a Good Diet to include the environment. It contrasts simple and complex approaches to sustainability for food systems and diet in particular. It proposes a multi-criteria approach to dietary analysis and to policy guidelines. The experience of a number of countries are summarised and analysed for sources of resistance and difficulty. It proposes that the socio-cultural dimension of Sustainable Diet requires further analysis but already offers promising avenues for change.

Good diets in flux: Sustainable Diets as interdisciplinary concept

What is a good diet? This is once more a powerful question within food policy and the everyday workings of the food system. First tentatively sketched in the early to mid-20th century, the policy model for food systems is being questioned not just for its impact on production but for what and how people eat. This paper explores how the notion of Sustainable Diets is now a key concept for those charting a way out of the difficulties currently ensnaring the food system. It considers how the concept has come to play this role within the modern critique of consumption, what is meant by it, and how it raises challenges for policy makers, food supply chains and consumers themselves.

Rethinking the model

The need to clarify and answer the question about a Good Diet contributed to the rethinking of agri-food policy from the 1930s, as well as before, during and immediately after WWII (Boyd Orr, 1966; Brandt, 1945; Le Gros Clark, 1947). Today it contributes the same urgency to overall food system policy direction as in that post-war reconstruction period. At the 1943 Hot Springs conference in Virginia, USA, 44 countries gathered for three weeks to map out a new policy direction (Boudreau, 1943; Hot Springs Conference, 1943). States were aware that the old order of boom and bust in agriculture could not be allowed to return. Those ideas were operationalised at the Quebec founding conference for the post war Food and Agriculture Organisation of the United Nations (FAO-UN) in October 1945. The Quebec conference, like Hot Springs, was lengthy (Phillips, 1981), contrasting with today's policy gatherings that last barely three to five days. Meetings of preparatory committees (Prep-coms) add to the duration, but can be as much about distilling out the agenda as setting it.

The theme of Sustainable Diets is likely to feature at the 2021 UN Food Systems Conference (UN, 2020). It is already a recommendation from systematic reports at the global (Willett et al., 2019), regional (Nordic Council of Ministers and Nordic Food Policy Lab, 2018)

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and national levels (Ministry of Health (Brazil), 2014a; Netherlands Scientific Council for Government Policy (WRR), 2015). This paper discusses how the idea of Sustainable Diets is coming onto the policy agenda, noting that in some countries, it is already emerging as a guiding principle, for example in the Netherlands (RIVM, 2017). In other countries its passage is more of a zig-zag – one moment looking to be important, the next moment pushed back, as happened in the USA in 2013-15 and the UK in 2009-10 (Lang and Mason, 2018a).

The diet question is a matter of considerable interest within and between scientific disciplines. Nutrition science tended to dominate the academic input to the definition of a Good Diet but other issues, criteria and disciplines now crowd into that policy space. Health is not the only arbiter of worth. Sustainable Diet is now a significant feature in the modern debate about desirable food systems. Inherited notions of Good Diet have been put into a state of some flux. The Mediterranean Diet may still be lionised as desirable nutritionally, and with sound nutritional justification (Bonaccio et al., 2017; CIHEAM and FAO, 2015; Dernini and Berry, 2015; Schwingshackl et al., 2015); but the Mediterranean regions do not necessarily follow it and others find the pattern culturally inappropriate. The growth of consumer capitalism and the nutrition transition means globally there is a trend towards severing past cultural patterns of production, consumption, and the connections between them.

Recognition that there needs to be more comprehensive guidance as to what populations consume, and how that food is grown processed and distributed, is now pressing in on policy makers from many sides. Calls for dietary change have come from scientists from many fields. How food is grown and consumed is a driver of many problems, which means the case for change is both far-reaching and difficult. It may be possible to provide elegant critiques of the 'eat anything you like' ethos of consumerism, for example, or of the supremacy of nutrition science in defining dietary responsibility. But what can be done if dietary change is hard?

Sustainable Diets thus represent a societal process of redefinition. It is being proffered as a new benchmark for a good or desirable diet. It carries moral and cultural as well as practical implications. For instance, the scientific consensus that rising levels of meat and dairy consumption worldwide, particularly in affluent societies, need to be reined back means that land use, agricultural practices, and the definition of efficient food production are all being reconsidered. Such messages can meet firm resistance yet the evidence continues to mount from population-scale studies that human and ecosystems survival depends on reducing the trends towards diets rich in ultra-processed foods high in salt, fats and sugars; with high intake of meat and dairy; and often lacking in fresh plant-based foods particularly fruit, vegetables, nuts and seeds (Willett et al., 2019; Monteiro et al., 2018; McMichael et al., 2007).

The state of diet, often presented as an individual or domestic responsibility, is now being recast by a broad scientific call to change how industrialised economies have developed food systems over the 20th century. The food system is now widely accepted to be undermining the infrastructure on which human well-being ultimately depends. This includes: potable water availability (Hoekstra and Mekonnen, 2012); soil health (Amundson et al., 2015); phosphate use in farming (Blackwell et al., 2019); mineral extraction (Withers et al., 2019); land use and biodiversity loss (IPBES, 2019); climate change (Willett et al., 2019); plastic food packaging waste (Smith et al., 2018; Geyer et al., 2017); sea life viability (Rogers and Laffoley, 2013); food contamination (WHO, 2020); (); the state of wildlife (Gladek et al., 2016); energy use in transport (IEA and OECD, 2009); food's role in spreading antimicrobial resistance (Review on Antimicrobial Resistance, 2016; Wellcome Trust and Good Business, 2015; Verraes et al., 2013); and the normalisation of non-communicable disease ranging from diabetes type 2 to cardiovascular disease (Imamura et al., 2015). These specific impacts are in themselves weighty, but collectively they have led to a broader systemic questioning of the great success of post-WWII agri-food industries, namely the vast increase of output and capacity to feed more people more calories. The success of post-1945 policies was to cut the proportion of

people living in hunger (Grigg, 1981; Shaw, 2007), even though the number has remained stubbornly just below a billion people(FAO et al., 2019). This success has come at a cost: the increasing use of non-renewable resources, narrow application of efficiency criteria to the detriment of human and environmental values, diets lacking nutrient density, and land use dominated by commodity production (Marsden et al., 2018; Marsden, 2017). The model of agri-food efficiency has been driven by and accompanied a massive concentration of economic power off the land and, while farming is the largest employer on the planet, the profits and added value flow off the land (Lang and Heasman, 2015; Howard, 2016).

The policy problem: addressing complexity

The notion of Sustainable Diet has entered public policy discussion, it is being argued here, because the connection between human health and ecosystems health is once more being fundamentally questioned. Whether there is yet a complete paradigm shift, in the sense of major policy reorientation, is yet to be apparent. Certainly so far, however, the food debate is in keeping with the scientific concern that the planet might have entered a new era, Anthropocene, in which humanity's footprint is indelibly stamped into geology and the biosphere (Steffen et al., 2009), and that food consumption, not just its production, processing and distribution, is part of that shift. The Good Diet question has raised and now faces the distorted normality of culture, economy, health, and environment. Themes central to the long sociological debates about global food supply and the shape of societies have risen up the mainstream policy agenda – discussed at forums such as the World Economic Forum, the OECD and UN. The apparent policy success in tackling the pre 1940s era of hunger and under-production of cereals and animal products has long been questioned by evidence about persistent global hunger, but now has also to address the more complex pattern of co-existing under-, over- and mal-production and consumption (Lang and Mason, 2018b).

Nothing symbolises this complexity more than the double burden of obesity and overweight co-existing with hunger (Frongillo and Bernal, 2014; WHO, 2017). The double burden is manifest within, as well as between, nation states; even low-income economies have rising incidence of overweight and obesity. How then can policy address this new enormous challenge? The preliminary answer is that despite growing knowledge that food is a major driver of humanity's footprint, the policy situation is essentially unchanged and collectively weak. To take one specific example: bird populations are globally under threat, with one in eight of all species judged at risk, a 40% increase over 1988-2018 (Birdlife International, 2018). Yet an estimated US $243 bn was spent in 2019 on agrichemicals (pesticides, insecticides, herbicides) whose purpose is to destroy the life forms on which wild birds depend (Garside, 2020) and at the same time removing a source of biological pest control. In this period, the power of agrichemical and seeds companies has concentrated: whereas 13 companies dominated world markets in the 1990s, this has shrunk to five (Nishimoto, 2019). Agrichemical potency has also increased (PAN-UK, 2018).

This is policy failure on a planetary scale and mixed messages about problems without adequate responses. This is why the entry of Sustainable Diet into food policy can be seen as rational but also posing a 'wicked' problem, in the sense it raises seemingly intractable cultural and social problems while levels of complexity exceed the capacity of consensual solutions (Rittel and Webber, 1973; Levin et al., 2009).

The initial interest in the juxtaposition of human and environmental health, which first framed the academic notion of Sustainable Diets in the 1980s when two US nutritionists argued that nutrition advice for consumers should include diet's environmental impact (Gussow and Clancy, 1986), has now grown into a discussion about whether it can be dealt with in that dualistic framework of 'human health + environmental health', or whether a more complex

multi-criteria policy analysis is required (Lang and Mason, 2018b, 2018c). While Sustainable Diet remains mostly associated in public consciousness, if there at all, with those two 'healths' – human and environmental - the policy and scientific analysis has expanded considerably. It has introduced other features and dynamics well beyond health and now includes aspects under the broad headings of economic (e.g. jobs, costs), socio-cultural (e.g. inequalities of access) and quality (e.g. cosmetic versus intrinsic) characteristics. These thus draw in governance and political consideration (e.g. decision-making and trust) (Mason and Lang, 2017). While this may appear to detract from the environmental urgency of what constitutes a 'good diet' for modern times, the apparent incapacity of the world to face the enormity of food's impact has inevitably led scientists to give more attention to policy making that they dreamed of doing a few decades ago. The powerful effect of independent scientific advice to policy makers, such as from the Intergovernmental Panel on Climate Change (IPCC) or the more recent Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) have provided case studies of reworked relationships between science and politics(IPBES, 2018; IPCC, 2019).

This complexity for policy makers should be no surprise. As social historians and social scientists have shown, when changes to land use and food consumption are shaped by ethics or politics, sensitivities can be high (Stuart, 2006). In the 1970s, Western counter-culture, for example, began to view dietary choice through various cultural lenses, framed not just by the pursuit of the new but also by seeking softer impacts and recognition that personal health, environmental viability and kindness to animals were political issues within consumption. Domestic cooking and food choice as environmental and personal politics was proposed by books such as *Diet for a Small Planet*,(Lappé, 1971) and social movements such as feminism which partly questioned and partly championed female association with food (Adams, 1990) and the back-to-the-land and organic movements (Conford, 1988; 1992; 2001). Within contemporary cultural politics it is to be expected, then, that food consumption practices take on heightened sensitivity.

The linking of two seemingly innocuous and widely used words – sustainable and diet – has thus raised questions about what a good diet is and how its sourcing and modes of production are factors in its definition. Academically, as well as politically and practically, the Sustainable Diet Question is now a test for *whether* and *how* scientific knowledge can be meaningfully integrated, while posing a major challenge for policy makers. The rational policy model that sees evidence as being translated into policy and thence framing behaviour does not fit what has happened in reality.

The formalised meaning of Sustainable Diets

The concept of sustainable diet is 'plastic' in that it can be pulled into many shapes. It shares this malleability with the notion of food security (Lang and Barling, 2012; Berry et al., 2015). Policy making realities mean there is an inevitable tension between those on the one side who see advantage in 'keeping it simple' (for example reducing it to 'calories + carbon'), and those on the other side who understand that it is intrinsically complex in concept and operationalisation. As the scientific data mount as to why sustainability of diet is multi-dimensional and complex, pragmatists can argue that this probably consigns Sustainable Diets to the 'too hard to handle' or 'postpone till later' categories in the policy toolbox. The need to negotiate such tensions is why more attention has to be given to insights that come from policy analysis and demands from decision-making forums. So far over the last two decades, most pressure and interest in Sustainable Diets has come from mounting scientific evidence. As so often among scientists, the working assumption has been that, if there is strong evidence for change, surely policy and practice must change to address that evidence. This is not necessarily

so. The rational and linear model of change which can be characterised as evidence → policy → practice often illustrates how it is not delivered, nor even appropriate in food policy (Lang et al., 2009; Parsons et al., 2018; Lang and Mason, 2018b). While evidence for sustainable dietary change increases yet action falters. This paper returns to that problem in later sections. Meanwhile, a clarification of the meaning of Sustainable Diet is required.

The most cited definition of Sustainable Diet was produced by the large scientific workshop and report in 2010 hosted by the FAO and Bioversity International (FAO et al., 2010):

> "Sustainable Diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources."

This is honourable and aspirational – declaration: the present author chaired that process - but, as the workshop from which it stemmed showed, clarification of which criteria are used to decide what is or is not sustainable is needed. The FAO-Bioversity definition cited above is an excerpt from a longer four-page definition, but it recognised the following as key criteria: nutrition, culture, supply, economics, health and environment. It implies social, biological, and material resource impacts. It combines short and long-term effects.

Back in the mid-1980s, when the first academic paper articulated Sustainable Diet as the need to bridge nutrition and environment, Joan Gussow and Kate Clancy highlighted food consumption as the link between environmental and public health. It captured the personal as the eco-political (Gussow, 1978, 1999) and made an intervention into an evolving policy area at the US federal level, the newly approved Dietary Guidelines for Americans (DGA). These had first been issued in 1977 following a much publicised Senate inquiry led by Senator George McGovern (McGovern Report, 1977). This had reviewed the status of US diets and made the first DGA to address the gap between public health reality and desirability. The DGA motive was to improve health education, and by 1990 DGAs were required by law to be updated every five years. In the new legally framed process, the US President has to institute a review of scientific evidence to inform the regular update of the official DGA. Two federal institutions, the Department of Health and Human Services (HHS) and the US Department of Agriculture (USDA), are mandated to work together and encourage US consumers to follow the guidelines.

This formal process did not exist when Gussow and Clancy presented their 1986 argument but in 1980 there had already been an update of the first 1977 McGovern DGA; this second set being conducted by HHS and USDA (USDA and HHS, 1980). A third GDA was produced in 1985, again as a voluntary collaboration between HHS and USDA. The 1990 legislation simply consolidated and mandated a process which had already had two runs, and which the two nutritionists knew was set to be part of the US food policy terrain. That terrain included some commercial opposition from powerful agri-food interests (Nestle, 2002; Wilde, 2013). Partly in response to that contestation, a Dietary Guidelines Advisory Committee (DGAC) was to be appointed for each 'round' of revisions (U.S. Government, 2020). Thus, over two decades, the idea of national nutrition-focussed dietary guidelines transitioned from a first articulation (the McGovern guidelines) into the current routinized process of GDA revision and promulgation. The 2025 revision process is already underway.

The evidence of food's environmental impact was already sufficient for Gussow and Clancy to argue for a broadening of the GDA to incorporate environmental requirements. Yet it took a quarter of a century before the DGAC made their own recommendations for such inclusion following its report on diet's environmental impact (Merrigan et al., 2015; Dietary Guidelines Advisory Committee, 2015). This too was brushed aside by the two secretaries of state – and vehemently so by the Agriculture Secretary. An inevitable behind doors policy tussle ensued, amplified by an immediate outcry from civil society and scientific communities.

An unprecedented flood of submissions was made to the DGA consultation website, to no avail also. The 2015 GDA when published contained no integrated environmental advice (DHHS and USDA, 2015). Members of the DGAC were privately furious at their evidence being sidelined – this was under President Obama, note – and quickly produced a revised systematic review of their data, published in peer-reviewed journal, arguing the case for including environmental factors into the DGA process had actually strengthened (Nelson et al., 2016). This US experience illustrates just how 'wicked' the notion of Sustainable Diet can be even within established policy processes.

At the global level, meanwhile, the role of dietary guidelines was also in some flux. At the 1992 International Conference on Nutrition, the Food and Agriculture Organisation (FAO) and the World Health Organisation (WHO) had called for urgent improvement in population nutrition (FAO and WHO, 1992). Member states were recommended to produce food-based or nutrient-based dietary guidelines with more specific advice given subsequently (FAO and WHO, 1996; WHO and FAO, 1998). Not all countries have done so.

The FAO-WHO policy logic was simple, that guidelines send signals throughout the food system from production to consumption and can and should reshape both. The UN, however, is purely advisory; member states need to ratify their own legislation and to implement guidelines. Health, even in the European Union (EU), is a member state responsibility, but Europe in fact has a high level of approval (EFSA, 2010). A 2019 global study showed that only 90 countries have created food-based dietary guidelines since the 1980s: 7 in Africa, 17 in the Asia Pacific region, 33 in Europe, 27 in Latin America and the Caribbean, 4 in the Near East, and 2 in North America (Herforth et al., 2019).

Nutrition and dietetic scientists understandably could argue that, faced with what appears to be an uphill task, it might be better to leave DGAs to nutrition alone or at best aim for the simplest form of sustainable dietary advice. This is usually couched as the 'carbon + calories' approach, an overlap for which there is good evidence. If populations ate as advised by nutrition and food based guidelines, their dietary emissions of CO_2e would drop (Green et al., 2015). Equally, if environmental criteria are applied to dietary change, there are improvements in human health (Milner et al., 2015; Scarborough et al., 2012); evidence that supports the initial Gussow and Clancy idea.

There is a problem, however, if climate change is taken as the sole proxy for environment. And this would also ignore other well evidenced determinants of diet such as social divisions, cultural preferences and economic circumstance. The social sciences have long shown that social factors shape food intake (Germov and Williams, 1999; Fieldhouse, 1995 [1985]). The only surprise is that nutrition policy seems to have underplayed this, when the history of nutrition science shows it developed from studies of the importance of social factors in diet (Mason and Lang, 2017). Studies by Atwater on diverse working conditions in the USA (Atwater, 1891; Atwater, 1894) and Rowntree on social deprivation and labour inequalities in the UK (Rowntree, 1901; Rowntree, 1921), evidenced how diet is socially constructed. Von Liebig's pioneering work on minerals in Germany, Boussingault's in France, and long-term studies by Lawes and Gilbert in Rothamsted, England, all showed the complexity of environmental factors on food and diet (van der Ploeg et al., 1999).

To reduce 'sustainability' to carbon or the need for varied nutrient intake to calories would be a diminution of both environmental and nutrition sciences. Neither the environment nor society have simple effects on diet. When the Brazilian Ministry of Health promulgated new dietary guidelines, rather than extol their environmental impact and necessity, it was tested and promoted at the population level as a cultural good with health benefits (Monteiro et al., 2015; Ministry of Health (Brazil), 2014a; 2014b). This is why much contemporary work on Sustainable Diets accepts and adopts a multi-criteria approach, using more than CO_2e or

climate, but including other environmental features (Springmann et al., 2018; Willett et al., 2019; Lang and Mason, 2018a).

It has been shown, thus far, how the richness of the concept of Sustainable Diet lies partly in its reassertion of the need for integration of academic disciplines. No one discipline 'owns' it. But if no one owns it, all can park it. It can be a problem which falls between policy responsibilities. Academics from diverse disciplines are now aware of this danger, recognising that in an era when highly specialised knowledge is fragmented into sub-disciplines, it is important to be able to tap into other strands of disciplinary knowledge. Nutrition science, for example, is often located as a branch within the Life Sciences when it has strong and deep social and environmental traditions, too. Other wicked problems such as obesity are forcing nutritionists to link and update those traditions (Lang and Rayner, 2007). Rather than assuming that a 'good' diet can be reduced to one or two essential key features such as 'carbon + calories', diet has to be recognised as intrinsically multi-factorial. Clark and colleagues have shown, as have others, that foods associated with the largest negative environmental impacts—unprocessed and processed red meat—are consistently associated with the largest increases in disease risk (Clark et al., 2019). Although there are correlations between carbon and calories in diet, the relationship is not unilinear. Increasing consumption of sugar, for example, might be negative for health but not necessarily have equally negative environmental impact. Increased consumption of fish might be deemed good for health but can add to problems at sea. This study showed how even increasing consumption of one serving a day of 15 foods had marked effects on 5 health and 5 environmental effects.

Applying theories of policy change

The FAO-Bioversity symposium which produced the much-cited definition of Sustainable Diet recognised that there is no one criterion for 'good' diet, only multiple criteria (Burlingame et al., 2012; Burlingame and Dernini, 2012). That this can be threatening to some interests, and suggests a shift in policy emphasis mostly on production to a more systemic orientation, is now clear. But what to do about it?

The challenge made by the Sustainable Diets discourse for food policy is that it reasserts the need to negotiate these multiple meanings, traditions and factors (Reynolds et al., 2014). The problem is how? With what model of policy change? The popular models of policy change analysis such as punctuated equilibrium (Baumgartner et al., 2014), advocacy coalitions (Sabatier and Jenkins-Smith, 1988), or actor network theory (Latour, 2005), are appropriate for analysing what has happened more than guiding what might be made to happen. They help analyse processes rather than how to meet goals. Today, that policy space is mostly dominated by theories of behaviour change drawing upon behavioural economics (Brinsden and Lang, 2015a; Brinsden, 2020). This terrain has tended to be dominated by micro behavioural change approaches such as 'nudge' theory (Thaler and Sunstein, 2008). This has been criticised in particular for being unable to address macro-societal change of the kind to which the Sustainable Diet arguments point (Mols et al., 2015; Rayner and Lang, 2011; Wise, 2011). Many early proponents accepted that boundaries and responsibilities in the approach were personal (Halpern et al., 2004). Nudge might be effective in engendering discrete and specific behaviours (Vlaev et al., 2016), but less so for 'multi-channel' action such as is implied by a shift to sustainable diets.

Aware of the financial power of advertising and marketing, some food policy analysts turned to social marketing as a possible cultural counterweight (Andreasen, 2002; Hastings, 2007). Few public interest funders, however, have deep enough pockets to be able to push back the enticement to consume unhealthy products such as confectionary or soft drinks. The largest world's largest soft drink manufacturer, for instance, in 2015 had a marketing budget of $4 bn,

twice the size of the entire WHO budget and dwarfing the WHO budget for promoting health, a mere $0.39bn (Mason and Lang, 2017). Thus, whatever the evidence or intellectual case for a transition to Sustainable Diets, experience so far suggests it might be overwhelmed before it has even had a chance to begin.

But could the apparent weakness of Sustainable Diet – that no discipline or interest owns it – actually be a potential strength? In an era when academic disciplines are highly specialised and fragmented into sub-disciplines, Sustainable Diet requires collaboration across conventional boundaries. Narrowing it to one or two essential key features such as 'carbon + calories' is to denude its essential multi-factorial nature. In a multi-level (global to local), multi-sector (farm to fork), multi-actor (state, civil society, commerce, science) food world, there is no one criterion for 'good', only multiple criteria, as the FAO-Bioversity definition symposium recognised and its subsequent account amplified (Burlingame et al., 2012; Burlingame and Dernini, 2012). Sustainable Diet, surely, has to be viewed through a multi-criteria lens. When food choice generally is recognised to be a juggle by consumers of many factors and criteria, why should Sustainable Diets be any different? The appeal for change, thus, should draw upon that diversity rather than rule it out of order *a priori*.

Multi-criteria analysis for a multi-headed problem

Multi-criteria analysis (MCA) is an approach well developed within science policy and has been applied for diverse circumstances (Stirling, 2006; Burgess et al., 2007; Li et al., 2019). Its attraction is that it *accepts complexity as the starting point for policy making*. Within economics MCA tends to be addressed – but does not necessarily need to be addressed – by the language of 'trade-offs'. A gain in one aspect of diet is likely to be offset by a loss in another. The delicacy comes in ascribing values - what matters most? – and measures to apply to help policy makers decide. The most widely used MCA approach is cost-benefit analysis (CBA) with monetary value as the common indicator. At least one manual even fuses MCA into CBA (DCLG, 2009; Alessio and Philippe, 2013). This operational research approach offers pragmatic but mostly monetised routes for decision making. As this approach to MCA has been applied, it has also inevitably met the problem already explored for sustainable diets, namely the fluidity of values rather than just value (Lang, 2010). Different social actors do not necessarily share the same values (Macharis and Bernardini, 2015).

This is why multi-criteria analysts often involve multiple stakeholders into a process of collective decision making; no single interest group is assumed to have dominance. MCA studies turn to modes of engagement such as citizen juries and assemblies or other methods of deliberative democracy to face this issue of values (Gutmann, 2004; Miller, 1992; Stirling, 2006). The alternative when facing multi-factorial nature of a problem is to cede power in decision making to existing governance processes or, in extremis, to impose change via top-down decision-making. This may be appropriate in crises – it is what happened in Covid-19 worldwide – but might not be acceptable for a matter such as a transition to Sustainable Diets. A multi-criteria analysis approach to Sustainable Diet was developed in 2008-10 by the UK Government's Sustainable Development Commission in tandem with the development of new national food security indicators and a national food policy following the financial and commodity crisis of 2007-08 (Defra, 2010a, 2010b; Cabinet Office Strategy Unit, 2008) Regrettably, this was halted with a change of government. Had it continued, the proposition was that the complexity of food sustainability would be addressed under six broad headings: food quality, health, environment, socio-cultural, economy and governance (see Table 1). Under these headings, other more specific issues could be grouped. This taxonomy provides a common framework which could bring diverse but still wide topics into the policy terrain and has been used in detailed exploration of the connections across the different headings (Mason and Lang, 2017; Lang, 2020). The topics listed under the headings can be relocated under

others. Food choice, for example, can and should be addressed under economics but also Health and Quality. The term 'water' under Environment could be analysed through the lens of 'embedded' or virtual water within a particular food product, or national economies, or under Economy as a cost, whether externalised or fully internalised (Hoekstra and Mekonnen, 2012; Mekonnen and Hoekstra, 2012; Vanham et al., 2013).

Why the Policy reluctance over Sustainable Diets?

Progress in achieving wide-scale adoption and promotion of Sustainable Diets has been slow and at best patchy. Actual and potential sources of opposition or delay can be identified. They can be any or all of commercial, ideological, political, intellectual, cultural and scientific in intent. And the state of policy can reflect a range of overt to covert, general to specific, and ideological to pragmatic reluctance.

Commercial resistance is in some respects the easiest to understand. Powerful farming interests, particularly animal-based industries, have already been threatened by the emergence of strong advice to cut back on consumption of meat and dairy products. The FAO presented data in 2006 suggesting that the growth of livestock production was causing excess environmental damage (Steinfeld et al., 2006). This report led to an outcry and pressure to repeat or soften the findings but a later review essentially repeated the policy implications (Gerber et al., 2013), while acknowledging that cattle can play a beneficial role in agriculture: using lands which otherwise cannot be cropped, converting the inedible (for humans), sequestering carbon into soil, maintaining some forms of biodiversity, and providing vital basic income in many low income economies. Those caveats did not reduce the original powerful argument that the problem is scale: how much is consumed, in what ways, and how often (Fairlie, 2010). This had long been powerfully put as a problem within US agri-politics in particular, from Sinclair's 1906 exposé of dangerous conditions in the Chicago cattle and meat trade, which spawned the US food acts (Sinclair, 1906; Sinclair, 1985 [1906]), through to wider critiques today (Rifkin, 1992; Jacobson, 2006; WCRF, 2018). With the trends showing rising meat production and consumption globally, policy concern also rises, and this puts pressure on nutrition guidance. Rising meat and dairy consumption are hallmarks of the rapid nutrition transition globally (Drewnoski and Popkin, 1997; Popkin, 1994, 1998, 2017). Even low and middle income economies are rising up the slope (GloPan, 2016; Baker et al., 2014). And this is associated with a rising intake of 'ultra-processed' foods which are high in fats, salt and sugars (HFSS foods): the kind of foods which tend to be generously marketed, are cheap and with long shelf-life.

Table 1. A Taxonomy for Sustainable Diets and Sustainable Food Systems

Policy group	**Features which could contribute to food sustainability**	**comment**
Food quality	taste, seasonality, visual appeal, freshness, authenticity	Essential for cultural appropriateness
Health	safety, nutrition, equal access, availability, affordability, information, education	Importance of these varies by geography and economy
Environment	greenhouse gas emission, energy use, water, land use, soil, biodiversity, waste	All already feature in Sustainable Diet discourse but not evenly
Social values	pleasure, culture, identity, status, animal welfare, ethics, justice, trust, skills, citizenship	Socio-cultural features warrant higher profiles within Sustainable Diets
Economy	food security, resilience, affordability, price / cost internalisation, efficiency, competition, fair returns, employment, working conditions, choice	Some are measurable; others are 'looser' but require policy attention through a sustainability lens e.g. 'fairness' and 'efficiency'
Governance	decision-making, science evidence base, transparency, democratic accountability, ethical processes	These are essential as both societal processes and in relation to trust in food

Source: adapted from Mason & Lang (2017)

A second potential source of opposition is a concern that injecting environmental and other considerations into nutrition guidelines is a disruption and deviates attention from the long-haul of trying to get populations to take nutrition qua nutrition seriously in dietary choice. But how actually useful or effective are current State guidelines on food and health? The 2019 EAT-Lancet Commission's modelling confirmed the earlier FAO studies' evidence that meat and dairy products tend to have far higher environmental impacts per food serving than fruit and vegetables direct for human consumption, when measured for greenhouse gas (CO_2e) emissions, land use, energy use, acidification potential and eutrophication potential (Willett et al., 2019). Using EAT-Lancet recommendations as a benchmark, a subsequent 2020 study showed that countries which have food-based dietary guidelines (FBDG) have an average 15% reduction in premature mortality and 13% reduced greenhouse gas emissions (Springmann et al., 2020). But a third of the 85 national FBDGs studied were incompatible with the agreed health agenda on non-communicable diseases, and 67%- 87% had elements which were incompatible with the Paris Climate Agreement and other environmental targets! The study showed that if these FBDGs were to adopt the EAT-Lancet recommendations, there would be 34% greater reductions in premature mortality, more than three times greater reductions in greenhouse gas emissions, and general attainment of the global health and environmental targets. It suggested that the FBDGs of the UK, US, and China were actually incompatible with the climate change, land use, freshwater, and nitrogen targets, and that if those three countries adopted guidelines in line with the EAT-Lancet Commission recommendations, the UK would increase the number of avoidable premature deaths by up to 104,000 a year, by up to 585,00 in the USA and up to 1,802,000 in China. Thus far from needing to inject the 'environment' into dietary advice, they need a complete overhaul in line with sustainable diet and multi-criteria thinking.

A third source of opposition is ideological. This can veer into the abstract, for instance in arguments that climate change or biodiversity fluctuations have always occurred so there is little concern about a few degrees rise or species lost. Such arguments distil down into intellectual arguments about choice and individual liberty, on the one hand, or uncertainty in science, on the other. Diet is a personal matter from which governments and other powers should be kept away. The difficulty here is that personal choice is a fine principle if there is any. The evidence on food's impact on society and environment is that how the affluent have been eating and how progress has been defined is now being seen as a driver for reducing choice and destabilising the food economy. Choice, moreover, is not an on-off switch. Choice is framed by social circumstance, accident of birth, gender, class, history. The argument for Sustainable Diets is that it encourages a population-scale understanding more appropriate to the conditions of 21st century consumption and production.

Sweden, for example, began to have official discussion and advice on sustainable lifestyles in the early 2000s (Institute of Food Sciences (Sweden), 2005; Ministry of Sustainable Development (Sweden), 2005; Ministry of the Environment Sweden and UN Environment Programme, 2011). In 2009 it produced what is believed to be the first Official Sustainable Dietary Guidelines (OSDG) (National Food Administration and Sweden's Environmental Protection Agency, 2009). These were then notified to the EU only then, for reasons still being debated, to withdraw them in 2010. There is a debate about whether pressure came from the European level – a consequence of US commercial pressure or arcane matters of EU single market trade - or that Sweden recognised that its advice would not work within the Single Market. It came back to the issue producing new guidelines arguing for sustainable diets on cultural grounds in 2015 (Livsmedelsverket and National Food Administration (Sweden), 2015).

Brazil's policy trajectory is another interesting example. A scientific revision of existing national nutrition-based guidelines was set up in the early 2010s. The expert process

decided to stick to nutrition-focussed advice but environment 'tested' them and consulted widely with the Brazilian public. Like Sweden, having produced new guidelines, it promoted the messages more as cultural responses to the nutrition transition than either health qua health or environmental (Ministry of Health (Brazil), 2014a, 2014b).

In Australia, a process more akin to the USA's unfolded. An expert committee introduced recommendations to reduce meat and dairy consumption into its draft report, only to have these severely constrained and altered following heavy lobbying pressure by the powerful meat sector (Friel et al., 2014).

Many hypotheses could be considered. Is support for Sustainable Diet a function of democracy and political freedom? Table 2 draws on research by the present author reported elsewhere (Lang and Mason, 2018a; Mason and Lang, 2017), and on the conceptual thinking presented here (Brinsden, 2020; Brinsden and Lang, 2015a, 2015b; Lobstein et al., 2013; Swinburn et al., 2019). It presents a 'state of policy play' classification indicating sources of opposition, the status of transition to official or semi-official Sustainable Dietary Guidelines (OSDG) for a number of countries on which the transition to sustainable diet has been reported. Table 3 illustrates the focus of some reports on Sustainable Diet.

Qatar is one country which began the policy journey on Sustainable Diets (Seed, 2014). On the established Freedom House indicators, Qatar, an authoritarian Emir-led society, is measured as 'not free' with an overall score of only 25/100 - made up of 7/40 for political rights and 18/60 for civil liberties (Freedom House, 2020). Yet it instituted changes in its official dietary advice to include sustainability considerations in 2014 (Seed, 2014; Seed et al., 2013). Concerned about its considerable burden of diet-related non-communicable diseases such as obesity, diabetes and heart diseases, Qatar radically revised its dietary guidelines to include both human and environmental health (Qatar Supreme Council of Health, 2014a, 2014b). The long-term cultural outcomes are as yet uncertain.

Germany's progress on sustainable diets has been within the voluntarist rather than top-down mode. Germany has no formal sustainable dietary guidelines but has an evolving set of voluntary advice to consumers urging them to consider multiple features when shopping for food (German Council for Sustainable Development, 2003, 2008, 2014). This is promulgated not by a central, weighty Ministry but an officially designated but arms-length Council for Sustainable Development, the RNE. Freedom House judges Germany to be 'politically free' with an overall score of 94/100, made up of 39/40 for political rights and 55/60 for civil liberties.

The Netherlands, which is scored even higher, with 99/100 overall – dropping one point on the civil liberties score - is perhaps developing the most comprehensive and central system of sustainable dietary change. In the 2010s it has slowly developed, first, the case for sustainability to drive its food system from production to consumption, and then gradually integrated environmental features into its scientific position and official public health dietary advice (Scientific Council of Government Policy (WRR), 2015). This experience suggests what might be an important feature for further research. The Netherlands has built up a long-term expertise which sees the importance of comprehensive advice and has done its homework on what the possibilities are (van de Kamp et al., 2017; van Dooren and Kramer, 2012; van Dooren et al., 2014). It has also taken the 'tortoise' strategy – slow incremental change and consensus building across institutions of governance. This may be beneficial as a process of governance but might not be appropriate if there is accelerated disruption to the food system, whether from climate change or geo-political uncertainty.

The UK began a process of engaging with Sustainable Diets following the shock of the global commodity and oil price rise in 2007. This led to a national review within the Cabinet Office, answerable to the Prime Minister, and the 2008 *Food Matter*s report proposed a 'carbon + calories' approach (Cabinet Office Strategy Unit, 2008). Over the next

Table 2 Transition to Official Sustainable Diet Guidelines (OSDG): a classification of opposition and outcomes

	Food- based dietary guidelines	Official / semi-official Sustainable Diet Guidelines	Commercial opposition	Organised Political opposition	Cultural opposition	Scientific opposition	Policy outcome to date
Australia	Yes	Overt in draft, then rejected	Yes	Yes	No	No	Beaten back
Brazil	Yes	embedded	Yes	No	No	No	Uncertain
Germany	Yes	'arms-length'	No	No	No	No	Emerging
Netherlands	Yes	Yes	No	No	No	No	Emerging
Qatar	Yes	Yes	No	No	?	No	Uncertain
Sweden	Yes	Yes	No	External Yes, Internal No	No	No	Official
UK	Yes	Yes	No	Yes (Gov't change)	No	No	Uncertain
USA	Yes	Yes	Yes	Yes	No	No	Uncertain

Source: author, drawing on Mason & Lang (2017), Lang & Mason (2018)

Table 3. Diversity of Reports on Sustainable Diet

report	*date*	*country*	*authorship*	*Geographical focus*	*Emphasis in diet*
Food Matters	2008	UK	Cabinet Office	National	Carbon + calories
Environmentally Effective Food Choice	2009	Sweden	Government agencies	National	Health + Environment
Biodiversity and Sustainable Diets	2011		UN agency + CGIAR agency	Global	Multi-criteria, with special emphasis on biodiversity
Guia Alimentar para a População Brasileira	2014	Brazil	Health ministry	National	Nutrition + culture
Scientific Report of the 2015 Dietary Guidelines Advisory Committee to USDA & HHS	2015	USA	Special scientific committee	National	Nutrition + environment
Find your way to eat greener	2015	Sweden	Government health & environment agencies	National	culture
Solutions Menu: A Nordic guide to food policy	2018	Denmark, Finland, Iceland, Norway, Sweden	Intergovernmental region policy council	Regional	Health, environment, culture
Food in the Anthropocene	2019	Global	Health Commission	Global	Nutrition + Environment

Source: Author

two years, a process of detailed analysis and consultation broadened the *Food Matters* dual approach to include food security, dietary change and food industry realignment. This culminated in a new multi-criteria national strategy in 2010 which included Sustainable Diets as a goal – the *Food 2030 Strategy* (Defra, 2010a, 2010b). This was approved by the Prime Minister only for the entire strategy and consensus to be jettisoned by an incoming Coalition Government after a national election the same year. Pressure to continue with this approach was narrowed down to a production and consumption approach requested from a Green Food Project, produced by a short-life committee, which was set up after pressure from industry and civil society (Defra, 2012, 2013). This too was allowed to wither! The path to Sustainable Diets is seemingly never smooth!

Looking ahead: scientific advice

The review conducted here demonstrates that diet is a complex, personal and cultural matter, so the case for including 'messier' social, cultural and economic drivers of diet such as family relations, affordability / cost or social class is strong, not least to address potential sources of resistance to the transition to Sustainable Diets, or what the EAT-Lancet Commission termed 'the Great Food Transformation'. The paper presents this food systems transition as warranting a multi-lever, multi-actor, multi-sector, multi-disciplinary coherence for and from policy makers.

One outcome of this analysis is to question the desire for the simplicity of 'carbon + calories' as the policy message. The multi-criteria approach proposes the advantage of diversity as a principle for Sustainable Diet. This is in keeping with diversity as an ecological principle and allows for country-specific effects.

Within the MCA approach, there are many options for change. The Nuffield Ladder of Intervention usefully proposes a rising ladder of intervention from rung 1, the simplest intervention which is to do nothing, to rung 2 to provide information and education; then rung 3 to guide choice by changing the default; rung 4 to guide choice through incentives; rung 5 to guide choice through disincentives; rung 6 to restrict choice; and finally rung 7 to eliminate choice. All these options are applicable to Sustainable Diets (Lang and Mason, 2018b).

While Michael Pollan's much-cited rubric 'eat only what your grandmother would recognise' is pithy and culture specific, its advice may be more pertinent for food economies where the grandmother might have eaten simply than for a world which is rapidly going through the nutrition transition. Lifestyles have changed but that should not indicate an absence of culture, rather that culture has changed and is always dynamic. The emergence of movements and guidance such as the Nordic Diet or the Chefs Collaboration, a worldwide network of mostly young chefs and restaurateurs committed to helping drive food choice in a more sustainable direction but putting culture at the centre of the table, suggests that the socio-cultural element within Sustainable Diets is worthy of more support and research (Chefs Manifesto, 2018; Mithril et al., 2012; OPUS, 2009; Saxe, 2014).

At global, regional, national and local levels, there has been a remarkable renaissance of interest in reshaping food systems to address some or all of these problems. In 2015 the United Nations agreed fairly ambitious Sustainable Development Goals (SDGs). 17 Goals spawned over 160 specific goals, an estimated 70 of which imply food change. Although governments wanted to be seen to be acting, to date serious action on Sustainable Diets has been muted and relatively sparse, as has been shown. Some new policies and campaigns have emerged, including a particular focus on food waste. The UN Food Systems conference due in 2021 suggests the emergence of what elsewhere has been termed the SDG^2 strategy – national and regional Official Sustainable Dietary Guidelines to deliver the UN Sustainable Development Goals – may help focus attention on a new global food system vision. The

evidence strongly suggests need to engage more immediately with not just producing more food – the productionist mid-20th century policy vision - but changing what and how food is produced and consumed to help humanity and life to prosper within environmental limits on a socially just and negotiated basis.

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