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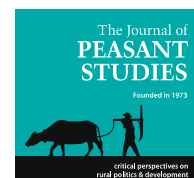
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Mapping Domains of Food Access and Consumption: a Conceptual Tool for Appreciating Multiple Perspectives within Food System Governance

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Abstract

Discourse on food systems is overly characterised by dichotomies such as farmers and consumers, urban and rural, and subsistence and surplus. These divisions have largely influenced the governance responses to food systems, locating and limiting them within one of these dichotomies without recognising the complexities of the broader system. This is problematic because of the rapid changes that food systems are facing through globalisation, financialisation and 'modernisation'. This paper provides a conceptual framework that connects multiple understandings of the food system in order to make positionality more explicit and through this to strengthen decision-making.

The framework is informed by two distinct definitions of the term food 'regime.' The first refers to political economy analysis by Friedman and McMichael, which seeks to link international modes of food production and consumption to specific periods of capitalist accumulation or regimes. The second emerges from social-ecological systems theory where a regime refers to the combination of variables that constrain the way in which systems function and can be structured. The Food Access Domains (FAD) framework uses these regime definitions to illustrate a set of domains through which people access food.

In South Africa, there are two main axes defining the landscape within which food is accessed and consumed: the level of formality of value chains and the degree of food processing. This defines four quadrants: direct subsistence from agriculture/urban gardens, informal retail, formal retail and 'restaurants' where prepared food is consumed. It is possible to map different domains of each of these sectors. Using this framework, it is shown how various groups can map their own research or interests across various domains, as well as mark areas of intervention that can shift domains.

The FAD framework can be a governance tool for recognising multiple interests in the food system ranging from the food sovereignty movement to retailers. This paper develops the ideas behind the framework and references specific research and food movement groups that fit into each of the domains. It sets an agenda for furthering the framework to address specific governance outcomes for different interest groups, including government, research and civil society.

Introduction: Disrupting Dichotomies in the Food System

Achieving the goal of global food security sustainably is one of the greatest challenges of the 21st century. With a current world population of 7 billion, expected to rise to 9 billion by 2050, global demand for food is increasing (Beddington et al. 2012). Food price spikes from 2008 have dramatically affected the affordability of food for much of the world's poor, halting the progress that had been made towards meeting the first Millennium Development Goal of halving hunger by 2015. Added to this is a burgeoning crisis in how we utilise the food we do access: the food system is failing to meet the needs of the 795 million undernourished , 2 billion with micronutrient deficiencies and 600 million obese people (FAO et al. 2015; WHO 2015; Micronutrient Initiative 2009). An ailing food system also exacerbates problems in the health system with severe health implications not only arising from under-nutrition, but with obesity and overweight being linked to 44% of the diabetes burden, 23% of the ischemic heart disease burden, and 7-41% of certain cancer burdens (WHO 2015; Cordain et al. 2005). Compounding these trends is that with increasing affluence, diets are shifting dramatically towards a 'Western diet' of more animal, sugar and fat products to the exclusion of more traditional- and sometimes more sustainable- diets (Kastner et al. 2012). As the world moves towards achieving the Sustainable Development Goals by 2030, goals 2 and 3, to end hunger and improve health respectively, are critically aligned to an improved global food system.

The underlying premise of this paper is that in order to make the food system more sustainable and socially just, there is a need to disrupt the dichotomies that pervade food system discourse, especially in developing country contexts. The perceived division between farmers and consumers, urban and rural, subsistence and surplus production, even the natural and social has largely determined the context in which governance of the food system takes place. Interventions, whether through policy, programming, activism or research, are usually located within one of these spheres without recognition of the multiplicities and complexities of the broader system. Since the early 2000s, authors have proposed the need to disrupt some of these pervasive dichotomies (Lockie & Kitto 2000; Lockie 2002; Lerner & Eakin 2011). They argue that the 'common-sense dichotomy' between production and consumption is as flawed as the distinction between the natural and the social that has been perpetuated through a modernist ontology (Lockie & Kitto 2000: 4). In an urbanizing world, the distinction made between the rural as the site of food production and the urban as the site of food consumption masks realities that lie along a continuum of a continuously transforming landscape (Lerner & Eakin 2011).

Despite some of these shifts towards broader thinking around food, research in particular has become increasingly compartmentalized into specific domains of expertise that do not necessarily map onto the reality of how people grown, rear, catch, process, buy, prepare and consume their food. There is very little sharing taking place across different domains[1] and the result is a patchwork understanding of the food system that does not aid in good decision-making. In many developing countries, this is particularly problematic because of the rapid changes that their food systems are facing as they become more globalised, financialized and 'modernised.' This paper provides a conceptual framework that aims to connect multiple understandings of the food system in order to make positionality more explicit and through this understanding to strengthen decision-making.

The paper begins with an introduction to the literatures informing this conceptual framework- starting with the food regimes work by Friedmann & McMichael (1989). It then develops an innovation-focussed interpretation of food regimes that helps to inform the Food Access Domains (FAD) framework that re-interprets stability domains in resilience theory (See Gunderson 2003) as access domains from where people consume food. We then test the framework in the South African food system through a combination of literature review and a workshop held with some key researchers that work across different domains of the South African food system. We conclude with the longer-term implications of this framework in helping to understand the configuration of the global food system from a diversity of perspectives.

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[1] For example, 'urban food' researchers will rarely find themselves engaging with rural food security researchers and similarly agricultural economists rarely concern themselves with the research on food nutrition.

The Conceptual Framework

The framework is informed by two distinct definitions of the term 'regime.' The first refers to political economy analysis by Friedman and McMichael (1989) on global food regimes that seeks to link international modes of food production and consumption to specific periods of capitalist accumulation- or regimes. The second reference to regimes comes from social-ecological systems and resilience theory where a regime refers to the combination of variables that constrain the way in which systems function and can be structured; it uses a 'ball-and-cup' analogy to describe how some regimes are more resilient than others, i.e. the deeper the 'cup' within which a system (the ball) sits, the less likely that it is to shift into another regime state. This analogy can be extended to refer to a landscape of peaks and troughs within which a system can find itself. This landscape can shift to enable a system to undergo a regime shift, which alters its state or function.

Food Regimes

In 1989, Friedmann & McMichael (1989) published a seminal paper that identified 2 global food regimes, the diasporic-colonial food regime of 1870-1914 and the mercantile-industrial food regime of 1947-1973. The food regime analysis highlighted the important role of food in global political-economy and provided a structured approach to understanding agriculture's role in capital accumulation as patterns of food circulating in the world economy became apparent (McMichael 2009b). The first food regime was defined by food imports to Europe from the colonies; basic grains and livestock from the settler colonies (notably Australia, Canada, USA) and tropical imports from the rest of the occupied colonies (McMichael 2009b). By outsourcing its food production, Britain in particular was able to provide its industrial class with cheap food thereby delineating 'development' in the twentieth century as a dynamic between national agricultural and industrial sectors (McMichael 2009b). The second food regime re-routed this food from the USA "to its informal empire of postcolonial states on strategic perimeters of the Cold War" (McMichael 2009: 141). Framed as a development project that consisted of a suite of interventions such as food aid, Green Revolution technologies and the extension of markets into the countryside, this regime "universalized a national model of economics as central to the state system following decolonization, whilst simultaneously creating a new international division of labour in agriculture that was centered on transnational commodity complexes" (Raynolds et al 1993 in McMichael 2009: 141).

Friedmann (2005) has suggested a third corporate-environmental regime that has emerged as globally powerful food retailers and agro-food companies selectively appropriate demands from environmental and social movements. She grounds her argument in the restructuring between regimes rather than on the periods of stability themselves, thereby intuiting that food regimes emerge out of the contests between social movements and powerful institutions that result in a new institutional frame (Friedmann 2005). The rise of the third regime is arguably a response to the environmental critique of industrial agriculture that began at the pinnacle of the mercantile-industrialist regime in the 1960s; it saw alternatives such as 'organic' and 'local' farms experimenting with agro-ecological practices in the North whilst in the South, the Green Revolution and industrial agriculture were simplifying agro-ecosystems to increase the yields of staple crops whilst marginalizing rural communities and eroding agro-biodiversity and indigenous knowledge at the same time (Friedmann 2005). Recent social movement responses to these processes, as wide-ranging as Slow Food and Via Campesina, are partly shaping this new food regime, but capital has pre-empted this shift by reorganizing supply chains into meeting the needs of rich consumers and poor consumers differently; the result is if you can afford healthy, sustainable food then you will buy from Whole Foods and its equivalents, but if price is your main consideration then you will have to procure food from the Wal-Marts of the world (Friedmann 2005).

This shift from a focus on agriculture or the production end of the food system to access or consumption is an interesting one and has implication for this paper as it provides a potential alternative regime framing that can differentiate heterogeneities in the global North and South more explicitly. Concerns of food consumption patterns within food regimes have already been highlighted by authors such as Dixon (2009) who traces the history of the 'imperial calorie' through the 'protective' vitamin and now to the 'empty calorie' linking these to the 'nutrition transition' (See

Popkin 2014). The ecological dynamics of food regimes have also been brought into the discussion by Campbell (2009) who uses resilience theory to characterize 'Food from Somewhere' as having a localized impact on the environment, but he notes that despite this opportunity for changing key social and environmental relations, this social legitimacy of this new type of food relation requires the ongoing existence of the opposite pole of world food relations (the "Food from Nowhere" regime). The framework offered in this paper aims to help resolve this tension by focusing more explicitly on "consumption politics" (Campbell 2009: 313) over production dynamics in the food system and uses social-ecological regimes theory to conceptualise the multi-level dynamics in the food system that can help to reconcile global networks influencing local outcomes and vice versa.

Friedmann and McMichael's (1989) food regimes concept enables a discussion of broader global drivers that define the landscape within which national food systems operate. However, this is essentially a top-down approach where the institutional landscape is defined externally and it takes agriculture as its starting point. The extension of the 'Domains of Food Consumption' (DFS) framework is that it can be applicable at multiple levels and is therefore suitable for interrogating a national food system: the framework starts from the current perceived state of the food system in a particular location and builds up, rather than starting with global processes. This is important from the developing country perspective as these countries are often envisaged as passive recipients of regime-defining processes with little to no agency to act in the face of broader power structures. By reconciling the multi-level dynamics, the framework will also clarify some of the tensions that countries like South Africa face as they are confronted by the existence of multiple regimes within one country. The framework also focuses explicitly on food consumption, not production. In emerging economies like South Africa, this is extremely important as these food systems are facing the duel burden of under and over-nutrition as well as the nutrition transition that results in an increase in non-communicable diseases due to diet-related causes, especially amongst the poorest (Shisana et al. 2014; Igumbor et al. 2012; Mayosi et al. 2009; Hofman & Tollman 2013; Kimani-Murage 2013).

In contrast to the food regimes heuristic offered by Friedman and McMichael that emphasises the role of capital accumulation in the global food system, the proposed FAD framework starts from a simpler angle that traces shifts in how people have accessed their food, emphasizing the increasingly important role that the private sector has played in mediating this access. We then create a heuristic landscape that allows for a multi-dimensional mapping of these different regimes or domains that can exist simultaneously in the same system using the example of South Africa.

Socio-ecological Regime Shifts in the Food System

Socio-ecological systems (SES) are the complex combination of social (e.g. economic, political, legal etc) and ecological systems (Berkes et al. 2003). This complexity is created not just through interactions of interdependent variables across scales and levels (Berkes et al. 2003; Ramalingam et al. 2008; Thompson & Scoones 2009), but also through multiple feedbacks and thresholds present in the system at large. There is an increasing consensus that the food system can be conceptualised as a social-ecological system: it consists of cross-scale, multi-level interactions between human and natural systems and has emergent properties arising from its dynamic, self-organising components (Folke 2006; Ericksen 2008). At the same time, there is also a large technological component to the food system, in terms of on-farm and processing technologies, but also in business models and institutional innovation. Socio-technical regimes become embedded over time, at which point transitioning them towards preferred alternative regime states can be difficult. A socio-technical perspective aids in appreciating the recursive relationships between the social and the technological and helps us to identify areas of lock-in and path dependence and where there is room for structural transformation into an alternative regime (Smith & Stirling 2010).

In this paper, a regime shift is defined as "a substantial re-organisation in system structure, functions and feedbacks that often occurs abruptly and persists over time" (Crépin et al. 2012: 15). Often referred to as large, persistent change in the structure and function of ecosystems with impacts on human wellbeing (Biggs et al. 2012), in the context of the food system, there are social and ecological components to the regime shift. How and what we eat is largely determined by the socio-economic, political and cultural fabric of the food system in which we find ourselves. The role that private sector

actors play in shaping this context has become highly significant over the last century especially as large corporations have consolidated processes across the food system (Von Braun & Diaz-Bonilla 2008; Patel 2007). This array of actors is fundamental through their role in precipitating the regime shifts that the food system has undergone over the last two centuries, largely through innovation in response to changing social and institutional contexts.

The legacy of the Green Revolution is an innovation system for food security that emphasises improving agriculture by increasing crop yields through improved inputs: from seeds to machinery and irrigation (Ingram 2011; Pingali 2012). Although these innovations have undoubtedly improved food security in terms of increasing the total amount of calories grown globally, they have left out the rest of the food value chain- where concerns over access and nutrition are addressed. One of the critical areas for innovation in the food system therefore centres on behaviour change and people's taste preferences- both in the developed and developing world. Current food consumption trends in the developed world and increasingly in emerging economies are unsustainable (Godfray et al. 2010), but as people become more affluent, price indicators alone are not going to succeed in incentivising people to eat more sustainably or healthily. On the food consumption side, companies have invested heavily in the creation of novel foods that meet demands for tasty, convenient meals, but that often run counter to cultural traditions around food and the high sugar and fat contents of these foods have been shown to have severe negative health consequences, especially for poorer households that either cannot afford healthier alternatives or do not have physical access to fresh fruit and vegetables (Stuckler & Nestle 2012; Pollan 2007; Battersby & Peyton 2014; Nestle 2007).

Innovation has gradually become supply driven rather than demand-driven where today interesting new ideas or tools create companies that invest in marketing to stimulate product demand: ''Need'' is created (Westley et al. 2011). Business has become locked-in to an unsustainable growth-oriented regime with a focus on optimizing shareholder value and externalizing costs, which is at odds with a world made up of interconnected social-ecological systems (Westley et al. 2011). Overcoming this requires finding the institutional frameworks to stimulate the kinds of innovation that solve rather than augment social and environmental challenges (Steffen et al. 2011). The history of food system regimes presented below is an example of how innovation has overcome certain challenges, whilst sometimes creating bigger problems- a consequence of innovation in a complex social-ecological system. Systemic innovation differs from conventional innovation strategies because they are founded on notions of complexity, ambiguity and *diversity* (Westley et al. 2011). The heuristic model of adapted renewal cycles or 'panarchy' provides a useful tool through which to conceptualise this process (See Figure 1). At the local level, small, fast variables allow for rapid experimentation to occur; this can be equated with the 'niche' or safe space for innovation. Most innovation will not survive and so there will be a continual process of design, re-design and collapse, but every so often, when there is a conducive landscape, an innovation will be successful enough to revolt into the next level where intermediate processes start to formalize the novel innovation. At this stage, the innovation can become part of the dominant regime or it can fail and return to the smaller system where social memory will allow for it to be adapted to the changing landscape environment.
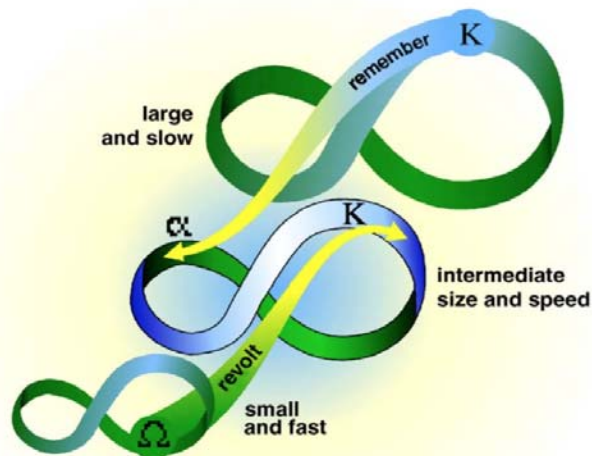
Figure 1: Panarchy, a heuristic model of nested adaptive renewal cycles emphasising cross scale interplay (modified from Gunderson and Holling 2002). *Source: Folke 2006: 258.*

Focusing on some key innovation interventions in the Western food system, it is possible to identify three regime shifts that are pertinent to food consumption patterns that map well onto Friedmann and McMichael's food regimes.

Regime Shift 1: From Labour-intensive and Subsistence Agriculture to Commercial-Industrial Agriculture that Could Feed Growing Cities

In the early nineteenth century, Europe was still largely an agrarian society where the majority of the population cultivated food for a living, but by the end of that century, as the industrial revolution took hold, peasants left the countryside for the cities and an industrial working class was formed (Fukuyama 2015). As people moved from farms into urban areas, there was a need for a steady supply of produce from farms to feed the increasing number of workers in expanding cities, but less labour available on farms. The industrial revolution was thus not only the cause of the problem, but it also provided the means to a solution: mechanized agriculture. This mechanisation coincides with the colonial-diasporic food regime that predicated a need for supplying food to these European cities and workers from the colonies (Friedmann 2005). The industrial revolution resulted in increased mechanization of agriculture and a move away from it being a labour intensive sector to one more reliant on other input costs, associated with the scientific discoveries of the age. The 'disruptive innovation' of the Industrial Revolution enabled Western societies to transcend a Malthusian world (where it was believed that population growth would eventually outstrip natural resources), largely through revolutionising the instruments of production and the division of labour (Fukuyama 2015).

A transformative innovation in this process was the Haber-Bosch process (of fixing N_2 into NH_4), first observed in 1909, that led to the production of synthetic fertilisers (Galloway & Cowling 2002). Fertiliser in turn contributed to vast increases in the amount of food that could be produced on the same amount of land- i.e. intensification (Mosier et al. 2004). As more food was needed to supply burgeoning cities, this intensification of agriculture that increased yields from finite areas of farm land and animal bodies was a welcome development (Campbell 2009). However, the new technological package of fertilizers, pesticides, heavy machinery and new stock/crop varieties came at a significant environmental cost with increasing reliance on industrial inputs, a reduction in internal natural cycles on farms, pressure on landscapes and animals and a growing list of environmental impacts (Campbell 2009). Furthermore, this trend created the space for companies to start specializing in agricultural inputs like farm machines, seeds, fertilizer and pesticides, and then for these later to merge into the

agribusiness giants of today: e.g. Monsanto, Bunge, Cargill, Agrium and Archer-Daniels-Midland (See McMichael 2009a; Patel 2007).

Although cities throughout history have relied on food coming in from rural areas- the core has always been fed by the periphery- the scale at which industrialization enabled this relationship resulted in a growing disjuncture between food production and its consumption. The distanciation of the food system (as argued by Friedmann (1993)[2] is reinforced by the second major regime shift, which focuses on the power of global supermarket chains.

Regime Shift 2: From Known Food Providers to the Convenience of Global Supply Chains: the Establishment of Supermarkets and Fast Food Restaurants as Acceptable Sites of Food Procurement

In response to people moving into cities and needing a central location for their food, the birth of the supermarket can be seen as a transformative innovation in the food system. European groups pioneered the establishment of the grocery stores that were to dominate global food retailing business a century later and which would also provide an outlet for the food industry to sell its processed food stuffs in the twentieth century. The first Sainsbury's opened in London in 1869, although it was only privately listed in 1922. The next biggest extant supermarket was founded in 1887 in the Netherlands by Albert Heijn and became Ahold. The French followed with the establishment of the first Casino store in 1898. These retail giants were to become part of the food retail oligopoly that would come to dominate the western world over the course of the twentieth century and then spread to all reaches of the globe (Deloitte 2011). The remainder of this powerful group of food retailers were established in the mid-twentieth century; the UK's Tesco's in 1952, France's Carrefour in 1958 and the US's Wal-Mart in 1962.

According to Shaw (2005) supermarkets were transformative for four main reasons:

1. Their patterns of innovation created Schumpeterian 'disruptive competition.' By continuously reinventing their format, processes and channels of distribution, they created novel business models that became impossible to outcompete as they were constantly adapting.
2. They transformed consumer culture in that customers came to expect a variety of products on offer in one convenient location where they were free to roam the aisles at their own pace.
3. Their competitive edge and adaptive business model made them so successful that it led to the rapid growth of supermarkets and so their influence spread quickly.
4. This rapid growth also had universal applicability and so was soon transferred to a range of economies. Having spread the business model throughout the US and Western Europe, in the latter part of the twentieth century, these companies became multinationals, establishing themselves in foreign markets either directly or by getting their foothold in the market through partnerships with local companies.

This second regime shift identifies a new centre of power within the global food system, the rise of the global supermarket chain that has profoundly impacted what a large proportion of the world eats as well as how that food is produced, processed and marketed (Burch & Lawrence 2007).

A similar source of convenience in the food system arose on the other side of the Atlantic and made its way across to Europe: the development of fast food restaurants. Schlosser's (2001) book on the rise of the fast food chain in the US gives a detailed account of the innovation that not only developed a model for getting cheap, convenient and addictively tasty meals to all Americans, but also transformed how agricultural supply chains operated. As the establishment of supermarkets allowed for the convenience of accessing all your food in one place (instead of going to the fresh market, the baker, the butcher etc.), fast food chains provided ready-made food at a cheaper price than cooking it at home. These innovative business models have continued to grow off each other in the twentieth century and as technologies have provided the means for efficiency (e.g. the microwave), the food

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[2] Friedmann argues that reversing the distanciation of the food system is how to reshape global food relations, to move outside global scale relations towards local, regional, communal and ecologically-embedded levels of food relationships (Campbell 2009). This analysis lies at the centre of the third regime shift in the food system- arguably that proposed by Friedmann (2005) as the corporate-environmental regime.

industry has developed products accordingly (e.g. ready-made meals). The development of these two models changed the rules of the game and made different models of food access acceptable. This has enabled the food industry within the mercantile-industrial food regime to provide consumers with increasingly processed and unhealthy foods (Nestle 2007; Lang & Heasman 2004; Stuckler & Nestle 2012). However as the focus of this discussion is on food access points, the agro-industrial complex remains in the background of this discussion, but it remains a defining feature of how many people access their food and what this food constitutes.

Regime Shift 3: From Anonymous Global Supply Chains to Alternative Food Networks: the Global Versus Local Debate

The phenomenon of the global expansion of supermarket chains into multi-national corporations that have established themselves in developing country markets since the 1990s is a product of the mercantile-industrial food regime (Reardon et al. 2009; Weatherspoon & Reardon 2003; Reardon et al. 2003). These companies now have the network power to source and supply anything from everywhere; it has become commonplace to be able to find Indian mangoes, South African avocadoes, Kenyan green beans and Chilean grapes all in the same aisle at your local UK supermarket. However, this monopolization of the global food system by a few companies has brought with it a backlash as consumers want to know more about what they are eating- how and by whom it is grown/reared/caught, where the seeds come from and how many inputs were applied to it. The corporate response to this has been auditing of supply chains through standards from bodies like EUREP-GAP (now GLOBAL-GAP) (Friedmann 2005). This has been capital's attempt to create 'Food from Somewhere' in response to the anonymity of the 'Food from Nowhere' that is the product of the globalized mercantile-industrial regime (Campbell 2009).

The rise of 'alternative food networks' is arguably the social movement critique of the increasing disconnect between the majority of consumers from how their food is produced, that is transitioning into from the mercantile-industrialist regime into what Friedmann (2005) posits as the corporate-environmental regime. These 'alternatives' include the organic, local and slow food movements and the more mainstreamed processes of food labelling and certification from bodies like Fair Trade and the Forest Stewardship Council. As Goodman (2009: 10) notes:

"This shift towards the production of quality local foods, as opposed to the generic 'placeless' commodities of productivist agriculture, which often are sold into the closed 'internal markets' of conventional supply chains and contract production relations, is variously conceptualised as the re-embedding, re-socialising, and re-localising of food systems. Slow Food Supply Chains are a major institutional expression of these reconfigured production-consumption relations, whether in the form of direct, face-to-face contact at farmers' markets, for example, or narrated to distant consumers by symbols, logos and labels of quality and 'qualification' of place, process, and product… Thus farmers are encouraged to 'short-circuit' industrial supply chains and to reconstruct the producer-consumer interface by engaging with different conventions and constructions of quality "that evoke locality/region or speciality and nature" (Marsden et al 2000: 425)."

Innovations like ethical labelling in particular, seek to create a sense of trust that the product in question has been made according to a set of standards. Fair Trade chocolate, Carbon neutral wine, Rainforest Alliance coffee and even Organic cheese are certified labels that all impact production based on the preferences of 'ethical' consumers and effectively puts them (and their certification bodies) in charge of how food production is undertaken. This has interesting repercussions for farmers in the developing world where much of the changes are taking place. Studies on the Roundtable on Sustainable Palm Oil have shown that despite an attempt at full equality and engagement among multiple stakeholders, the major processors and traders still fill the majority of the seats at the table (Paoli et al. 2010). Fair Trade certification similarly suffers from good intentions in the North that do not necessarily translate into actual change for producers in the South (Valkila & Nygren 2010).

The above summary of shifts in how people around the world access food and their relation to Friedmann & McMichael's (1989) food regimes reinforces the link between food consumption patterns and broader innovation-driven regime dynamics. The framework laid out in the next section outlines a way to map the variety of food access points that people across urban-rural, poor-rich, developed-

developing countries dichotomies utilise. The application of this framework for fostering understanding across levels in the food system is then described.

Food Access Domains: the Framework

Whilst the food regimes concept refers to periods of transition where the regime is destabilised by social movements and other interests, it does not empower these actors to see their role in transforming the system and shifting it into an alternative regime. The social-ecological systems approach on the other hand has been criticised for not taking into account power dynamics, but it provides a visual framework within which to understand how dynamics can shape the food system. The combination of these into a new domains of food consumption framework aims to bring the best of both understandings of regimes together to provide a place where alternative viewpoints can be articulated and where differences in understandings of dynamics can be made explicit.

The FAD framework follows a resilience approach in defining a set of domains or 'cups' through which people access food. As this framework has been developed with the South African food system in mind, it describes access domains within South Africa's national food system, but it is equally applicable to other contexts and at different levels. The framework starts with the ball-and-cup heuristic used to describe ecological resilience where a system (the ball) can exist in multiple states or stability domains (the cup) depending on the variables defining that landscape; a perturbation can cause the landscape to shift (i.e. the cup to change shape) and the system to shift into an alternative state (See Gunderson 2000; Walker et al. 2004; Folke 2006). Figures 2 and 3a and b illustrate both the 2-D and 3-D versions of this ball-and-cup heuristic. Figure 2 shows a simple 2-D representation of systems (the balls) shifting into different domains (the cups) as the landscape changes. Figures 3a and b provide a more mathematical, 3-D representation of the same, but referencing the variables that define the resilience of the system (latitude, precariousness and resistance).
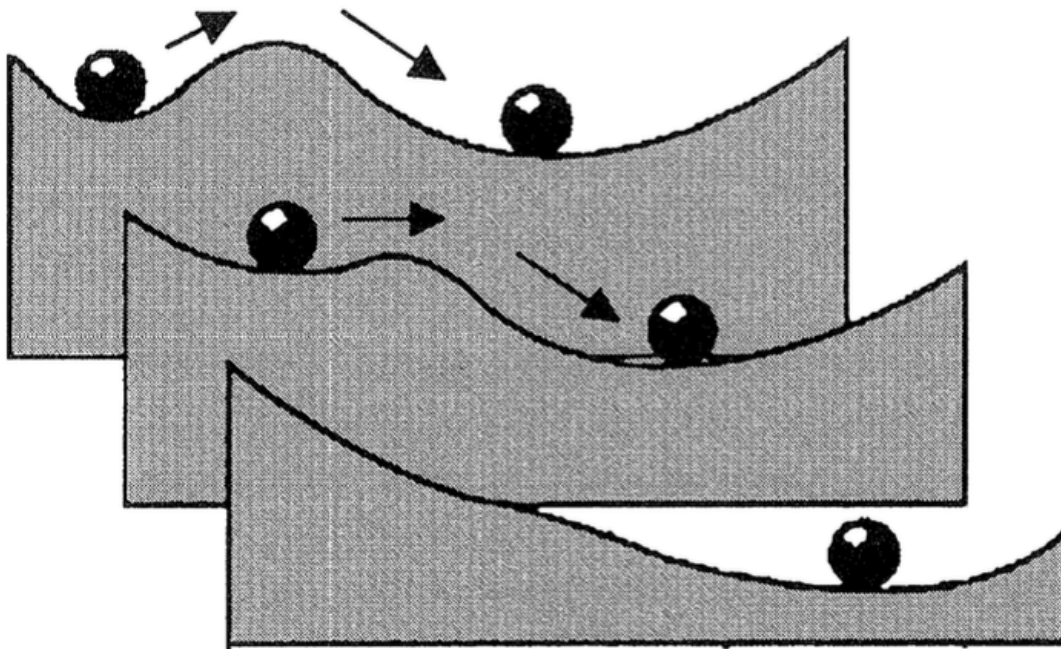

Figure 2: Ball and cup heuristic of system stability. Valleys represent stability domains, balls represent the system and arrows represent disturbance. Engineering resilience is determined by the slopes in the stability landscapes, whereas ecological resilience is described as the width. Adaptive capacity refers to the ability for the system to remain in a stability domain as the shape of the domain changes (as shown by the three slices or landscapes). *Source: Gunderson 2000: 427.*
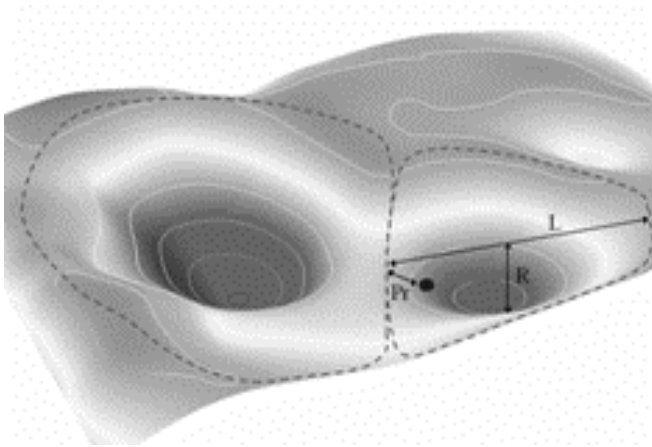
Figure 3a: Three-dimensional stability landscape with two basins of attraction showing, in one basin, the current position of the system and three aspects of resilience, L = latitude, R = resistance, Pr = precariousness. *Source: Walker et al. 2004: 8.*
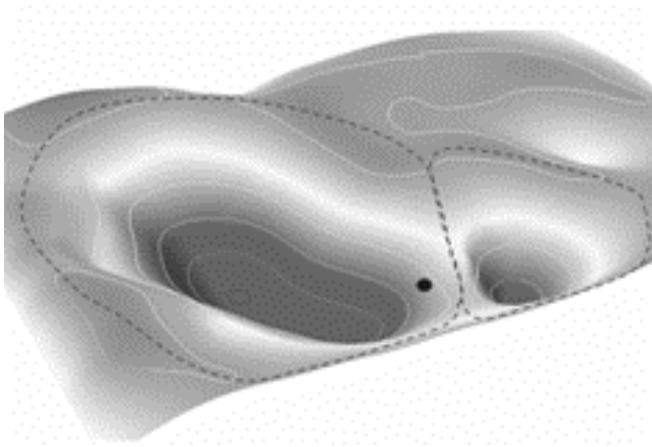

Figure 3b: Changes in the stability landscape have resulted in a contraction of the basin the system was in and an expansion of the alternate basin. Without itself changing, the system has changed basins. *Source: Walker et al. 2004: 8.*

The 'disruptive innovation' references earlier can trigger transitions or transformation out of dominant regimes (Westley et al. 2011). As **Figure 4** illustrates, the role of an institutional entrepreneur can shift the landscape so as to enable the system to transition to an alternative state or domain- it can be argued that a set of institutional entrepreneurs were at the core of the regime shifts discussed in the previous section.
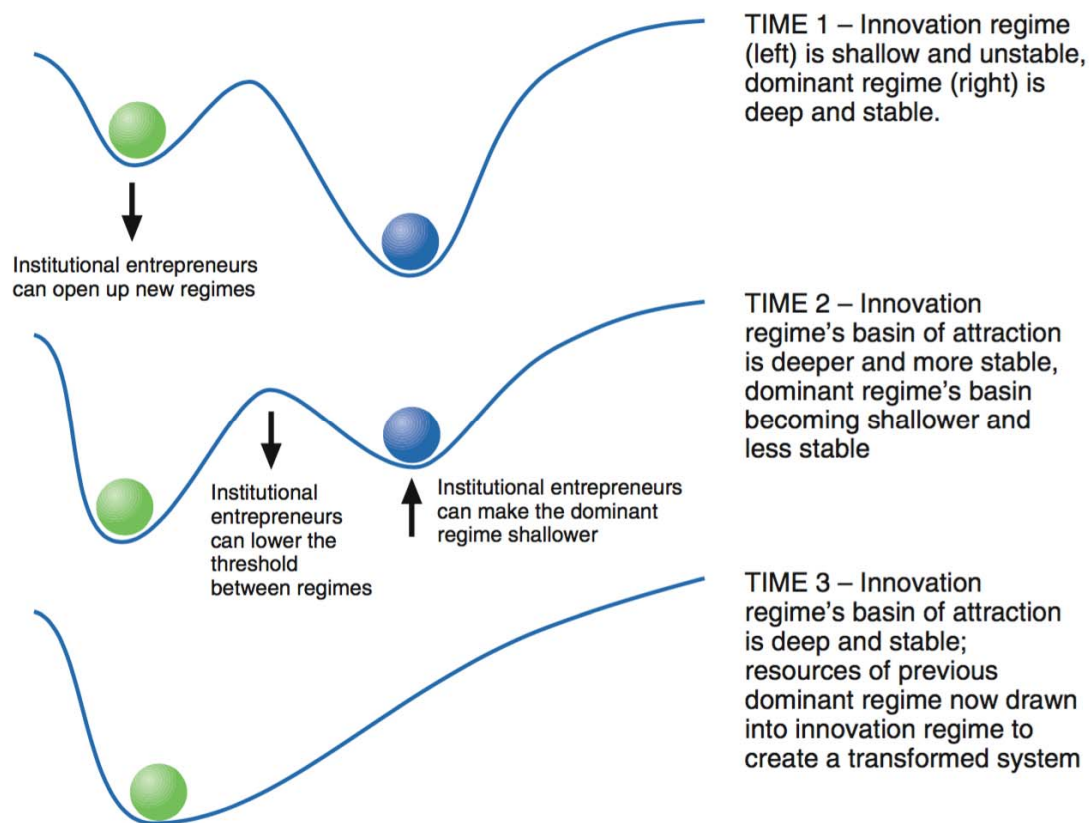
Figure 4: Cross-scale dynamics of social (systemic) innovation and the role of institutional entrepreneurs. Institutional entrepreneurs are key to systemic transformation. Their role is to question the institutional context, frame it for those working at more microscales, identify those inventions with potential to tip systems ad sell these to institutional decision makers when the opportunity arises. *Source: Westley et al. 2011: 768.*

The foundation of the FAD framework is these domains within landscapes, but without the inclusion of a system- i.e. the cups without the balls. In essence, it allows for the creation of multiple alternative, distinct domains from which food can be accessed- these potential access points all exist at the same time, but a person will only ever access one at any point in time. The depth of the domains is defined by the embeddedness of that domain as a food access point in the system (i.e. how resilient the domain is; the deeper, the more resilient the domain is as a food access point). This is the key variable that can be used to map the differences between individuals and groups in terms of how they view the landscape of the entire system at any point in time. The key useful aspect of this landscape map is that it can be defined by different people with different perspectives of the food system, allowing for scrutiny of the underlying assumptions behind the definition of the variables and the shape of the domains to be discussed. The food system landscape can also be mapped at various levels- from an individual level where a single person can map their own landscape of food consumption domains (with the depth of the domain being defined by the relative importance of a particular domain as an access point) through to an entire country where the landscape can be defined by the number of people that access food from different domains. A practical example using South Africa is described below.

In South Africa, there are two main axes defining the landscape within which food is consumed: the level of formality- from informal value chains to more formalised value chains and the degree of industrial processing that the food undergoes. This allows four quadrants of the landscape to be defined: direct subsistence from agriculture or gardens, informal retail, formal retail and 'restaurants' where prepared food is consumed, this includes everything from fast food to high-end cuisine (Figure 5). It is possible to map different sizes of domains of each of these sectors from different perspectives and for different groups of people- across urban/rural divides as well as across socio-economic classes and it is also possible to track areas where consumption patterns are changing (by using dotted lines to

signify where someone thinks changes in the landscape are occurring to change the shape of the domain). Using this framework, various groups are able to map where their own research or interests lie, they can also mark areas of intervention that can shift some domains to be deeper or shallower based on what they perceive to be a better system. Figure 5 shows an initial mapping done by the authors.
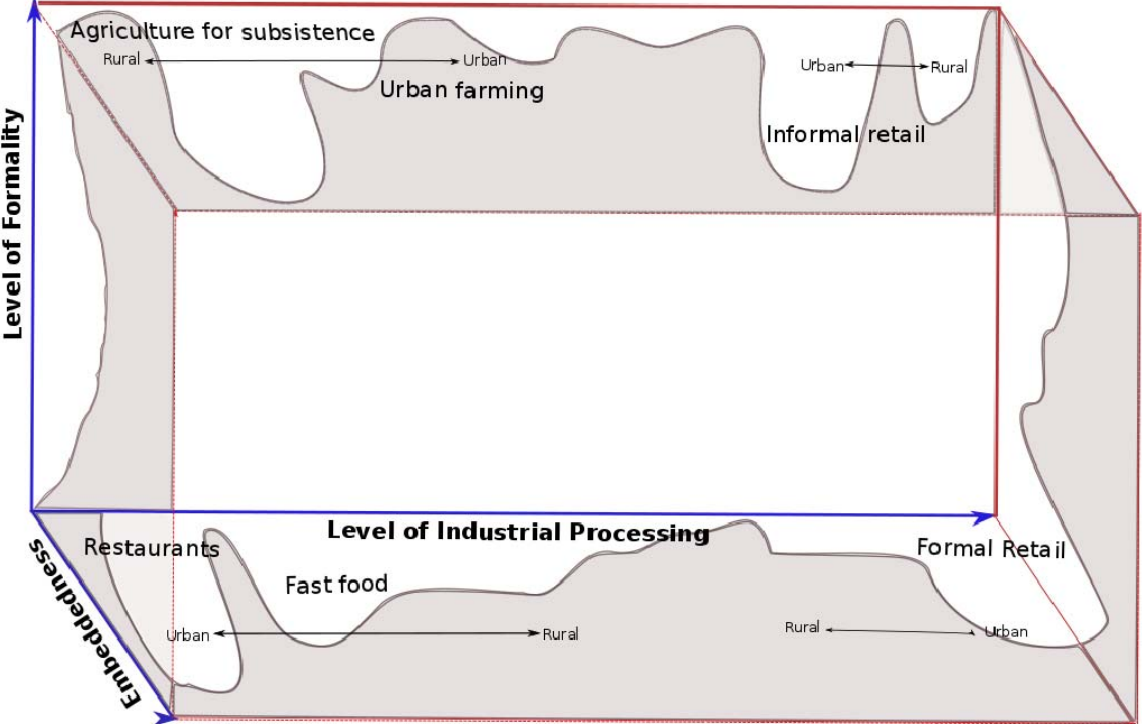

Figure 5: A simplified mapping of domains of food consumption in South Africa. The x-axis is the level of industrial processing that the food undergoes from least to most processed, the y-axis is the level of formality of the domain, from most formalized to least and the z-axis is the depth of the domain or its embeddedness in the food system. For clarity, the actual domains (ie. Looking from the top into the page) are not drawn in as this would require mathematical modelling rather than a heuristic representation.

Specific Cases in South Africa

Mapping different perspectives around food through the FAD framework can thus be a governance tool for recognising multiple interests in the food system- ranging from different conceptualizations of the system to issues pertaining to environmental justice groups, the food sovereignty movement and human rights campaigns. This paper further develops the ideas behind the framework and references specific research and food movement groups that fit into each of the domains. In particular reflection is made on discussions from a workshop held in December 2015 that explored the FAD framework and the practical application of the domains of food consumption in South Africa.

This initial dialogue has been designed to feed into a broader multi-stakeholder process intended to consider how to re-orientate innovation in the food system towards sustainability and to explore novel methodologies for engaging the public in tackling complex problems. It is argued that the FAD framework can "hold" a number of different perspectives that can then usefully be assessed as a "whole" to understand linkages, overlaps, contradictions and sites of struggle. The FAD framework and the concept of domains was therefore presented as a way to hold these various perspectives of the food system within one "container" that could usefully allow different analyses and interpretations to engage. During the workshop a small group of people who had been thinking critically about domains of consumption either as academics or as NGO practitioners, working across different sites in South Africa, considered the FAD framework critically to ascertain whether it had potential to allow for the

synthesise of existing knowledge. These perspectives ranged from small-scale rural subsistence production to urban formal and informal retailers. Some initial reflections from this process are described below as a way of illustrating the usefulness of the framework and domains concept.

An example of a domain or 'cup' through which people access food is that of the informal retail (top right of Figure 5). Even-Zahav has explored the food security contribution of the informal food economy on the margins of South Africa's cities, particularly of street-foods, in a recent study (2014). Through systematically reviewing the contemporary literature on the informal food economy published between 2009 and 2014, the research mapped out the present state of knowledge about the informal food economy and its contribution to food insecurity. In particular, Even-Zahav (2014) argued that the informal economy trades not only in food commodities, but also in the provision of other socially invaluable services: of kinship, reciprocity, tradition and nostalgia.

Notwithstanding the persistent 'rural production' bias that still dominates food security literature, there is a small, but fast growing body of research demonstrating high to acute levels of food insecurity in South African cities (See Naicker et al. 2015; Crush & Caesar 2014; Shisana et al. 2014). As confirmed by Gareth Haysom during the workshop, the Cape Town chapter of the African Food Security Urban Network (AFSUN) study found that 80 per cent of surveyed households in poor communities were either moderately or severely food insecure (Battersby 2011). Furthermore, shack dwellers living in informal settlements were found to be 20 per cent more likely to be food insecure (Battersby 2011). Placing the domain of urban informal alongside rural production and consumption within the framework allowed for the inter-linkages between them to be identified and discussed, as well as the separateness.

An important finding is that the reliance on the informal economy in urban informal areas across South Africa is high and it is itself mainly associated with access benefits and utilisation (nutrition and safety) concerns (Even-Zahav 2014: 44). Despite access benefits, utilisation concerns dominate the literature on the informal economy's contribution to food security. That said, there are too many gaps in knowledge to permit generalizations. Very little can be deciphered about the full contributions of the informal economy to food insecurity across the food supply and value chain for more than a handful of commodities.

A key argument emerging from the study was that contrary to mainstream theories, traders were neither forced into the informal economy, nor did they wish to formalise (Even-Zahav 2014). Further, food security literature was found to focus on techno-scientific food-centric perspectives of the informal economy, which, while valuable, was largely divorced from the lived realities, means and concerns of workers in the informal food economy (Even-Zahav 2014). The thesis concludes that, in the absence of human-centred, trader-centric accounts of the informal food economy, there is little prospect for appropriate prescriptions and successful interventions. In talking through some of the pertinent issues relating to this domain, Even-Zahav argued that the FAD framework should be considered and critiqued by people living within these "cups of access" to validate and inform its applicability and usefulness.

By contrasting this domain against that of the formal retail domain, important insights were gleaned. An issue that was raised was the degree to which the expansion of the informal sector was possible in light of the overwhelming dominance of the formal food sector (bottom right of Figure 5). Most of the literature expressed concern about the degree of formal sector power and patterns of diffusion into informal settlements and its potential impact of the informal economy and food security. Concerns over real limits to growth within the informal economy, primarily based on formal sector dominance and consolidation, were detected by Even-Zahav's (2014) review. By placing the formal retail domain alongside that of informal retail, these linkages and concerns could be easily identified, particularly if the expansion of one meant the contraction of the other, or, against general thinking, both were connected in a mutually reinforcing synergy that was largely co-beneficial.

Even-Zahav (2014) reiterated a point that his and other research has revealed heterogeneity within the informal food economy. Whereas traditional spaza shops[3] are conceived by some to be under

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[3] An informal convenience store in South Africa, often found in townships and peri-urban areas.

existential threat, from the entry into their market by either foreign-owned spazas or Big Food consolidation and dispersion, it appears that the street-trading sub-sector may be more resilient to macroeconomic changes and shocks as well as important for local food security (Crush & Frayne 2010; Pereira et al. 2014). A typology of the informal food economy would greatly assist in differentiating and enabling more nuanced understanding of contributions, risks and opportunities. Importantly, this would need to move beyond looking simply at retail, towards including various stages along the food value chain.

Another important issue was that significant overlap existed across the domains of consumption. They were clearly not discrete, clearly defined and bounded domains. Steps can be taken to deal with this difficulty, including breaking down categories that contained divergent disciplinary designs, for example the addition of peri-urban to the urban and rural categories, and combining sub-categories that spoke to more than just consumption, but also production. The latter became clear in discussing vegetable production and consumption in rural areas (Faber & Wenhold 2007).

As the FAD framework is being developed with the South African food system in mind, it can clearly describe access domains within the national system, allowing for the creation of multiple, alternative, distinct domains from which food can be accessed. The example of informal retail clearly galvanized a discussion that brought in other domains and allowed a broader, more holistic picture of the system to emerge.

A Future Research Agenda Using the Framework as a Tool for Opening up a Dialogue

The December 2015 workshop was also important in helping to start set a research agenda for furthering the framework. This was to allow it to talk to specific governance outcomes for different interest groups, including government, research and civil society organisations. As illustrated above, by elaborating on one domain of the food system within the framework, the connections with other domains could be identified and a more comprehensive picture of the food system achieved. As this discussion unfolded, it became clear that the group lacked certain knowledge about the inter-connections, which helped identify key questions. This was the beginning of a research agenda.

Clearly the application of the framework and concept of food domains revealed through the ensuing discussions that contemporary real-world problems are inherently complex, involving many stakeholders, with different opinions about what the problems are and how to measure and address them. The framework allowed fairly diverse perspectives that were seldom discussed in the same conversation to be engaged through the safety of the "container". A more comprehensive picture or concept of the food systems and its multiple domains of consumption could thus be developed.

Dimensions that need to be considered under this more comprehensive conception include looking beyond the rural farm; mapping the entire food value chain as far as possible from production through to waste as well as its impact on and from the environment; encompassing nutritional insecurity in all its forms, including not only hunger, but also over-nutrition and micronutrient deficiencies; and relatedly, looking at the impact of the nutrition transition, food system consolidation and power-relations and urbanisation on human health and wellbeing. All of these provide important entry points for an emerging research agenda.

These questions, however, pertain to the system as a whole, consisting of the various consumption domains. The crisis in the system, described in more detail at the beginning of this paper raises more pressing questions that the framework can be used to engage further:

- Why do people eat the food they do?
- How will we feed a growing and mostly urban population within environmental limits?
- What is the role of informal trade markets in food supply and access?
- How will the current trend in market consolidation influence the functioning of the value chain in the future?
- Should we regulate food? How will we regulate food? What is the appropriate balance between government intervention and market mechanisms?

- What are the extent and nature of climate change impacts on what food is available for consumption?
- What is the role of wild caught and foraged marine food sources and aquaculture species in food consumption? What and how much is being consumed?
- Can we eat a more bio-diverse diet? Should we?
- What will people be eating in the future? What does the role of indigenous and traditional food play in the future food system?
- Can we change people's nutrition awareness and food choices?

Conclusions

The underlying premise of the FAD framework is to bring multiple conversations about food access and consumption together in one space. The benefit of the mapping exercise is that it creates a sense of ownership of what the map represents whilst it also allows for others to interrogate the underlying assumptions and data sources that lead to the final product- and these can and will differ between different groups of people. The concept of the FAD framework has a diverse disciplinary foundation, starting with the concept of the regime as a period of a particular form of capital accumulation driving the global food system and then developing this idea further to identify key transformative or 'disruptive' innovations that contributed to transitions into new regimes. Combining these 'disruptive innovations' within a social-ecological systems framework allows for a visual representation of how systems transition from one state to another. However, what the case of South Africa shows is that it is impossible to define one system state at play at any one point in the country- it is a highly heterogeneous system. Therefore, it is necessary to map these differences from a starting point that allows for diversity and does not enforce traditional research dichotomies. The FAD framework allows for a diverse, participatory mapping of how individuals and groups perceive the food system. It is possible to stop at this point and to use the FAD map as a heuristic for stimulating dialogue and debate.

However, it is also possible to use multiple FAD maps from diverse perspectives to dialogue what aspects of the system are problematic (i.e. a domain that we want to shift away from or at least make smaller) and what are the constraints on widening the domains that have positive aspects, without pointing fingers at particular actors. It is at this point that it may be possible to identify factors that are locking-in problematic domains and making it difficult for institutional entrepreneurs to shift the landscape and open-up an alternative domain.

Whilst the underlying premise of the FAD framework is theory-laden and draws from many different disciplinary backgrounds, it is nevertheless possible to explain and use in a workshop setting, which makes it a useful tool for dialogue as well as a starting point for bringing together more complicated, in-depth information about particular aspects of certain domains. The next step will be to test-run it further with a more diverse groups of stakeholders and potentially to model the domains using a set of mathematical criteria.

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