



**Forecast for the Future:
Scaling Up the Community Food Sector**

Research by Cardiff University for the
Making Local Food Work Programme



**Working Paper on
Food, Systems Thinking
and Complexity**

1 Introduction

The Forecast for the Future research aims to assess:

- the networking and business support functions within MLFW, highlighting best practices and extracting key lessons for future programmes;
- the potential for promoting collaboration, e.g. through secondary support mechanisms, designed to support community food enterprises.

The third phase of the research has included two main research tasks:

- a) Understanding good practice in social enterprise development, including development of a framework for assessing MLFW support interventions (networking & business support).
 - The aim here is to assess the effectiveness of the various “strands” within MLFW, and also to identify other approaches to networking and business support which could be applied to the community food sector.
 - Key Activities:
 - Attendance at MLFW events (e.g. National Conference, CSA’s, Food Co-ops, Buying Groups, Enterprise Support)
 - Review of literature to compare with other approaches
- b) Assessing the potential role of collaboration, eg through secondary structures, in the community food sector.
 - The aim here is provide a definition of collaboration, eg through secondary structures, and assess how they could support an improvement in the impact of related community food enterprises.

There is a clear overlap with the work on Local Food Systems being undertaken through Making Local Food Work, and the research team have engaged with this programme strand in order to distil key lessons. We are developing the concept of “local food systems” as an over-arching aim and organising principle – it is proposed that the development of more effective networking and business development interventions, together with the promotion of secondary structures to support the operation of individual community food enterprises, can lead to an enhanced “local food system” which supports the viability and resilience of individual entities within a defined locality (and beyond – e.g. fair trade partners).

2 Local Food Systems – a framework of analysis

2.1 Introduction

Community food enterprises can be understood in system terms, i.e. as “a set of things working together as parts of a mechanism or an interconnecting network; a complex whole” (from Oxford On-line Dictionary).

“Systems thinking” examines the linkages and interactions between the elements within a system. Systems theory views the world as a complex system of interconnected parts. Moreover, according to Meadows (2008: p.11), “a system isn’t just any old collection of things. A system is an interconnected set of elements that is coherently organised in a way that achieves something. If you look at that definition closely for a minute, you can see that a system must consist of three kinds of things: *elements, interconnections, and a function or purpose.*”

According to Meadows (2008: p17), “the least obvious part of the system, its function or purpose, is often the most crucial determinant of the system’s behaviour.”

A community food enterprise can be thought of as a system, as can a local food economy. As Meadows (2008: p12) explains: “Systems can be embedded in systems, which are embedded in yet other systems.”

In the previous working paper, we developed a simple economic model, based on the understanding that all food systems transform inputs into goods and services:

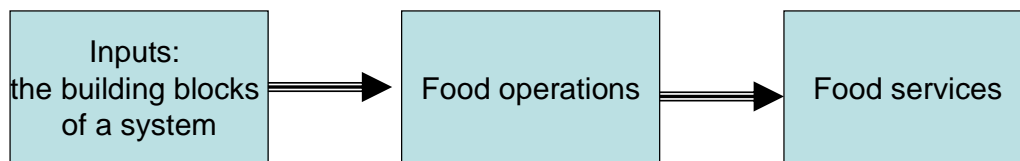


Figure 1: The basic input-output model of a food system

We saw in Working Paper 2 that the inputs can be understood as comprising the “5 capitals”:

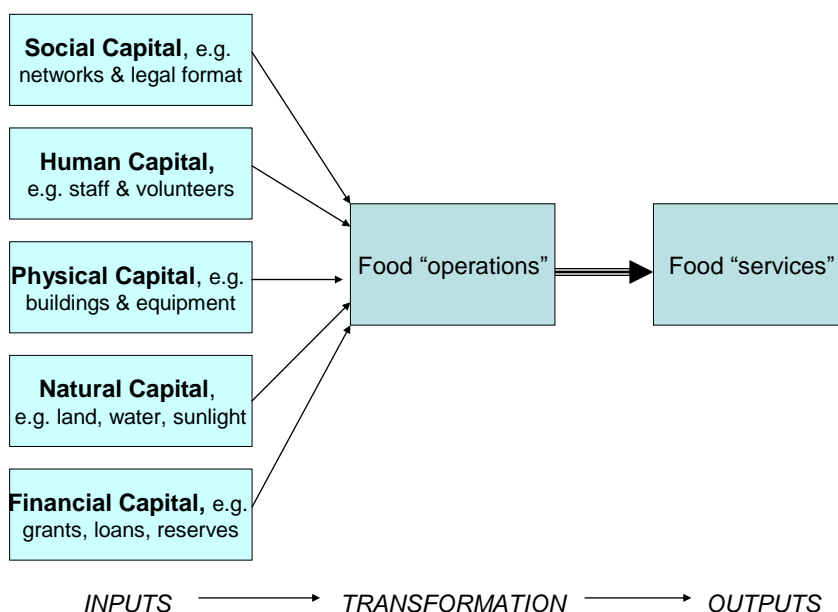


Figure 2: Inputs broken down into the 5 Capitals

The 5 capitals are combined within the operations function (which may consist of primary production, processing, food service and retail – or some combination of these). The resulting food is then supplied to customers:

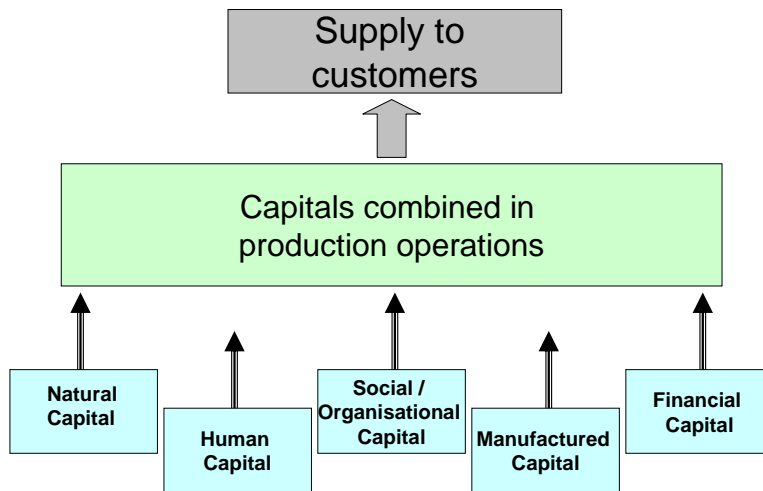


Figure 3: The 5 Capitals, transformed into food and supplied to customers

In the neo-classical economics model, supply (from economic actors) reaches an equilibrium with demand (from customers), through markets and the price mechanism. The model recognises that supply and demand can be influenced by many factors, and that this will adjust the “equilibrium” and by definition the nature of the food system:

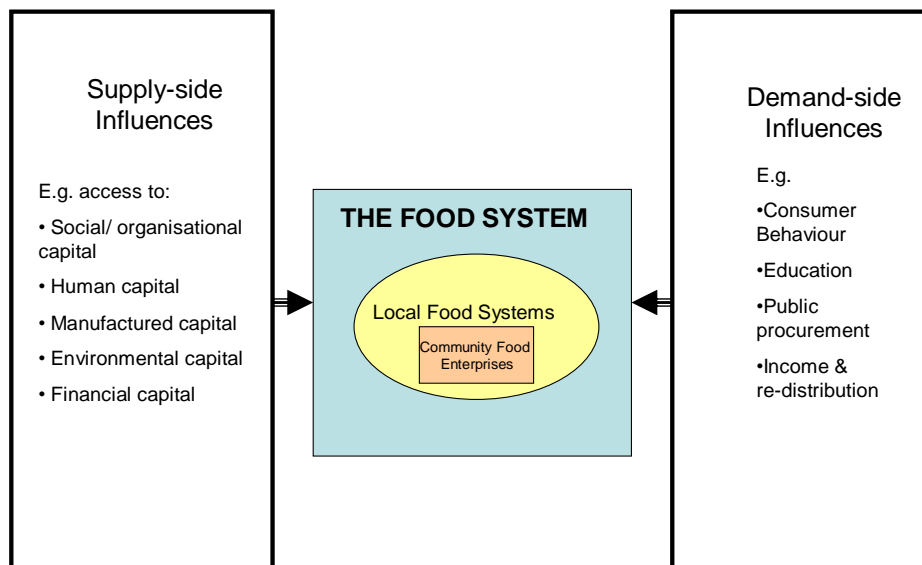


Figure 4: The Influence of Supply & Demand on Food Systems

As will be explained below, the simple models described above are being superseded by more complex models, and it will be argued that this allows greater understanding of how food systems could evolve in a more sustainable and equitable direction.

2.2 Food enterprises as open, circular systems

There is a growing understanding that enterprises do not operate in a vacuum – they exist within wider systems, such as local and national economies as well as ecological and social systems. This is particularly obvious with food enterprises, which require inputs from nature (“natural capital”) and use nature as a sink. If they deplete key inputs (such as fossil fuels, water or top soil) and over-pollute (for example, producing excessive greenhouse gas emissions) then the functioning of the food system becomes affected.

Another way of explaining this is to see food enterprises, and the wider food system, as “open systems”, which exchange matter, energy and information with the environment. According to Brown and Macy (2004):

“The relationships forming an open system are both external and internal. By virtue of the dynamic interdependence of its parts, a system is a self-organizing whole in its own right. By virtue of its dependence on energy and information from its surrounding world, it is also a subsystem of larger systems, be they social, economic or ecological.....The essential feature, which permits open systems to both maintain their form over time (homeostasis), and adapt to challenges by changing (evolution), is feedback. Alert to signals both from within and without, open systems monitor their own performance by matching it to their existing goals or values (acquired through previous learning). When a mismatch persists, the healthy systems adapts by reorganizing its internal structure and goals.

Information flow is of paramount importance, therefore, to the health of any living system--or enterprise. Feedback from its component parts, and from the larger systems in which it operates, is essential to its long-term survival. When feedback is blocked or discounted, the system cannot meet its own changing needs or respond to a changing environment.”

Morris and Martin (2009), suggest that “questions about food supply are best understood in terms of a complex, interacting food system involving land, animals, machinery, people and organizations [Figure 5 below], not just unconnected crops, retail outlets, consumers etc. Models like [Figure 5] are systems diagrams of the way that things currently are, in this case, a diagram of the current food production system as seen by one observer. They act as starting places for learners to consider how whole systems, or components of systems, can be redesigned along more sustainable lines.”

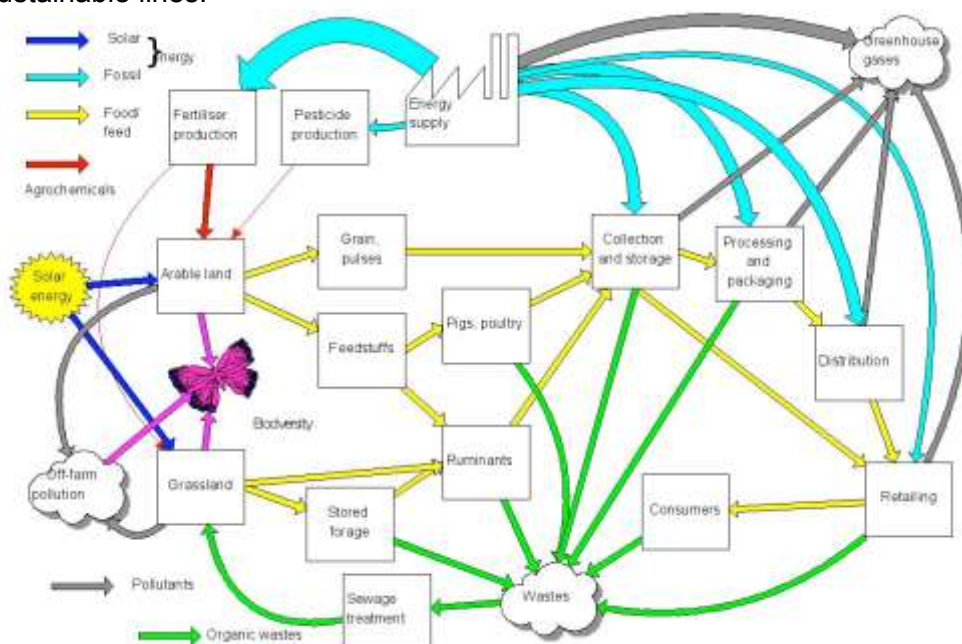


Figure 5: Food supply from a systems perspective

Complexity and local food systems

Mahli, L. et al (2009) suggest that if we wish to see local food systems which are “healthy, green, fair, and affordable”, we have to understand that this is a complex challenge:

“Although the food supply chain is often described in a linear fashion, beginning with production, processing, and distribution and continuing with marketing, retail, and consumption, the specific variables in each of these subsystems interact with each other in a nonlinear fashion, with many interdependencies and both balancing and reinforcing feedback loops.....Variables such as the power and influence of large retail chains and large food processors, government agricultural policies, and technological advances all increase further the complexity of the food systems landscape.”

They go on to explain that “outcomes like (1) ubiquitous and cheap nutrient-poor, calorie-dense food; (2) concentration of power in specific parts of the food chain; or (3) common agricultural practices that harm the environment may not result from specific, identifiable causal pathways. As a result, an understanding of causal relationships may not be sufficient, possible, or even necessary. Examination of individual variables or of pairs of relationships in isolation does not elucidate the behaviour of a complex system over time.....Tackling a complex problem requires a different approach, one that accepts the problem as complex and seeks solutions appropriate for complex problems.”

Strachan (2009) also illustrates the idea of complexity in relation to the food system:

“the ability to recognize inter-connections and understand the relevance and the importance of the relationships represented by these inter-connections..... is essential for understanding the nature of the sustainability crises we face and therefore essential in finding solutions. The use of pesticides on crops is one example of how a solution to one problem has created further and greater problems. While trying to combat a pest or disease to improve food production, pesticides in many cases have disrupted ecosystems, some of which indirectly support the crop being grown, and have had adverse health effects on people from pesticide residues on food crops. Place the use of pesticides into the context of the ‘Green Revolution’ of the 1970s where they were part of a package with artificial fertilizers, financial credit, irrigation and increased mechanisation, and the inter-related social, environmental and economic consequences become complex.”

The role of entropy, and the blocking of feedback mechanisms

The First Law of thermodynamics states that energy is neither created nor destroyed. The Second Law states that entropy, a measure of disorder or randomness in a system, is always increasing. In other words, in any natural process there exists an inherent tendency towards the dissipation of useful energy. However, in an open system, the energy and matter flowing into it can be used to create order, structure and complex patterns. According to Beinhocker (2007. P:70-71):

“The economy is not a closed equilibrium system; it is an open disequilibrium system and, more specifically, a complex adaptive system.....Modern economies power themselves with Big Macs and microwaveable ready-meals, as well as with oil, natural gas, coal, hydropower, nuclear power, and any other energy source we can get our hands on. Energy comes into economies to power the fight against entropy and create order. Likewise, economies obey the Second Law and export disorder back into the universe around them as they throw off waste, pollution, greenhouse gases, and heat.”

If this process of entropy causes problems, such as global warming, then one would expect an open system to adapt to the feedback and adapt. However, as Brown and Macy (2004) point out, challenging the objectives that lead to this highly entropic behaviour means challenging notions such as the “free” market, economic growth and profit maximisation:

“Feedback from the biosphere--climatic disruptions and loss of forests, fisheries, and topsoil--is revealing that our present economy is unsustainable. It indicates an urgent need to change the goals our system pursues and the values by which it measures its success. Many systems thinkers and ecologists perceive that the maximization of corporate profits as our economy's highest priority is progressively destroying the interwoven fabric on which all life depends. When we block this feedback, our corporate economy, being geared to a dysfunctional goal, spins out of control. In systems terms, it is on "runaway." Lacking vital information about the effects of its behaviour, it is caught in a vicious self-amplifying cycle, causing "overshoot" in one area after another.”

One key feature of the food systems we wish to see developed will therefore be much greater information. As Boyd (2011) points out, without this there is the danger that the food system will face the same crashes as the financial system:

“The financial system that nearly led to a global financial collapse, and which has caused the largest recession since the Great Depression, is a sprawling, globalized mess so complex that it cannot be managed or understood. One thing we have learned is that the mortgage bond market is a textbook example of how lack of visibility can make a system dangerous to all those involved, even to those who make money from its instability.....

in the global food system, the risks inherent in food — not just food safety, but the environmental costs of outsourcing food production to distant lands with unregulated food production — are concealed by distance, and the unwillingness of the players to keep track of and share information.....

In the final analysis, long food chains with closed information cannot be safe, and create a situation where it is impossible to make informed decisions about the impacts of our food choices. And the companies that have come to control the global food market do not want to gather or provide that information. And it is difficult to imagine that our governments would start to compel them to do so.”

Embedding food systems in society

We have seen that there are arguments for developing food systems (from the firm level to the global level) that are embedded in the environment, and that adapt or evolve in order to lessen the disorder or entropy that they currently entail.

However, it is important also to recognise that economic systems also need to be embedded in society. One of the most original thinkers in this area was Karl Polanyi, whose book, *The Great Transformation*, provides a critique of neo-classical economic theories that suggest free markets always lead to outcomes that are efficient and equitable.

Polanyi (2001) suggests that the economy is not autonomous, as described in mainstream economic theory, but should be understood as subordinate to social relations, politics and, in many countries, religion. Modern economic theories see the economy as an interlocking and equilibrating system of markets that automatically adjusts supply and demand through the price mechanism:

“The control of the economic system by the market is of overwhelming consequence to the whole organisation of society: it means no less than the running of society as an adjunct to the market. Instead of economy being embedded in social relations, social relations are embedded in the economic system.”

Polanyi points out the consequences of such an approach, in a critique that complements that of systems theorists:

“Our thesis is that the idea of a self-adjusting market implied a stark utopia. Such an institution could not exist for any length of time without annihilating the human and natural substance of society; it would have physically destroyed man and transformed his surroundings into a wilderness.” (p.3)

His thesis is based on the idea that neo-liberal economics demands that everything, including human beings and the environment, be turned into commodities. According to Block (2001), writing in the Introduction to *The Great Transformation*, Polanyi believed it was “wrong to treat nature and human beings as objects whose price will be determined entirely by the market. Such a concept violates the principles that have governed societies for centuries: nature and human life have almost always been recognised as having a sacred dimension.”

Alongside this moral argument, Polanyi also makes the point that market societies need the state to play an active role in managing the economy, and that role requires political decision making. As Block points out:

“When state policies move in the direction of disembedding through placing greater reliance on market self-regulation, ordinary people are forced to bear higher costs. Workers and their families are made more vulnerable to unemployment, farmers are exposed to greater competition from imports, and both groups are required to get by with reduced entitlements to assistance. It often takes *greater* state efforts to assure that these groups will bear these increased costs without engaging in disruptive political actions.”

Severyn Bruyn (1992) develops Polanyi’s idea by suggesting that “fictional” commodities can be embedded in institutions that are insulated from market pressures. He argues that there are a number of institutional innovations that can be established such as the community land trust (for land), the democratic firm (for labour), community finance institutions (for finance), local learning centres (for knowledge) and community development companies (e.g. development trusts) – the latter providing a co-ordination function. This working paper explores below how these institutional forms can be utilised for the benefit of local food systems and individual community food enterprises.

Moving towards food systems that are open, circular, complex and adaptive

Looking at dominant economic systems through the lens of both systems theory and Polanyi’s critique, the issue of externalities comes to the fore. Feedback from the environment is ignored or denied, and even when the science is proved as with climate change, the economic system’s over-riding purpose of growth means that the system cannot adapt quickly enough. On the social side, firms do not have to bear the full social costs of their operations (including the costs of training, poor working conditions, unemployment and, in the case of the food system, diet-related ill-health). From an economic side, the arguments of Arthur, Beinhocker and others suggest that the dominant food system does not deliver efficient or optimal outcomes.

Writing in the *Guardian*, Joanna Blythman (2011) summarises these ideas and argues that:

“If we want our food to be truly safe, we must recognise that this can only be delivered by a radically different model of food and agriculture, one that is based on the largely untapped potential of small-scale, much more regional production and food distribution. We need a new system that no longer concentrates power and control of the food chain in the hands of a few global corporations and interest groups, at the expense of everyone else, one that puts diversity at its heart and respects the limits of the natural world, rather than trying to override them. Until then, expect more food scares. It’s business as usual.”

The *Forecast for the Future* research looks at the way community food enterprises have sought to develop new food systems, at a firm level and, more often than not, at a wider level – local, regional, national or international. The motivation may be sustainability, localisation or fair trade, but common features include:

- ensuring that prices reflect real costs (i.e. costs are internalised, not treated as externalities to be borne by others);
- building feedback from natural systems into their models.

We argue in this paper that the adoption of systems thinking could enhance people's understanding of the way in which food systems can be improved. Key points include:

- food systems, and the problems that may be associated with them, are complex;
- we need to assess the inter-relationships, interactions, and interconnectivity of elements within food systems and between a food system and its environment;
- systems are open to energy, information, etc;
- the more open the system, the greater the opportunity for feedback which leads to improvements in the sustainability and fairness of the system;
- systems experience entropy;
- this entropy can be reduced through creating more efficient systems, and ones that have some element of circularity incorporated (e.g. waste is recycled);
- successful systems require clear objectives;
- the objectives of growth maximisation and profit maximisation, set above those of environmental sustainability and social equity, lead to the undermining of natural systems and social systems;
- new food systems must have multiple objectives and seek to benefit multiple stakeholders;
- the existing food system allows increasing returns to scale by a relatively small number of corporations, and this in turn discourages the evolution of more appropriate business models;
- food systems should encourage evolution through greater differentiation – innovation, entrepreneurship and diversity should be supported not stifled.

2.3 Systems Thinking - Implications for Community Food Enterprises

The first conclusion from this understanding of food systems is that food enterprises should be conceptualised as circular, rather than linear, entities. The diagram below illustrates some of the problems associated with the mainstream food system:

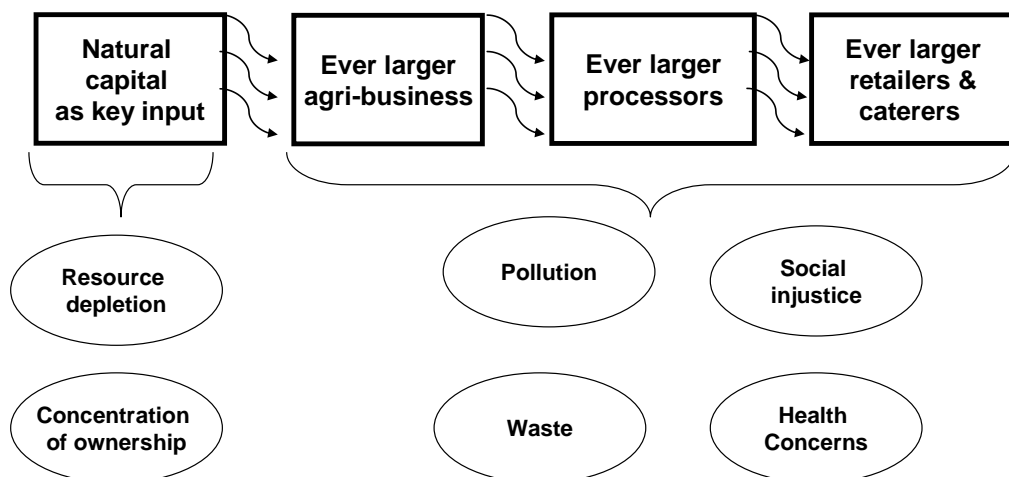
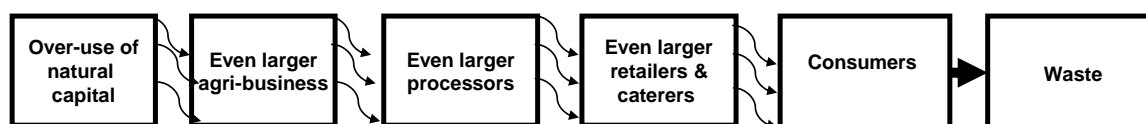


Figure 6: Externalities associated with the dominant food system model

From an environmental perspective, some of these issues can be addressed through adopting approaches that reduce reliance on fossil fuels, minimise pollution and re-cycle wastes. The diagram below illustrates this approach:

“Linear” food systems



“Circular” food systems

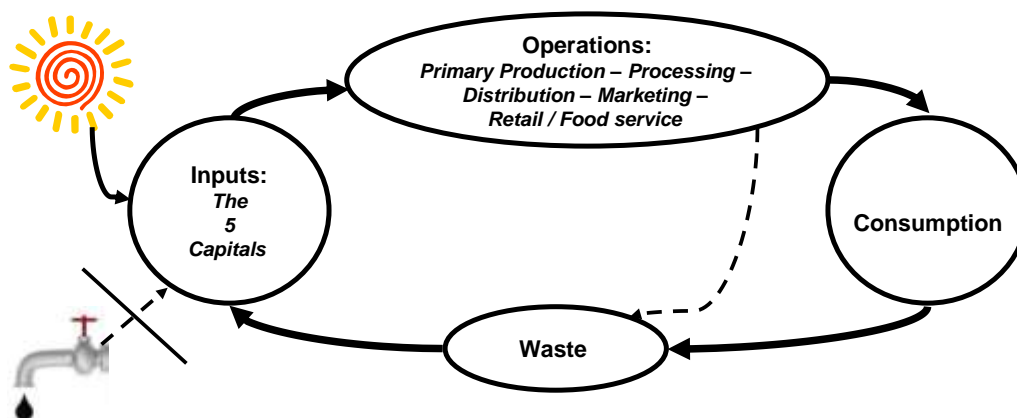


Figure 7: A comparison of linear and circular food systems

From the discussion above it can be seen that this is an improvement on the model developed in working paper 2, and it provides the opportunity to do three things:

- assess existing Making Local Food Work interventions – and propose new interventions – that seek to improve, **at the level of an individual enterprise**, the different stages of the cycle;
- assess existing MLFW interventions – and propose new interventions – that seek to improve, **through collaborative mechanisms**, the different stages of the cycle;
- assess existing MLFW interventions – or propose new interventions – that seek to work on the identified **system as a whole**.

We have seen from research into a series of case studies that the model can incorporate two additional elements of “circularity” – that consumers can take on the role of “co-producer” and also the role of investor.

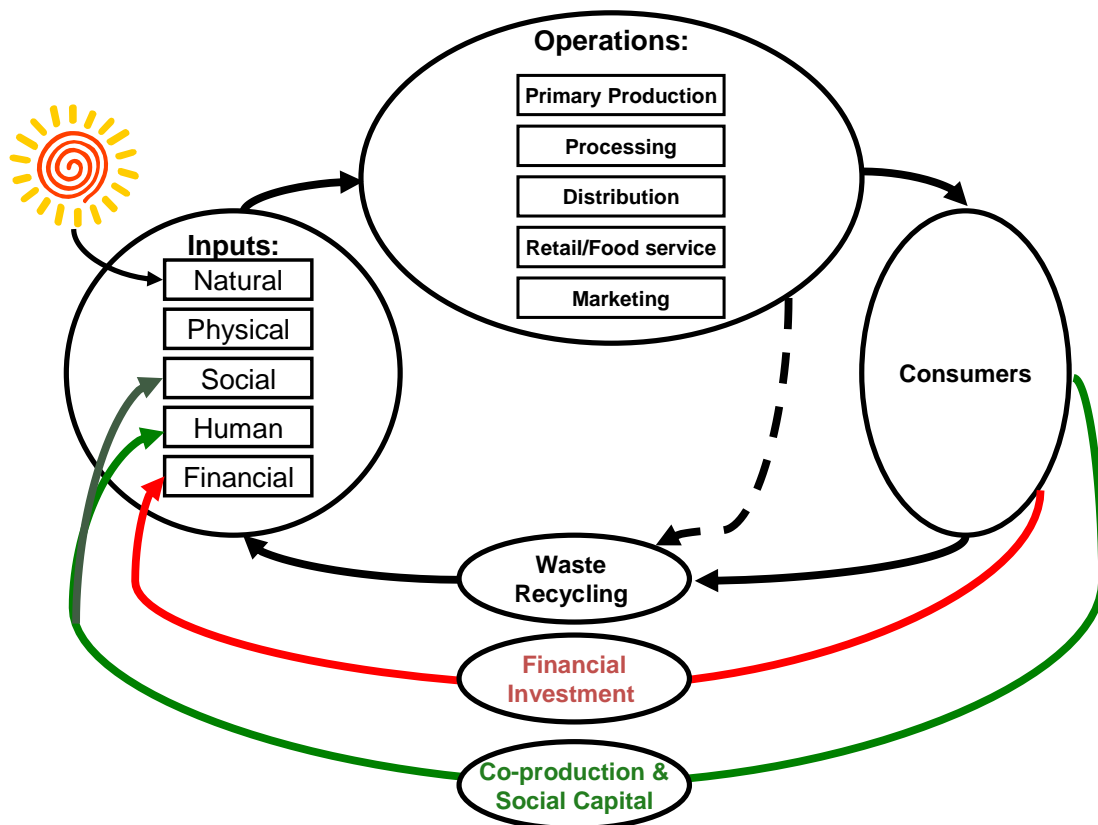


Figure 8: A circular food system

3 Preliminary conclusions

Systems thinking can take us beyond a narrow focus on issues such as “food miles”, and also help local actors move beyond zero sum scenarios. It could also address issues such as the growing lack of competition in the food system and the need to promote evolution and innovation – possibilities which are becoming ever more constrained.

Systems thinking can help us understand “resilience”, which is defined as the ability of a system to adapt to shocks. Key “shocks” – e.g., oil price rises, water shortages, food commodity speculation and demand for land – are resulting in a globalised food system which is struggling to adapt to these shocks without high price rises, yet this undermines the key rationale of the system – to provide affordable food to consumers. There is the potential to define food systems which are more resilient as well as being more sustainable and equitable.

According to Meadows (2009), complex food systems require solutions appropriate for complex problems. Meadows outlined 12 places or levels of intervention for complex problems. At one end of the spectrum are “constants, numbers and parameters,” (p. 5), leverage points that are relatively easy to change but which only have a small impact. At the other end are the goals of the system and the paradigm under which the system operates, leverage points that are often very difficult to change but if changed can have a large impact. These “places to intervene” arose out of Meadows’ experience working with simple solutions that seem intuitively correct but are often wrong.

Following Meadows, Mahli et al (2009) adapted Meadows' 12 "places to intervene" into a 5-level framework (Table 1):

Paradigm	<ul style="list-style-type: none"> - System's "mindset" - Deepest held, often unspoken beliefs about the way the system works - Goals, rules, and structures arise out of the paradigm - Actions and ideas at this level propose to either shift or reinforce the current paradigm - It is very difficult to intervene at this level, but it can be very effective
Goals	<ul style="list-style-type: none"> - Conform to the system's paradigm - Are targets that need to be achieved for the paradigm to shift - Actions at this level focus or change the aim of the system - The levels below conform to and enable the system's goals
System structure	<ul style="list-style-type: none"> - All of the elements that make up the system as a whole, including the subsystems, actors, and interconnections between these elements - Conforms to the system's goals and paradigms - Actions at this level will change the entire system structure by changing the linkages within the system or incorporating novel types of structural elements - System structure gives rise to the dynamic behaviour of the system over time
Feedback & delays	<ul style="list-style-type: none"> - Feedback allows the system to regulate itself by providing information about the outcome of different actions back to the source of the actions - Feedback occurs when actions by one element of the system in turn affect the flows into or out of that same element - Can be simple and direct or involve multiple variables - Can be self-regulating/balancing or self-reinforcing - Actions at this level attempt to create new, or increase the gain around existing, feedback loops - Adding new feedback loops or changing feedback delays has the potential to restructure the system
Structural elements	<ul style="list-style-type: none"> - Subsystems, actors, and the physical elements of the system - Connected through feedback loops and information flows - Actions at this level affect specific subsystems, actors, or elements of the system - Many actions at this level are usually required to create system-wide change

Table 1: Intervention Level Framework, from Mahli et al (2009)

The following table draws on the analysis above by summarising dominant food system models, and indicating interventions which might improve the functioning of food systems in the direction of health, sustainability and fairness:

Intervention levels	Dominant food system: globalised, industrialised, un-sustainable	Interventions which could support local food systems
Paradigm (deepest held beliefs)	Neo-liberal economic models: - equilibrium analysis - self-interest leads to optimal outcomes Technological solutions to food security.	“New” economics: - Complexity perspectives - Green/Ecological approaches - Co-operative approaches Sustainable agriculture and food production.
Goals (the targets)	Profit maximisation Growth maximisation Rewards to investors prioritised	Well-being, sustainability and fairness as over-arching goals. Profit is necessary but not sole goal. Goals of all stakeholders built into the objects of firms.
System structure (across the system)	Concentration and large scale operations encouraged by de-regulation (weak competition policy, planning policy, etc) and subsidies	Policies, programmes and public education that support sustainable food production, distribution, availability, and affordability.
Feedback & delays (loop dynamics)	Externalisation of costs permitted Lack of transparency throughout the food chain	Internalisation of costs Transparency and openness are key features
Structural elements (subsystem specific)	Dominant companies within each element of the food chain. Fragmentation within non-mainstream food sectors (local, organic, community, etc)	Cap payments to large farms. Increase the viability of multi-function farms rather than Mono-culture farms. Ensure that low-income families receive sufficient food assistance to afford healthy food.

Table 2: Possible interventions in food systems

The table below, from Barlow and Stone (2011) provides another useful framework for considering change from a systems perspective:

Seven Lessons for Leaders in Systems Change: A report from the field.
Barlow, Z. and Stone M. (2011)

Lesson #1: To promote systems change, foster community and cultivate networks.

Nature sustains life by creating and nurturing communities. Lasting change frequently requires a critical mass or density of interrelationships within a community. For instance, to improve food in schools leaders must cross department boundaries and bring people addressing parts of the problem around the same table. In the push to make decisions and produce results quickly, it's easy to bypass people — often the very people, such as food service staff and custodians, who will have the task of implementing changes and whose cooperation is key to success. It's necessary to keep asking: "Who's being left out?" and "Who should be in the room?"

Lesson #2: Work at multiple levels of scale. "Nested systems" is a core ecological principle - most systems contain other systems and are contained within larger systems: cells within organs within individuals within communities; classes within schools within districts within counties, states, and the nation.

Changing a system affects both the systems within it and the systems in which it is nested. The challenge for change agents is choosing the right level, or levels, of scale for the changes they seek. The answer is often working at multiple levels: top down, bottom up, outside in, and inside out.

Lesson #3: Make space for self-organization. Networks that can effect systems change will sometimes self-organize if you set up the right conditions. The pattern favoured by life "is a network pattern capable of self-organization. Life constantly reaches out into novelty, and this property of all living systems is the origin of development, learning, and evolution.

Lesson #4: Seize breakthrough opportunities when they arise. Living systems generally remain in a stable state, and this can make systems change very difficult. From time to time, however, a system encounters a point of instability where it is confronted by new circumstances or information that it can't absorb without giving up some of its old structures, behaviours, or beliefs. That instability can precipitate either a breakdown or — due to systems' capacities for self-organization — a breakthrough to new possibilities.

Lesson #5: Facilitate — but give up the illusion that you can direct — change. The only way to change a system is to disturb it:

- by introducing information that contradicts old assumption;
- by demonstrating that things people believe they can't do are already being accomplished somewhere;
- by inviting new people into the conversation;
- by rearranging structures so that people relate in ways they're not used to;
- by presenting issues from different perspectives.
- by nurturing networks of connection and communication, creating climates of trust and mutual support, encouraging questioning, and rewarding innovation.

Lesson #6: Assume that change is going to take time. People may take a number of years to change attitudes, adopt new practices, or use new tools. Set high goals, but take manageable steps. Look for intermediate achievements that allow people to experience — and celebrate — success and to receive recognition on the way to the ultimate goal.

Lesson #7: Living systems generate properties that are not predictable from the properties of their individual parts. Systems theorists call these "emergent properties." Participants should be prepared to be surprised by what appears.

Table 3: How to create change within a food system

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Appendix : Organisations involved with Systems and Complexity

Centre for Advanced Spatial Analysis - UCL Bartlett Faculty of the Built Environment

<http://www.bartlett.ucl.ac.uk/casa>

Complex Systems Society: <http://www.complexsociety.eu>

Food and Agriculture Organisation: <http://www.fao.org>

Paper:

Food and Agriculture in Cities

http://www.fao.org/fileadmin/templates/FCIT/PDF/FoodAgriCities_Oct2011.pdf

Landshare CIC: <http://www.landshare.org/index.html>

How to feed a city project

Paper: How to Feed a City - A review of UK food chain resilience and environment impact

http://www.landshare.org/uploads/7/5/4/1/7541639/foodprint_report.pdf

New Economics Foundation: <http://www.neweconomics.org/projects/new-economic-model>

Paper:

<http://www.neweconomics.org/publications/great-transition>

New England Complex Systems Institute: <http://www.necsi.edu>

Paper:

M. Lagi, K.Z. Bertrand, Y. Bar-Yam, [The Food Crises and Political Instability in North Africa and the Middle East](#). arXiv:1108.2455, August 10, 2011.

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<http://podcasts.ox.ac.uk/series/complexity-and-systemic-risk-hilary-term-seminar-series-2010>

Santa Fe Institute: <http://www.santafe.edu>

Research programmes:

Cities, Scaling and Sustainability: <http://www.santafe.edu/research/cities-scaling-and-sustainability>

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Appendix 1: The Literature on local food systems – A review by Suzanna Kostricova, Masaryk University and Wessex Community Assets Intern

Terminology:

Different authors tend to think and write about food systems in very different ways. Some of them just use the expression “food systems” with various adjectives, relying on the assumption that the understanding of what it means is somehow tacitly shared. Ingram (undated) speaks about food systems without any adjectives. He says the principal *objective* is food security (with its aspects of availability, utilisation and access) – this objective is the result of *outcomes*. These come out of *activities* (producing, processing, packaging and distribution, retailing and consuming). There are also external *drivers* (state and changes in demography, economic, socio-political, cultural, environmental context) which influence links between activities and outcomes. The author says this concept is especially useful for analyses of the interaction of changes in and stresses brought from e.g. changes in CAP.

The FLAIR Report (2003) does not even speak about food systems – they use the expression “local food sector”. They speak about “parts of the food chain”, and five capitals. The activities of the actors (parts of the food chain) then either increase or reduce particular capitals.

Allen (2010) adds a criteria of social justice, using a definition by Activist Researcher Consortium: “A socially just food system is one in which power and material resources are shared equitably so that people and communities can meet their needs and live with security and dignity, now and into the future”. Allen highlights, that producers does not mean just farmers, but also farm workers, who tend to be the most vulnerable actors. Quoting Anderson (2008), Allen mentions criteria for “rights-based food system”: absence of human exploitation, democratic decision making, transparent access to resources for food production including knowledge and no impingement on the ability of people in other locations to meet these criteria.

Sumelius and Vesala (2005) use the expression “alternative food system”.¹ The emphasis is on spatial dimension of the whole chain related to food. The concept of **food chain** refers to a value-added, consumption continuum from primary production through processing to consumption. Compared to this, the **food system** refers to the entity of the food chain from the systemic perspective going beyond the production-consumption chain by adding the use of inputs as well as the consequences for the natural environment as topics of interest.

They actually do not present a definition of AFS, they just distinguish it from the „globalised“ system: By introducing a local and short connection between the production, distribution and consumption of food, a **horizontal** alternative is created as opposed to the conventional, **vertically**-structured food chain.

The authors present a simple view that there are two modes of production (organic/conventional) and two modes of distribution (horizontal=local/vertical= global) Of the four possible combinations of these, three could be considered as somehow alternative: org production & loc. distribution; org prod & global distribution; conventional production & local distribution.

Sonnino and Marsden (2006) also use the adjective alternative, in particular “alternative food **networks**” – defining what they meant by this simply by: “alternative food **system**² of food provision

¹ AFS have their roots in organic farming, which historically is said to have been “local or community controlled, embedded economically into the local community, ... and structured to promote the interaction of producers and consumers in ways that familiarise each with the wants and needs of the other, so that the promote cooperation, trust and social cohesion”. But recently, due to the “convergence” with conventional food system causes the loss of localness and community value.

² This leads me to a feeling that it is often just coincident if an author is using the word system, network, alternative, regional and whatever – it does not have to carry any information about his way of conceptualizing the topic.

is fundamentally a short circuiting of the conventional chain". They add that it is not easy to divide existing projects into these two categories, because many of them might fall in both. They suggest the concept of "embeddedness" as a analytical tool.

Community food systems

Hendrickson (2001) used the expression „community food systems“.³ The definition provided is as follows: A 'community food system' is one in which sustainable food production, processing, distribution and consumption are integrated to enhance the environmental, economic, social and nutritional health of a particular place. (taken from Garret and Feenstra, 1999).

Food activists and academics in Kansas developed a Food Circle concepts. The aim is to reshape the relationship surrounding food, so that farmers, eaters, grocers, chefs and processors are aware that they are equally important, all interconnected. The concept highlights that the food systems should not be **linear** and **hierarchical**. The desirable attributes of a CFS are: community-centered, relational (encouraging the development of just, sustainable relationships), place-based, participatory (all members are involved in all aspects of growing and eating food.) healthy, participatory and supportive of the local economy.

Also Anderson (2008) differentiates local- and community-based food systems. Community-based refers to residents having control over making decisions about their food system, while local means physical geographic dimensions. (quoted according to Allen, 2010)

Regional food systems

Donald et al 2010 say that re-regionalization of food systems is mostly a high income country phenomenon. They do not provide any explanation about the actual difference between localized and regionalized, we just can feel that the latter is somehow bigger in geographical scale, complexity etc. They only distinguish two types of re-regionalization „ Trend towards local food production and consumption that embraces regional food and the emergence of new regional food networks. They also mention a **network** perspective, which provides the conceptual terminology for a system that deals with „flows, processes and relationships“, but they do not deal with this concept any further.

In the academic literature on regional food systems there are two approaches: consensus based and inequality based approach. In the former, the actors are simply producers and consumers and the food system is a result of a consensus between them which advantages both groups. (this lies on a neoclassical assumption that human capital factors and lifestyle choices explain why producers engage in farming for local markets and why consumers seek to purchase their products.) Inequality based approaches emphasize tension and conflict between key local actors. One branch of this approaches views the need to preserve family farming and community based food systems, see them as essential to democracy. It emphasize the inequality on producer side, focusing on strategies how the small scale producers are trying to survive. One of these strategies is networking with others, farmers, consumers, retailers. Nothing said about secondary structures explicitly, but they might be hidden under the word networking.

The other, more critical branch, which has its foundation in radical political economy theory, claims that unequal society begets an unequal food system that will be difficult if not impossible to change. Focus on regional food systems project can even be a barrier to alleviate hunger and poverty – if they function as cosmetic solution to real changes in the allocation of societal resources.

A phrase is quoted that cities should promote cosmopolitan localism, rather than localism *per se*.

³ Again, these are described as an alternative to the „globalized“ and „industrialized“ conventional system, the features mentioned are „localized“ and „personalized“. Important aspect here is the absence of the possibility to participate in decision making about who, where and how is growing food for the community. This power to do the decisions lies just in hands of policy makers and giant agribusiness.

Clusters

Rosenfeld (2010) – speaks about “clusters”, unit which are defined as a system that include those firms and organisations that have observable common needs and interests. It is a group of interdependent companies, organisations and institutions in geographic region with a common and complementary interest that have reached sufficient scale to develop specialized expertise, services, resources, suppliers and labour. The clusters main source of competitiveness is said to be the **easy flow of tacit knowledge, skills and experiences**. One company can be part of more cluster, in fact, The picture of the whole system aims to be quite complex: part of the model is also “supporting infrastructure” (services, research, banks...) a attention is paid to the fact, that each part of the food chain has its own value chain (seed, machinery, packaging suppliers etc...) The term clusters is used also in another American report – Oakland Food System Assessment Report: “a healthy local food processing and distribution clusters is an important building block increasing consumption of local foods.”(40)

Mainstream research by, for example, Porter, Jacobs and Krugman suggests that the development of local food “clusters”, of city regions with a strong food sector, or of geographical networks of food sector organisations, could provide a bulwark against competition from the globalised farming and food industry. Additional research into local and alternative food systems provides further pointers as to how local sustainable food systems, with community food enterprises at their heart, could be built.

One key point is that community food enterprises will have limited impact if they do not interact with other “private” enterprises in their locality. The community food sector is a small part of the overall local food economy, and although some play a key role as secondary structures (e.g. farmers’ markets, Country Markets and other retail outlets), it is essential that alliances be built up with other enterprises. At the start of this working paper we pointed to the range of motivations which drive enterprises in the local and community food sectors, and while this can lead to competition it would clearly be advantageous to recognise the benefits of building a “local food cluster” or “sustainable food system”. There is also the potential to link with other clusters, such as tourism and the creative sector, as has happened successfully in places such as Vermont (Rosenfeld, 2010):

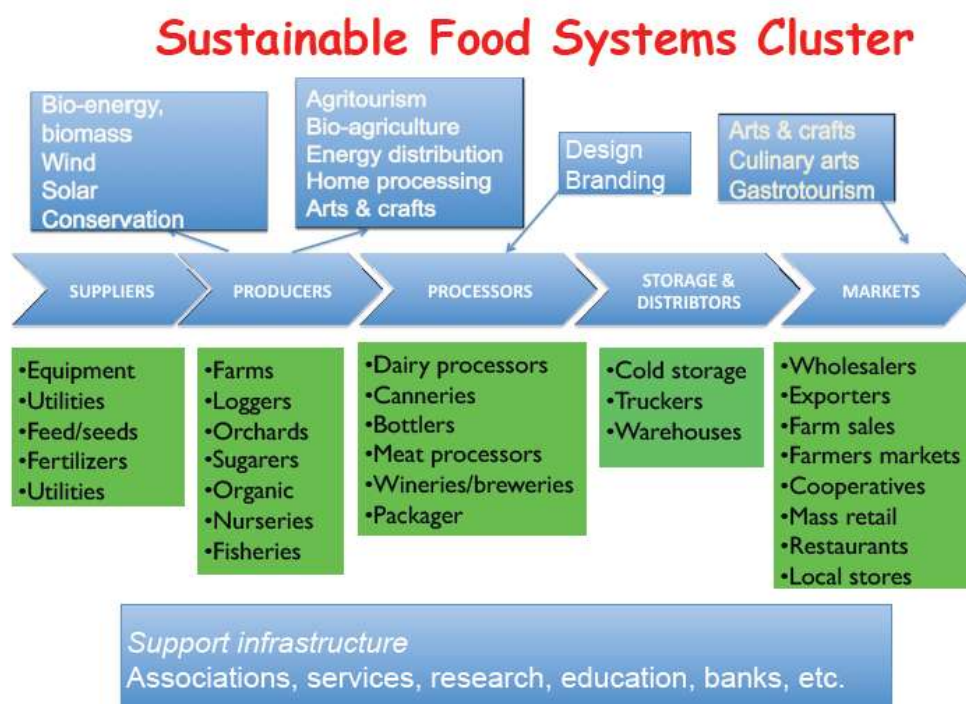


Figure 9: Sustainable food systems cluster in Vermont, US

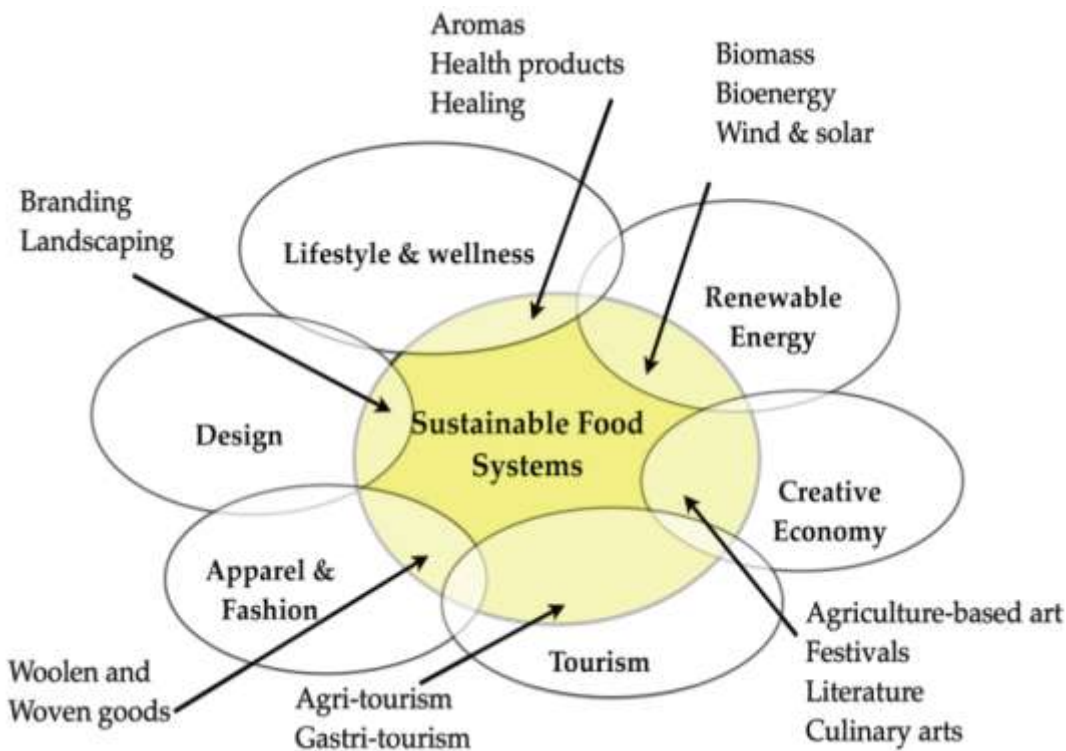


Figure 10: Convergence amongst clusters in Vermont, US

The scale of local food systems:

Being an exception among the papers quoted in this text, Rosenfeld (2010) gives some insight in his view of the boundaries – “regional production systems are defined by the distance and time that people are willing to travel for employment and that employees and owners consider reasonable for meeting and networking.”

Allen (2010) does not see the scale as being defined geographically: place is the outcome of social process, geography is not a defensible arbiter of the scope of caring action or understanding.

Similarly Morgan (2008) says the dichotomy between local and fair, is a false one, and that what we need is a new geopolitics of care. By care he means responsibility of the public sphere and must be applied at a global, not only local level. “Both, local and extra local knowledge are necessary for developing equitable food systems in places”, concludes Allen.

Born and Purcell (2007) criticise the assumption that local (or small scale) is inherently better, saying, that scale is just a strategy (not the end in it self), it is socially constructed and as such it is both fluid and fixed and also relational. Instead of focusing on scale, they advocate that the researchers should take the network theory approach, focusing on a combination of “vertical and horizontal networks. Vertical networks refer to a local agricultural economys links to a broader set of processes, which exist beyond rural areas, while horizontal network refers to links to non agricultural interests in or near the local area”. They also think about endogenous and exogenous development

Recommendations:

The “FLAIR report” sees the most substantial barriers in lack of insufficient infrastructure, lack of time and money to diversify and too much bureaucracy. A significant growth area could be the public sector, where cooperation between actors should be encouraged. Continued support and education is required in order for local suppliers to be competitive.

How to support the real demand for local food (not the just the expressed one, which is quite high but just theoretical) is the main issue of another recent report of MLFW: Influencing customer buying behaviour. Fitzpatrick and MacMillan, 2010) Briefly the recommendations the authors give are making local food **easy** (cheaper and achievable), **normal** (people observe and copy habits, especially if a “local celebrity” is engaged in promoting them) and **personal** (points to the motivation role of personal stories, individual approach etc.) The recommendations are targeted more on shop owners, volunteers, people who are directly running some project. But it fits well with the opinion expressed in the EAFL paper, that without encouraging the demand side (through campaigns, hands-on projects, the local/community food sector can not substantially grow in the future.

Along with this academic work, there was a project going on in Kansas, called Food Circles focused on enhancing food security in Missouri and also very direct project called Growing the Growers, which aims to improve the food system situation simply by encouraging more people to grow food, become farmers and do so in sustainable way.

The convergence of clusters is presented as the way to increase demand for sustainably sourced food – potential is described of the overlapping with arts, design, wellness, agrotourism etc. (quite similar to the concept of multifunctional agriculture). Specifically for the Vermont conditions, expanding the processing of local food, wood and fibre is a way to keep more added value (financial capital) in the local economy (Rosenfeld 2010).

Recommendations given by Allen (2010) are basically focus on institutional food purchasing programs (which can include social justice criteria in their purchasing standards), labelling schemes that include social justice criteria (similar to “domestic fair trade principles”) and more abstract – developing socially inclusive “creative food economies”.

Oakland Food System Assessment sees the opportunity for improving the local food system in supporting the processing and distributing sector with using non-traditional distribution mechanisms, such as CSAs, public institution purchasing (schools, hospitals) and non-retail wholesale markets, explicitly designed to serve low-income communities.

Sonnino and Marsden (2006) summarize various recommendations from different case studies. These include: measures that expand the market for this quality sector as well policy measures based on targeted environmental action, public investment in processing capacity and more interventionist approach in the food supply chain to promote explicit and independent mechanisms that monitor and certify the production and distribution of local foods.

The paper by East Anglia Food Links (2008) speaks about the role of other key actors - NGOs in the attempt to improve the prevailing food systems. There are four types of activities NGOs are engaged in. These are campaigning (persuading consumers), supply chain brokerage (with existing commercial businesses to modify the way they buy food), direct intervention in food supply chain (by setting up new distribution businesses or “food hubs”) and hands-on projects (“grow your own, community food buying groups or local food centres).

The author appreciates the first and the last type of activities: “it’s hard to find a sustainable food campaign that wasn’t originally begun by an NGO.” Resp. “(hands on projects with environmental focus are) a potentially a powerful tool to help bring about the culture change that I suspect we need in order to mitigate future threats to our food supply.” But deriving from his or her experiences of working in NGO, he is quite sceptical to supply chain brokerage and food hubs, saying that: “once the NGOs have spread the message and helped to create the consumer demand for a particular attribute in food, they should leave it to commercial businesses to tweak their business models to fulfil that demand”. (invisible hand???) The results of these activities (in terms of money invested and the number of successfully running business, food hubs) is very poor. So he would like the NGO to play the role of those, who are setting the agenda, if possible, deeper and more radical agenda than the one focused narrowly on food miles.

(and I do not see much difference between community food buying groups, local food centres (which the author favours) and setting up new distribution businesses. But I really like the term “food cultures” and the call for more radical approach in this paper. There is not very strong social equity aspect, in saying, that the commercial businesses simply do not supply customers with more sustainably sourced food because the customers are not willing to pay the price premium (not everyone can do so).

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Anderson (2008) - taken from Allen 2010

Garret and Feenstra (1999) - taken from Hendrickson 2001

Morgan 2008 – taken from Allen 2010