

In Search of a Resilient Food System

A Qualitative Study of the Transition Town Totnes
Food Group

aLp Pir



**Thesis submitted in partial fulfillment of the requirements
for the Degree of Master of Philosophy in
Culture, Environment and Sustainability**

Centre for Development and the Environment

University of Oslo

Blindern, Norway

December 2009

Acknowledgements

I would like to express my gratitude to my supervisor, Ilan Kelman, for his extraordinary efforts in facilitating my learning and navigation through the planes of science.

My informants (members of the TTI, TN, TTT and Totnesians) have provided invaluable insight, information and understanding in regard to food, food systems and community. I am grateful for their courage, hospitality and generous exchange of valuable information. Their contributions made this thesis possible.

I want to thank Chris, Keziah and Hayoka Salisbury for being wonderful hosts during my fieldwork.

My deepest gratitude goes to my Cathrine for her relentless support, love and understanding. I have greatly appreciated the support of May-Britt and Odde Hallan. I am also thankful to Chicko for his playfulness and ability to keep me in the moment.

It has been a privilege to have had Harald Wilhite, Nina Witoszek, Dan Banik, Desmond McNeill, Tanja Winther and Stephen Schneider as my teachers.

I want to extend my thanks to Kenneth Bo Nielsen, Kristian Bjoerkdahl, Karen Syse and Hanna Marie Ihlebæk for their openness and continuous support.

The friendship, support and inspiration of my dear friends Ed Doell, James McEntee, Lars Bergh, Robin Alfred, Irem Duraman Bennetts, Hale M. Karabekir and Victor Ananias have been a guiding light during this period.

As always, I am grateful to the presence and support of my family and my lovely niece Selina.

aLp Pir

Oslo, December 2009

Abstract

Food systems have a need for better conceptual and applied tools to evaluate the extent to which they are resilient. The purpose of this thesis is to conceptually explore a better understanding of what a resilient food system might entail within the dynamics of social, cultural, economic and environmental phenomena. Based on this, by applying personal resilience valuation criteria from a longitudinal study in the field of Psychology, the thesis uses the Transition Town Totnes Food Group, in the town of Totnes, England, as a case study to evaluate existing understandings of resilience. The evaluation found that the resilience of food systems being linked to social, cultural, economic and environmental phenomena is a crucial, contemporary concern which may be better understood when considered in parallel to the resilience of the self. Findings illustrate that while Totnesians have a high level of awareness of environmental and food-related issues, this is not matched by their patterns of behaviour which can be primarily attributed to three factors: 1) the cost and convenience of food production and consumption largely define patterns of behaviour, 2) the attraction to choice and exotic variety is difficult to resist, 3) the lack of social cohesion, landownership and political will are three major structural factors preventing the realisation of food-related, visible outcomes for the TTT Food Group. While there are a number of food-related attempts by the TTT Food Group such as the Garden Share, the Food Guide, Nut Tree Planting and Seed Swops, due to their scope, contributions for resilience building have a symbolic meaning at this stage. These are largely manifested in the consideration of mindsets and not in attitudes, and patterns of behaviour. As a result, the TTT Food Group has thus far not been effective in catalysing wide ranging change in behaviour on the consumption, production or policy side of the food system.

Abbreviations

BBL	barrel
CAP	Common Agricultural Policy
CCD	Colony Collapse Disorder
CIA	Central Intelligence Agency
CLSA	Credit Lyonnais Securities Asia
DCLG	Department of Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
EDAP	energy decent action plan
EEB	European Environmental Bureau
FAO	Food and Agricultural Organization of the United Nations
FCAG	Financial Crisis Advisory Group
FG	Food Group / Food Group members of the TTT
FM	food miles
FSA	Food Standards Agency
GHG	green house gas
GM	genetically modified
GMM	genetically modified micro-organism
GMO	genetically modified organism
HA	hectares
IEA	International Energy Agency
IGD	Institute of Grocery Distribution
IPCC	Intergovernmental Panel on Climate Change
M	men
NASA	National Aeronautics and Space Administration
ONS	Office of National Statistics
OECD	Organisation for Economic Co-operation and Development
OPEC	Organisation of the Petroleum Exporting Countries
OT	members of TTT groups (other than food group)
T	Totnes / Totnesians (with no affiliation to the Transition Town Totnes)
TM	Transition Movement
TN	Transition Network
TSC	Totnes Sustainable Construction
TTI	Transition Town Initiative
TTT	Transition Town Totnes
UCSAREP	University of California Sustainable Agriculture Research and Education Program
UNDP	United Nations Development Programme
UNDP HDR	United Nations Development Programme Human Development Report
UNESC	United Nations Economic and Social Council
UNFCCC	United Nations Framework Convention on Climate Change
USEIA	United States Energy Information Agency
UN WFP	United Nations World Food Programme
UN WHO	United Nations World Health Organisation
W	women
WRAP	Waste and Action Resources Programme
WWF	World Wildlife Fund

[illegible]

○ = Study Area : Totnes

Source : <http://www.abcounties.co.uk/counties/map.htm>

Table of Contents

Acknowledgements	3
Abstract.....	4
Abbreviations	5
Table of Contents.....	7
1. Introduction	11
Meanings and importance of food	13
Key concepts.....	15
The concern of resilience.....	15
Exploring resilience in food systems	19
The potential of climate change	21
The potential of peak oil	23
The Transition Towns Initiative (TTI)	25
What is a Transition Town?	28
Thesis Outline	30
2. Exploring the UK food system and resilience.....	31
A view of the UK food system	31
Health and growing population	33
Food and the Environment	34
Further growth and GM dichotomy	35
The journey from here to there.....	37
Understanding and anticipating food system resilience?	39
3. Theory and Method	41
Research Approaches	42
Analysis of Data	44
Limitations.....	44

4. Fieldwork results.....	46
Totnes	46
Fieldwork analysis	48
Preparing for the field.....	49
Food system and resilience – varied meanings and understandings?	50
The TTT Food Group	51
Fieldwork findings	51
Responses on the Totnes food system	52
Awareness and Affordability.....	52
Local food production and the economic reality.....	53
Major concerns	54
The industrial food system	54
Disconnection and deskilling.....	55
Land issues	55
What needs to change?.....	56
What would help?	57
Exploring personal engagements with food	57
Factors contributing to resilience	59
Community, locality and seasonality	59
The land structure	59
Factors preventing resilience	60
Effects on people	61
TTT Food Group contributions to food system resilience	61
The TTT Food Group’s effectiveness.....	62
 5. An exploration of “significant others”	 64
 6. Discussion.....	 68
Comparing the Self with the Totnes Food System and TTT Food Group	68

Exacerbating risk factors	69
The Food System of Totnes.....	69
TTT Food Group	71
Mitigating factors	75
The Food System of Totnes.....	75
TTT Food Group	76
Factors for the Totnes food system:	78
In search of a resilient food system.....	79
The Food System of Totnes.....	79
The TTT Food Group	83
Signs of resilience	84
The Food System of Totnes.....	84
The TTT Food Group	85
 7. Conclusion	 91
 8. Bibliography	 95
 Appendix I.....	 105
Interview Guide	105
Interview Locations and Visited Sites	106
Appendix II.....	107
Exploring Resilience Indicators.....	107
Appendix III.....	108
Tables.....	108

SECTION 1

1. Introduction

The approach to the way food is produced, marketed and consumed has changed dramatically over the past few decades. There has been a shift in focus from local, seasonal low energy methods of food production to global, year-round high energy practices (Maxwell & Slater 2003). According to the data contained in the Intergovernmental Panel on Climate Change (IPCC) 2007 Report, the combined practices of industrial production, storage, distribution and waste of food, i.e. the food system, can be said to be the largest contributor to global warming (IPCC 2007). As a result, food, water and energy Security have become major global concerns. The loss of biodiversity and ecosystem services also point to further critical vulnerabilities of the food systems. Therefore, there is a growing interest in building resilience into food systems not only to secure long-term basic life sources for human survival, but also to simultaneously respond to environmental, economic, and social challenges. In this process, however, the role of local communities in fostering resilience for the production, transportation, storage, retailing, consumption and recycling of healthy foods seems underexplored. Even so, due to its scope, food systems and their social context need an anchor to help with an in-depth focus on corresponding components and their dynamics. The choice of this anchor might entail such diverse areas as economics, politics, culture, geography, technology, and psychology among others. Furthermore, educational systems also embrace a challenge in influencing citizens to become active and aware, to make decisions, to have an understanding for people in other situations and to influence their environment (Carlsson & Jensen 2006).

The UK is one of the richest countries in the world (CIA World Fact Book 2008) and ranks among the highest in food imports, energy consumption and food-related health problems (Wandel 1994, Nationmaster.com 2005, CIA

World Fact Book 2008,). This thesis investigates the role of Transition Town Totnes (TTT) Food Group's activities in Totnes, England in building a resilient food system. It is thereby assumed that TTT holds some of the aforementioned characteristics of an anchor which could help in facilitating the focus of this study.

TTT is the first Transition Town of the Transition Towns Initiative (TTI) in the UK aiming to catalyse a bottom-up approach to sustainable development (Hopkins 2008). Whereas some of TTT's activities involve food systems, others involve energy security, local economics, education, local building, transportation, personal development and others. There have been other attempts in the UK and elsewhere with a similarly wide-ranging vision. Some of these attempts are the Bugday (bugday.org/eng), Slow Food Movement (slowfood.com), Slow Cities Movement (slowmovement.com), Slow Money Alliance (slowmoneyalliance.org), Global Ecovillage Network (gen.ecovillage.org), One Earth (oneearth.org), Walking the Talk (walkingthetalk.net), Covenant of Mayors (eumayors.eu), Moveon.org, Getup.org, Dosomethingaboutit.org.uk, 350.org, Localeyes.org, 38degrees.org.uk and many others that deserve an equal amount of attention.

The importance of this study lies in the overwhelming shortage of wide-ranging practical solutions for local adaptation to a low energy based living and resilient food systems. Resilience is an increasingly used term in the context of development, which focuses on the positive adaptation capacity of a community in case of internal or external shocks. In this context, whereas related responsibility is generally attributed to and expected from top-down national, regional or global authorities, TTI aims to pursue a bottom-up approach based on a positive vision that focuses on community-led, practical responses.

In a broader sense, TTI seeks ways to “significantly increase resilience (to mitigate the effects of peak oil) and drastically reduce carbon emissions (to mitigate the effects of climate change)” (TTI Website 2009). The aim in this thesis is to examine TTT’s activities, particularly the TTT Food Group, and to inquire about their effectiveness. The research questions explored are: (1) In what ways does the TTT Food Group contribute to building resilience in the local food system?, and (2) In what ways can it be said to be effective?

This thesis argues that the resilience of food systems being linked to social, cultural, economic and environmental phenomena is a crucial, contemporary concern which may be better understood when considered in parallel to the resilience of the self.

Embarking on a journey in order to better understand what comprises resilient food systems is a very meaningful yet highly challenging task. For that reason, I have chosen to anchor my pursuit in the Transition Movement (TM), a voluntary movement of heartfelt, passionate and brilliant people. I am first of all thankful for their work without which this work would not have been possible. Due to the nature of this assignment, I will make a proactive and critical attempt with the intention of shedding further light on the journey of anticipating resilient food systems. In this process, I hope to contribute to a better understanding of what resilience means in the context of food systems and how the role of TTT Food Group and its effectiveness may be understood.

Meanings and importance of food

Aside from being essential for survival, food is part of our cultural identity and the main source of global income (Fernandez-Armesto 2002). Whereas food can be seen as a basic source of nourishment, it is also an integral source of medicine, cultural symbolism, and resources. Consequently, food systems can

be seen as a means of relating to environmental, economic and social phenomena as they affect and are affected by the interaction of all spheres of life. Fernandez-Armesto (2002) argues that our most intimate contact with the natural environment occurs when we eat it. Thus, the physical act of preparing and consuming food is also related to the act of feeding and nourishing social, cultural, and spiritual realms. To this day, feasting rituals continue to hold importance for the creation of conviviality, as well as in the necessity of maintaining social hierarchy. As a consequence, gathering around food can be seen as a “space for apprenticeship in the norms of social behaviour” or as a site for the “metaphorical construction of identity and political power” (Tomasik & Vitullo 2007:XV-XVI). It is also argued that “the sharing of cooked food... is a public statement of inclusion in a single moral and social community among whose members there is trust” (ibid.:109). The renaissance humanist philosophy of food transcended the traditional mind-body dichotomy and recognised a more inclusive force which unified man and nature. In early modern Europe, the production of tastes may therefore have been closely linked to the production of texts (ibid.).

Consequently, today’s challenges relating to food might be better understood. According to the United Nations Economic and Social Council (UNESCO) (1999), “the right to adequate food is realized when every man, woman and child... has physical and economic access at all times to adequate food or means for its procurement”. Access, in addition to physical and economic levels, can also stand for the ability to interpret the content, quality and lifecycle of foods. On the other hand, adequate food is influenced by social, economic, cultural, climatic, ecological and geographic conditions. As a result, it should not be limited to the context of poverty or the alleviation of hunger alone.

Food must be available to everyone to aid in satisfying individual nutritional needs at a true cost, while being free from unhealthy substances and non-

genuine ways of production and exchange. Within today's highly industrialised and centralised food systems, much has come in the way of making food available in the previously mentioned ways. In much the same way as in the historical past where food is still a symbol of inclusion, order and security in some contexts, it is also a symbol of exclusion, disorder and ambivalence in others (Tomasik & Vitullo 2007). Hence, hunger, malnutrition and obesity may be food-based concerns largely influenced by existing and emerging cultural values, but also by a lack of education and decisions involving its distribution. Therefore, the role of local communities in ensuring a healthy and resilient food system is crucial not only for a balanced and nutritional diet but also for the redefinition of cultural priorities and environmental concerns feeding those aspects.

Key concepts

The concepts of resilience and food systems are the key areas of concern to this thesis. A definition of resilience will lead the way to the definition and exploration of resilience in food systems. Climate change and peak oil will provide the background for illustrating why it might be urgent to acquire an understanding of resilient food systems and how the TTT Food Group relates as a case study in analysing community-led responses for building food system resilience.

The concern of resilience

The concept of resilience is considered one of the most important contemporary research topics within the context of sustainability (Perrings et al. 1995, Kates et al. 2001, Foley et al. 2005). It addresses the need for responses to vulnerabilities of an environmental, economic and social nature in a positive way. It has been suggested that resilience research fundamentally differs from risk research due to its focus on the positive aspects of development (Werner & Smith 1992, Davis 1999). Resilience can also be

described as a consequential concern arising from a complex set of ad hoc environmental, social and economic crises which to date have received insufficient practical responses through the sustainable development discourse. Therefore, resilience might also differ in its focus on flexible response, coping, and adaptation mechanisms in the presence of internal or external shocks. Increased amounts of drought, heat waves, sea level rises, large-scale loss of biodiversity, population growth and pollution are some depictions of such shocks. The global financial crisis, poverty, pandemics, violence, and the depletion of resources are further, wide-ranging influences on the environment and culture at large.

Though it can have both implicit and explicit meanings, here the term resilience will stand for the “manifestation of positive adaptation despite significant life adversity” (Luthar 2003:xxix). Originally rooted in the discipline of psychology, resilience involves the health and ability of people and the environment to adapt to changing life circumstances. Furthermore, in order to understand resilience, one could also anticipate an understanding of vulnerability. It is argued that vulnerability is not only the exposure to hazards alone, but also the resilience of the system, and in turn its people who experience the hazard. This involves the ability to adapt to change and uncertainty, in addition to the capacity to nurture ecological, social and political diversity, thereby harnessing knowledge for learning and problem solving (Berkes 2007). Resilience encompasses both the capacity of a system to react appropriately to crises that have not been entirely anticipated, and to its ability to anticipate these crises to enact, through planning and recovery, changes in the systems that will mitigate their effects (Aguirre 2006). Essentially, these processes suggest an alert, continuous and flexible transformation rather than a reactive restoration.

Within the TTI, the concept of resilience is defined as “the capacity of a system to absorb disturbance and reorganise while undergoing change, so as to still

retain essentially the same function, structure, identity and feedback” which can be applied to settlements and their need to be able to withstand vulnerabilities and shock (Hopkins & Lipman 2009). The TTI uses the “move from a less desirable to a more desirable regime” as its aim of resilience management and governance (ibid.). Though this might be a legitimate way of defining the aim for building resilience in the study of change, “it emerges that the connection between change and inconsistency is deep and that the case for inconsistencies in motion and other change is surprisingly robust” (Stanford Online Encyclopaedia of Philosophy 2006). As such, a definition of resilience excluding the inevitability of systems’ transformation in the case of external or internal shocks and consequently the change of their “function, structure, identity and feedback” becomes problematic. This further implies that adaptation may mean an attempt to recreate what was rather than adapting, in a continuously changing new shape and form, to the conditions of what has newly occurred or what is about to occur. In considering adaptation, vulnerability can also be seen as more than a state, e.g. a long-term process covering the ongoing, chronic, underlying conditions that have led to the observed state (Kelman 2008). Nevertheless, the observed state might also be dynamic and involve a particular time period and space. As Heraclitus once noted, “everything moves on and that nothing is at rest; you could not step into the same river twice” (Heraclitus ~ 500 B.C.). Gandhi further noted that “all that appears and happens about and around is uncertain, transient” (Gandhi 1957:250).

Moreover, levels of vulnerability and shock can vary, from a collapse in bee colonies to oil shortages. For example, Colony Collapse Disorder (CCD) (Cox-Foster et al. 2007) is said to have wiped out one-third of the bee colonies in the US and up to 70% of bee colonies in the UK, Germany, France, Holland, Spain, Denmark, Taiwan and Brazil. In China, the situation has been said to be so serious that pollination is increasingly being done by hand. Though one-third of all agricultural production in the world is said to depend on bee

pollination, the causes for the collapse of bee colonies is largely unknown (CCD Steering Committee 2007, Penn State University College of Agricultural Sciences 2007). Hence, vulnerability and resilience can be seen to be significant sources of interdependencies affecting and being affected by multiple known and unknown factors and relationships, with missing information about the proceeding transformation. Because of this, a return to a known state seems unlikely. Since natural and social systems are complex and interrelated, the immediate local effects of shocks and an anticipated recovery could involve more than restoring what was. Goodwin noted that there is truth in each of us, but to see some of it we should be humble enough to accept that it is too big that we could get to see it all (Goodwin 2009).

Similarly, it may be more desirable to aspire for a continuous practical adaptation as a means of further inquiry and action rather than to a theoretically predefined template or model. Achieving adaptation and resilience could therefore be more of a continuous, practical journey. For that reason, open and experiential activities such as that of TTI seem meaningful as they provide a practical, real-life platform for “presencing” (Scharmer 2007), a journey that connects us more deeply to both what wants to emerge in the world and to our highest future possibility. They also facilitate the physical experiencing, exchange, interpretation and open learning with regard to adaptation rather than working on a theoretical framework that reflects a controlled and partial reality. In this context, a “move from a less desirable to a more desirable regime” for resilience management and governance might be more useful in that it aims for what could be achievable in daily living practices. Nonetheless, the concern has been raised during the May 2009 Transition Network Annual Conference that the movement, in terms of its participants, has an ethnically “white” dominant identity, as is also represented in the “white only” Transition Movie. Though the movie was said to be a compilation of all received inputs, the concern of partiality or the lack of inclusivity might thereby not be diminished.

“Resilience is non-exclusive” (Swanson 1995:74). Thus, it also seems crucial

to continuously work on tools that help question the understanding and usefulness of the term resilience in its larger context, alongside ways to evaluate, measure and interpret it. Much like the dependency of the poor Irish on potatoes in the 19th century which was said to have laid the foundations for catastrophe (Fagan 2000), creating and being blinded by a potential new discourse may also have quite contrary effects than facilitating adaptation or feeding the masses and protecting the environment.

Exploring resilience in food systems

A healthy and uninterrupted food system, i.e. food system resilience, is naturally one of the most critical areas of concern. A resilient food system has been defined as a collaborative network that integrates sustainable food production, processing, distribution, consumption and waste management in order to enhance the environmental, economic and social health of a particular place (Garrett & Feenstra 1998). Members of local community, e.g. farmers, consumers and communities, thereby cooperate to create a more locally-based, self-reliant food economy. Furthermore, resilient food systems are formed by resident participation to establish:

- A stable base of family farms that use sustainable production practices with local inputs;
- Direct marketing and processing practices between farmers and consumers;
- Access to an adequate, affordable and nutritious diet to all members of the community;
- Food and agriculture-related businesses that create jobs and recirculate financial capital within the community;
- Improved living and working conditions for farm and food system labour;
- The creation of food and agriculture policies that promote local or sustainable food production, processing and consumption; and
- The adoption of dietary behaviours which reflect concern about individual, environmental and community health (UCSAREP 2009).¹

Food systems comprise a wide range of disciplines from nutrition to the economic development of a community. Although food systems are generally

¹ <http://www.sarep.ucdavis.edu/cdpp/cfsdefinition.htm>

classified as conventional or alternative, both share social, political, economic and environmental influences and vary across regions. For the purpose of this thesis, however, it is important to point out the relevance of conventional food systems that have come to influence, and largely dominate, food systems towards a worldwide uniformity (Sachs 1992). It is nevertheless questionable as to whether highly mechanised and fossil fuel-based systems are in themselves resilient. Ranging from products of biotechnology, agro-chemicals and high-tech machinery to centralised wholesale and supermarket chains with just-in-time delivery systems, conventional food systems have become deeply associated with commoditisation, industrialisation and politics. In addition to suggesting a shift from quality-oriented food production to food commodities, all of these stages have strong social, political, economic and environmental implications on a global scale. For this reason, it is necessary to look at whether current food systems, such as that in the UK, actually contribute to resilience at home and elsewhere. The effects of these global food systems will be studied from a resilience perspective within the community of Totnes, Devon.

However, the aim here is not to provide a detailed account of the types and manifestations of these systems, but rather to focus on the resultant current attitudes, meanings, choices and challenges for members within them. In addition to innumerable individual and community-based local initiatives worldwide, initiatives such as the Slow Food Movement, Slow Cities Movement, Slow Money, Covenant of Mayors, 350.org, Walking the Talk, and Transition Towns Initiative demonstrate examples for larger scale responses to current vulnerabilities. Whereas some of these responses are driven by local government to involve communities, others such as the Slow Food Movement and the Transition Towns Initiative are largely community driven.

Introducing climate change and peak oil as further influencing factors of food systems will lead into a detailed account on the formation and attempted functions of the TTI and TTT.

The potential of climate change

“The empire of climate is the first of all empires” wrote Montesquieu in 1748, referring to the climate that he had predicted was more favourable for progress in Europe than anywhere else in the world. According to IPCC, this might have served true not only for the past, but also has increasing relevance for the present and the future (2007).

The international community accepts that climate change is happening and that a policy response is needed, hence the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. It has also been noted that climate change threatens socially, economically and environmentally vulnerable areas the most. Similar to the International Energy Agency (IEA), the TTI also sees climate change and energy security as the twin challenges of our time (Hopkins 2008).

Climate change refers to changes in weather over a period of time and over a region, including changes in temperature, wind patterns and precipitation (NASA 2005). Aside from water vapour that constitutes Earth’s most significant greenhouse gas (GHG), the largest anthropogenic GHG is CO₂ which is induced by fossil fuel-based human activity. Also relevant to food is methane (largely induced by intensive animal husbandry), which is 23 times more potent than CO₂, nitrous oxide (296 times more potent than CO₂), and refrigerant gases which are thousands of times more potent than CO₂ (Garnett 2009). Furthermore, through the absorption and emission of infrared radiation, GHGs contribute to the heating of the Earth’s surface, causing effects such as sea level rise, unstable weather patterns, severe heat waves and drought. The warming of the Earth’s climate is defined by IPCC as unequivocal and, with over a 90% certainty, most of the observed increase in globally averaged temperatures since the mid-20th century is due to the observed increase in anthropogenic greenhouse gas concentrations (IPCC 2007). The degree and

rate at which this heating occurs will be one of the determining factors in the level of biodiversity loss, sea level rise and the dangers of amplifying feedbacks and runaway effects (Legget 2008), as well as the length of the ecosystems' carrying capacity. In addition to human health and ecological consequences, this translates into severe consequences for a variety of areas ranging from food and water supplies to the increased risk of conflict and societal stability. UNDP has declared climate change as "the defining human development issue of our generation" (UNDP 2007).

In the context of food systems, it is relevant to note that the combined activities of industrial farming, packaging, transportation, storage and waste constitute the highest contribution to GHG emissions in the world. Whereas the effects of global warming may increasingly produce threats to drought stricken and flood prone areas and coastal settlements of the Southern Hemisphere, it may serve to be more favourable for agricultural production in the Northern Hemisphere (IPCC 2007).

The industrial food system makes up a substantial amount of human activity and not only releases excess levels of GHGs along the entire food chain, but also causes high levels of stress by ignoring the limited ability of the environment to sustain life. Though with varying degrees of impact, rapid changes in climate systems pose numerous predicted and unknown challenges to all living systems and therefore need to be included in any considerations of problem solving involving development. In a related manner, the IPCC's 2007 report notes that the developed world needs to achieve at least an 80% cut in CO₂ emissions by 2050 (IPCC 2007). Hence, the current trends in climate change in relation to energy intensive production and sourcing practices of food systems have a varying but strong contextual importance. Relatedly, since climate change is widely accepted to be induced by the burning of fossil fuels, the potential of peak oil also gains a crucial importance in the context of this thesis.

The potential of peak oil

A substantial concern along the food chain is the main source of energy, i.e. fossil fuels, on which the entire industrialised way of life depends. By definition of the character of a system relying on a finite resource, peak oil addresses the issue of running out of easy-to-obtain, cheap oil (Energy Bulletin 2009). This suggests that the most widely used energy source fuelling our modern way of life, including food production, processing, storage, transportation, and the handling of waste along with many other industrial activities, will decline permanently. Although Hubbert (1956) made predictions as early as 1952, many sources confirm that the world's largest oil wells have been depleted (IEA 2009, USEIA 2009).² Even though there are varying views as to when oil production will reach a permanent state of decline, there seems to be an urgent need to transform attitudes and response mechanisms in order to adapt a lifestyle in which oil is highly expensive, scarce or even unavailable to many.

As a consequence, the production and supply of food runs a higher risk of uninterrupted continuation and faces greater pressure on the provision of substitute solutions in order to meet basic needs (Heinberg 2003). In such a case, the scope and scale of events would certainly be more difficult since most of our industrialised way of life depends on fossil fuels. Hopkins asserts that “our degree of oil dependency is our degree of vulnerability” (Hopkins 2009). Related consequences might manifest themselves in reduced food supplies due to limited petrol to transport supplies from fields or warehouses to supermarkets, blackouts during hot and cold temperature extremes, and an inability of emergency services to respond because of petrol restrictions.

As witnessed in the UK during September 2000, there is a high likelihood of social disruptions as was demonstrated when fuel depots were blockaded, which led to a nationwide petrol shortage (Robinson 2003). This also had direct

² Also see Table 1 under Appendix III.

consequences for the food system as supermarket supply chains were interrupted and panicked citizens in pursuit of securing a short-term food supply emptied shelves. Furthermore, the four major blackouts in Europe and North America in August-September 2003, Auckland's blackout in February-March 1998, and Hurricane Rita reducing oil supplies from the Gulf of Mexico in September 2005 are examples of scenes in which the status quo was significantly challenged without a ready response mechanism (Kelman et al. 2007). A possibly less obvious but no less substantial area of concern also lies in our daily reliance on fossil fuel-based products ranging from plastic packaging, tools, clothing, and building materials to wide-ranging forms of daily household practices such as heating, cooling and cooking.

In a negative trend, in which oil reserves come to a state of permanent decline and oil prices show a permanent increase, the production of oil could logically continue until the extraction of one barrel of oil is equal in cost to one barrel of oil. This is cause of special concern in the Northern Hemisphere where agricultural activities rely heavily on fossil fuel-based inputs and foodstuffs being transported over thousands of miles. Still, fossil fuel-based farming technologies have also become increasingly prominent in the Southern Hemisphere. Therefore, the issue of oil as a finite and polluting resource, but also one that continues to be assumed as a *de facto* resource fuelling most spheres of "modern" life, deserves closer consideration in the context of this thesis, particularly with respect to the potential vulnerabilities it promotes for food systems. In turn, it can be said that food security depends upon national and international energy security. In oil dependent economies, threats to domestic energy security are likely to have an adverse impact on domestic food security. This makes energy security a priority of both short- and long-term concern (FCAG, Defra December 2006).

A basic premise is that "where in the past, we focused more on wealth, growth and efficiency, the future will need to be about well-being, quality and sufficiency" (Fedrigo & Tukker 2009:19). For example, "an international oil

shock will affect energy prices, and, depending upon energy intensity in the food sector, could affect the real price and affordability of food” (Defra, August 2009:13). When considering the fragility of the current food system, anticipating resiliency will need to involve inputs that, unlike finite fossil fuels, are themselves resilient. This may involve conversion to the use of renewable energy sources and forest products, in addition to traditional methods of agriculture such as animal and human labour, and exchange. Furthermore, it appears critical to consider the behavioural aspects of consumption that address a sense of sufficiency rather than an endless quest in efficiency-based, technologically controlled growth. Therefore, corresponding experiments, such as the TTI, seem crucial for the exploration of large-scale behavioural and systemic changes within communities. A detailed account on the TTI and TTT will be given next.

"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete" (Buckminster Fuller). This quote shows to be one of the guiding inspirations for the evolution of the Transition Town Initiative.

The Transition Towns Initiative (TTI)

The Transition Towns Initiative (TTI) is a socio-environmental movement founded in the UK which aims “to serve as a catalyst for community-led responses to climate change and peak oil” (Brangwyn & Hopkins 2009). TTI seeks the community initiated fostering of resilience building activities in the areas of food, energy, health, education and economy, among others, by facilitating the formation of local working groups. The stated intention of the Transition Network Ltd., an affiliate of TTI, is to realise such facilitation by “inspiring, encouraging, supporting, enabling, networking and training” (Hopkins & Lipman 2009). It is intended that the movement works bottom-up,

as well as top to bottom, in cooperation with local and national government, the private sector, NGO's, educational institutions and other actors.

The Transition concept emerged from Rob Hopkins' work with his students at Kinsale Further Education College, Ireland in 2004. There, he and his students looked at creative ways to adapt to sustainable agriculture, energy production, health, education and economy in the form of an Energy Descent Action Plan (EDAP). It was one of his students, Louise Rooney, who set about developing the Transition Towns concept and presented it to the Kinsale Town Council, which resulted in the councillors adopting the plan to work towards energy independence. In 2005, Hopkins moved to Totnes where he and Naresh Giagrande conducted a series of talks and film screenings to raise awareness on the issues of climate change and peak oil. The response from the local community resulted in the launching of Transition Town Totnes in September 2006 with the participation of some 400 people. In 2007, in association with Schumacher College and the Dartington Hall Trust, a daylong "Estates in Transition" event was held to bring together landowners and local Transition Initiatives. Open Space Technologies (Owen 2008) and the World Cafe (Brown 2005) were used to more openly and effectively engage the public in sharing and harnessing their ideas for community-led solutions. This resulted in the formation of local working groups. Some of the working groups have been named as food, energy, transport, building & housing, economics & livelihoods, local government, health & well-being, and heart & soul. These volunteer-based groups essentially formed according to the needs expressed by local people. The group leaders of these working groups formed the Transition Town Management Team, and various projects sprung out of these working groups. Some projects relevant to food which emerged from this are Community Garden, Garden Share, Nut Tree Planting, Healthy Futures, Seed & Plant Swap, Organic Farming Courses, Great Reskilling, Local Food Guide, and Community Health & Well-being Garden ³. Recent projects also include

³ <http://totnes.transitionnetwork.org/>

the study of “Can Totnes feed itself?”, based on Kenneth Mellanby’s book “Can Britain Feed Itself”, exploring the practicalities of food relocation in Totnes by Hopkins et al. in July 2009. Additionally, a book by Pinkerton and Hopkins (2009) entitled “Local Food” was published in September 2009 and studies local food initiatives across the UK for Transitioners.

TTI is currently said to span over 254 Transition Towns internationally ⁴. A further 600 international “mullers” are said to be contemplating the idea of becoming a TT.⁵ Mullers are those in the process of contemplating and preparing in one form or another to become a TT or to take local action under a different form. Transition Towns not only come in the form of a “Town”, but in such diverse forms as Transition Streets, Transition Islands, Transition Hamlets, Transition Valleys or some other creative form. Transition Town status requires the fulfilment of 12 steps and the subsequent approval of the TT Board of Trustees. In this sense, the Transition Model can be viewed as being centrally influenced and normative.

The 12 steps to embark on a Transition journey are:

1. *Setting up a steering group* and designing its demise from the outset.
2. *Awareness raising*; for building networks and preparing the community to launch a local Transition Initiative. This stage aims to make sure participants understand the potential effects of both peak oil and climate change – the former demanding a drive to increase community resilience, the latter a reduction in carbon footprint.
3. *Laying the foundations*; for networking with existing groups and activists, thus making clear that the TT Initiative is designed to incorporate previous efforts and future inputs by looking at the future in a new way, while acknowledging and honouring their work and stressing that they have a vital role to play.
4. *Organising a great unleashing*; for creating a memorable milestone to mark the project’s “coming of age”, moving it right into the community at large, building a momentum to propel the initiative forward for the next period of its work and celebrating the local community’s desire to take action.

⁴ <http://transitiontowns.org/TransitionNetwork/TransitionCommunities>

⁵ Official figures can be found under (<http://www.transitiontowns.org/TransitionNetwork/Mulling#GoogleMaps> and <http://transitiontowns.org/TransitionNetwork/TransitionCommunities>).

5. *Forming sub groups*; for developing an Energy Descent Action Plan by “tapping into the collective genius” of the community. This is facilitated by setting up a number of smaller groups to focus on specific aspects of the process. Some examples of these groups are food, waste, energy, education, youth, economics, transport, water, local government.
6. *Using open space*; Open Space Technology (Owen 2008) is used largely across the TTI to run meetings and to explore particular topic areas.
7. *Developing visible practical manifestations* of the project. For example, in Transition Town Totnes, the food group launched a project called “Totnes-the Nut Capital of Britain” which aims to get as much infrastructure of edible nut bearing trees into the town as possible.
8. *Facilitating the great reskilling*; based on the premise that the facilitation of communities to move to a lower energy future and relocalise will require the development of traditional and new skills.
9. *Building a bridge to local government*; cultivating a positive and productive relationship with the local authority.
10. *Honouring the elders*; engaging with elders who directly remember the transition to the age of cheap oil, especially the period between 1930 and 1960, in order to learn from their experiences.
11. *Letting it go where it wants to go*; the role of transition is not to come up with all the answers, but rather to act as a catalyst for the community to design their own transition. Hence, trying to hold on to plans in a rigid way must be avoided.
12. *Creating an Energy Descent Plan*; together, practical actions to increase community resilience and reduce the carbon footprint form the Energy Descent Action Plan (Brangwyn & Hopkins 2009).

What is a Transition Town?

A TT is a model, set by a set of evolving rules, for a community to embark on a journey of a low energy future. TTI Trustees must endorse the evolving rules and the status of a local Transition Initiative (TI) to become an official TT. The system feeds from inputs coming from all spheres of life, disciplines of inquiry, and practice.

The evolving rules of a TT are:

1. An understanding of peak oil and climate change as twin drivers.
2. A group of 4-5 people willing to step into leadership roles.
3. At least two people from the core team willing to attend an initial two-day transition training course.
4. A potentially strong connection to the local council.
5. An initial understanding of the 12 steps (see page 19).
6. A commitment to ask for help when needed.
7. A commitment to regularly update the Transition Initiative web presence.

8. A commitment to write up something on the Transition Towns blog once every couple of months.
9. A commitment, in the Transition, to give at least two presentations to other communities that are considering embarking on this journey.
10. A commitment to network with other communities in Transition.
11. Minimal conflicts of interests in the core team.
12. A commitment to work with the Transition Network re grant applications for funding from national grant giving bodies. Local trusts are one's own to deal with as appropriate.
13. A commitment to strive for inclusivity across the own entire initiative.
14. A recognition that although the entire county or district in question may need to go through transition, the first place to start is in one's own local community.
15. At least one person on the core team should have attended a permaculture design course (ibid.).

“The network aspires to simultaneously maximise local autonomy and maximise coherence at the macro-level through shared learning and purpose” (Goodwin 2009). The seven principles have therefore been defined to achieve this aspiration.

These are:

1. *Positive Visioning*; based on a dedication to create tangible and practical visions for the community beyond a dependence on fossil fuels, positive visioning focuses on creating positive, empowering possibilities and opportunities by generating new stories and myths.
2. *Helping people access good information* and trusting them to make good decisions.
3. *Inclusion and openness*; Transition Initiatives need an unprecedented coming together of the broad diversity of society.
4. *Enabling sharing and networking*; sharing successes, failures, insights and connections at the various scales across the Transition network, so as to more widely build up a collective body of experience.
5. *Building resilience*; across a wide range of areas (food, economics, energy, etc.) and on a range of scales (from the local to the national).
6. *Inner and outer transition*; enabling and supporting people to do what they are passionate about, what they feel called to do.
7. *Subsidiarity*; working with everyone so that transition is practiced at the most appropriate, practical and empowering level, and in such a way that it models the ability of natural systems to organise themselves (Hopkins and Lipman 2009).

Transition further promotes the importance of telling stories that are positive and exciting to create motivation for fun driven changes in attitudes. Some of those stories are TT Totnes and TT Lewes printing their own local currency, school car parks being turned into food gardens, TT Stroud having written the local council's food policy and communities creating their own local energy,

building or consulting companies. Transition story line on the British radio soap opera the Archers, Transition Handbook being voted the 5th most popular book that British MPs took on holiday, the Secretary of State for Energy and Climate Change attending the 2009 Transition Network Conference in London as a “keynote listener”, and the Scottish Government, through its Climate Challenge Fund, funding Transition Scotland can be counted as further stories (Hopkins 2009).

TTI involves a twenty-year experiment into the future whereby steps of a twenty-year vision are backcasted by means of an Energy Descent Plan⁶ to enable current, practical actions. There are, however, limited tools and studies available on the effectiveness of TTI’s existing activities. Therefore, in studying the food aspect of the TTT activities, i.e. the TTT Food Group, it is intended to learn about ways in which TTT contributes to building resilience in the local food system and in what ways these practices may be interpreted as being effective.

Thesis Outline

Section 2 is dedicated to a literature review on the UK’s food systems to contextualise the study in Totnes. A general picture draws links between economic, social and ecological drivers of food systems in the UK. The section also provides a closer look at the scope and functioning of food systems. Section 3 discusses theory and applied methods. Section 4 discusses fieldwork findings in Totnes. Section 5 prepares the ground for examining the connections between food system resilience and personal resilience, and highlights why that might be useful. Section 6 is dedicated to discussion where the threads are attempted to be pulled together. Section 7 draws conclusions.

⁶ See Appendix III, Table 2 for Energy Descent Plan Flow Chart.

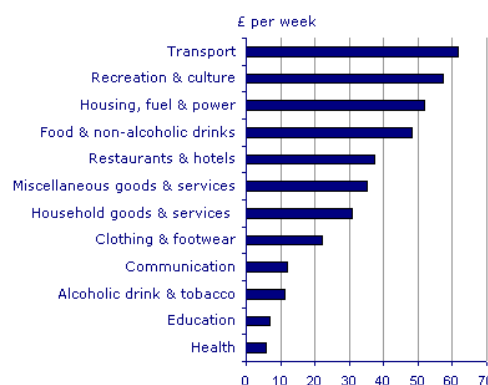
SECTION 2

2. Exploring the UK food system and resilience

Based on a literature review and examples, this section provides a general picture of the current characteristics and challenges of the UK's food system at large. An attempt will be made to examine more generally whether the UK food system is one in which food production, processing, distribution and consumption are integrated to enhance the environmental, economic, and social and nutritional health of its people.

A view of the UK food system

The UK's food and drink industry accounts for 7% of national output and provides 3.7 million jobs, including a significant number of part-time jobs in the retail and food industry. The UK's largest manufacturing sector is farming and fishing, with £172 billion of generated economic value a year. The expenditure on food is estimated to be worth £121 billion a year, comprising an average of 15% of total household spending. This is said to be over 50% less than 50 years ago (ONS 2007). By contrast, the average household expenditure on food in Asia is 23% (CLSA 2007).



Average weekly household expenditure on main commodities & services, 2007, UK

Source : ONS

The UK produces half the food it consumes and is 60% “self-sufficient” (Cabinet Office 2008b: see Appendix III for Table 3 on UK Food Self-sufficiency 1980-2005). Nonetheless, 60% of the vegetables and 95% of the fruits consumed in the UK are imported (Defra 2005). Whereas 68% of UK food imports come from the EU, a total of 26 countries accounted for 90% of the UK’s food supply in 2006 (Defra 2008a: see Appendix III for Table 4 for a UK Food Chain Scheme and Table 5 for the origins of food consumed in the UK). While Table 4 shows the stages in which economic value is generated within the UK’s food chain, it fails to include the value attributed to waste. 6.7 million tonnes of food, approximately one-third of the total food purchased in the UK, with an estimated value of £10.2 billion goes to waste each year (WRAP 2008).

Waste is also linked with food miles, which has been used to measure the distance food has been transported from its production until it reaches the final consumer (Iles 2005). Food miles constitute a significant portion of the debate concerning the UK’s food system vulnerability. It is noted that though food miles seem to comprise only 3% of the overall concerns regarding food in the UK (Cabinet Office 2008b), it accounts for approximately £1.51 billion of the external costs of UK agriculture per year. Furthermore, agriculture and food produce account for 28% of goods transported on UK roads, which currently imposes an estimated external cost of £2.35 billion per year. Whereas sea and air transport are said to “lie in low volumes”, road transports comprising the food carried from the shop to home is estimated at £1.28 billion per year. Thus, the real cost of the per capita UK food basket is calculated to be £2.91 more per person per week if externalities and subsidies are included, with farm externalities, domestic road transport, government subsidies and shopping transport contributing the most (Pretty et al. 2005). Consumers’ decisions on specific shopping preferences and transport choices therefore seem crucially important.

Health and growing population

Paradoxically, while there are approximately 1.6 billion overweight people worldwide (WFP 2007, Defra 2009), there are approximately 1 billion people who are chronically hungry (WFP, Winning the war on hunger). The Foresight Project indicates that by 2050, 60% of adult men, 50% of adult women and 25% of all children under 16 in the UK could be obese (Foresight 2007). On the other hand, undernourishment is an aspect of malnutrition (or poor nutrition) that contributes to 30% of coronary heart disease deaths and 33% of all cancer deaths in the UK. Behavioural problems as well as a lack of concentration and diabetes are observed consequences, particularly in children, relating to malnourishment. Socioeconomic differences, a lack of cooking skills and food poverty, i.e. the inability to choose, buy, prepare and eat an adequate quantity of healthy foods, are further causes for health related problems and premature deaths in the UK (Press & Mwatsama 2004).

Population growth brings a further, substantial component into the dynamic involving consumption and health. Estimates indicate that the UK had 60,975,000 people in mid-2007, up by 388,000 from the previous year and nearly two million more than in mid-2001 (ONS, August 2008). Yet, despite population expansion, food and drink consumption fell 2.6% in the first quarter of 2009. In terms of food, spending on vegetables fell 5.6% and bread and cereals 4.0%, and non alcoholic beverages, mineral water and soft drinks fell 5.5%. However, clothing and footwear consumption went up 4.1% along with recreation and culture, which increased by 2.8 per cent (ONS 2009). A recent Strategy Unit report asserts that there is a gap between what people do and what they say. Hence, the intention-action gap manifests itself in the positive attitudes to healthy eating and the environment not being matched by spending patterns (Cabinet Office 2008b). Even though this may be attributed to higher food prices and cultural attitudes, the predominant non-inclusion of externalities - costs involving environmental, social and health impacts -

simultaneously point at an undervaluation of food and the environment.⁷ This may also be attributable to the capacity of supermarket chains to influence the interplay between urban consumers and rural producers not only nationally, but also throughout the global market. The dynamics of these complex relationships will constitute the basis for further investigation in a local context, i.e. Totnes, England, later on in this thesis.

Food and the Environment

Whereas growth in agricultural production is said to continue to be greater than growth in the world's population (FAO 2006a), the extent to which production can increase without significant damage to the natural environment is not clear (Defra 2008a). A wide range of literature points at inextricable factors such as diminishing soil fertility, collapsing ecosystems and loss of biodiversity, among others, which damage a healthy agricultural system (Moerner et al. 2002, Robertson & Swinton 2005, Badgley et al. 2007).⁸ Relatedly, the effects of growing urbanisation on the availability of arable land and skilled labour become crucial areas of concern. Whereas one-third of GHG emissions in the UK's food chain come from farming and fishing, 25% come from food produced abroad, excluding the GHGs attributed to transportation and 13% from household food shopping, storage and preparation (Defra 2008a). Hence, transport has become the biggest energy user in the food chain while farming, particularly intensive livestock production, is the single largest source of greenhouse gas emissions and water pollution (Cabinet Office 2008b).⁹

⁷ Some influencing factors on UK food prices can be seen under Table 6 in the Appendix III.

⁸ Also see Table 7 on the Global Status of Provisioning, Regulating, and Cultural Ecosystem Services, Millennium Ecosystem Assessment Synthesis Report, (Pre-publication Final Draft Approved by MA Board on March 23, 2005) under Appendix III.

⁹ See Table 8 in the Appendix III for Food System Diagram pointing out stages and transport links (Source FCRN).

Agriculture also accounts for 70% of all freshwater withdrawals compared to 20% for industry and 10% for municipal and domestic use. In Africa and Asia, more than 80% of water is used for agriculture compared to an average of less than 40% in Europe and North America. It takes roughly one litre of water to produce one calorie of food energy (FAO 2006b).

Furthermore, according to FAO, the total demand for meat will rise from 228 million tonnes in 2000, feeding 6 billion people, to 459 million tonnes in 2050 to feed 9 billion people. Similarly, the total demand for milk will rise from 475 million tonnes to 883 million tonnes (FAO 2006a). It seems alarming to note that wide-ranging trends such as protein-rich diets require substantially more water than vegetarian or vegan diets. For example, in view of the fact that it takes 16,000 litres of water to produce 1 kg of meat, it “only” takes 1,350 litres to produce 1 kg of wheat. On average, human beings need to drink between 2 to 4 litres of fluids a day, but consume 2,000 to 5,000 litres a day through the water used in producing their food (FAO 2009). Similarly, while the UK’s average per capita water consumption is 1,245 m³ per year, an additional 70% of its water footprint falls outside the UK, which is attributable to its worldwide imports (ibid.).¹⁰

Further growth and GM dichotomy

Whether grown locally or imported, responding to the needs of a growing population brings further complications to the equation as technological solutions are made increasingly prominent. One such example is the genetic modification of organisms as a food source. A 2008 survey by the British Institute of Grocery Distribution shows that 58% of respondents declare neutrality or the lack of an opinion with regard to genetically modified (GM) foods. Along with the coming of age of agriculture and domestication, selective

¹⁰ See Table 9 under Appendix III for The UK’s external agricultural water footprint

breeding has been a common practice to allow organisms with the best traits to breed. However, genetic modification involves the alteration of genetic characteristics of an organism or of unrelated organisms by means of genetic engineering. The primary objective may lie in obtaining a higher yield and reducing costs. However, this has yet to be proven. The effects of growing GM foods on the surrounding life are also rarely fully understood, which constitutes a variety of threats.

In addition, use of fossil fuel-based, cost-intensive pesticides, herbicides, fungicides and the like are essential to ensure the growth of GM crops. This not only undermines the food and energy security of human beings, but also the life support systems of which we are all a part (Ropeik & Gray 2002). Furthermore, as GM seeds are hybrid, it is inevitable that costly new seeds will have to be bought every planting season, thus further contradicting the argument for economic viability.

There is a wide range of evidence pointing at alarming concerns with regard to the potential for the long-term health-based, economic and ecological effects of growing and eating GM foods (D'Mello 2003, Myhr & Traavik 2004).

Nonetheless, GM technologies are seen by 52% of British consumers as an important tool for the mitigation of increasing global food shortages and for responding to food production challenges posed by climate change. Forty-seven per cent of UK respondents regard GM crops as the solution for increasingly extreme weather conditions and for combating plant diseases (IGD 2008). Despite these views, there are “only” small-scale attempts and no approval for large-scale GM based food production in the UK.

Relative to the scale and scope of food imports into the UK, the consumption of GM foods can only be consciously chosen by consumers or avoided if a clear and effective labelling system is in place and is well communicated (Verdurme & Viaene 2003, Prakash & Kollman 2003). Whether the current

system is clear, effective in its application and communicated well is questionable.¹¹

The journey from here to there

Today's UK food system faces a series of current and future challenges related to economics, equity, health, population, safety and the environment.¹² In addition to the aforementioned, sudden increases in global commodity and energy prices, an estimated 70,000 premature deaths, approx. 300,000 suffering from food contamination and food related diseases every year, and the environmental impacts of fragile food chains are some among many relevant and immediate examples depicting these challenges (Cabinet Office 2008b). On a related basis, just-in-time delivery systems, business continuity planning, the role of short-term stocks, and how technological efficiencies could be a weakening factor for resilience, particularly in the case of unexpected events, are the target of recent studies (Defra August 2009). Moreover, food-related ill health costs, which reached £7.7 billion in 2007 (Cabinet Office 2008a), paved the way for great future concerns for both the government and its citizenry.

The context of climate change, the potential for short-term interruptions in energy supply, the steady decline in farm income, and wide-ranging geopolitical tensions are additional causes for potentially greater disruptions in the UK's domestic food supply. The then environmental secretary said "the growing world population, climate change and rising fuel costs were all leading to an unprecedented threat to Britain's food security" (ibid.). There is also a growing concern about the nutritional content of many people's diet in Britain. It has been noted that for the first time since the World War II, Britain's food

¹¹ Also see Table 10 for a sample of labelling requirements under EC Regulation No. 1829/2003 for authorised GMOs (updated April 2008) under Appendix III.

¹² Also see Table 11 under Appendix III for the framework of the barriers to healthy eating on a low income.

industry has been examined in this way (Grey 2008). Therefore, within the current system, “the precautionary principle appears to be too simplistic a tool for addressing the multi-faceted challenges of food security” (Food Chain Analysis Group 2006).¹³

Conversely, in the context of this thesis, it is also important to note that to a larger or smaller degree, there have been myriad local responses across the UK. Some of these responses range from community gardens to buying groups, crop share with allotments, food coops, alternative payment/barter schemes, food festivals & fares, farmers markets, box schemes, guerilla gardening (i.e. gardening in open public spaces without permission), mobile fruit press, dumpster diving (examining dumpsters for food that has been thrown away merely because of imperfect looks, damaged packaging etc.) and food banks. There are also community or university-based community supported agriculture schemes, garden/land sharing, local food directories, food hubs, workplace box schemes, community shops, cooking and small-scale farming teachings, private allotments, seed swaps, community-owned processing, community transport share schemes and many more. These activities may increasingly gain importance in people’s daily lives as a means for rebuilding community and local resilience, as well as having potential effect in the processes of policy making over time.

This thesis takes a closer look at the particular ways in which the TTT Food Group is contributing to resilience and how these ways can be seen as being effective. It also looks at other existing local food initiatives such as small farmers, allotments, school gardens, garden projects, permaculture coops, etc. to explore the degree of their ability to meet the community’s needs. This will also help in learning about consumer choices and how these affect local food system resilience. This section gave a general overview of the UK food system

¹³ See Table 12 under Appendix III for Challenges and Risks to UK Food Security.

to highlight the context and influences that underlie the food system of Totnes and TTT Food Group.

Understanding and anticipating food system resilience?

Much like vulnerability, resilience is also a resulting “state” brought about by a variety of factors which in themselves are dynamic. A food system can be seen as being resilient when it can feed itself through its own members’ health initiatives in learning a balance among growing, harvesting, foraging or hunting, thereby using the capacity of their environment in an optimal but respecting manner. This also entails adapting to shocks from both within and without, and finding flexible ways to continue existing in new forms without undermining the life of ecosystems and people. For example, ideas from the architecture of buildings may apply to the “architecture” of food systems:

It is the pervading law of all things organic and inorganic,
Of all things physical and metaphysical,
Of all things human and all things super-human,
Of all true manifestations of the head,
Of the heart, of the soul,
That the life is recognizable in its expression,
That *form* ever *follows function*. This is the law.¹⁴

Is it then not the psychological resilience of the human being more than anything that needs to learn to adapt to need rather than to greed and comfort? Can resilience be achieved without everything - not only the area of food but at all levels of human engagement - feeding it? Alan Greenspan recently pointed out that crises are due to human nature, and as long as we are faced with dealing with human nature, we are apt for a crisis. Even so, a crisis can also be seen as resourceful means for shifting consciousness and behavioural patterns.

¹⁴ Louis Sullivan, (March 1896) "The Tall Office Building Artistically Considered", Lippincott's Magazine.

When factoring in the place, it becomes apparent that not many places in the world are like Totnes, which is rural, with a small but highly educated number of people that are largely conservative, e.g. resisting change, and green. Yet, Totnes is surrounded by farms of varying sizes and practices, e.g. conventional and alternative ones that are largely focused on meat and dairy farming. There are also a number of organic growers and arable land that could be used for growing a variety of crops. Be that as it may, Hopkins et al. (2009) in “Can Totnes feed itself?” conclude that it cannot do so unless meat and dairy consumption is significantly reduced and choices are limited to a significantly lower amount of local and seasonal foods. It is important to note that whatever might prove effective in building a resilient food system in Totnes can primarily serve as a tool for meeting Totnes’ needs. Resilience may therefore be better understood as a result of the experience of converging events of culture and the environment.

How do we shift from individualism, control and efficiency to an interconnectedness with the community and environment? How might reciprocity and a sense of sufficiency be enhanced? If we are to continue evolving as a species in a healthy and mutually supportive way with our environment, we may have to learn to coexist with our community in different ways just as much as we need to secure our food sources. Minister Hilary Benn of the UK Department for Environment, Food and Rural Affairs recently said that: *“We need a radical rethink of how we produce and consume our food. Globally, we need to cut emissions and adapt to the changing climate that will alter what we can grow and where we can grow it. We must maintain the natural resources – soils, water, and biodiversity – on which food production depends”* (DEFRA 10 August 2009).

SECTION 3

3. Theory and Method

This thesis aims at finding out about contributions made by the TTT Food Group to food system resilience and ways in which these may or may not be effective. Since this thesis explores resilient food systems in the context of culture, choosing qualitative research strategies seems more useful in addressing the richness and complexities involved (Orlinsky et al. 2004). Within the Grounded Theory approach (Glaser & Strauss 1967), which will be described in the following, an emphasis is made on the generation of theory from data in the process of conducting research. Hence, results are sought based on a constant comparative process.

Rather than beginning by researching and developing a hypothesis, I chose research questions and collecting data to find answers, through a variety of approaches. From the data collected, I marked the key points with a series of codes which were extracted from the interview transcriptions. The codes were then grouped into similar concepts in order to make them more workable. From these concepts, categories were formed which constitute the basis for the creation of my theory. Through the process of analysis and the extraction of categories, relationships were sought which led to theories that can be said to be grounded or anchored in the reality described by the interviewees (Glaser & Strauss 1967). Glaser describes Grounded Theory as being *emergent* from the data material rather than being *forced*. Emergence may be characterized by “emergent entities (or properties) that ‘arise’ out of more fundamental entities and yet are ‘novel’ or ‘irreducible’ with respect to them” (Stanford Online Encyclopaedia of Philosophy 2006). By creating this distinction, the role of the researcher is underscored to be as free of preconception as possible so that the data can speak for itself (Glaser 1992).

The views of Glaser and Strauss later split (Strauss 1987) due to a difference in perspective. Whereas Glaser emphasised induction, emergence and the creativity of the researcher within a clear frame of stages, Strauss emphasised validation criteria and a systemic approach (Strauss & Corbin 1990).

Research Approaches

This thesis is based on a selection of qualitative approaches: literature research, text analysis, course visits and qualitative interviews. I have chosen a qualitative approach to provide an in-depth analysis of resilience in the context of food systems. The methods chosen provide a basis for exploring the UK food system and the concept of resilience in detail. Furthermore, they provide a basis for the analysis of the two concepts in a cultural context. The following research strategies have been used:

1. Literature research - to find information on the origin and understanding of resilience thinking, food systems, particularly the UK Food System, and the Transition Towns Initiative.
2. Text Analysis - to find out about the Transition Town Initiative's vision and the nature of their activities on the one hand, and an understanding of resilient food systems on the other.
3. Courses - I attended two psychology courses, one in psychosocial development and one in multicultural societies at the University of Oslo's Department of Psychology to obtain a better understanding of the makings of the Self and the construction of meanings in a cultural context. I also took a course in the ecology of farming and food systems at the University of Life Sciences in Aas to acquire a better understanding of the challenges involving food systems from the farmer's perspective.

4. Qualitative Interviews – were conducted during a two week stay in Totnes, to explore how resilience in food systems may be perceived and experienced by those who participate in it. Interviews were conducted with members of the TTT Food Group and others from various TTT working groups, with each interview lasting an average of 45 minutes. I also conducted interviews with Totnesians who were involved in different spheres of life such as farming, education, catering, local government, taxi driving, allotments, orchards, permaculture, agroforestry, writing, retail, cooking and advocacy. I made a few attempts at arranging an appointment with the main local supermarket, but was referred to their head office as that was said to be their company policy. I could not get through to the corresponding person at the head office who would grant an appointment with the local store in Totnes. I could have also pursued more quantitative data; however, that would have been a different research style, requiring a larger sample of people leading to more breadth but less depth. Instead, I chose to use the qualitative form of interviewing to explore a deeper inquiry process with interviewees' opinions and experiences (Yin 2003).

I used the same semi-structured interview guide for all the interviewees in order to facilitate comparisons (See Appendix I). Although I had a clear idea of what I wanted to explore in the field, I prepared a semi-structured interview guide in the hope of facilitating the process of having a flexible attitude in case the conversations would lead to unexpected areas that had strong direct or contextual relevance. During the appointment making phase and the interviews themselves, I attempted to communicate my intentions clearly by highlighting my genuine interest in learning from interviewees' views and insights. I attempted to pay particular attention to avoiding leading questions to enable the interviewee to express his/her ideas and emotions freely (Rubin & Rubin 2005).

I attempted to adhere to the ethical standards of science by: obtaining informed consent of all interviewees, ensuring that no dependent relationship existed that

could influence their decision to give consent, and by ensuring that the recordings would not be made publicly available. I have done this by asking the interviewees in the beginning of each interview to give an oral consent for digital recordings, requesting signatures on the written form of the semi-structured interview guides or via email.

Analysis of Data

The different levels in which the data has been considered in the analysis process will attempt to parallel the levels provided in the Grounded Theory approach. On the most basic level, the concept of *describing* will include the interviewees' own stories and models of explanations. The *extraction* process leading to the core categories and subcategories will represent a more specified level of analysis. Within Grounded Theory, this is known as *conceptual ordering* and will emerge in the fieldwork results section. Finally, the relation between categories will be considered and placed within a theoretical context in which a potentially pragmatic value can be discussed. This is called *theorising* (Strauss & Corbin 1998) and will constitute the latter part of the discussion section.

Limitations

The results of my research are not representative of either the food systems as a whole, the UK food system in particular, or each initiative of the Transition Town movement across the UK or elsewhere. This is due to the selection process of informants which does not only rely on a representative sample (Lunt & Livingstone 1996). Nevertheless, the choice of the Transition Town in Totnes allowed me to explore resilience in-depth within the context of a local food system. Though there are multiple ways and forms of inquiry, anchoring my study in the TTT has been valuable for the purposes of this thesis in that it provided a unique social context for studying resilient food systems (Yin

2003:13). Therefore, even though the findings may not be regarded as necessarily directly representative of larger contexts, I hope this thesis will contribute to a better understanding of the challenges and opportunities involved in food system resilience and help raise further questions about the effectiveness of the Transition Towns movement in building resilient food systems, and how these can be improved. The focus is the study of Totnes.

SECTION 4

4. Fieldwork results

Totnes

“Here I stand and here I rest,
The town shall be called Totnes.”
Attributed to the legendary Trojan Prince, Brutus (1170 BC)

Totnes, an ancient borough and river port, and one of the 28 towns in the County of Devon, is among the best performers in the UK in terms of environmental awareness. Aside from being an historic market town on the ridge above the River Dart, Totnes is also known for its arts and crafts, history and architecture. Historically, Totnes was a market town that supplied most of its food locally. Today, Totnes is largely a tourist town with a number of small to medium sized enterprises. The use of the River Dart is no longer trade-related, but largely used for recreational purposes and tourism.

The town has a population of approximately 8,400 people, with an overall population growth rate of roughly 4.5% (Totnes Town Council 2001) and an unemployment rate of 2.4% (Devon County Council 2006). In 2007, agriculture accounted for 2.9% of total regional employment in the southwest, which was the largest in the nation. This number represents 22% of the total amount of people engaged in agriculture in England (Devon County Council 2007).¹⁵ Today, the main sectors of employment are the wholesale and retail trade, health and social work, and manufacturing and education. Totnes has more part-time and less full-time and self-employed workers than the national average. The number of households with an income below £20,000 is 50% higher than the national average. Only 5.54% of local people work in the food, forestry and fishing industries (agricultural employment numbers were unavailable) (ONS 2001). Although younger age groups from 0-19, 20-44 and

¹⁵ Also see Tables 23-25 in the Appendix III.

45-64 are predicted to decrease by 13%, 8% and 4% respectively, older age groups from 65 and up are predicted to increase by 35% over the next 15 years, with the age groups from 70-74 predicted to increase by 50% (Devon County Council 2007). This aging population trend may indicate a limit on the future of farming by local residents. Interviewee T2 also described the decline of the farming population in the area as being a result of the tough economic environment created by the supermarket system and the open market. Nonetheless, as a region, the southwest still has a greater proportion of small and very small farms (<20 Ha), and fewer large farms (>100 Ha) compared to England as a whole (Devon County Council 2007).

Totnes and the district contain about 23,700 hectares (ha) of land (DCLG 2005). Agricultural land consists of approximately (approx.) 19,282 Ha, and woodland and set aside land covers approx. 1,273 Ha (Defra 2004). Buildings, roads, paths, railways, water and “other” account for roughly 1,272 Ha, whereas gardens account for 329 Ha (DCLG 2005). Even though there are a large variety of agricultural and horticultural practices in the area, most farms focus on dairy farming. Among other small ones, there is a large, local organic farm with a restaurant and shop in addition to a shop in Totnes. Totnes, which is in line with the greater southwest, has declining numbers of grazing livestock and an increase in the amount of grassland, the result of which has been to a more extensive type of production system.

The weather in the area has been described as “wetter than average” according to the Farm Business Survey (FBS 2006-2007). Whereas the winter had a higher rainfall than average, the early part of the spring was dry and the summer, until August, was very wet.¹⁶ The dry spring weather restricted the yield potential of the cereal crop and the harvesting of grass for silage. Overall, the hay yield was difficult with the amount of rainfall being over 50% greater than the long-term average (ibid.).

¹⁶ Aslo see Table 19 under Appendix III

The dramatic change in the retail price of gas oil, which is a major input for farmers and growers, has brought about further challenges to farm profitability.¹⁷ The price increases from September 2007 onwards are described as unprecedented in their scale. This parallels the area expansion of bigger “players” in the market and is congruent with the concerns surrounding peak oil, as farm business income was 81% compared to that of England as a whole (ibid.).

The southwest has a higher percentage of grazing livestock farms producing lower income than any other type of farming.¹⁸ In terms of area and size, the farms in the southwest are smaller as well. The cereal and dairy farms are comparable between England and the southwest. Smaller businesses and less profitable farm types therefore result in lower farm business income per farm (Defra FBS 2007-2008).

Fieldwork analysis

I carried out a total of 25 recorded interviews with 13 people from within and 12 from outside the TTT. Living in a household during my fieldwork in Totnes also enabled me to conduct some participatory observation. The interviews took place at the TTT office, farms, farm shops, local food shops, local market, local school, project sites, a permaculture site, an allotment site, a forest garden, orchards, woods, cafes, a taxi and a local news shop.¹⁹

Interviewees will be referred to by pseudonyms throughout this thesis. Five interviewees were from the TTT Food Group (FG) and eight from other TTT Groups (OT). A further 12 interviewees were from Totnes (T) and the surrounding parishes, and had diverse backgrounds involving various stages of

¹⁷ Also see Table 21 under Appendix III

¹⁸ The mix of farm types and sizes is listed under Table 25

¹⁹ A sample of a semi-structured interview guide, as well as a map showing all the interview- and visited locations in and surrounding Totnes, can be found in the Appendix I

the local food system and other spheres of daily life. These included farmers, a public officer, a professor, a project officer, a head gardener, a caterer, an NGO director, a taxi driver, a news shop owner, member of a permaculture cooperative and a cooking teacher. The interviewees were chosen upon availability or upon further recommendation.

Preparing for the field

My initial idea was to interview a set of people and set up three focus group workshops of half a day (2-3 hours) each, spread over 2-3 weeks in cooperation with the TTT in which people from various groups would be mixed into three to five groups; each containing 4-6 people working with the same questions used in my semi-structured interview guide. The participants would be from the TTT Food Group, other TTT groups and Totnesians without any association with the TTT. The idea was to apply an action based research approach to learning about resilience in food systems and TTT Food Groups' contributions. An environment in which potentially differing views would find space to be shared, and lead to new learning. I tried to facilitate the organisation of these focus groups by sending e-mails to members of the TTT and Transition Network as well as to other local people. I described my project and fieldwork plans and asked for support. I also placed my descriptions on various Transition blogs and forums. Although most of my e-mails remained unanswered or were answered weeks later, the answers I received were either clarifying notes about a lack of time, capacity, etc. or for why I could not be helped any further. Hence, I was further directed to someone who then also directed me further or apologised for not being able to help. I did not receive any reaction to my blog and forum postings other than being warned not to do multiple postings and being redirected further. To reciprocate for the support, I also offered to be a volunteer for the TTT Food Group or another TTT group a certain number of hours per week in an area of activity that needed the most

support, including making copies, though this also did not find any positive reaction. In short, I was not able to receive any support from the TTT office before my arrival in Totnes. This was particularly puzzling in relation to the 7 Principles of Transition which include helping access good information, inclusion and openness. Though a scarcity of resources (time, people, priorities) might lie in the centre of this experience, it seems important to keep the experience and how it relates to the Transition Vision in mind.

After continuous perseverance, once I was in Totnes, I was able to convince five members of the TTT Food Group through both direct and indirect contact to conduct an interview.²⁰ Other members of the TTT also agreed to talk to me once I made personal contact or was introduced by a TTT Member who I had interviewed who found the interview useful. This led to further recommendations to talk with others. All the TTT and Totnesian interviewees were open and very helpful during the interviews.

Food system and resilience – varied meanings and understandings?

Even though I set the stage in the beginning of each interview by clarifying what I meant by the food system in accordance with the definition in the Introduction, it took on various meanings and understandings to each interviewee. While for some, the food system was comprised of food shops and restaurants, others saw the food system as a series of actions leading to the production and consumption of food, and the same was the case for resilience. Most attributed resilience to having access to locally grown, organic food. For some, it was about the level of renewable energy used to produce and transport

²⁰ The standard method of approach was to send an e-mail to the interviewee with a request explaining my project and a request for an appointment. I then reiterated my e-mail if I did not receive a response. I contacted the person by phone upon my arrival in Totnes to reintroduce my project, clarify my aim and agree on a meeting location.

food. The meaning of “local” also varied from proximities of Totnes to the larger entity of the EU.

The TTT Food Group

The TTT Food Group is “working to strengthen the resilience of Totnes and the surrounding district in the area of food”. By working closely with the farming and business community, the aim is to develop a relocalised food infrastructure to encourage individual and community action to grow food locally (TTT Food Group homepage November 2009). Some of the actualised projects are: Garden Share, Local Food Guide, Nut Tree Planting, and Seedy Sisters. Some of the pending projects are: Food Hub, Totnes Healthy Futures Community Garden, additional Allotments, and Local Food Mapping Project as a local Partner for the Pilot Mapping Exercise of the Campaign to Protect Rural England (CPRE). In the following, there is a summary of my fieldwork findings with various direct quotations attached as being illustrative, not comprehensive, of the interviews. I did this to directly portray the level of awareness and experience of local people in order to enable the gradual emergence of an eventual theory (Strauss & Corbin 1996). The main themes emerging from these responses are then analysed and grouped for discussion in the following section.

Fieldwork findings

Abbreviations:

Transition Town Food Group Members (FG1-FG5)

Transition Town Group Members other than the TTT Food Group (OT1-8)

Totnesians with no affiliation to the Transition Town Totnes (T1-12)

W: Women, M: Men

Demographics:

Number of Transition Town Totnes Food Group (FG)	: 5 (4W, 1M)
Number of Transition Groups Other than TTT FG (OT)	: 8 (5W, 3M)
Number of Totnesians (T)	: 12 (5W, 7M)
Total number of women	: 14

Total number of men	: 11
Average age (Range: 25-84)	: 47.8
Average education (Range: A Level – Post Doctorate)	: University

Numbers in the text:

One (1), Very few (2-5), some (5-10), many (10-15), most (20), all (25)

Next section will present categories, concepts and quotes from the interviews. Core categories and subcategories emerged through the organisation of the data material based on the principles of Grounded Theory. To ensure a conceptual understanding of the different categories and to explain the phenomena as close to being experienced as possible, direct quotes from the interviews are included. Given the size of the data material it is difficult to avoid that the categories are partially overlapping. Some of the concepts will therefore appear under several categories. The main emerging themes are then analysed and discussed in the following section.

Responses on the Totnes food system

Awareness and Affordability

Whereas some interviewees pointed out that Totnes is a unique, alternative town, many pointed out that it has a *high level of awareness in relation to the environment and food issues*. Some also found that Totnes has a *local food culture* unlike any other town in the UK, and does not depend on supermarkets alone. Even so, most defined the *price of local food* as being *very expensive* and therefore *not affordable by most*. Many also attributed *choice of food* to *affordability*. For that reason, many said that *imported food at the supermarket was cheaper*, and most Totnesians do their food shopping at the local supermarket.

T9 said: “*We’re very lucky in Totnes; there are a lot of local food producers growing really good quality food, a lot of organic vegetables, some biodynamic farms, and a number of small-scale cheese makers. So you can go to Totnes and buy almost all of your food from local sources if you want to, which is very unlike a lot of this country*”.

OT8 described local food as: *“I think it is fashionable in Totnes to buy local and organic food. It has become a fashion. It is like celebrity food though. It becomes very special. Whether you’re given a cake that somebody has made or a meal if they say it is organic, suddenly it is like gold. And then if they say they grew it, it is even more incredible”*.

FG 4 said: *“I think it is still more of a sex issue rather than a real issue for a lot of people. I think there’s awareness but not real action based on that awareness”*.

OT3 pointed out that: *“large supermarkets are taking over at the expense of small businesses. I think that has a huge impact on the economy and ultimately on consumer choice and on farmers.”*

Even though many emphasised the importance of *local food*, the term *local* had significantly *varying definitions* both within and across the interview groups. While for many, local meant Totnes and the surrounding parishes, for others it meant the UK. One person saw the EU as still being local. Despite these variances, most perceived the Totnes food system as being essentially reliant on supermarket-based imported foods, i.e. being *the same as anywhere else in the UK*.

T6 pointed out that: *“Totnes is tied into the greater system which is southwest England, which is England, and which is the UK. And we’re all, to a lesser or greater degree, tied into those big distribution systems where most of the food doesn’t come locally, it comes in trucks from God knows where... A lot of it goes to the supermarket of course. That applies in general to Totnes as well, which is the same as anywhere else. The majority of our food supply hangs on a thread. It really hangs on a thread. You know we’ve got three days worth of food. And Totnes is majorly a part of that system. Until that infrastructure starts to change, particularly because the price of fossil fuels goes up, we will all be plugged into the current system”*.

Local food production and the economic reality

Many commented on the *economic reality of local food growers and family farms* as being very difficult vis-a-vis larger scale farms that specialise or diversify, and are thereby able to compete with cheaper imported or long hauled foods in the open market. The fast disappearance of local food processing facilities in recent years, except for a small abattoir in Ashburton,

was also tied to the high price of local food. Many described *farm profitability* as a major challenge and thus the main reason for the *loss of skills* resulting from the migration of farm children to higher paying jobs in the bigger cities.

T11 described it as follows: “*Economically, with the small or large family farms in general, the par lies with the corporation and the supermarket as buyers. They force, if there’s any surplus profit in the system, they capture it. This is even the same for the big landholders. The prices of milk products have dropped between 18-40% in the last year. But the price in the supermarket only dropped 2%. That clearly shows where the par lies. That is the problem*”.

FG2 further noted that: “*There are some local businesses who produce locally and can find a direct market locally but most of the producers who need to process their food have to do it elsewhere because it is too expensive to do the processing locally or get the food produced locally*”.

T2 said that: “*A generation or two of farmers’ children haven’t taken over the family farms and haven’t learned the skills. That is lost and they have gone off to cities. Because they couldn’t see how they could make a living, it is low status, hard work and it is very isolated. So the average age of farmers in this country is 64, something like that. Tens of thousands of farms have stopped being farms over the last decade*”.

FG1 also said: “*We live in a culture, and Totnes is no different, where there is a huge differentiation between the manual farming work and office work. The labour for farming is very badly payed in the UK.*”

Major concerns

The industrial food system

Most of the interviewees expressed the *fossil fuel-intensive production, processing and just-in-time distribution system* as the biggest concern for the future of the local food system. Relatedly, many expressed that *most food* bought and sold locally is *long hauled or imported and out of season*.

OT7 pointed out that: “*Food is produced almost entirely on an industrial scale, distributed through supermarkets, and if that is interrupted in any way we are in a perilous state... In September 2000, lorry and tanker drivers blockaded oil refineries so that fuel was prevented from getting to many of the petrol stations and supermarket petrol stations. The whole country went into a crisis of fuel starvation and supermarket shelves started to empty. To me that was a wake-up call, that was a shock. Now, 9 years later, the potential of that happening again has not receded, but it feels more and more that it is just around the corner. And I see peak oil as a big, big problem*”.

T8 also pointed out that: *“a fraction, approximately 1%, of food sold in Totnes is produced in Totnes, but also 1% of food produced in Totnes is sold in Totnes, almost none to maybe 1% of it is produced sustainably”*.

Disconnection and deskilling

Whereas some viewed the vast majority of *people* as being *disconnected and detached from their source of food*, many recognised that while *lack of skills* represented a need for reconnecting with the land, it also signified the size of the gap.

T8 also noted that: *“basically people have absolutely no skills to grow food and no sense of physical work”*.

Land issues

Most attributed the *extremely high land prices and availability of land* as a defining factor in the progression of agricultural practices. As a result of this, *landownership* can be said to define the practice of food and energy use, both in terms of production and consumption. Some said that there is also more and more *building*, in the form of houses, *on agricultural land* due to attractive economic returns.

OT6 pointed out that: *“Anybody who owns land who thinks there’s any possibility to build a house or a group of houses won’t allow that land to be used for anything else, not even rent it long term, because they could be sitting on a fortune. The difference in value in this country is that an acre of land is worth about 6,000 pounds for agriculture, though for development you could put 10 houses on it and for each of those houses the land is worth 100,000 pounds. So an acre of land without planning consent is 6000 pounds, and with planning consent it is 1,000,000 pounds. Anybody with a big garden, if they can get a planning consent, they can make a lot of money and that distorts the market for food”*.

OT5 said that: *“There are 3 significant landowners in this area, I mean people own small bits, but in terms of bigger landscape you’ve got the Duke of Somerset, Dartington Estate and Sharpham Estate. And they are big landowners, very big landowners. Then you also have Prince Charles. Landownership is probably the most significant thing that will make or break Transition.”*

What needs to change?

Most interviewees expressed *mindsets and attitudes* as the primary areas where change needs to happen. The *supermarket-oriented food system* was also expressed by most as a crucial area for change, as well as *social networks, community and skilling*. Very few said that *government action* and one said that *what people cook needs to change*.

FG 1 said: “*If people could see shopping food as a political voting and in terms of where they put their vote...*”

FG4 pointed out that the: “*Mindset is the most important thing that needs to change. I think without people getting to see food and the true cost of food, it will be hard for people to change.*”

OT5 said: “*I think the biggest problem we have is the supermarkets because they have distorted people’s spending patterns by targeting the issue of convenience. I mean most people drive to do their shopping from the supermarkets, and I wonder if in a few years time as the oil comes down and oil prices shoot up people, will still be driving to go to the supermarket*”.

T3 said: “*Very few people here have a community ethic. They’re quite scared of community*”.

T6 noted that: “*A complete change of the social set-up that we work in is needed. We would need loads more people actually working on the land. The latest Soil Association Report pointed out that we only have about 2% of our population involved in agriculture, whereas we would need about 20% of the population to be engaged in the food production, primary food production, not processed food. Now that’s a huge social change, huge social upheaval. I think it could be done, but what concerns me most is the skills needed to do it. It is one thing to have the land, but it is another thing to be able to use it well. And those skills are disappearing rapidly as farmers move into office jobs where they can make more money. Farming is a skill and requires discipline, much more than people realise*”.

T8 said: “*government action is needed, I can’t see a coherent argument why the government does not tax the hell out of energy, it is politically unacceptable, but it is clearly what we should be doing. Eighteen months ago when the recession kicked in and oil prices shot up, it was unbelievable to see how things changed... We’ve got all the mechanisms in place to do it, but the carbon trade issue makes things so complicated, nobody understands it... when in the next 10 years the s... hits the fan... we’re just not fast enough to respond to what needs to be done*”.

What would help?

Most noted that *money* was the *primary indicator for people's food choices*.

Most also expressed *education and awareness raising* as being critical for helping to create resilience in the local food system. *Land* was also expressed by most as a key element for building resilience, and some also found *political support* as an important input to local food system resilience.

FG 3 said: "*Money, I'm afraid, is the main issue, as it is for most people*".

OT2 further noted that: "*It is really expensive to support those small organic shops when you're on a tight budget*".

T12 also said that: "*Money and profitability determine our decision making. For example, we had to put our organic status on hold when the feed prices went up*".

OT3 said: "*Finding the land would help a lot because that has been very difficult. That seems to be phenomenally difficult*".

OT6 noted that: "*Changing the planning laws would be a big help, because we have very strict planning laws in England about living on the country side*".

Exploring personal engagements with food

	% of homegrown food	% of home cooked food	Average number of meals per day	% of local food used
Average % for FG	12.5	91.5	3.4	40.5
Range	0-30	75-100	3-5	20-70
Median	10-15	90	3	30
Average % for OT	3.95	65	3.125	33
Range	0-30	10-95	2-5	5-90
Median	1	65	3	25
Average % for T	30	88	2.75	60
Range	0-80	5-99	1-3	1-90
Median	20	97	3	70
Total averages in %	15.5	81.5	3.09	44.5

On average, TTT Food Group members said that 12.5% of the food they consumed was *grown by themselves*. Interviewees from other TTT Groups averaged 3.95%, while Totnesians averaged 30%. ²¹ The total average for homegrown food was 15.5%. TTT Food Group members also said that, on average, they cooked 91.5% of the time at home versus eating out or ordering in. Other TTT Group members averaged 65%, while Totnesians averaged 88%, and the total average for home cooked meals was 81.5%.

TTT Food Group members said that the *average number of meals* they consumed per day was 3.4. Other TTT Group members put that number at 3.125, while Totnesians' average was 2.75 meals per day. Altogether, the total average number of meals eaten per day was 3.09.

TTT Food Group members said that the *average share of local food* they used in their meals was 40.5%. Other TTT Group members averaged 33%, while the Totnesians' average was 60%. ²² The total average of local food used in meals was 44.5%.

Though the TTT FG scored higher than other TTT Group members overall, Totnesians scored much higher in growing their own food and eating local. This is largely attributable to the farmers in this group. Nonetheless, TTT FG scored highest in eating home cooked meals. Means of preparation has not been asked although from my participant observation natural gas and electricity seemed to be the most commonly used sources.

²¹ See range, median and average numbers above

²² The number of farmers (organic and others) in the Totnesian interview group led to a remarkable percentage of local food being used compared to what the overall trend might be. Nonetheless, the total average of local food used is congruent with the national average (Defra 2005).

Factors contributing to resilience

Community, locality and seasonality

Most interviewees pointed out the *need for a strong community* as a key component for building resilience, with others saying that changing eating habits to *seasonality* and *locality* was also important.

OT1 further pointed at: *“The market has local growers and hand baked bread, and lots of conversations happen there. Also the local independent food shops and restaurants have a lot of conversations going on and they all have bulletin boards. Something about that feels very strong. Also, meetings in the town hall to discuss issues feels like a strong community building element. There’s also a new wave of people moving into this area, probably more so in the last 10 years, because they want to explore ways of doing things differently”*.

FG3 expressed the current situation as having: *“...a massive gap there. I think it is through community that we can build a healthy food system again”*.

T8 said that: *“The most important thing we do is to encourage people to cook and to use seasonal food, but 95% of the households lack the skills and the willingness to compromise their diets. Most people do not even know what is in season; more importantly than us being an organic producer is our efforts to get people enthused to use seasonal food. We have improved our efficiency over the last years in using fossil fuels, spent a lot of time studying alternative energy sources, brought about significant reductions in our energy usage and also asked our customers to do so. But unless people are willing to compromise their diets to shift to seasonal foods, the level of change will remain minimal. Even the greenest people's fridges are full with tomatoes in winter; it is just not happening”*.

The land structure

The *steep land structure* was also pointed out by most as a contributing factor to resilience because of the difficulties involved in using high-tech machinery and hence the prevention of larger scale intensive farming on steep hills.

T4 said: *“When you look at the land in this whole area, it lends itself to a gentle kind of farming. Not everything is organic by any means, but it is hilly and that helps”*.

Factors preventing resilience

Land distribution and high land prices were pointed out by most as a key factor in preventing resilience. The *high cost of local food* was also expressed as a preventative factor by most, and most also attributed the *lack of skills* for growing, preparing, preserving and sharing food as a critical factor in preventing resilience. Many mentioned the transport of food as a significant aspect of the local food system heavily impacting the environment. Many said there is a *lack of a sense of community*. Some mentioned that there was *no longer a local economy*. Very few mentioned *food miles, climate change and peak oil*.

FG2 pointed out that: *“Most people can’t afford to buy local food and so they go to the supermarket. The money aspect supports that whole way of doing things and it makes it very hard for us to make something very different”*.

T4 said: *“To me that is a tragedy. People lack skills; that is probably the biggest weakness. Over intellectualisation and lack of skills.”*

FG 1 said that: *“It is an enormous web that makes up the food system. But transport seems to make up an enormous amount of its impact”*.

OT3 said: *“One of the major factors is family and social networks. We have a community that is already fragmented and not cohesive.”*

T2 pointed out that: *“The villages have lost their economic heart. In many of the villages, the pub, the baker, the shop, the small industries, the post office have all gone.”*

T1 said that: *“It is very difficult. People are so used to just going to the supermarket and buying imported apples even though this is an apple growing area. It is kind of an expectation, a pattern, a habit of buying. Seventy percent of apples are imported even in the season.”*

FG5 said: *“Most people are shopping in the supermarket, even though there are a large amount of independent retailers, a lot of the food there is travelling from the other side of the world, a lot of it is produced out of season, using very intensive methods and fossil fuels. Food miles are large, the environmental footprint is huge, CO2 emissions are enormous, and the danger of recurring oil shocks and peak oil, and climate change is well established. How are we going to relocalise our food economy and our food supply? How to convert more local farms to sell in the local area and produce a wider range of produce?”*

Effects on people

Whereas many described the scale of challenges involving the attitudes around the food system and the environment *frustrating and disheartening*, some said that *not having enough time or lack of available land* was also an important source of tension. Very few mentioned *freedom of choice and convenience* as an assumed norm that is hard to argue with and change.

OT1 said: “*Sometimes I feel blessed to be actively engaged and what I can then feel is oh... I forgot to pay attention to the fact that we are a very, very small bubble in a very, very large system. That takes me to feelings of a range of excitement about the challenge to frustration and fear about what a small part of community that we are*”.

FG2 said: “*There are times when I can be very depressed and very disheartened, but I also feel energised by a passion to resolve it and the belief, deep down, that it can be done*”.

T12 said that: “*People do not want to eat or drink the same things all the time. That is one of the greatest challenges really. In a time when we can have almonds from Turkey and olives from Greece and kiwi from New Zealand, that’s something my parents didn’t have and yet we assume it is normal in our daily lives*”.

TTT Food Group contributions to food system resilience

Many have expressed *awareness raising* as the main contribution of the TTT Food Group. Some mentioned *empowerment and reskilling* as important contributions, and some also mentioned the *Local Food Guide* (also called the Food Directory), *Nut Tree Planting*, *Garden Share Project*, *Seed Swops*, and the *Food Hub Project* (in planning). Some said they *did not know* what the TTT Food Groups’ contributions might be. Very few mentioned the *Food Mapping Project* (a pilot project of the Campaign to Protect Rural England in Totnes in cooperation with the TTT Food Group), and very few had not heard of the TTI, the TTT or the TTT Food Group at all.

OT5: “*I think they’re doing a fantastic job. I mean the Food Directory is really good. They’ve generated awareness*”.

FG2: *“TTT creates a forum where people can get together and feel empowered to speak out that they’d like things to be different and that people can do things together”.*

OT6: *“One of the things about transition is about this idea of the great reskilling, where we have to change people’s mind-sets about how things are”.*

OT1: *“Keeping the conversation alive in the community and starting new ones about food and the value of good, local food. Nut Tree Planting, Garden Share Scheme, supporting people around growing their stuff, Seed Swops, and a sense of empowerment of being able to grow and share”.*

FG5: *“The Food Hub Project is going to be the most important contribution, because it aims to sell local produce at supermarket prices. I think all the other ones, they don’t have so much potential to revolutionise the relocalisation of food supply. Its basically selling local food at supermarket prices. And what can be better than that. It ties up the loose ends”.*

OT8: *“I do not know what they are doing at all. I guess the Totnes pound creates a social network and because it is used in local shops it must be part of the Transition Food Group activity”.*

T2: *“The Food Mapping Project was helped by the TTT and it is about to be finished, and I hope the food group will use it”.*

T7: *“Transition Town? Don’t know anything about it”.*

The TTT Food Group’s effectiveness

Some described awareness raising, the Nut Tree Planting Project and the Local Food Guide Project as effective activities, although they were not able to highlight how this could be justified. Some interviewees expressed that they *did not know* or *they did not know enough* to be able to say in what way the TTT Food Groups’ activities could be said to be effective. Very few said they *did not know* of the TTT Food Group’s activities *at all*.

FG2: *“It isn’t just that we’re all going to the supermarket, but there’s something else happening, something different that draws people to think and act differently. It is a place where people can dialogue, where ideas can develop and get stronger because you’re testing it out, you’re having a go, you’re seeing what works”.*

OT1: *“I wouldn’t know what the evidence is, but my guess would be that, maybe give it another year or so, maybe in looking at the income streams of local food businesses and food growers and particularly those who have started thanks to the TTT. One of the key things that the TTT has done is to point out to people what was already*

happening and there, that is something that TTT should be valued for because that is an important part of what they have done”.

The next section is an attempt to draw a link between the challenges mentioned above and examine whether lessons from the development of the Self might provide insights into the development of our relationship with our food sources and their resilience.

SECTION 5

5. An exploration of “significant others”

The previous Section presented some challenges and opportunities involving the food system in Totnes as they were experienced by the interviewees. These challenges can also be seen as some of the components that comprise the current food system. In the pursuit of understanding food systems and resilience, both of which are human concerns, the presence and resilience of the Self appears central. “For this is the journey that men and women make: to find themselves. If they fail in this, it doesn’t matter much what else they find” (Michener 1972). The relevance for a resilient food system appears no different. Therefore, by visiting a longitudinal study in the field of Developmental Psychology, in which the importance of “a significant other” is highlighted, this section will examine some exacerbating, mitigating and contributing factors to resilience in children. It is thereby intended to acquire insight and elicit criteria to obtain a better understanding of what some of the corresponding “significant others” for a resilient food system might be. It is thereby intended to appraise whether these factors could prove useful in understanding the ways in which we develop our relationship with our food sources and, in turn, to mutual resilience.

As defined in section 1, resilience stands for the “manifestation of positive adaptation despite significant life adversity” (Luthar 2003). In the context of this thesis, it addresses the ability of a given community to adapt to its needs involving food in the presence of pressing challenges (past and present). As highlighted in the section 2, the UK’s food system shows many challenge areas in which adaptation has become more and more necessary. Since food systems are increasingly attempted to be “controlled” by people, it seems useful to explore the psychology behind people’s developmental process of the Self, i.e. identity, in order to better understand behaviours that seem counterintuitive to

essential needs. This may shed further light to the pursuit of building food system resilience.

However, when considering a person's entire lifespan, a continuous shift - both psychological and physical - seems to occur in attitudes, behaviours, capabilities, capacities and needs. These can be said to be generally different in the various stages of a person's life, and are affected by the presence of the surrounding culture and environment. Therefore, in consideration of their more flexible abilities for learning and change, the focus here will be on children and childhood adversity based on longitudinal studies conducted in New Zealand. It is therefore intended to investigate lessons for adult decision making. There is wide-ranging literature and familiar examples on *children's ability to avoid developing later problems of adjustment* despite exposure to extremely adverse environments (Garmezy 1971; Werner & Smith 1992; Rutter & Madge 1976). Another approach could be to study adulthood adversities:

I was losing myself. The ground, once so firm beneath my feet, now quivered; the path below disappeared. And then I met the abyss, where my own name and possessions became strangers, unfamiliar baggage in this formless place. But this very abyss, where all was lost, somehow, somewhere gave rise to what I now dare to call "me".
(A 16-year-old voyager) (in Kroger 2004)

In their longitudinal study over a 21-year period in which they studied the contributing and preventive factors to resilience in children's psychopathology, Fergusson & Horwood (2003) distinguish between *Protective Processes*, where the exposure to resilience factors is beneficial to those exposed to the risk factor, but has no or little benefit for those not exposed to the risk factor, and *Compensatory Processes*, where the resilience factor has an equally beneficial effect on those exposed and those not exposed to adversity.²³ The focus here takes both of these processes into consideration.

²³ Also see my illustrations based on the "Insights from the Study of Childhood Adversity and Resilience" under Table 13 in the Appendix III.

Whereas socioeconomic adversity, parental change and conflict, child abuse and parental adjustment problems are provided as measures of adversity, family, individual and peer factors conferring to resilience to children reared in high-risk environments are classified in six categories:

1. Intelligence and problem solving abilities, suggesting that resilient children demonstrate a higher intelligence or problem solving skills than their non-resilient peers
2. Gender, suggesting that, for example, in the context of marital discord or divorce, females may be less reactive to family stress than males.
3. External interests and affiliations, suggesting that children who develop strong interests outside the family, or form attachments with a confiding adult outside their family (a significant other), may be more resilient.
4. Parental attachment and bonding, suggesting that a warm, nurturing, or supportive relationship with at least one parent may act to protect against or mitigate the effects of family adversity.
5. Early temperament and behaviour, suggesting that temperamental and behavioural factors may be associated with resilience to adversity.
6. Peer factors, suggesting that positive peer relationships may contribute to resilience

(Fergusson & Horwood 2003).

The study concludes that with increasing exposure to childhood adversities, there are: a) *marked increases in rates of both internalising and externalising problems* in adolescence and young adulthood, although some are able to develop resiliency; b) *modified effects by a series of factors that act to mitigate or exacerbate these risks;*²⁴ c) *factors contributing to resilience that are equally beneficial for those not exposed to these adversities.*²⁵

The above outcome suggests that resilience building factors can be beneficial to those both with and without significant life adversities. The third point conferring to resilience, i.e. “*external interests and affiliations*”, further shows the need for *a significant other*, suggesting the development of strong interest

²⁴ Also See “Comparing Personal Resilience with Food System Resilience Table 14 for exacerbating factors, Table 15 for mitigating factors” under Appendix III

²⁵ Also See under Appendix III for “Comparing Personal Resilience with Food System Resilience, Table 16 for contributing factors”. The Tables 14-16 are intended to serve as a tool for exploring a comparison in the resilience of the Self, Totnes Food System and the TTT Food Group

outside the family or forming attachments with a confiding adult outside of the family.

Bosma and Kunnen (2001) also suggest that outward actions begin only in the presence of *readiness*, when there is *sufficient ego strength* to withstand the withdrawal of earlier external and internal “props” which have served to define the Self. This action is assisted by *a significant other* who is able to bridge both sides of the internal dialogue, but fundamentally support the newly emerging Self (Bosma & Kunnen 2001).

Similarly, the following areas appear to be relevant for further inquiry:

- a) whether and where there might be readiness and sufficient ego strength to withstand withdrawals from earlier “props” for the Totnes food system and the TTT FG;
- b) who can bridge both sides of the internal dialogue, for example, nature and culture both ultimately support the newly emerging system, i.e. contribute to the building of a resilient food system. My fieldwork in Totnes and the related analysis of the TTT Food Group is an attempt to explore who and what those may or may not be; and
- c) who and what some of the “significant others” for the food system and the TTT FG be.

The next section will attempt to answer these questions.

SECTION 6

6. Discussion

Based on fieldwork results outlined in section 4 and using grounded theory as explained in section 3, emerging themes will be discussed with an aim to explore answers to the main research questions which are: (1) In what ways does the Transition Town Totnes (TTT) Food Group contribute to building resilience in the local food system?, and (2) In what ways can it be said to be effective? The study of the Self as outlined in Section 5 is attempted to serve as a metaphor for the Totnes food system and the TTT Food Group. This is an attempt to facilitate the exploration of exacerbating risk factors, mitigating factors and resilience building factors for each (Totnes food system and TTT Food Group), and will be outlined interchangeably. This will lead into the discussion of the effectiveness of the TTT Food Group. Some “Significant others” emerge as a result of this discussion.

Comparing the Self with the Totnes Food System and TTT Food Group

In the context of the Totnes food system, the *development of strong interest* may be said to stand for awareness raising and reskilling. This is attempted through TTT and other local educational and practical initiatives to address food system-related concerns. If compared to a child, the Totnes food system can be said to be in the process of developing a strong interest despite significant life adversities, and *forming attachments* may stand for community building activities. Even though there have been various attempts initiated by TTT, TTT Food Group and other actors, the inclusion and coordination of public, private and non-profit actors seems to remain an area of great challenge. On the other hand, *sufficient ego strength* may be attributed to the readiness for change.

As a consequence of wide ranging challenges involving the formation of necessary attachments, Totnes does not currently seem to portray sufficient ego strength for change when mindsets and attitudes are considered. Because of that, TTT strives to act as a *bridge* among various actors of the community. However, such a bridge shows a strong need to be built by a close cooperation of various actors (public, private and non-profit) and coordination of resources; this in itself necessitates financial, social and environmental resources, for example in form of land, which currently seem constrained. However, the realisation of such cooperation may act to *fundamentally support* the newly emerging food system and its members. In the emergence of such a process, the *ability to withstand dissolution and guilt* may therefore be said to stand for social, economic and environmental pressures, some of which have been highlighted in this thesis. This ability, coupled with *an iterative process of person-context transactions*, for example social cohesion, may lead us closer to the *structural change* needed to build a resilient food system.

Exacerbating risk factors

The Food System of Totnes

Overall, a strong *environmental* and *food-based* awareness shows up as a general characteristic of the food culture in Totnes area. At first sight, this is observed by the picturesque food retailers, whole food restaurants and health shops in town, with the ongoing Friday-Saturday Market also providing limited amounts of local foods. Most of the organic food is sold by a large, local organic food supplier with a box scheme - home delivery system - of fresh, seasonal and local foods, among others, while other local farmers supply Totnes with a small portion of their produce largely comprised of dairy and meat products, but seasonal vegetables, fruits, nuts, wild food (fruits and meat) and wines as well.

There is currently a symbolic number of allotments and over 12 community-supported farming projects in the area where people produce a part of their consumption needs. The local Rudolf Steiner School involves children in biodynamic farming as a part of their curriculum, and there is also a number of small-scale organic gardens and orchards which experiment with biodynamic farming and permaculture methods. Among others, TTT and TTT Food Group support food-related activities by networking between consumers and producers, and conducting and partaking of studies and organising practice-oriented events.

By contrast, lack of skills for growing, choosing and preparing foods were contradicting factors with the level of environmental awareness. Furthermore, two local supermarkets provide the majority (approximately 80%) of locally consumed food. As a result, the local food supply is largely dependent on the supermarket based just-in-time system. On average, even the highest scoring farmers and food growers in regard to the percentage of locally food consumed (see chart on p. 57) attributed their diet to being 40% reliant on non-local foods. The highest scoring interviewee was a local farmer who said that the proportion of non-local foods in his household was 30%. Even though the interviewees said that an average of 81.5 % of the food they consumed was cooked at home, “cooking from scratch” with seasonal foods did not represent their general consumption habits.

Although affordability, availability of choice and the convenience of easily prepared foods were among the defining factors influencing decisions for preferring the supermarket, exoticism of foods and the convenience of driving were also crucial. This was largely attributed to highly processed, packaged and frozen foods from elsewhere that often necessitate high amounts of additional use for their “easy” preparation. Hence, environmental and food awareness did not necessarily represent consumption patterns, and the possibility of change appeared to be limited to those who can afford it.

Affordability also had varying connotations for the local producers of food. Whereas price pressures from the open market were expressed as the main reason for having to sell in the open market, lack of local demand was also an inhibiting factor of profitability. As a result, local produce is largely sold further afield, in a way mirroring local sourcing patterns from often even further afield. In this context, the local economy was often pronounced as being largely absent or fully integrated into the larger EU scheme whereby local decisions were hampered.

Land related issues have further been expressed as significant concerns. Landownership is concentrated in three big landowners, who own the majority of the arable and non-arable land in the area. This has direct implications on land prices as well as the opportunity for land access. Whereas accessing land is often economically impossible for the average Totnesian, the extra-ordinary land prices have also made building on the land much more attractive than farming (see Fieldwork Results for specifying quotes).

Therefore, the concern of socioeconomic status and social cohesion appear critical. OT3 noted that “*one of the major factors is family and social networks. We have a community that is already fragmented and not cohesive*”. But how do you create social cohesion with strongly varying income levels and a lack of opportunity for landownership? How to bring about cohesion without equitability?

TTT Food Group

The TTT Food Group attempts to address these critical issues in various forms. Organising activities to address food system related issues, raising awareness and building a sense of empowerment can be counted as some examples.

Thematic events and workshops, often held in the local town hall or the Methodist church, aim at bringing Totnesians together to explore ways of finding mutual responses to highlighted concerns. It is often as a result of these meetings that working groups may be formed or individuals volunteer to spearhead further activities and make connections. The degree of contribution depends on the level of willingness and personal commitment to change, as well as participation, seeking of know-how, providing available time and resources.

This is facilitated by uniting with other initiatives to respond to these challenges. Educational activities for reskilling, the Local Food Guide, Garden Share and Nut Tree Planting are some examples that depict the TTT Food Group's efforts. However, since all of group's members are volunteers, the amount of time and resources allocated to initiate and run these activities in a consistent manner is limited. This also holds true for the know-how and access to land required for enhancing food-oriented activities. In turn, essential financial, social, environmental (particularly available land) and political resources needed to fulfil the anticipated goals appear significantly constrained. At this stage, this is largely exemplified by the high level of volunteer circulation which seems to inhibit the build up of organisational know-how. There are only a limited number of people who are socially and financially capable of dedicating their time and energy without having to worry about their rent or other daily expenditures, which has many connotations.

First, even though volunteerism may generate high levels of enthusiasm and a strong spirit in terms of supporting change, it is also a source of frustration and potential burnout in the absence of achievable goals, guiding structures and especially visible outcomes. Second, the knowledge required to catalyse a wide reaching activity is limited to those who can afford to volunteer and to those who can occasionally dedicate their time. This also prevents the formation of an internal check and balance system for monitoring progress that creates an

imbalance in the workloads with potential for burnout or frustration. Third, since volunteers are not under any contractual obligation, they cannot be held responsible for being consistent with their participation and input, which has various implications as far as quality, accountability, time orientation and communication of the issues being raised and the actions taken.

Not having any local farmers in the TTT Food Group also limits the communication and capacity to influence farmers as integral players in the local food system. In contradiction to the TTI principle of inclusivity, the aforementioned leads to a team spirit of like-minded people who willingly or unwillingly make it hard for others, possibly those who are most needed to implement, to join in. This may be why people from both within and outside of TTT often say that TTT has not yet been able to generate any significant enthusiasm from the average person. It is likely that this further influences TTT's behaviour towards building a collaborative network and fulfilling practical, wide-ranging objectives. Therefore, like-minded organisations and institutions may be more often sought or attracted than not for collaboration. The inclusion of and cooperation with other community members or partners, who may be less comfortable to work with, may thereby also be prevented. In this regard, checks and balances seem necessary to maintain internal coherence, and staying committed to learning to cooperate with diverse actors. As a result, a lack of resources (financial, social, environmental and organisational), combined with a lack of practical know-how and volunteerism-based inconsistencies seem to make it difficult to accomplish the visible manifestations as originally intended. Overlapping factors with the Totnes food system have not been restated but will be outlined in the proceeding list.

The following factors emerge from this discussion that may be outlined under potentially *exacerbating risks* to adversities:

Factors in the Totnes Food System:

- Lack of skills and consumption patterns contradict level of environmental awareness;
- Local food supply is dependent on the supermarket based just-in-time delivery system;
- Environmental awareness is constrained primarily by economic factors and by a lack of access to land;
- Convenience, availability of choices and exoticism override environmental awareness;
- Open market based price pressures, lack of local demand and increasing land prices threaten farm profitability and farm continuity;
- Lack of access to land is a crucial concern;
- Lack of social cohesion is shown as an inhibiting factor to community action;
- Lack of policy instruments supporting local land use, food production and food sales;

Factors in the TTT Food Group:

- Lack of skills and consumption patterns contradict level of environmental awareness;
- Frustration and burnout;
- Imbalances in workloads;
- Lack of landownership or access to land;
- Lack of or very limited access to resources (time, practical know-how, social, financial; political, organisational) to catalyse large-scale change;
- Volunteerism based-inconsistencies;
- Biased inclusivity;
- Ambiguous accountability;

When compared to the definition of a resilient food system in section 1, the issues discussed above involved some of the factors that may exacerbate the risks to adversity and therefore suggest a non-resilient food system. These, coupled with the potential effects of climate change and peak oil, or peak energy inputs (potash, natural gas or else), may be said to constitute some of the significant life adversities of the current food system in Totnes. In this context, political support and Government action were also expressed as a significant area of support whereby change could be facilitated. The grounded theory approach focuses on what might emerge as a result of a continuous exploration of these reoccurring clues (Strauss and Corbin 1998). Hence, the next section will look at factors which may act to mitigate the outlined risks to adversity.

Mitigating factors

The Food System of Totnes

The Totnes area shows a significant number of activities and initiatives geared towards exploring alternative ways of addressing food related issues. These range from forming community allotments to permaculture co-ops, in which food is grown locally and ways of low energy living practices are explored. Moreover, a range of local organic and biodynamic farms and orchards run educational activities as part of the general growing practice. Community supported farming schemes and workshops for cooking, baking and preserving food take place as knowledge and skill enhancing activities.

The Small Farmer's Association also addresses the needs and concerns of small farms in the area, and attempts to enhance knowledge and capacity by arranging regular events. Riverford Farm, the largest organic producer in the area, actively engages in providing practical advice for choosing and cooking seasonal foods. Sharpham Estate is currently engaged in studying cooking oil crops in order to supply local cooking oil. Most oil is currently imported. The Dartington Hall Trust regularly organises a variety of educational and cultural events which address practical ways forward for food issues. The Agroforestry Research Trust conducts studies of mixed agroforestry systems as a way of increasing the fertility of the land and biodiversity, while producing a variety of fruits, nuts, medicinal plants and fuel. Additionally, there are a number of local retail shops and restaurants selling locally grown (often organic) foods, while acting as a platform for citizens to network and be informed about food related issues and events.

Despite of these varying activities, most seemed to take place individually with little or no signs of exchange or cooperation. Relatedly, community involvement entailed differing meanings. Although for some this meant building *social networks* within and outside the food system, for others it stood

for activities *bringing local citizens together* to work for a common goal such as finding alternative ways for meeting some of the community needs. Others mentioned *social cohesion* in the form of having direct friendships with the producers of food, eating together or mingling at the town market as ways to strengthen community ties and enhance a sense of belonging. This usually meant that the person would feel strong enough to speak up or be motivated to get involved.

The *steep land structure* of the area was also often seen as a mitigating factor to risk, as it disallowed for the use of large-scale, high-tech machinery as well as large monoculture fields. This, coupled with woods, hedgerows and rivers, allowed the area to lend itself to a gentler kind of farming and grazing.

TTT Food Group

In addition to attempting to closely network with various actors in the community, the TTT Food Group also organises activities to help raise awareness, enhance skills and influence general attitudes. The Local Food Guide contains information about food producers together with those businesses, market stalls, shops, cafes, pubs, restaurants and hotels/guest houses in the area that support them. The Garden Share Project links people who have unused land or part of a garden with local growers, and in return they share the harvest. The Seedy Sisters Project facilitates seed swapping events, while gardening courses aim to teach basic gardening skills. The “Totnes, the Nut Tree Capital of Britain” initiative plants fruit and nut trees in and around Totnes, and the TTT Energy Descent Plan includes a model for the relocalisation of food in Totnes and its surrounding parishes. The TTT Food Group has also been chosen as a local partner by the Campaign to Protect Rural England to pilot the “Mapping Local Food Webs Project”. This project studies retail, supply and the consumption of local food in the area as a first step toward changing local shopping habits. Some additional pending projects are the “Community Health and Well-being Garden Project” and the “Food Hub

Project”. Whereas the former aims to unite gardening and food growing with therapy and healing, the latter aims to provide a producer and consumer-owned supply chain for small-scale and family food enterprises. Furthermore, in line with the Transition Energy Descent Plan 2009-2030, priority actions over the next 10-15 years for food and farming have been defined which are:

- Building and increasing the market for local food;
- Increasing the physical and political infrastructure for local food growing processing and distribution;
- Changes to land legislation, including planning laws to open up land for food production;
- Decreasing the distance between producers and consumers;
- Utilising available resources for urban agriculture;
- Producing food using a minimal amount of imported materials in a sustainable manner.²⁶

The following resilience indicators have also been identified for monitoring progress:

- Percentage of the population with basic food production skills;
- Percentage of the population who feel confident in cooking with fresh produce;
- Percentage of food consumed locally which has also been grown locally;
- The number of people who feel they have access to good advice, skills and retraining in basic food production;
- Rates of obesity and chronic heart disease;
- The average body mass index (TTT EDAP 2009).

Though not exclusively, these indicators seem to have a particular focus on consumers, while other actors could include the farmers, retailers, businesses, educational institutions, the local government and the environment.²⁷ Overall, the inquiry into mitigating factors seems less forward and may be an area for further research. Nonetheless, the following criteria can be said to have reemerged for mitigating risks:

²⁶ This list is taken from “Transition in Action, Totnes and District, An Energy Descent Action Plan 2009-2030, Part 3 Themes & Pathways for Energy Descent, Working with Nature, 2. Food Production & Farming, but originates from The City of Buenaventura (2009) Transforming Urban Environments for a Post Peak Oil Future: A Vision Plan for the City of Buenaventura. Available at www.cityofventura.net/files/public_works/maintenance_services/environmental_services/resources/post-peakoil.pdf

²⁷ Some additional criteria have been worked out in the Appendix II that may usefully serve this purpose.

Factors for the Totnes food system:

- Mindsets and attitudes;
- Awareness on the environment and food;
- Educational and practical explorations for alternative ways of engagement with food;
- Activities for enhancing Social cohesion;
- Skilling;
- Steep land structure and woods, hedgerows and river-based biodiversity as valuable ecosystem services.

Factors for the TTT Food Group:

- Awareness raising and skill sharing events;
- Networking and initiating community-building (empowering) activities;
- Seeking ways for making better use of available resources for urban agriculture;
- Organising events for building and increasing the market for local food;
- EDAP 2009-2030.²⁸

In the context of resilience thinking, the issues discussed above involve some of the factors which could act in mitigating risks to adversity, although there are currently no mechanisms in place to measure or evaluate the effects of these factors. Nonetheless, they constitute current attempts to alter existing trends and may encourage further research and practical involvement.

Therefore, the TTT Food Group can be said to facilitate the initiation and facilitation of discussion in the community to mitigate the effects of the currently predominant consumption and production patterns. The next section will attempt to examine whether *resilience building factors* differ from mitigating factors, and whether and in what ways these can be said to be effective. This will lead into a discussion of what some of the “significant others” for building resilience could be.

²⁸ <http://totnes.transitionnetwork.org/EDAPwebversion>

In search of a resilient food system

The Food System of Totnes

If the study on the Self outlined in Section 5 were to be mimicked with the current food system in Totnes and the TTT Food Group, how could the level of “readiness and ‘sufficient’ ego strength to withstand withdrawals from earlier props” be interpreted?

This thesis has focused on resilience and how resilience thinking might contribute to a better understanding of the food system in Totnes. It appears that the understanding of resilience is not a straight forward endeavour, and may constitute varying levels of understanding and dynamics between the actors. For example, despite of the number of activities mentioned earlier, the state of the farmers has hardly been mentioned. Apart from a few remaining small to medium size family farms and retail shops, the current food system in Totnes and the surrounding area can be said to have lost almost all of its historic connection to growing, preparing, preserving and the exchange of food. This may be one of the reasons why a local economy was perceived as largely absent. Even though some current activities focused on reviving the local food culture, mechanisms to involve farmers seemed underexplored.

As the number of small and medium farms has declined, the average farm size has grown consistently, with an increase in the shift from the use of mixed farming methods to monoculture practices and the use of intensive methods. Dairy farming has also been increasingly based on imported inputs, and as local produce has been substituted by cheaper, exotic foods imported from afar, local farmers have had to pursue national or international markets, which has also led to the closing of local food processing facilities and shops. With increased pressure from the open market and conditions of the Common Agricultural Policy (CAP), farmers have had to specialise or diversify their

activities in order to be profitable, although this strategy has not always worked. Methods of farming and agriculture, as well as related processing, storage and transportation activities have become increasingly energy intensive. As a result, soil fertility has been said to have continuously declined in parallel to the decline of local produce and shops that have been replaced by two supermarkets (T9).

The internationalisation of the population has also led to the internationalisation of tastes and food choices. Though most of the food shopping has concentrated on the supermarket, the types of foods purchased and cooking habits have been transformed in the process, thus causing old skills to be lost or forgotten. In addition to the availability of year-round, out of season exotic foods, a substantial portion of consumed foods have been packaged and preserved by synthetic means, or been frozen by the use of imported energy inputs, leading to higher energy use while delimiting the amount of individual time and effort for the individual preparation of foods. Instead of travelling to the baker for bread, to the butcher for meat, in vegetable shops for vegetables, etc. in the old-fashioned way, shopping for everything at one location has further diminished the personal effort involving food and more importantly, increased the loss of connection to their source. As such, convenience has taken precedence over an authentic connection to and experience of food at its source.

Therefore, this new system can be seen as having put the essential means of survival, along with cultural identity, sources of income and the environment, at significant risk. In the process of outsourcing the source of nourishment, historical connections to foods, medicines and cultural symbolism have also been largely eliminated.²⁹ As a consequence, relationships to environmental, economic and social phenomena have been significantly altered. If our most intimate contact with the natural environment occurs when we eat it

²⁹ Also see “The Elizabethan Kitchen Unlock’d” by Pruw Boswell (2004), an account on the cooking and medicinal plants of the Elizabethan Age under References

(Fernandez-Armesto 2002), then the current contact between people and their natural environment can be said to be largely absent or broken. This has been confirmed to a great extent by the interviewees as well as by personal observation in the field (also see corresponding interviewee quotes in the results section). For this reason, social, cultural and spiritual realms can also be said to have become increasingly undernourished. As a result, the lack of gathering around food can be seen as a lost “space for apprenticeship in the norms of social behaviour” (Tomasik & Vitullo 2007: pp. XV-XVI). In addition, the lack of sharing in the ritualised tradition of cooking food can be interpreted as a public statement of exclusion in an anti-social community whose members share little trust.

“The right to adequate food is realized when every man, woman and child... has physical and economic access at all times to adequate food or means for its procurement” (UNESC Article 11: 1999). This concern may often be considered in relation to the “Developing World”; however, the evidence in this thesis may help to contribute to a change in this perspective. As previously discussed, this has become epitomised in the level of physical and economic access to adequate food or its sources. Adequate food has been defined as food which enables citizens to satisfy their nutritional needs at a true cost, while being free from unhealthy substances and unguine ways of production and exchange. Parallel to the larger context of the UK food system, which was provided in section 2, Totnes also cannot be said to have adequate food for its citizens at large.

The current status of landownership also significantly delimits the people’s access to land. There is a large disproportion among the number of people wanting to have access to land and the availability of that land. As depicted in various quotes in the Fieldwork Results Section, the majority of land is owned by three “land owners”. To make matters worse, the land that is available is excessively expensive, making it uneconomical for growing food.

The accumulated consequences of the contemporary system also hold true for Totnes and the surrounding area. It can be said that most working families cannot afford to pay the price for healthy, locally produced foods which are sold at farm shops or small local retailers. Because of this fact, a large portion of their customers can be said to be concentrated from among the retired population. Though there are no fast food chains in town, increasing numbers of citizens with malnutrition, diabetes and obesity problems are of increasing concern. Hence, the overall “ego strength” of the current food system can be said to be insufficient.

Even though Totnes is engaged in addressing critical food-related issues, an overall lack of coordination between different actors is preventing visibility and accessibility to the “average” Totnesian. Interaction and coordination among the different players in the public, private and non-profit sectors has also been characterised as insufficient. Although this may not be an easy task, it seems to be an integral part for moving towards defining the principles of a common goal for the construction of what might be called a resilient food system. Therefore, examining who and what can bridge both sides of the dialogue, e.g. among the various actors in the community, local and national government or between nature and culture, and ultimately support the newly emerging system, i.e. contributing to the building of a resilient food system, becomes crucial. This is where the Transition vision and the question on which it has been built become relevant:

For all those aspects of life that this community needs in order to sustain itself and thrive, how do we significantly increase resilience (to mitigate the effects of peak oil) and drastically reduce carbon emissions (to mitigate the effects of climate change)? (Transition Wiki, transitiontowns.org)

The Transition Initiative claims that, “Climate change makes this carbon reduction transition essential, peak oil makes it inevitable and Transition initiatives make it feasible, viable and attractive”. The following discussion

will involve an inquiry into to the contribution made by the various activities of the TTT Food Group.

The TTT Food Group

Even though it seems easier to elicit socially, economically and environmentally damaging activities, it may be less straightforward to argue as to what contributing factors and qualities are needed to improve those conditions, how they can be justified, and who may or should be held responsible. According to Constructivist Grounded Theory, knowledge is produced by struggling with empirical problems. Within that, social constructions are assumed to be the source of knowledge (Charmaz 2009).

Awareness raising and skill sharing events have demonstrated the highest amount of responses to the TTT Food Group's related questions which address the contribution to resilience. However, awareness has also shown different meanings. Whereas for some it stood for the implications of climate change or peak oil, for others it meant a lack of affordability, access to land or healthy foods. For that matter, the TTT Food Group may also have varying degrees of involvement that affect their level of contributions. By conducting regular studies involving a variety of local and non-local actors, the TTT Food Group can be said to be contributing to knowledge.³⁰ Internal and external challenges involving the translation of that knowledge have been described on various levels in the earlier part of the discussion.

The following factors that may contribute to resilience reemerged from this discussion:

³⁰ Hopkins et al. (2009) "Can Totnes feed itself?" is a recent example of such a study.

The Totnes food system:

- Overall, a high number of people with environmental awareness;
- A rich variety of educational and practical approaches for reviving local food culture, the connection to food and the exploration of resilience building activities;
- Small and medium size farms and orchards using mixed, organic and biodynamic methods (the numbers or proportion of contributions is unknown);
- Small and medium size local food shops, retailers, arts and crafts;
- Steep land structure, woods, hedgerows, rivers and biodiversity as valuable ecosystem services;

The TTT Food Group:

- Awareness raising and skill sharing events;
- Networking and initiating community building activities for the production and provision of healthy and environmentally friendly foods;
- Seeking ways for making better use of available resources for urban agriculture;
- Community building.
- Contribution to knowledge;

The contributing factors discussed above can largely be described as qualitative, as there are currently no quantitative mechanisms in place to indicate overall contributions and their varying impacts. Even so, both of these show the necessity for longitudinal studies paralleling practical engagements and for ways of evaluating both the production and the consumption aspects of the food system. The next section will attempt to explore how resilience building factors may be justified.

Signs of resilience

The Food System of Totnes

Though to varying degrees, most interviewees have shown an understanding of the current food system and its environmental and cultural implications.

Awareness might therefore be a critical first step towards building resilience-oriented attitude and behaviour shifts. However, it seemed that even with the explicitly environmentally friendly or well-off people, personal habits did not fully represent spoken or desired values. Resisting temptations generally

seemed a hard task, while increased choices have not made it any easier. With an aging population and related health concerns, these factors were further enforced. As pointed out under mitigating factors, there is a rich variety of educational and practical approaches to aid in the revival of the local food culture and re-establish a connection to food. These also include a range of exploratory attempts to discover resilience building activities, though economics, transportation, storage and the waste aspects of these attempts seemed underexplored.

Although there are still a number of small and medium size farms using mixed, organic and biodynamic farming methods, their profitability and ability to find local demand is a major concern. This plays a critical role in their continuation and ability to attract younger generations to continue family traditions. The situation for small and medium size local food shops and retailers might be somewhat different since their numbers are small. Even though they rely primarily on local customers, the fact that there are a large number of tourists and the town policy does not allow chain stores to enter the local market also provides support to their income. Nonetheless, both the farmers and the local retailers expressed concern with the TTT Food Group's activities involving food growing as it seemed to indicate a further threat for their livelihoods.

The TTT Food Group

Though known to a varying degree, the awareness raising and skill sharing activities of the TTT Food Group were largely recognised as a vital contribution in addressing concerns about the local food system and to enhance local capacity. Networking and community building activities addressed food issues in conjunction with climate change and peak oil. Although the concepts and implications of climate change and peak oil were understood in different ways, their general expression involved significant concern and fear. This

found different manifestations ranging from the urge to act and assume personal responsibility to revolt or resentment towards varying actors.

The urge to act or the willingness to assume responsibility was primarily linked with social cohesion and community building. Here, the TTT Food Group has been said to lack the overall ability to be inclusive. Inclusivity has also been previously addressed in conjunction with clear goals, guidelines and checks and balances mechanisms. This may be an area for further consideration.

The TTT Food Group also seeks ways to make use of urban spaces for food production. The Garden Share Project shows a positive, practical example of bringing people together to share their land, often a part of garden, in exchange for skills and a portion of the fresh, local, seasonal produce. Some 30 gardeners have found a match to cooperate under the framework of the Garden Share Project. Nut Tree Planting is another project where up to 100 fruit and nut trees have been planted, and its future plans also include a number of additional steps towards the construction and increase of local food system resilience.³¹ These have been often expressed to have their positive effect on the mindset of the local population since their current share of contribution to the local food system seemed symbolic in proportion.

As pointed out in section 1, change involves inconsistencies and the case for inconsistencies in motion in relation to other change can be said to be robust. When the activities of the TTT Food Group are considered within the larger context and dynamic of the current food system, they have shown some level of effectiveness in raising awareness and being able to raise important questions within the community, thus having a positive effect on personal and interpersonal relations. Similarly, a growing national and international attention on Transition activities over recent years seems to have contributed to increasing the hope for change. However, when considered in proportion to the daily attitudes involving all aspects of production, consumption and food

³¹ See detailed steps under EDAP 2009-2030 - <http://totnes.transitionnetwork.org/EDAPwebversion>

waste, current TTT Food Group activities do not provide clear signs of and means for enhancing effectiveness. Nevertheless, it is important to note that the understanding and expectation of effectiveness might also frequently be attributed to short-term change. The complexity of the issues and related attitudes do not suggest a straightforward process; hence a quick change.

Measuring and justifying the effectiveness of change is further a multidimensional endeavour, involving not only the tracing of directly observable inputs and outcomes in a linear way, i.e. changes and impacts, but also the indirect interactions between those factors. Observing the nature and effects of interactions is where the least amount of knowledge seems currently available. This further challenges existing structures and highlights the necessity in capacity-building for further exploration of approaches. Similarly, measuring and evaluating effectiveness may necessitate continuous efforts to expand and use knowledge in coherent ways, which seems only possible over time. The TTT Food Group has worked out some resilience indicators to monitor future progress. Some of these are listed below:

- Percentage of the population with basic food production skills;
- Percentage of the population who feel confident in cooking with fresh produce;
- Percentage of food consumed locally which has also been grown locally;
- The number of people who feel they have access to good advice, skills and retraining in basic food production;
- Rates of obesity and chronic heart disease;
- The average body mass index (TTT EDAP 2009).

Professor Tim Lang at the City University, London is also expected to publish an article discussing resilience indicators sometime in December 2009 with a focus on ethical food and related policy recommendations (Lang forthcoming).

Building food system resilience may also reveal unexpected truths. For instance, a local study conducted by Riverford Farm and Exeter University revealed that it was more environmentally friendly and less energy consuming to haul tomatoes produced in polytunnels during the summer from Spain than

produce them locally.³² It can be argued, though with potential controversy, that if tomatoes are not feasible to grow locally then they should not be consumed. Yet, this would involve a larger debate around democracy and freedom of choice which is not part of the aim here. Rather, the previous example attempted to point out that building local food system resilience might not be a linear endeavour as was often pointed out in the interviews. Therefore, a change of systems together with their function, structure, identity and feedback seems an important part of the process that may need as much attention.

A food system can be seen as being resilient when it can feed itself through its own members' health and initiatives in learning a balance between growing and sourcing, thereby using the full capacity of the environment and available resources in an optimal manner. This may also entail the adaptation to shocks from both within and without, in addition to finding flexible ways to continue to exist in new forms without undermining the life of ecosystems and people. Here, the psychological resilience of the people reappears as an important factor for learning to adapt to the need rather than pursuing the greed.

The following factors that may contribute to the effectiveness of the TTT Food Group emerge from this discussion. These may also be considered as contributing factors to resilience building:

- Forming teams of individuals with diverse backgrounds, know-how and practical experience;
- Financial, social and political resource sharing through cross disciplinary partnerships to accomplish anticipated goals;
- Accessing land through community involvement with landowners and policy makers at appropriate levels;
- Installing internal check and balance systems to monitor progress, balance workloads, and maintain internal coherence and transparency;
- A commitment to taking care of the land;
- A commitment to inclusivity to enthuse the average person and fulfil practical, wide-ranging objectives;

³² See Riverford's environmental website for further information on the research projects. <http://www.riverfordenvironment.co.uk/default.aspx> and Table 27 under Appendix III

- A commitment to implement, monitor and report on evolving rules; and to explore flexibility to adapt to changes where and when necessary;
- Develop ways to balance these factors.

Although this thesis has largely focused on community involvement, it has also directly or indirectly attempted to draw attention from political and business spheres, without which resilience thinking would be incomplete. The responsibility for individual actions lies within each individual, and that is where a significant portion of the responsibility for overall change may also lie. However, considering the amount and scale of challenges outlined in this thesis, it seems more plausible to expect large-scale changes in need-oriented, collaborative and equitable ways among various, often conflicting, actors. Looking at TTT also helped solidify the need for these in the context of attempting resilience.

Moreover, in the study of the Self, it has been noted that the presence of a “significant other” was essential for building personal resilience. Whereas one “significant other” may be sufficient for building personal resilience given the magnitude of complexities, food system resilience may require various “significant others”. Hence, the following criteria may further contribute to the enhancement of visible manifestations towards achieving a resilient food system:

- A healthy and cohesive community;
- Mindsets and attitudes;
- Equitability and fairness (for accessing healthy foods, land and ecosystem services, and education);
- Food based employment (agriculture, horticulture, mixed farming, processing, etc.);
- A sensible food culture (based on needs and environmentally conscious resource use rather than exoticism and convenience);
- Know-how and skills;
- Private and political will;

This section highlighted some of the complexities and signs involving resilience and their manifestation in the local food system. By drawing on fieldwork results, influencing factors have been examined. These have been outlined under the exacerbating, mitigating and contributing factors. Even

though these have shown similarities and in that some overlaps, through the iteration process they helped to arrive at “significant others”. While the desire and necessity for these might appear as being self explanatory, just as it would be for a child to naturally desire a healthy and happy mother and father, their absence clearly points at significant life adversities of current or historic nature. Hence, the pursuit of achieving resilience in the local food system can be said to be a noble aim of the TTT Food Group. However, it seems essential that it is considered in combination with the resilience of its organisational functionings and those of its members within the larger community of Totnes.

SECTION 7

7. Conclusion

This thesis has attempted to take a variety of approaches simultaneously. This was due to the nature of the challenges and complexities involving the anticipation of resilient food systems. First, it has tried to look at the meanings and importance of food to contextualise its place within culture and nature. Second, it has outlined some of the challenges in terms of the way food is currently produced and consumed, and placed it in the larger context of climate change and peak oil. This was shown by way of contextualising the critical importance of fossil fuels in the food chain and the consequential effects of burning fossil fuels to climate change. Third, it introduced resilience thinking in the context of the UK food system and anchored the study of the TTI within it. Fourth, by using Grounded Theory, it attempted to let the data define the emergence of truths. Fifth, using the self as a metaphor, tools from the field of Psychology were explored to study influencing factors of resilience. Looking at the food system in conjunction with the TTT Food Group helped identify and illustrate some influencing factors. Sixth, fieldwork results provided a glimpse into local experiences, and finally, the discussion attempted to bring together local challenges and the way the TTT Food Group is placed therein. By studying varying levels of exacerbating, mitigating and contributing factors, a better understanding of resilience and the role of TTT Food group was attained.

Resilience in food systems was linked to social, cultural, economic and environmental phenomena. It has been argued that resilience might also be linked to the (resilience of the) self. Even though the self stood as a metaphor, it served as a unique source of comparison for studying the food system in conjunction with the TTT Food Group. For example, seeking an understanding of resilience and food systems appeared to be an emotional pursuit as much as it was an intellectual and a physical one. It involved ethical claims and

dilemmas in attitudes. In the following, I will attempt to draw conclusions from the discussion to answer the research questions.

The need for resilience seems evident for the current food system of Totnes, the UK and elsewhere (Lang (forthcoming); Andries 2009; Hopkins et al. 2009; Cabinet Office 2008; Chapagain 2008; Millenium Ecosystem Assessment 2008; Defra 2008; Foresight 2007; FAO 2006; Foley et al. 2005; Press & Mwatsama 2004). The importance of resilience in food production, processing, distribution, consumption and waste management is increasing in importance in pursuit of enhancing the environment, the global economy and social wellbeing. However, practical outcomes manifest themselves on a symbolic level in Totnes, which can be traced to general supermarket-based just-in-time production and consumption patterns. My research shows that while Totnesians have a high level of awareness of environmental and food-related issues, this is not matched by their patterns of behaviour. First, producers and consumers seem largely motivated or constrained by the costs involving the production or consumption of foods. Second, the convenience of food, i.e. shopping, cooking and consumption, seems to be a priority for most consumers. Whereas this was largely attributed to shopping at the supermarket, where most needs could be met at once, it also reflected the general habit of driving to purchase food. Third, availability of choice was a critical issue justifying the shopping of exotic fruits and vegetables in addition to the already deeply enculturated staple grains, spices, teas, coffees and oils which are also not grown or produced locally. One of the members of the TTT Food Group even went on to say that eating local, seasonal foods year-round was “boring and unfair”. Fourth, landownership was a crucial concern for average Totnesians and the TTT Food Group members alike. Fifth, structural challenges needed to be addressed at the levels of social cohesion and political will. This was strongly attributed to the need for community building.

Varying degrees of challenges have emerged, primarily with regard to patterns of behaviour not matching the overall level of awareness. This was surprising in that educational endeavours (both in the TTT and otherwise) may be expected to have a reverse effect and awareness would seem to be attributed to the desired patterns or corresponding, responsive behaviour. Instead, Totnes showed a stronger tendency between socioeconomic status and production, and consumption choices of food. Convenience was also an overriding factor in spite of the high level of environmental awareness, which in general also held true for the TTT Food Group and TTT. More structural challenges appeared in the areas of landownership, social cohesion, open market-related consequences and political will. Considering the long-term intentions and plans of the TTT, it was inevitable that some of the organisational shortcomings would have to be addressed. It is hoped that some of the suggestions made in this thesis can serve a useful purpose in the realisation of visible manifestations.

As such, the answer to the first research question: “In what ways does the TTT Food Group contribute to building resilience in the local food system?” is that while there are a number of food related attempts by the TTT Food Group such as the Garden Share, Food Guide, Nut Tree Planting and Seed Swops, along with relevant studies such as “Can Totnes feed itself?”, contributions for resilience building at this stage have a symbolic meaning, largely manifesting themselves in considerations of mindsets and not in attitudes and patterns of behaviour. Although community building activities have often been described as an important part of the TTT Food Group’s activities, many likened it to “preaching to the converted”. However, the Food Hub project has been said to be a significant step forward in bringing local producers and consumers together in which an attempt is made to exchange local food for prices matching those of the supermarkets, though the level of seasonal supply, quality and variety relative to consumer’s needs was not expressed.

The overall perception of the TTT Food Group has shown that it was best known for raising awareness. Even so, this seemed largely focused on the concerns that may arise from climate change and peak oil, which are large concepts to comprehend and associate with, both for those involved and not alike (Leiserowitz 2006; Lorenzoni et al. 2007). Nonetheless, the key seemed to lie in the steps where awareness was translated into patterns of behaviour, which is likely one of the reasons as to why TTT has not been able to generate much enthusiasm with the average person. However, their vision and focus was said to be more about long-term change and adaptation, spanning over a twenty year period, rather than seeking immediate responses.

Even though the scale of practical manifestations seemed symbolic, they have been described by some to have had an important psychological effect on the local people. Be that as it may, there are currently no commonly agreed on or defined criteria for evaluating or measuring the effectiveness of the TTT Food Group's activities. Therefore, the answer to the second research question: "In what ways can it be said to be effective?" is that though the TTT Food Group has had an agreed affect on having been able to raise awareness, it has not been able to enthuse the average person. Although economic concerns seemed to be among the strongest motivators for common patterns of behaviour among Totnesians, varying practices of inclusivity by the TTT was also described as a barrier. As a result, thus far the TTT Food Group can not be described as being effective.

8. Bibliography

Aguirre, B. (2006). *On the Concept of Resilience*. University of Delaware: Disaster Research Center.

Andries, S. (2009): "Sources and Forms of Soil Chemical Degradation" in A.M. Bahadir & G. Duca (ed.): *The Role of Ecological Chemistry in Pollution Research and Sustainable Development*. Dordrecht: Springer Science + Business Media.

Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M.J., Avilés-Vázquez, K., Samulon, A., and Perfecto, I. (2007): "Organic agriculture and the global food supply". *Renewable Agriculture and Food Systems* 22: 86-108.

Berkes, F. (2007): Community-based conservation in a globalized world. *Proceedings of the National Academy of Sciences* 104: 15188-15193.

Bosma, H.A. & Kunnen, E.S. (2001): "Determinants and mechanisms in ego identity development: a review and synthesis". *Development Review*. 21(1): 39-66.

Boswell, P. (2004): *The Elizabethan Kitchen Unlock'd*. Totnes: Elizabethan House Publication.

Brangwyn, B. & Hopkins R. (2009): "Transition Initiatives Primer – becoming a Transition Town, City, District, Street, Village, Community, or even Island, Version 26"
www.transitiontowns.org/TransitionNetwork/TransitionNetwork#primer

Brown, J. (2005): *The World Cafe*. San Francisco: Berret-Koehler Publishing Inc.

Cabinet Office (2008a): "Food: Analysis of the Issues" (Updated & re-issued August 2008). The Strategy Unit [online] URL:
http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/food/food_analysis.pdf

Cabinet Office (2008b): "Food Matters. Towards a Strategy for the 21st Century". The Strategy Unit [online] URL:
http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/food/food_matters1.pdf

Carlsson, M. & Jensen B.J. (2006): "Encouraging Environmental Citizenship: The Roles and Challenges of Schools" In A. Dobson and D. Bells (eds.): *Environmental Citizenship*, pp. 237-262. London: The MIT Press.

CCD Steering Committee (20 June 2007): “Colony Collapse Disorder Action Plan”. [online] URL: http://www.ars.usda.gov/is/br/ccd/ccd_actionplan.pdf

Chapagain, A.K. & Orr, S. (2008): *UK Water Footprint: The impact of the UK's food and fibre consumption on global water resources (vol. 1)*. WWF-UK. Surrey: Panda House.

Charmaz, K. (2009): “Shifting the Grounds: Constructivist Grounded Theory Methods” in J.M. Morse, P.N. Stern, J. Corbin, B. Bowers, K. Charmaz & A.E. Clarke (Ed.): *Developing Grounded Theory. The Second Generation*. Walnut Creek CA: Left Coast Press.

CIA World Fact Book (2008): World Fact Book. [online] URL: <https://www.cia.gov/library/publications/the-world-factbook/index.html>

CLSA (2007): “Mr and Mrs Asia”. Credit Lyonnais Securities Asia. [online] URL: https://www.clsa.com/assets/files/reports/CLSA_MrMrsAsia_Final_070914Lo.pdf?disclaimer=on&accept=+Yes%2C+I+Agree&username=nganp&password=2389

Cox-Foster, D.L., Conlan, S., Holmes, E.C., Palacios, G., Evans, J.D., Moran, N.A., Quan, P-L, Brieese, T., Hornig, M., Geiser, D.M., Martinson, V., vanEngelsdorp, D., Kalkstein, A.L., Drysdale, A., Hui, J., Zhai, J., Cui, L., Hutchison, S.K., Simons, J.F., Egholm, M., Pettis, J.S. & Lipkin, W.I. (2007 September 6): A Metagenomic Survey of Microbes in Honey Bee Colony Collapse Disorder, in *ScienceExpress* [online] URL: http://www.pollinator.org/Resources/Cox-Foster_etal_2007_Science.pdf

Davis, N.J. (1999): *Resiliency: Status of the research and research-based programs*. Working paper draft. Washington DC: Substance Abuse and Mental Health Services Administration, Center for Mental Health Services.

Defra (2004): *Agricultural Waste Regulations -A Consultation Paper. Summary for Farmers and Growers*. London: Defra.

Defra (2005): “The Validity of Food Miles as an Indicator of Sustainable Development: Final report”. Issue 7. [online] URL: <https://statistics.defra.gov.uk/esg/reports/foodmiles/final.pdf>

Defra (2007): Consumer Trends ONS

Defra Farm Business Survey (2007-2008): “South West Commentary, 2007/2008”. [online] URL: www.fbpartnership.co.uk/documents/2007_08/southwest07_08.pdf

Defra (2008a): “Food Statistics Pocketbook”. Food and Farming Group, Economics and Statistics Programme, Department for Environment, Food and Rural Affairs. [online] URL: <https://statistics.defra.gov.uk/esg/publications/pocketstats/foodpocketstats/FoodPocketbook2008.pdf>

Defra (2008b): “Ensuring the UK’s Food Security in a Changing World”. Department for Environment, Food and Rural Affairs. [online] URL: <http://www.ifr.ac.uk/waste/Reports/DEFRA-Ensuring-UK-Food-Security-in-a-changing-world-170708.pdf>

Defra (10 August 2009): “Radical Rethink of Food Production Required”. [online] URL: <http://www.defra.gov.uk/News/2009/090810a.htm>

Defra (2009) “UK Food Security Assessment: Detailed Analysis”. Department for Environment, Food and Rural Affairs. [online] URL: <http://www.defra.gov.uk/foodfarm/food/pdf/food-assess-analysis-0908.pdf>

Devon County Council (May 2006): “Totnes, Devon Town Baseline Profile”. [online] URL: <http://www.devon.gov.uk/totnesbaselineprofile.pdf>

Devon County Council (July 2007): “Totnes, Devon Town Population Projections”. [online] URL: <http://www.devon.gov.uk/totnes-projections.pdf>

D’Mello J.P.F. (Ed.) (2003): *Food Safety. Contaminant & Toxins*. CABI Publishing.

Energy Bulletin (2009): “Peak Oil Primer” [online] URL: <http://www.energybulletin.net/primer.php> [last updated 16.06.09]

Fagan, B. (2000): *The Little Ice Age*. New York: Basic Books.

FAO (2006a): “World Agriculture: towards 2030/2050”. Global Perspective Studies Unit. Food and Agriculture Organization of the United Nations. [online] URL: <http://www.fao.org/ES/esd/AT2050web.pdf>

FAO (2006b): “The State of Food Insecurity in the World. Eradicating world hunger –taking stock ten years after the World Food Summit”. Food and Agriculture Organization of the United Nations. [online] URL: <ftp://ftp.fao.org/docrep/fao/009/a0750e/a0750e00.pdf>

FAO (March 16–22, 2009): “Media Fact Sheet. Growing more food – Using less water”. United Nations Food and Agriculture Organization (FAO). Fifth World Water Forum Istanbul, Turkey. [online] URL: http://www.fao.org/fileadmin/user_upload/newsroom/docs/water_facts.pdf

Farm Business Survey (2006-2007): "Horticulture Production in England (Horticultural Business Data)". [online] URL: http://www.apd.reading.ac.uk/AgEcon/research/AFIT/data/HorticultureProductioninEngland2006_07colour.pdf

Fedrigio, D. & Tukker, A. (2009) "Blueprint for European Sustainable Consumption and production: Finding the path of transition to a sustainable society". Sustainable Consumption Research Exchange & EEB European Environmental Bureau. Page 19. [online] URL: http://www.eeb.org/publication/2009/0905_SCPBlueprint_FINAL.pdf

Fergusson, D.M. & Horwood, L. J. (2003): "Resilience to Childhood Adversity. Results of a 21-Year Study" in S.S. Luthar (Ed.) *Resilience and Vulnerability. Adaptation in the Context of Childhood Adversities*" (pp. 130-155). Cambridge: Cambridge University Press.

Fernandez-Armesto, F. (2002): *Near a Thousand Tables: A History of Food*. New York: The Free Press.

Foley, J.A., DeFries R., Asner G.P., Barford C., Bonan G., Carpenter S.R., Chapin F.S., Coe M.T., Daily G.C., Gibbs H.K., Helkowski J.H., Holloway T., Howard E.A., Kucharik C.J., Monfreda C., Patz J.A., Prentice J.C., Ramankutty N. & Snyder P.K. (2005): "Global consequences of land use." *Science* 309: 570-574.

Food Chain Analysis Group (2006): "Food Security and the UK: An Evidence and Analysis Paper". DEFRA. [online] URL: <https://statistics.defra.gov.uk/esg/reports/foodsecurity/foodsecurity.pdf>

Foresight (October 2007): "Tackling Obesities: Future Choices" (2nd Edition). Government Office for Science. [online] URL: <http://www.foresight.gov.uk/Obesity/17.pdf>

FSA (July 2003): "Consumer views of GM food". Food Standards Agency's contribution to the public dialogue. [online] URL: http://www.food.gov.uk/multimedia/pdfs/gm_rep.pdf

Gandhi, M.K. (1957): *An autobiography: The story of my experiments with truth*. Boston MA: Beacon Press.

Garmezy, N. (1971): "Vulnerability research and the issue of primary prevention". *American Journal of Orthopsychiatry*. 41: 101-116.

Garnett, T. (23 April 2009): “Food and Climate Change. The world on a plate”. Food Climate Research Network. [online] URL: <http://www.docstoc.com/docs/6574462/Tara-Garnett-Slides>

Garrett, S. & Feenstra, G. (1998): “Growing a Community Food System”. Partnership in Education and Research. Washington State University and University of California, Sustainable Agriculture Research and Education Program, Davis. [online] URL: <http://smallfarms.wsu.edu/publications/WREP0135.pdf>

Glaser, B. (1992): *Basics of Grounded Theory Analysis*. Mill Valley, CA: Sociology Press.

Glaser, B. & Strauss, A. (1967): *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine Publishing Company.

Goleman, D. (2009): *Ecological Intelligence*. New York: Broadway Books.

Goodwin, B. (July/August 2009): Resilience. In Resurgence Magazine. (Issue 255) [online] URL: <http://www.resurgence.org/magazine/article2852-Resilience.html>

Gray, L. (2008): First council since Second World War set up to look at food security, in *telegraph.co.uk* [online] URL: <http://www.telegraph.co.uk/earth/earthnews/3352882/First-council-since-Second-World-War-set-up-to-look-at-food-security.html> [cited 06 October 2008]

Heinberg, R. (2003): *The Party's Over: Oil, War, and the Fate of Industrial Societies*. Gabriola Island BC: New Society Publishers.

Hopkins, R. (2008): *The Transition Handbook*. Devon: Green Books Publishing.

Hopkins, R. (2009): Running notes from session 7, at TED Global Oxford UK [online] URL: http://blog.ted.com/2009/07/rob_hopkins_at.php

Hopkins, R. & Lipman, P. (2009): “Who we are and what we do”. Transition Network, Version: 1.0 [online] URL: http://transitionculture.org/wp-content/uploads/who_we_are_low.pdf

Hopkins, R., Thurstain-Goodwin, M. & Fairlie, S. (July 2009): “Can Totnes and District Feed itself? Exploring the practicalities of food relocalisation.” Transition Network, Working Paper Version 1.0 [online] URL: <http://transitionculture.org/wp-content/uploads/cantotnesfeeditself1.pdf>

- Hubbert, M. K. (1956): "Nuclear Energy and the Fossil Fuels". Shell Development Company, Exploration and Production Research Division. Houston, Texas. Publication No. 95. [online] URL: <http://www.hubbertpeak.com/Hubbert/1956/1956.pdf>
- Iles, A. (2005): "Learning in sustainable agriculture: Food miles and missing objects". *Environmental Values* 14(2): 163-83.
- International Energy Agency (2009): *World Energy Outlook*. OECD/IEA. Paris: IEA.
- IGD (October 2008): "Genetically Modified Foods – Consumer Research". Institute of Grocery Distribution [online] URL: <http://www.igd.com/index.asp?id=1&fid=1&sid=8&tid=34&cid=548>
- IPCC (2007): *Climate Change 2007: Impacts, Adaptation and Vulnerability*.
- IPCC Fourth assessment report (AR4). Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.
- Kelman, I. & Karnes, E. (2007): "Relocalising Disaster Risk Reduction in Boulder, Colorado". *Australian Journal of Emergency Management* 22(1):18-25.
- Kelman, I. (2008): *Critique of Some Vulnerability and Resilience Papers*. Version 2, 17 November 2008 (Version 1 was 7 July 2008). [online] URL <http://www.islandvulnerability.org/docs/vulnrescritique.pdf>
- Kroger, J. (2004): *Identity in Adolescence. The Balance between self and other*. London: Routledge.
- Lang, T. (forthcoming): "From 'value-for-money' to 'values-for-money'? Ethical food and policy in Europe" in M. Goodman, L. Holloway & D. Maye (Eds.) *Special Issue proposal on 'Ethical Food-scapes' for Environment and Planning A Magazine* (2nd ch.)
- Leggett, J. (2008): "Peak Oil meets Climate Change" The Numbers Game of the Century, Youtube Presentation.
- Leiserowitz, A. (2006): "Climate Change Risk Perception and Policy Preferences: The Role of Affect, Imagery, and Values". *Climate Change, Earth and Environmental Science*, 77(1-2): 45-72

Lorenzoni, I., Nicholson-Cole, S. & Whitmarsh, L. (2007): "Barriers perceived to engaging with climate change among the UK public and their policy implications". *Global Environmental Change*, 17(3-4): 445-459

Lunt, P. & Livingstone S. (1996): Rethinking the focus group in media and communication research, in *LSE Research Online*. [online] URL: http://eprints.lse.ac.uk/409/1/focus_group-J_Comm1996.pdf

Luthar, S.S. (2003): *Resilience and Vulnerability*. Cambridge: Cambridge University Press.

Maxwell, S. & Slater, R. (2003): "Food Policy Old and New". *Development Policy Review*, 21 (5-6): 531-553.

Michener, J. (1972): *The Fires of Spring*. New York: Random House.

Millenium Ecosystem Assessment (2008a). Ecosystem and Human Well-Being. [online] URL: <http://www.millenniumassessment.org/en/Global.aspx>

Millenium Ecosystem Assessment (2008b). Food. [online] URL: <http://www.millenniumassessment.org/documents/document.277.aspx.pdf>

Moerner, J., Bos, R., Fredrix, M. (2002): "Reducing and Eliminating the use of Persistent Organic Pesticides". Inter-Organization Programme for the Sound Management of Chemicals (IOMC). [online] URL: http://www.chem.unep.ch/Publications/pdf/POPred_E.pdf

Myhr, A.I. & Traavik, T. (2004): "Genetically Modified (GM) Crops : Precautionary Science & Conflicts of Interests". *Journal of Agricultural & Environmental Ethics* 16(3): 227-247.

NASA (2005): "What's the Difference Between Weather and Climate?" [online] URL: http://www.nasa.gov/mission_pages/noaa-n/climate/climate_weather.html [cited 02.01.05]

Nationmaster.com (2005): "Health Statistics - Obesity (most recent) by country." [online] URL: http://www.nationmaster.com/graph/hea_obe-health-obesity

ONS (21 August 2008): "News Release: UK Population approaches 61 million in 2007". Office for National Statistics. [online] URL: <http://www.statistics.gov.uk/pdftdir/popest0808.pdf>

Office of National Statistics (2007) Report

Office of National Statistics August (2008) Report

Office of National Statistics (2009): Consumer Trends 1st Quarter

Orlinsky, D.E., Rønnestad, H.M. & Willutzki, U. (2004): "50 Years of Psychotherapy process-outcome research: continuity and change" in M.J. Lambert (Ed.): *Bergin and Garfield's Handbook of Psychotherapy and behaviour change* (pp. 307-389). New York: Wiley.

Owen, H. (2008): *Open Space Technology: A User's Guide*. San Francisco: Berret-Koehler Publishing Inc.

Penn State University College of Agricultural Sciences (2007, January 29): Honey Bee Die-Off Alarms Beekeepers, Crop Growers and Researchers. [online] URL <http://aginfo.psu.edu/news/2007/1/HoneyBees.htm>

Perrings, C.A., Mäler K.G., Folke, C., Holling, C.S. and Jansson, B.O. (ed.) (1995): *Biodiversity conservation, problems and policies*. Dordrecht: Kluwer Academic Publishers.

Prakash, A. & Kollman, K.L. (2003): "Biopolitics in the EU and the U.S.: A Race to the Bottom or Convergence to the Top?" *International Studies Quarterly*. 47: 617-641.

Press, V. & Mwatsama, M. (2004): "Nutrition+Food Poverty. A toolkit for those involved in developing or implementing a local nutrition and food poverty strategy". National Heart Forum. [online] URL: http://www.heartforum.org.uk/downloads/Nut_TkitAll.pdf

Pretty, J.N., Ball, A.S., Lang, T. & Morison, J.I.L. (2005): "Farm costs and food miles: An assessment of the full cost of the UK weekly food basket". *Food Policy*. 30(1): 1-19.

Robertson, G.P., & Swinton, S.M. (2005): "Reconciling agricultural productivity and environmental integrity: a grand challenge for agriculture". *Frontiers in Ecology and the Environment*. 3(1): 38-46.

Robinson, N. (2003): "Fuel Protests: Governing the Ungovernable?". *Parliamentary Affairs*, 56: 423-440.

Ropeik, D. & Gray G. (2002): *Risk: A practical guide for deciding what's really safe and what's really dangerous in the world around you*. Boston, MA: Houghton Mifflin Publishing.

Rubin, H.J. & Rubin, I.S. (2005): *Qualitative Interviewing: The Art of Hearing Data*. London: Sage Publications.

Rutter, M. & Madge, N. (1976): *Cycles of disadvantage: A review of Research*. London: Heinemann.

Sachs, C. (1992): "Reconsidering diversity in agriculture and food systems: An ecofeminist approach". *Journal of Agriculture and Human Values* 9(3): 4-10.

Scharmer, C.O. (2007): *Theory U: Leading from the Future as it Emerges*. Cambridge: Society for Organizational Learning.

Stanford Online Encyclopaedia of Philosophy (2006): "Change". First published Wed Dec 18, 2002; substantive revision Tue Dec 19, 2006. [online] URL: <http://plato.stanford.edu/entries/change/#intro>

Strauss, A.L. (1987): *Qualitative Analysis for Social Scientists*. Cambridge: Cambridge University Press.

Strauss, A.L. & Corbin, J. (1990): *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications, Inc.

Strauss, A.L., & Corbin, J. (1998): *Basics of Qualitative Research. Techniques and Procedures for Developing Grounded Theory (2nd Edition)*. Thousand Oaks: Sage Publications.

Swanson, T.M. (Ed.) (1995): *The Economics and Ecology of Biodiversity Decline: The Forces Driving Global Change*. Cambridge: Cambridge University Press.

Tomasik, T.J. & Vitullo, J.M. (2007): *At the table: Metaphorical and material cultures of food in medieval and early modern Europe*. Turnhout: Brepols.

TTI Website (2009): [online] URL: www.transitiontowns.org

TTT Energy Descent Pathways (2009): "Energy Descent Action Plan 2009-2030". [online] URL: <http://totnes.transitionnetwork.org/EDAPwebversion>

TTT Food Group Homepage (retrieved 10 November 2009): [online] URL: <http://totnes.transitionnetwork.org/food/home>

UNDP (2007): *Human Development Report 2007/2008*. The United Nations Development Programme. New York: Palgrave Macmillan.

United Nations Economic and Social Council (1999): "The right to adequate food (Art.11)". 12.05.99 E/C. 12/1999/5. (General Comments). [online] URL: <http://www.unhchr.ch/tbs/doc.nsf/0/3d02758c707031d58025677f003b73b9>

USCAREP (2009): [online] URL: <http://www.sarep.ucdavis.edu/>

USEIA (2009): "International Energy Outlook 2009". U.S. Department of Energy. [online] URL: http://home.hiroshima-u.ac.jp/er/ZR11_Z_32.html

FCAG Defra dec 2006

Verdurme, A. & Viaene, J. (2003): "Exploring and modelling consumer attitudes towards genetically modified food". *Qualitative Market Research: An International Journal*. 6(2): 95-110.

Wandel, M. (1994): "Understanding Consumer Concern about Food-related Health Risks". *British Food Journal* 96(7): 35-40.

Werner, E.E. & Smith, R.S. (1992): *Overcoming the odds: High-risk children from birth to adulthood*. Ithaca, NY: Cornell University Press.

WFP: "Winning the war on hunger". World Food Programme. [online] URL: http://one.wfp.org/policies/introduction/other/documents/guide_winning_hunger/ENG/Documento.pdf

WFP (2007): *World Hunger Series 2007: Hunger and Health*. United Nations World Food Programme. London: Earthscan.

WRAP (2008): "The Food We Waste. A study of the amount, types and nature of the food we throw away in UK households". Waste and Resources Action Programme. [online] URL: http://www.wrap.org.uk/downloads/Summary_v21.76d1e45e.5460.pdf

Yin, R.K. (2003): *Case Study Research: Design and Methods*. London: Sage Publications.

Appendix I

Interview Guide

Totnes Food System

Autumn 2009

Semi-Structured Interview Guide

Total of 1 Page

aLp Pir

Background Information :

Date:..... Time:..... Weather:..... Interview location:.....
Name:.....
Completed Education:..... Discipline:.....
Years of Professional Experience:..... Title:.....
Responsibility:.....
Association /Function in the TTT group:.....
Birth Year:..... Gender:.....

Introduction

* I'm conducting interviews with citizens of Totnes and members of the Transition Town Totnes to assess :

a) *In what ways* the TTT contributes to building resilience in food systems?

b) *To what extent* it can be said to be *effective*?

* The interview will last approximately 45 minutes depending on availability. Should a time constraint arise, the interviewer, aLp Pir, will ask selected questions.

* A digital recorder will be used if the interviewee finds that appropriate and I will record the interviewee giving verbal permission.

* Confidentiality is possible only if the interviewee explicitly asks. Even if you donot demand confidentiality, your name will remain anonymous.

Totnes Food System and You

- 1.What, in your opinion, does the Totnes' food system look like today? What are some major concerns therein?
- 2.What are some factors contributing to resilience (in Totnes' food system)?
- 3.What are some factors challenging resiliency (in Totnes' food system)?
- 4.How are you / your business / organisation affected by this?
- 5.What needs to change?
- 6.What is your current contribution to the needed change?
- 7.What would help you along the way to improving your contributions?

If time available :

- 8.How much of your food do you grow yourself (HGF:Homegrownfood)?
- 9.How much of the food you buy is local (LF:Localfood)?
- 10.How much of the food you consume is prepared by you or at home (HCF:Homecooked)?
- 11.What is the average number of meals you consume per day (AMC:Averagemealscons.)?

TTT Food Group

- 1.What are some of the key TTT FG contributions to resilience building in Totnes' food system?
- 2.In what ways can TTT FG's activities be said to be effective?
- 3.In what ways are TTT FG's activities not effective?
- 4.What are the greatest challenges involving TTT FG activities?

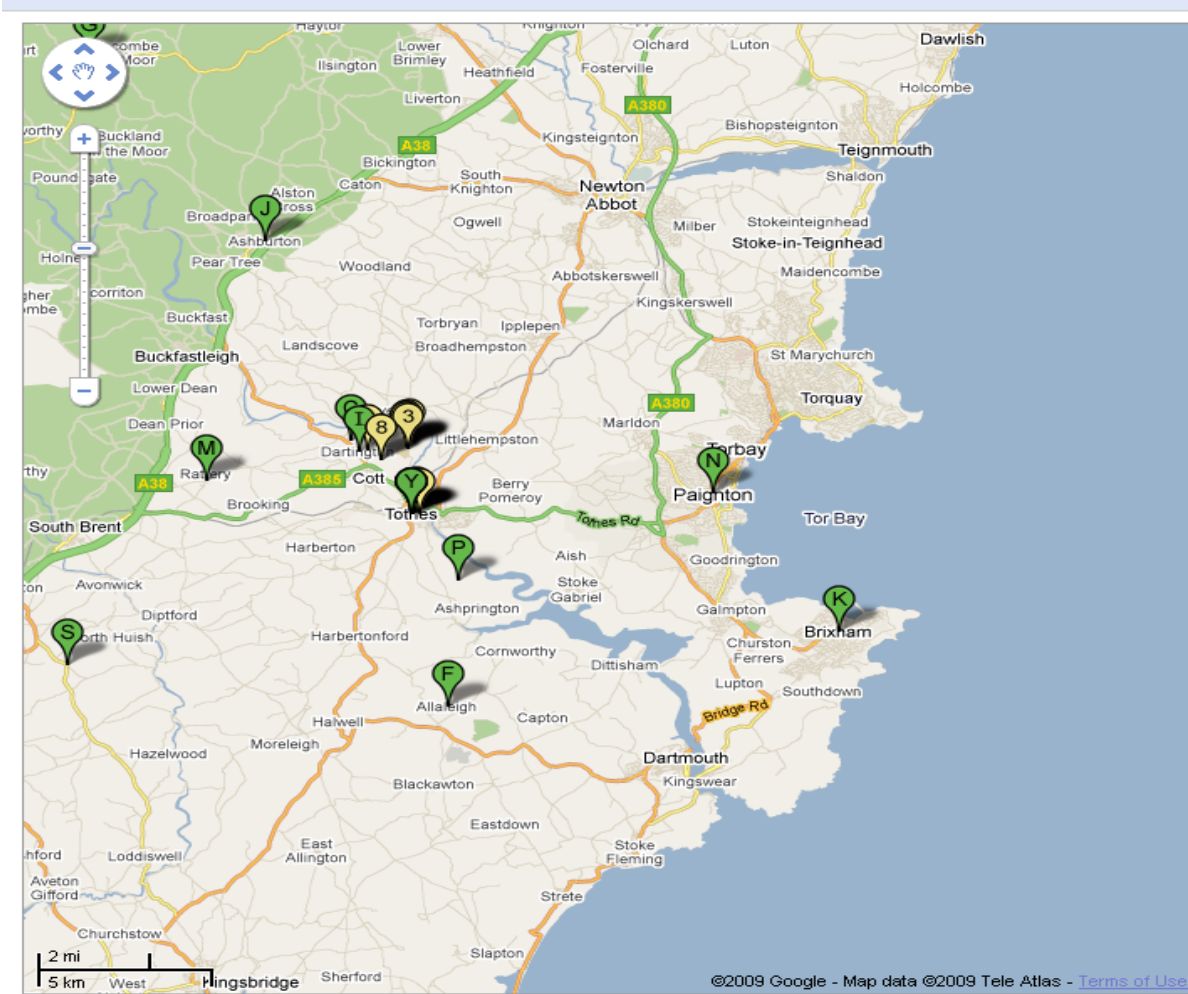
Thank you very much for your patience, open heartedness and cooperation.

Date

Name.....

Signature.....

Interview Locations and Visited Sites



Appendix II

Exploring Resilience Indicators

Additional Resilience Indicators to consider and be monitored over time may be listed as follows :

Number of people employed in farming, horticulture, fishing, hunting, foraging, forestry etc.
Number of hours of food based education in schools and educational institutions
Number of cattle, sheep and pigs
Numbers employed in farming, horticulture, fishing, hunting, foraging, forestry etc.
Numbers employed in local food processing
Number of policy requests (filed, Number of people employed in farming, horticulture, fishing, hunting, foraging, forestry, etc.;
Number of hours of food-based education in schools and educational institutions;
Number of policy requests (filed, responded);
Number of cars owned;
Number of bicycles owned;
Number of processing facilities;
Number of vehicles employed by public transportation;
Frequency of public transportation;
Destinations reached by public transportation;
Farm profitability;
Soil fertility;
Average rate of mycelium growth in the area;
Types of foods grown locally;
Percentage of local foods processed locally;
Percentage of healthy foods free of unhealthy substances;
Percentage of conventional foods;
Percentage share of biodiversity for sequestering carbon;
Percentage share of foods for sequestering carbon;
Percentage of locally produced foods that are sold locally;
Percentage of locally produced foods that are sold nationally, regionally, and globally;
Percentage of imported food (by sea, air, rail and land);
Percentage of out of season foods sold;
Percentage of ready-made vs. home cooked meals;
Percentage share of local foods that meet nutritional needs;
Percentage share of locally sold foods with additives and packaging;
Percentage share of local agricultural, horticultural and related food production;
Percentage share of carbon sequestration capacity of the above;
Percentage of food waste in production;
Percentage of food waste in consumption;
Percentage of food composting (household, farm, private and public institutions, etc.);
Percentage of recycling (household, farm, private and public institutions, etc.)

Appendix III

Tables

Table 1

This table orders the amount of petroleum consumed in 2006 in thousand barrels (bbl) per day and in thousand cubic metres (m³) per day:

Consuming Nation 2006	(1000 bbl/day)	(1000 m ³ /day)	population in millions	bbl/year per capita
United States ¹	20,687.42	3,289.0	304	24.8
China	7,201.28	1,144.9	1369	1.9
Japan ²	5,197.70	826.4	128	14.8
Russia ¹	2,810.76	446.9	142	7.2
Germany ²	2,691.81	428.0	82	12
India ²	2,571.90	408.9	1201	0.8
Canada	2,296.66	365.1	32[29]	26.5
Brazil	2,216.84	352.4	187	4.3
South Korea ²	2,179.90	346.6	49[30]	16.3
Saudi Arabia (OPEC)	2,139.42	340.1	27[31]	28.9
Mexico ¹	2,077.51	330.3	107	7.1
France ²	1,981.18	315.0	61[32]	11.9
United Kingdom ¹	1,812.01	288.1	61[33]	10.9
Italy ²	1,742.58	277.0	58[34]	10.9
Iran (OPEC)	1,679.20	267.0	68[35]	8.9

¹ peak production of oil already passed in this state

² This country is not a major oil producer

Source: [US Energy Information Administration](#)

Table 2

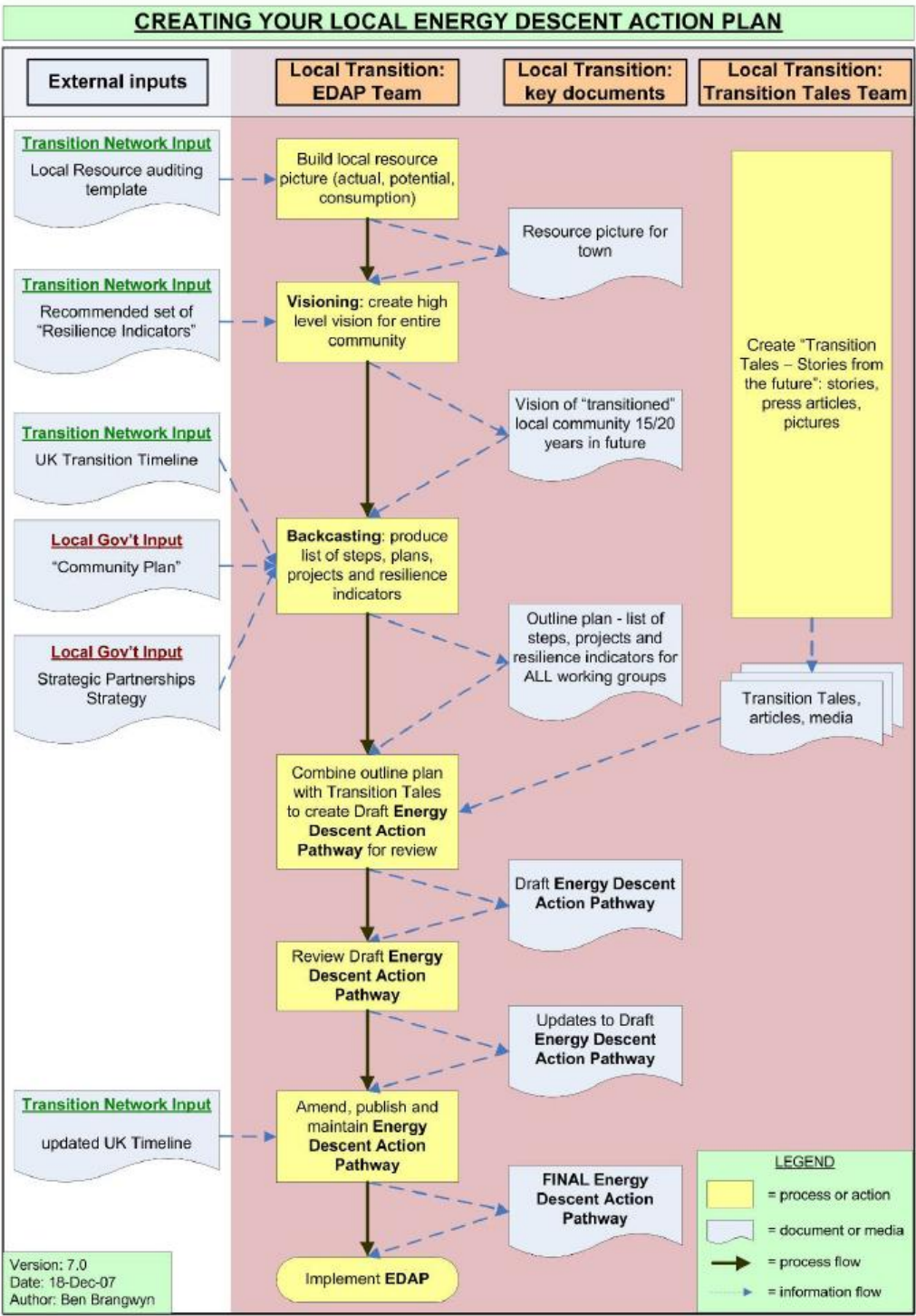


Table 3

UK food self-sufficiency (by commodity) 1980-2005

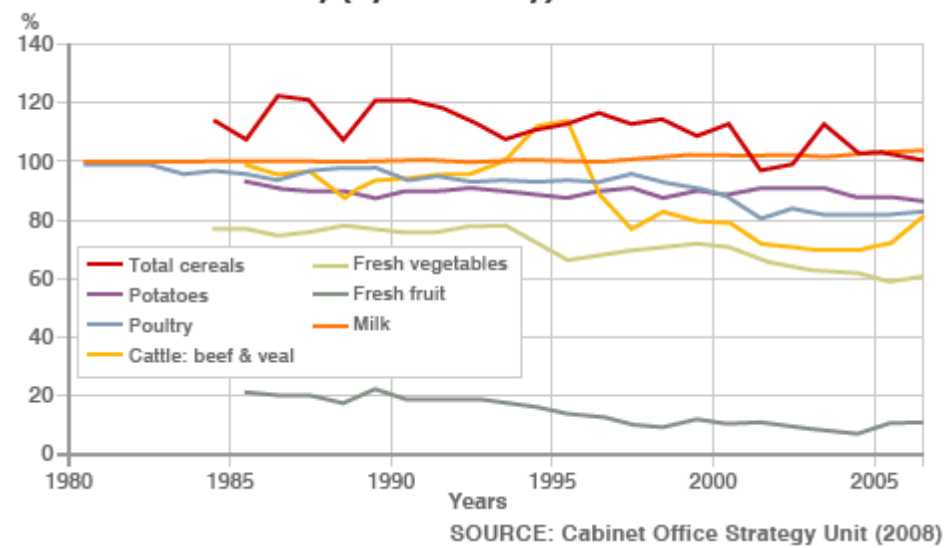
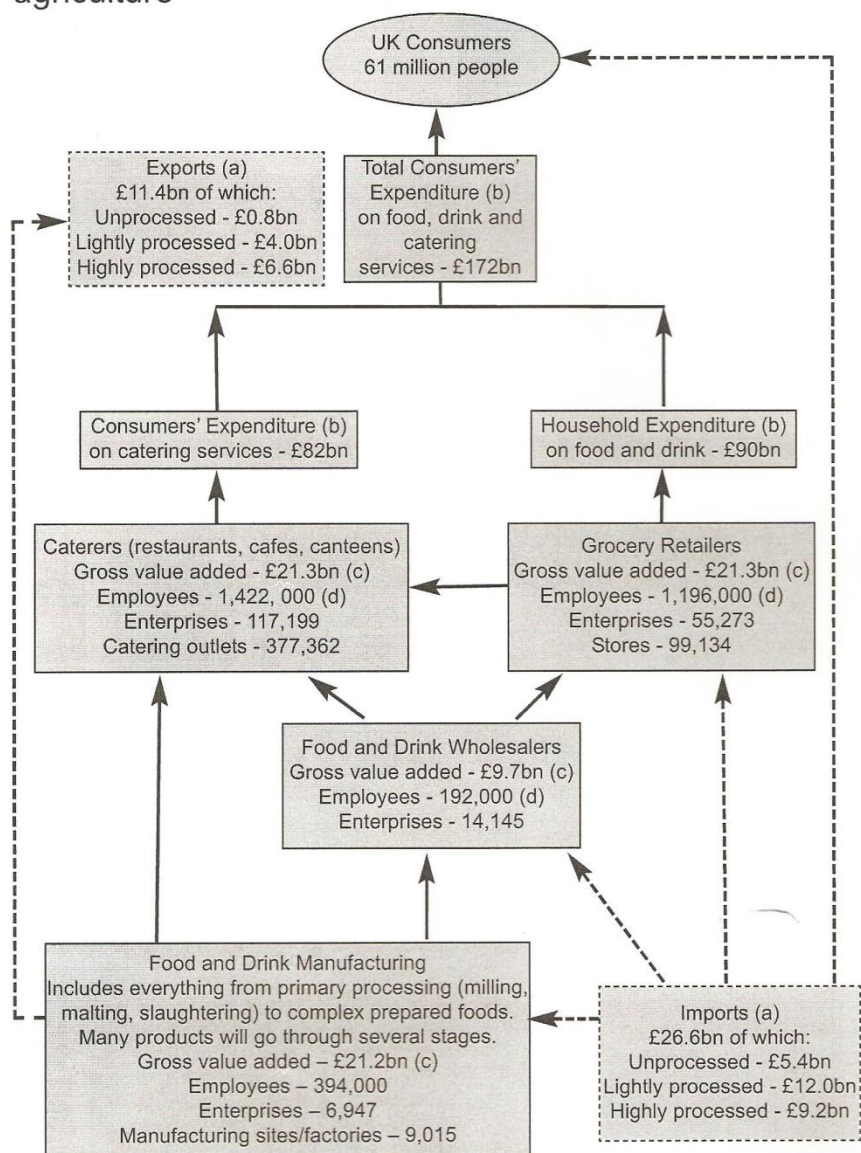


Table 4

Chapter 1: Food Chain

1.1: Economic summary of the UK food chain beyond agriculture¹



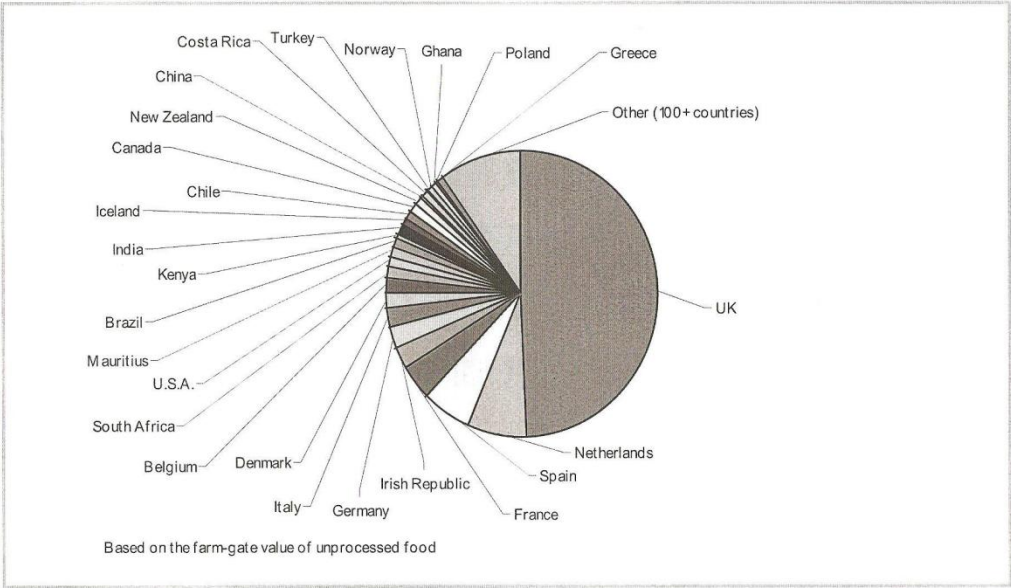
¹ Excludes sectors downstream from food and drink manufacturing such as the food and drink supply industry (food processing machinery).

Source: National Statistics 2008

Table 5

38 **Food Supply & Prices**

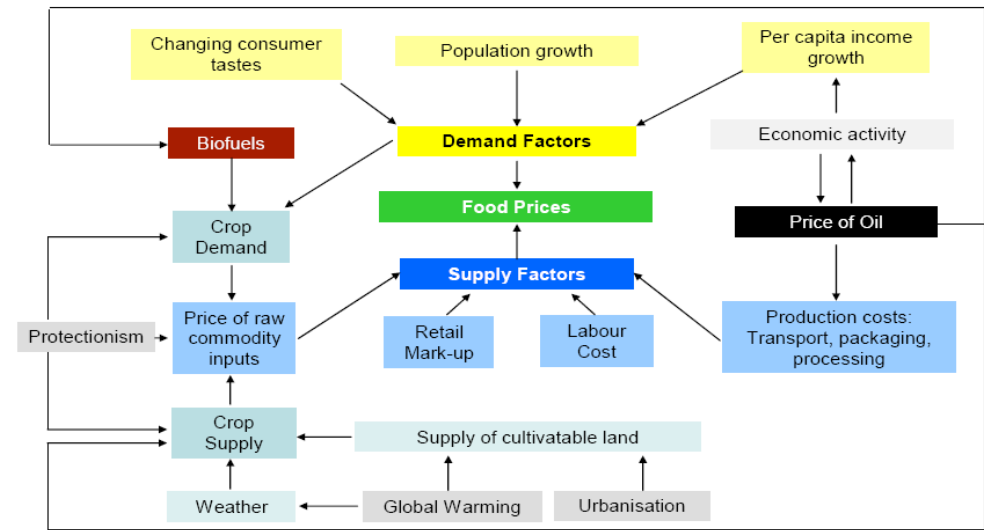
3.5: Origins of food consumed in the UK by unprocessed value, 2006



Source: Defra analysis of HMRC overseas trade statistics

Table 6

Figure 1: What influences food prices



Source: Defra (2008) “Ensuring the UK’s Food Security in a Changing World.”

Table 7

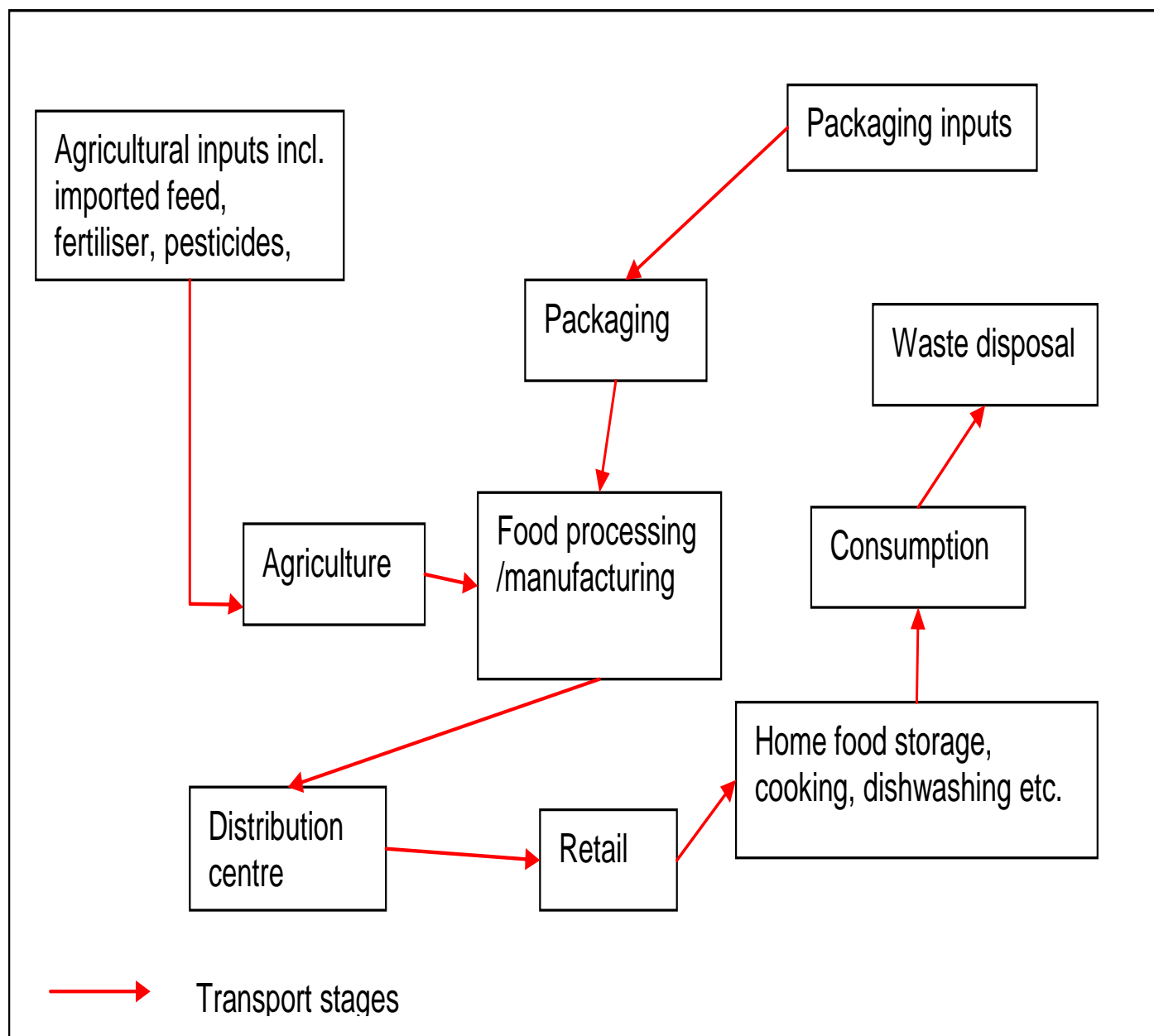
Global status of provisioning, regulating, and cultural ecosystem services

Service	Sub-category	Status	Notes
Provisioning Services			
Food	crops	↑	substantial production increase
	livestock	↑	substantial production increase
	capture fisheries	↓	declining production due to overharvest
	aquaculture	↑	substantial production increase
	wild foods	↓	declining production
Fiber	timber	+/-	forest loss in some regions, growth in others
	cotton, hemp, silk	+/-	declining production of some fibers, growth in others
	wood fuel	↓	declining production
Genetic resources		↓	lost through extinction and crop genetic resource loss
Biochemicals, natural medicines, pharmaceuticals		↓	lost through extinction, overharvest
Water	fresh water	↓	unsustainable use for drinking, industry, and irrigation; amount of hydro energy unchanged, but dams increase ability to use that energy
Regulating Services			
Air quality regulation		↓	decline in ability of atmosphere to cleanse itself
Climate regulation	global	↑	net source of carbon sequestration since mid-century
	regional and local	↓	preponderance of negative impacts
Water regulation		+/-	varies depending on ecosystem change and location
Erosion regulation		↓	increased soil degradation
Water purification and waste treatment		↓	declining water quality
Disease regulation		+/-	varies depending on ecosystem change
Pest regulation		↓	natural control degraded through pesticide use
Pollination		↓	apparent global decline in abundance of pollinators
Natural hazard regulation		↓	loss of natural buffers (wetlands, mangroves)
Cultural Services			
Spiritual and religious values		↓	rapid decline in sacred groves and species
Aesthetic values		↓	decline in quantity and quality of natural lands
Recreation and ecotourism		+/-	more areas accessible but many degraded

Source: [Millennium Ecosystem Assessment Synthesis Report](#) (Pre-publication final draft approved by MA Board on March 23, 2005)

Table 8

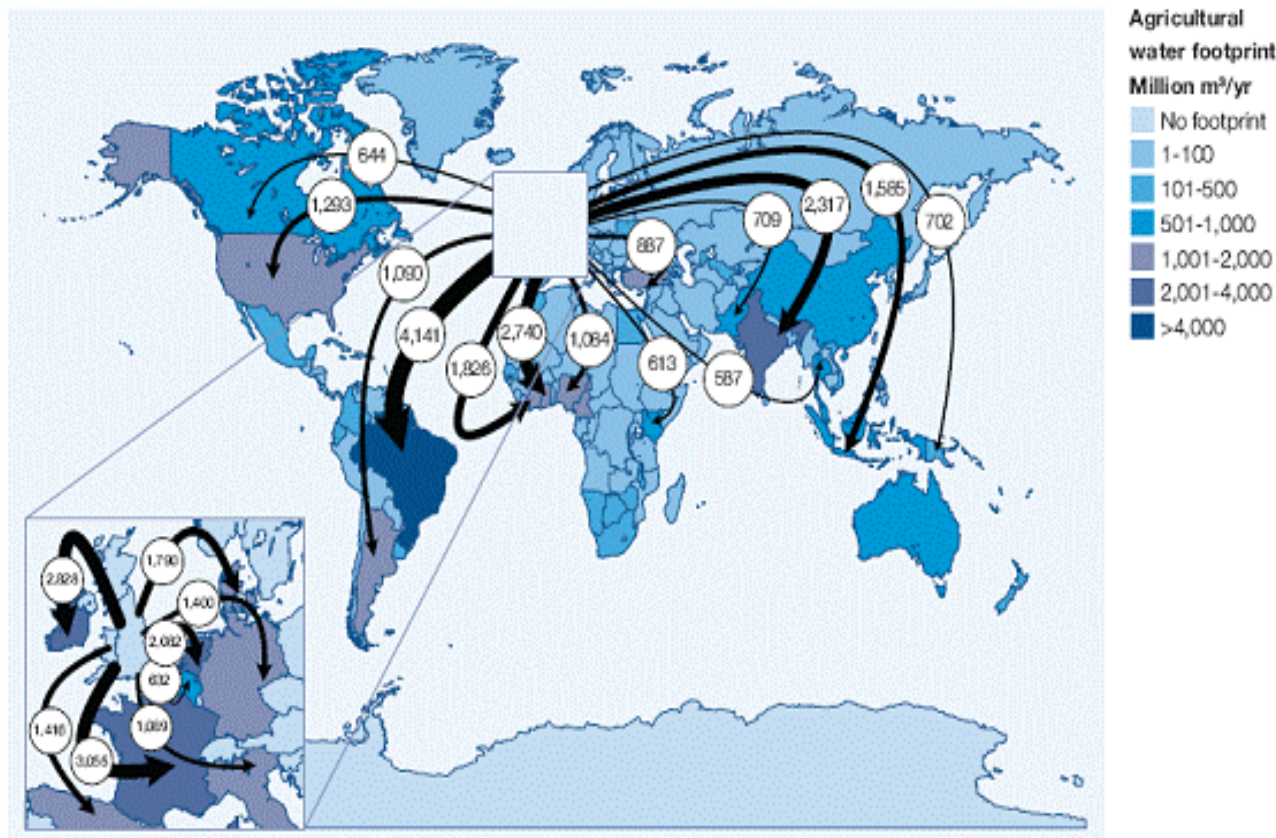
Food system diagram pointing out stages and transport links.



Source : FCRN

Table 9

The UK’s external agricultural water footprint



Source: Chapagain, A. K. and S. Orr (2008) UK Water Footprint: The impact of the UK's food and fibre consumption on global water resources, Volume 1, WWF-UK, Godalming, UK.

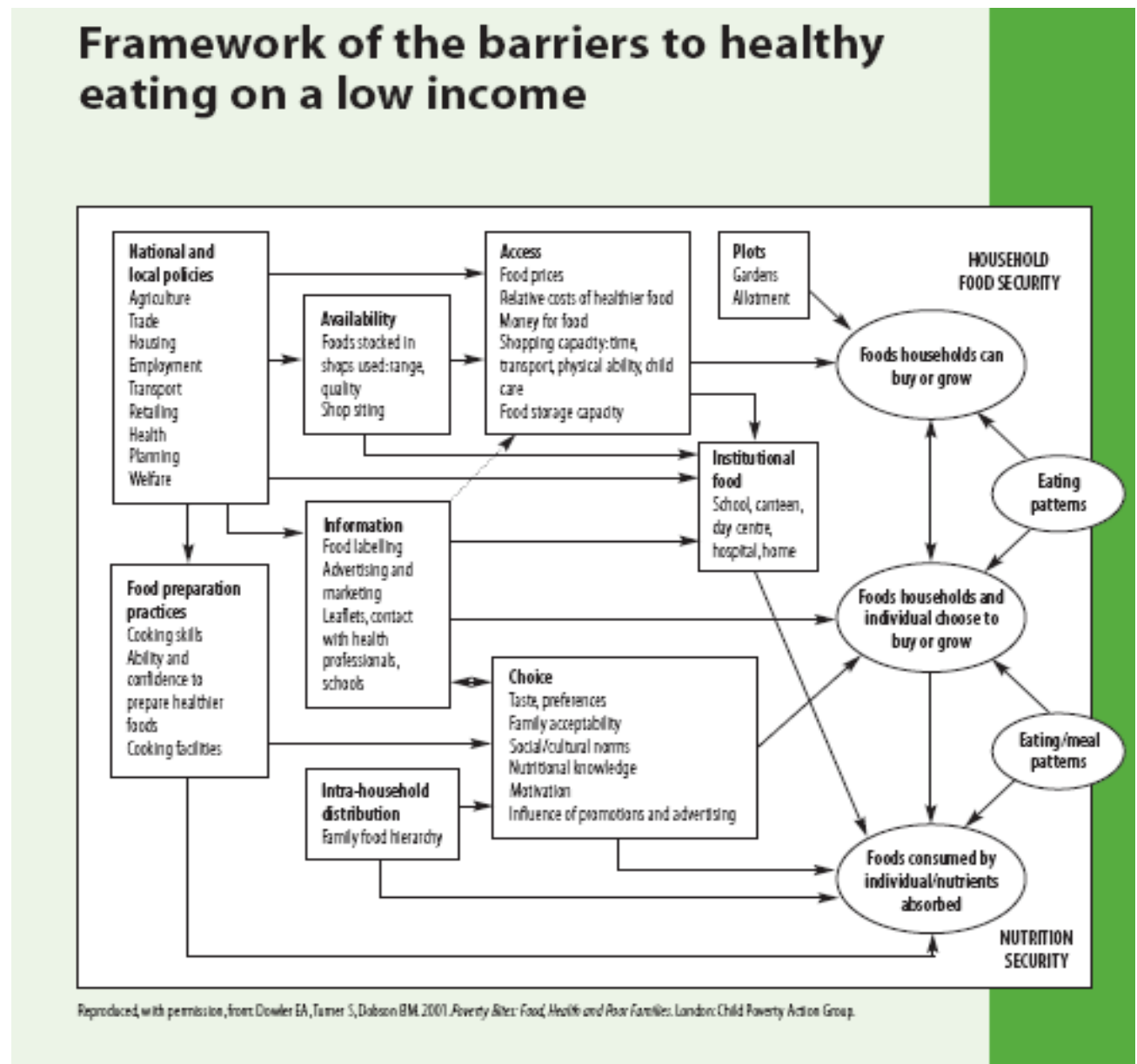
Table 10

Examples of labelling requirements under EC Regulation no. 1829/2003 for authorised GMOs (updated April 2008)

GMO type	Hypothetical examples	Labelling required?
GM plant	Chicory	Yes
GM seed	Maize seeds	Yes
GM food	Maize, soybean, tomato	Yes
Food produced from GMOs	Maize flour, highly refined soya oil, glucose syrup from maize starch	Yes
Food from animals fed GM animal feed	Meat, milk, eggs	No
Food produced with help from a GM enzyme	Cheese, bakery products produced with the help of amylase	No
Food additive/flavouring produced from GMOs	Highly filtered lecithin extracted from GM soybeans used in chocolate	Yes
Feed additive produced from a GMO	Vitamin B2 (Riboflavin)	No
GMM used as a food ingredient	Yeast extract	Yes
Alcoholic beverages which contain a GM ingredient	Wine with GM grapes	Yes
Products containing GM enzymes where the enzyme is acting as an additive or performing a technical function		Yes
GM feed	Maize	Yes
Feed produced from a GMO	Corn gluten feed, soybean meal	Yes
Food containing GM ingredients that are sold in catering establishments		Yes (the FSA's legal view is that labelling is required across EU Member States under EC Regulation 1829/2003).
GM – genetically modified		
GMM – genetically modified micro-organism		

Source: FSA

Table 11



Source: “Nutrition + Food Poverty”, (2004: p. 107) Written by Dr Vivienne Press, Edited by Modi Mwatsama, Produced by the National Heart Forum; the Faculty of Public Health; the Public Health Group, Government Office for the North West; the Public Health Unit, Government Office for the West Midlands; and the West Midlands Public Health Observatory

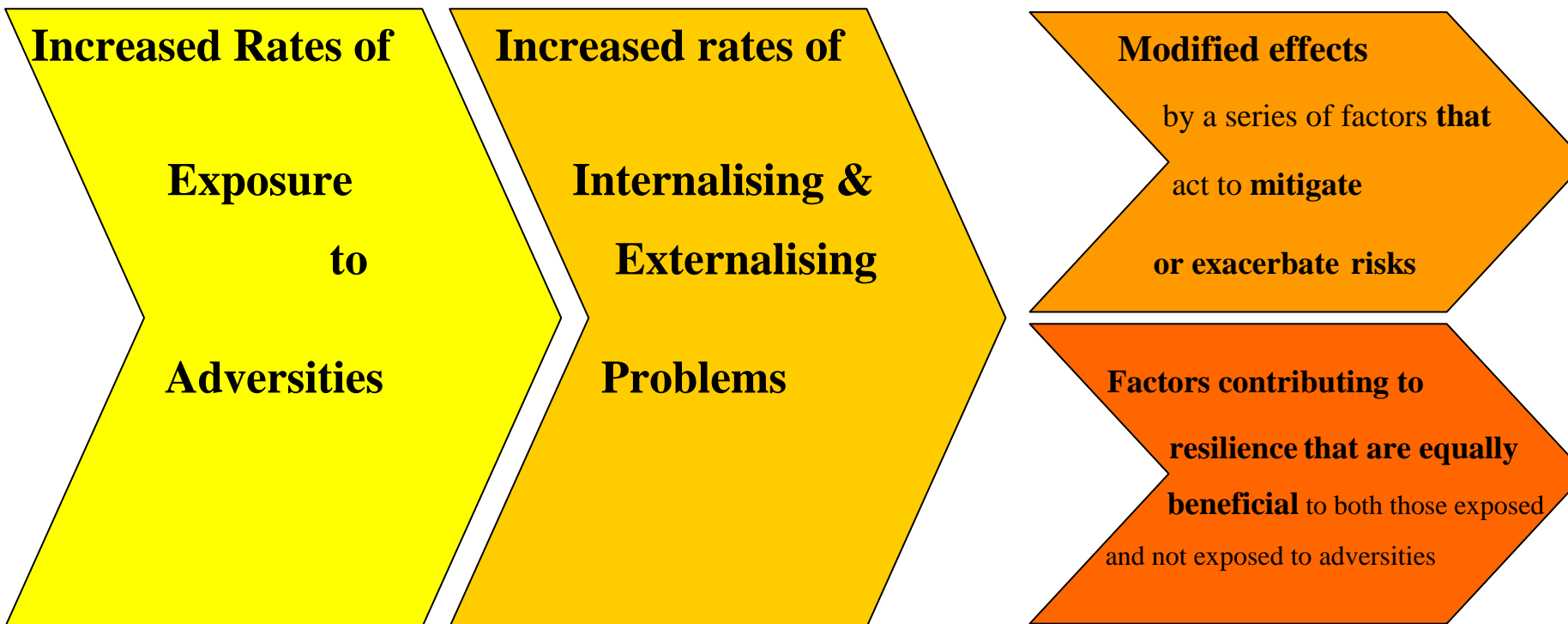
Table 12**Challenges and risks to UK food security**

	Types of threats and challenges (illustrative)			
Scorecard themes	Political	Technical	Demographic & economic	Environmental
Global availability	Wars Export restrictions Bilateral land deals Bio-fuel policies	Yield growth Investment and skills	World population growth Incomes growth	Floods, droughts Plants / animal disease Changing climate
Global resource sustainability	Wars; Institutional and policy failures	Farming practices	World population growth; Farming intensification	Water scarcities Desertification, Soil erosion Climate change; Ecosystems breakdown
UK availability and access	Trade embargoes, Breakdown in international trade; Breakdown in EU trade; EU Regulations	Decline in non-renewable energy; Port closures	Importance of fruit and veg consumption and imports; Sharp decline in UK competitiveness	Animal disease Coastal flooding of ports; Water scarcities; Bio-diversity risks
UK food chain resilience	Strikes / protests Regulation	Radioactive fallouts; IT corruption Contingency planning; Just-in-time	Oil shocks; Absenteeism due to pandemic flu; Food chain concentration; Financial crises	Extreme weather events
Household affordability and access	Planning restrictions	Lack of transport	Poverty; Food inflation; Currency devaluations; Unemployment	Extreme weather events
Safety and confidence	Malicious activity regulatory failures	Contamination;	Increasing demand for complex processed products; Longer supply chains	Pests and diseases

Source: Defra (August 2009) “UK Food Security Assessment”

Table 13

Insights from the study of childhood adversity and resilience: ³³



³³ I have attempted to illustrate the above progression based on Fergusson & Horwood's results of a 21-year study on "Resilience to Childhood Adversity" (Fergusson & Horwood in: S.S. Luthar 2003) with an aim to facilitate comparison to resilience in food system adversity later in the discussion section. Tables 14-16 have been completed as a result of the analysis and discussion sections.

Table 14: Comparing personal resilience with TTT Food Group and Totnes food system resilience

	Self	TTT Food Group	Totnes food system
Factors that exacerbate risks to adversities	<p>Gender</p> <p>Personality and related factors</p> <p>Low socioeconomic status</p> <p>Lack of education</p> <p>Family instability</p> <p>Direct or indirect physical violence</p> <p>Sexual abuse</p> <p>Parental alcohol & drug problems</p> <p>Criminality</p>	<p>Lack of skills and consumption patterns contradict level of environmental awareness;</p> <p>Frustration and burnout;</p> <p>Imbalances in workloads;</p> <p>Lack of landownership or access to land;</p> <p>Lack of or very limited access to resources (time, practical know-how, social, financial; political, organisational) to catalyse large-scale change;</p> <p>Volunteerism based-inconsistencies;</p> <p>Biased inclusivity;</p> <p>Ambiguous accountability;</p>	<p>Lack of skills and consumption patterns contradict level of environmental awareness;</p> <p>Local food supply is dependent on the supermarket based just-in-time delivery system;</p> <p>Environmental awareness is constrained primarily by economic factors and by a lack of access to land;</p> <p>Convenience, availability of choices and exoticism override environmental awareness;</p> <p>Open market based price pressures, lack of local demand and increasing land prices threaten farm profitability and farm continuity;</p> <p>Lack of access to land is a crucial concern;</p> <p>Lack of social cohesion is shown as an inhibiting factor to community action;</p> <p>Lack of policy instruments supporting local land use, food production and food sales;</p>

Table 15: Comparing personal resilience with TTT Food Group and Totnes food system resilience

	Self	TTT Food Group	Totnes Food System
Factors that (may) act to mitigate risks to adversities	Gender Personality or temperamental factors Affiliations and Attachments – Cumulative effects of resilience factors Omitted factors (i.e. non-observed genetic factors)	Awareness raising and skill sharing events; Networking and initiating community-building (empowering) activities; social cohesion; Seeking ways for making better use of available resources for urban agriculture; Organising events for building and increasing the market for local food; EDAP 2009-2030. ³⁴	A relatively high level of environmental and food awareness; Various educational and practical explorations for alternative ways of food engagement; Social cohesion; (continued on the next page) Mindsets and attitudes; Skilling; Steep land structure and woods, hedgerows and river-based biodiversity as valuable ecosystem services.

³⁴ <http://totnes.transitionnetwork.org/EDAPwebversion>

Table 16: Comparing personal resilience with TTT Food Group and Totnes food system resilience

	Self	TTT Food Group	Totnes food system
Factors contributing to resilience that are equally beneficial to both those exposed to & not exposed to significant adversities	Intelligence and problem solving abilities Gender External interests and affiliations Parental attachment and bonding Peer factors Neuroticism Novelty seeking Personality and temperamental factors Affiliations and attachments Cumulative effects of resilience factors Omitted factors (i.e. Non-observed genetic factors)	Awareness raising and skill sharing events; Networking and initiating community building activities for the production and provision of healthy and environmentally friendly foods; Seeking ways for making better use of available resources for urban agriculture; Community building; Contribution to knowledge;	Overall, a high number of people with environmental awareness; A rich variety of educational and practical approaches for reviving local food culture, the connection to food and the exploration of resilience building activities; Small and medium size farms and orchards using mixed, organic and biodynamic methods (the number or proportion is unknown); Small and medium size local food shops, retailers, arts and crafts; Steep land structure, woods, hedgerows, rivers and biodiversity as valuable ecosystem services;

Neuroticism, Novelty seeking, Personality and Temperamental Factors can also contribute to mitigating or exacerbating risks. Cumulative effects of resilience factors are accumulations of resilience factors that may act to mitigate the effects of the accumulations of childhood adversities on the risks of later internalising or externalising. Also, non-observed genetic factors such as neuroticism and novelty seeking – both with relatively high heritability - necessitate further research into resilience to separate the roles of nature and nurture in response to environmental adversity. Furthermore, as examples of gender related responses to resilience suggest, whereas being female reduces the risk of developing externalising reactions, being male reduces the risk of developing internalising responses. Hence, in addition to gender playing a role in the study of resilience, it is also important to distinguish between resilience to externalising and internalising responses. Research shows that what may confer to resilience to one outcome may increase vulnerability to another (Fergusson and Horwood 2003).

Table 17

Table 2 South West Agriculture at a Glance

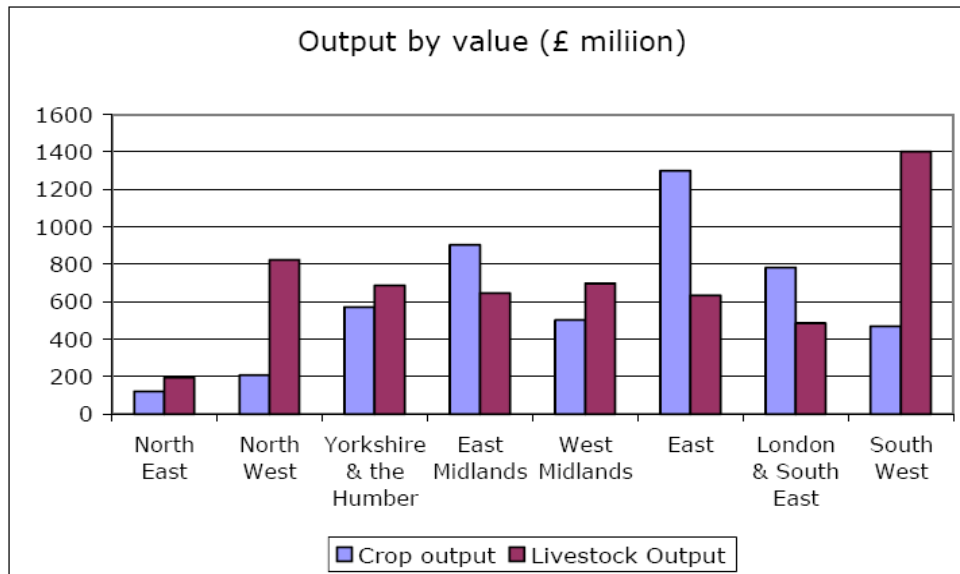
2007		
Land Use	Hectares	% of England
Crops	461,747	12.4
Bare Fallow	19,152	12.9
Grass under 5 years old	207,182	32.2
Grass over 5 years old	954,451	28.3
Sole right rough grazing	77,407	13.9
Set aside	46,340	12.7
Other land and woodland	69,604	22.8
Total area on agricultural holdings	1,869,030	20.1
Crops	Hectares	% of England
Cereal crops	295,513	12.3
Other arable crops	7,725	18.5
Potatoes	6,996	6.7
Horticulture	12,698	8.5
Livestock	Head	% of England
Cattle and calves	1,803,569	32.2
Sheep and lambs	3,162,338	20.5
Pigs	480,055	12.2
Fowl	18,315,773	15.3
Labour	Persons	% of England
Workforce in agriculture	76,341	21.6
Regional workforce	2,599,000	
Agricultural workforce as a % of total	2.94%	

Source: June Census

Source: June Census in Defra FBS (2007-2008)

Table 18

Figure 4 Crop and Livestock Output by Region



Source: Defra FBS (2007-2008)

Table 19

Figure 5 Rainfall in England SW & Wales S for 2007 as percentage of the 1961-1990 average



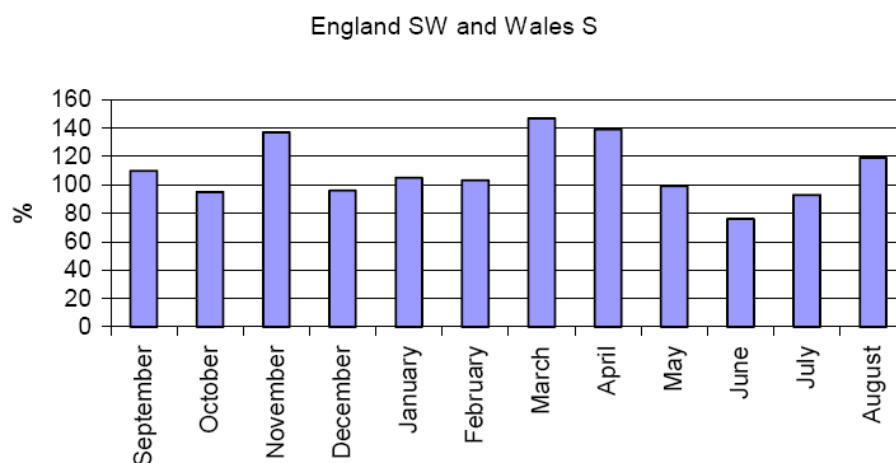
Source: Meteorological Office

The total annual average rainfall in England SW & Wales S was 109% of the 1961-1990 average. The sunshine hours tend to follow the inverse relationship to rainfall, and this is true for the 2007 season with particularly low hours in June and July (Figure 6).

Source: Meteorological Office in Defra FBS (2007-2008)

Table 20

Figure 6 Sunshine hours in England SW & Wales S for 2007 as percentage of the 1961-1990 average



Source: Meteorological Office

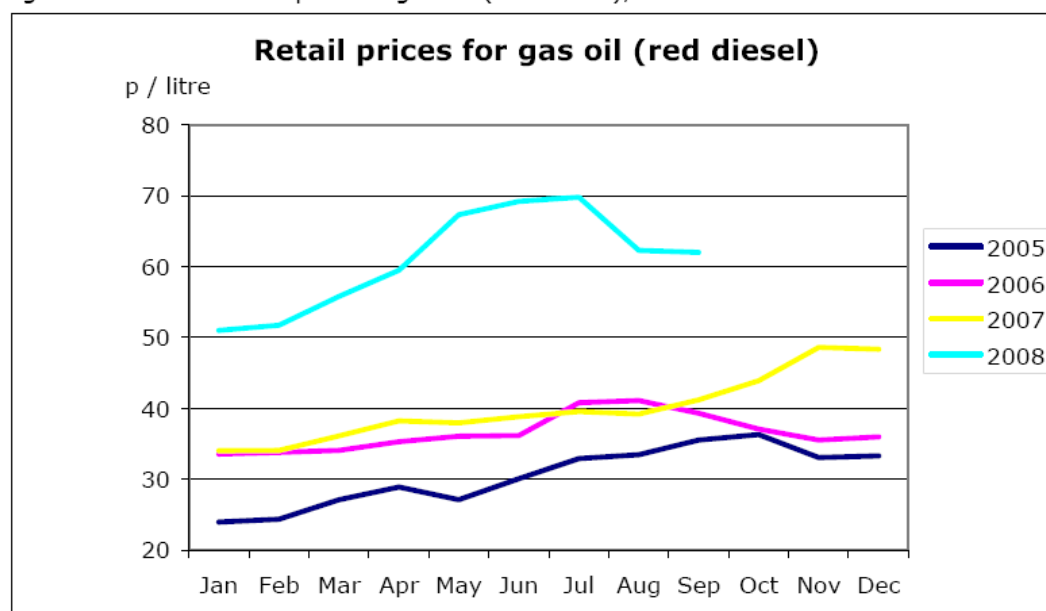
The mean temperature anomaly shows the possible effects of global warming with an average increase in mean temperature of over 1.3 °C for 2007.

Ten months were warmer than the long term average (Figure 7). This trend of higher than average temperatures also occurred in 2005 and 2006.

Source: Meteorological Office in Defra FBS (2007-2008)

Table 21

Figure 11 Trends in the price of gas oil (red diesel), 2005 to 2008

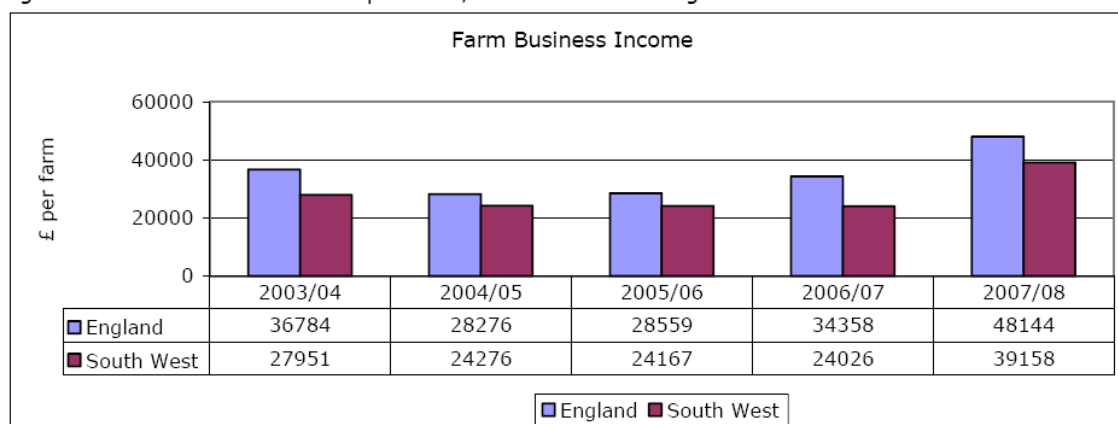


Source: DTI

Source: DTI in Defra FBS (2007-2008)

Table 22

Figure 14 Farm Business Income per farm, South West and England



Source: Defra FBS (2007-2008)

Table 23

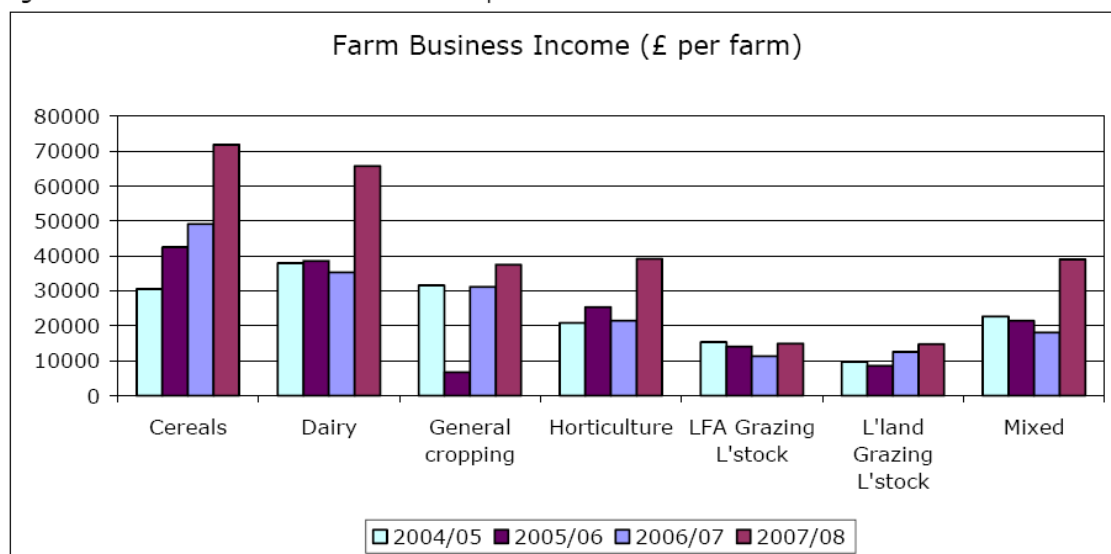
Table 3 Farm Characteristics by region

	Farmed Area (Ha)		Tilled area (Ha)		ALU	
	England	South West	England	South West	England	South West
All farms	132.9	110.9	72.2	40.1	2.8	2.5
Cereals	191.9	194.6	163.1	152.8	2.0	2.0
Dairy	119.4	123.5	26.4	26.9	3.1	3.4
LFA Grazing Livestock	127.1	105.5	1.1	1.2	1.4	1.3
Lowland Grazing Livestock	88.7	74.1	6.2	8.0	1.4	1.4

Source: Defra FBS (2007-2008)

Table 24

Figure 16 Trends in Farm Business Income per farm



All farm types saw an increase in their incomes between 2006/07 and 2007/08. The improvements in FBI for the Grazing livestock types (LFA & Lowland) were less than £2,000 per farm but all other farm types increased their FBI over £8,000 per farm with the Dairy group having an improvement of over £29,000 per farm.

Source: Defra FBS (2007-2008)

Table 25

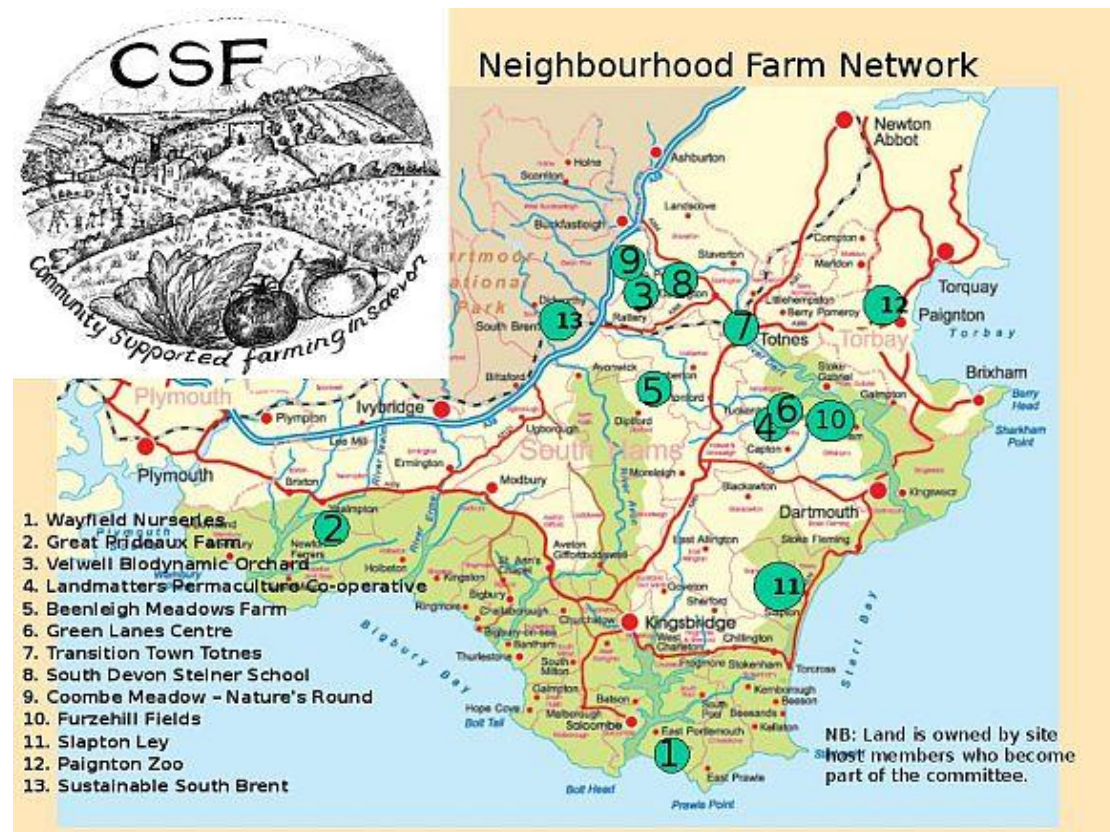
South West Agriculture at a Glance

Land Use	Hectares	% of England
Crops	461,747	12.4
Bare Fallow	19,152	12.9
Grass under 5 years old	207,182	32.2
Grass over 5 years old	954,451	28.3
Sole right rough grazing	77,407	13.9
Set aside	46,340	12.7
Other land and woodland	69,604	22.8
Total area on agricultural holdings	1,869,030	20.1
Crops	Hectares	% of England
Cereal crops	295,513	12.3
Other arable crops	7,725	18.5
Potatoes	6,996	6.7
Horticulture	12,698	8.5
Livestock	Head	% of England
Cattle and calves	1,803,569	32.2
Sheep and lambs	3,162,338	20.5
Pigs	480,055	12.2
Fowl	18,315,773	15.3
Labour	Persons	% of England
Workforce in agriculture	76,341	21.6
Regional workforce	2,599,000	
Agricultural workforce as a percentage of total	2.94%	

Source: Defra FBS (2007-2008)

<http://www.farmbusinesssurvey.co.uk/regional/index.asp>

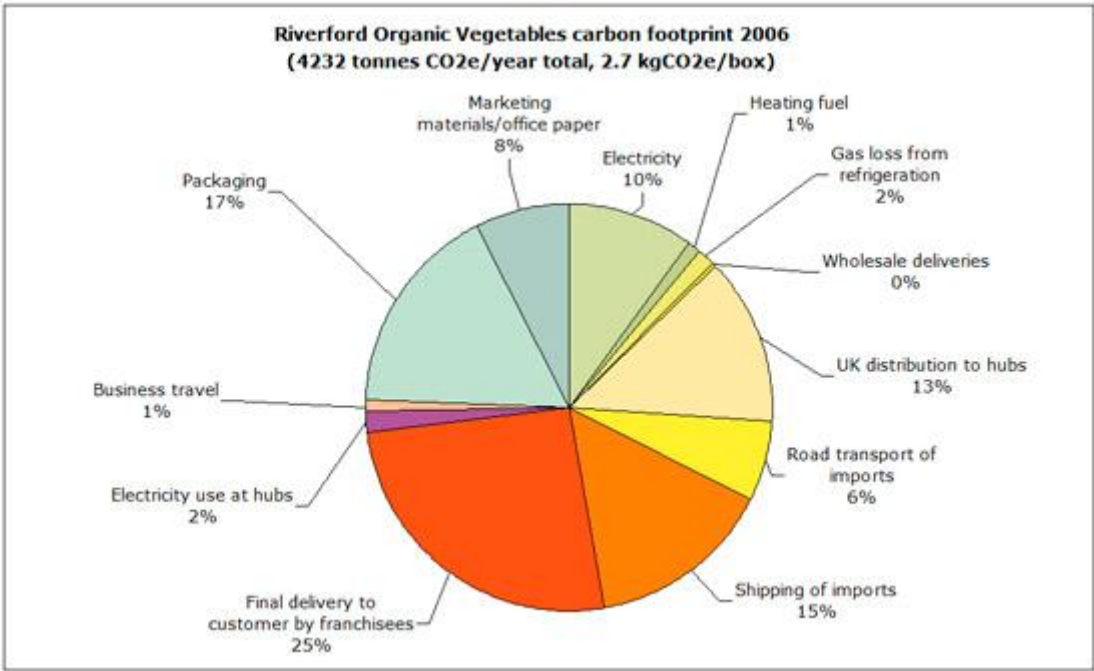
Table 26



Source: Community Supported Farming, South Devon

Table 27

Environmental impact of final food delivery



Source: Riverford Farm (a study conducted with Exeter University)
<http://www.riverfordenvironment.co.uk/Rivercarbfoot.aspx>